CAJANUS

VOLUME I

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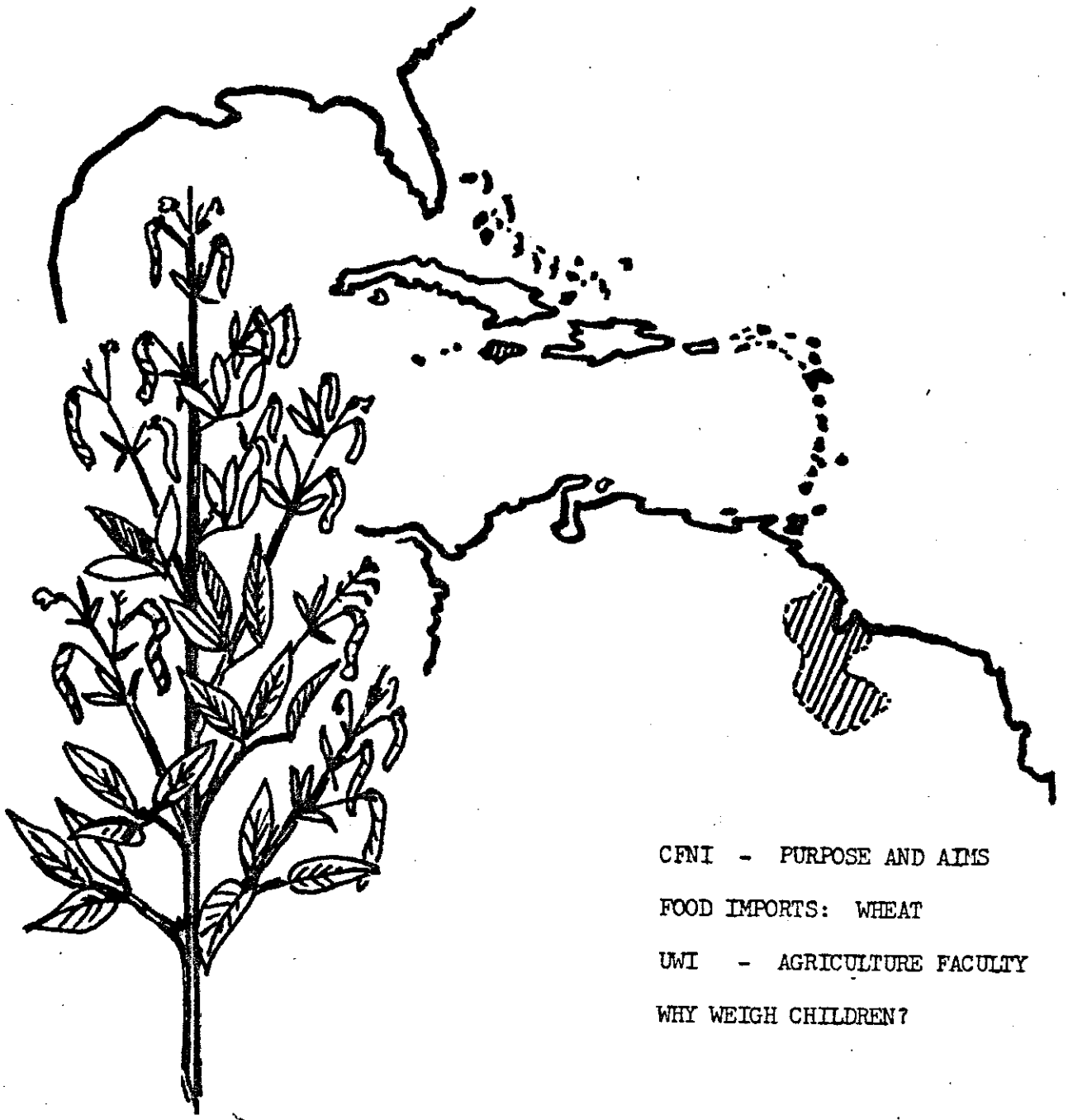
No. 1 February 1968

CAJANUS

NEWSLETTER OF

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE



CFNI - PURPOSE AND AIMS

FOOD IMPORTS: WHEAT

UWI - AGRICULTURE FACULTY

WHY WEIGH CHILDREN?

C A J A N U S

Newsletter of

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE

Mona P. O. Box 140,

Kingston 7, Jamaica

CONTENTS

Opinions expressed in this newsletter are reproduced for the sake of interest and information. They should not necessarily be construed as representing the views of the Caribbean Food and Nutrition Institute, nor of the bodies signatory to the agreement establishing the Institute, namely PAHO/WHO, FAO, University of the West Indies, governments of Jamaica and Trinidad Tobago, the Williams-Waterman Fund.

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE*

(I) PURPOSE & AIMS

The Caribbean Food and Nutrition Institute is a new entity on the West Indian scene, coming into being only in early 1967, and, at the present time, with the issue of the first number of its newsletter "CAJANUS", it has just completed its first year, largely spent in organization and dull, but necessary, spade-work.

It is, then, timely to try to describe what the Institute is, and, as important, what it is not.

Before doing this, it needs to be stressed that much information is already available concerning problems of food and nutrition in the Caribbean. For example, much is known concerning marasmus and diarrhoeal disease in young children, concerning the widespread dental caries seen in school children, and concerning the universal unhealthy equation of a too rapidly rising population and an agricultural pattern historically linked to the production of a limited range of cash crops, at the expense of nutritious foods, especially protein foods, for local consumption.

Additional social, cultural and economic factors obviously further complicate the picture, including family instability, unemployment, harmful food habits (especially concerning infant feeding), poverty and various forms of migration, together with

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*First of a series of articles to appear in CAJANUS concerning the programme of the Institute.

the nutritional influences, beneficial and otherwise, of the tourist industry and of highly advertised imported processed foods.

In addition, it is also self-evident that numerous groups and organizations in the Caribbean, many of international reputation, have been working in different aspects of this wide field for decades, with most valuable and productive results.

Nevertheless, as with all island chains, a basic problem has existed related to difficulties in communication and coordination between the territories concerned. It is, for example, quite possible for several countries to be working towards the solution of a common problem, such as the development of a high protein infant food, without being aware of each other's activities.

Also, recent world thinking has increasingly endorsed the realisation that a sound food and nutrition policy is imperative for the emergence of the healthy, productive, self-sufficient community needed for the economic development of a modern nation .

In addition, it has become more and more appreciated that problems of food and nutrition are almost never solvable by the isolated endeavours of one discipline or Ministry alone. What is required is rather what the economists term an "inter-sectoral" approach - that is a collaborative effort by those working in nutrition-related fields, including health, agriculture, and education.

This type of multi-disciplinary approach has already been commenced in some Caribbean countries, but is by its nature difficult to achieve because of traditionally compartmentalised thinking, and because it is a time-consuming process.

Caribbean countries themselves have become increasingly aware of the need to bridge between the artificially separated disciplines concerned with food and nutrition, as well as the different activities underway in various countries. As a result of this awareness the idea of a centre or institute, which could act as a channel for information, as a communications bridge, and as an inter-disciplinary training centre, was suggested by West Indian nutrition experts some years ago. Following this suggestion and after a long period of negotiation, the Caribbean Food and Nutrition Institute was initiated in early 1967 as a collaborative effort by PAHO/WHO, FAO, the Williams-Waterman Fund, and the Governments of Jamaica, and of Trinidad and Tobago.

With the needs of the area in mind, it seems apparent that the Institute's main role should be one of bridging - between islands, between disciplines, and between centres of advanced knowledge and less well-to-do families. Its principal concern should be with assisting and supporting activities aimed at practical, economical and realistic solutions to food and nutrition problems, based on an inter-disciplinary collaborative approach.

This philosophy is to run through all the planned activities of the Institute, including the training programme, the field investigations, and the advisory and coordinative work.

Conversely, the Institute is not a centre for detailed biochemical or clinical work. These important activities are already catered for elsewhere. Likewise, the research programme of the Institute will not be concerned with fundamental work, but rather with scientific field investigations into methods of application of modern knowledge in the community. Priority topics for research include the cost-availability of foods, the nutritional implications of increased local food production, the nutritional consequences of food import and export policies, the assessment of malnutrition in the community, and the evaluation of preventive programmes.

The philosophy of the Institute is also expressed by its cable address (and also the title of this newsletter) - CAJANUS. This was, of course, selected because of underappreciated importance of the humble gungo or pigeon pea (Cajanus cajan) as a sort of unsung protein Cinderella in the Caribbean, and because it seemed to symbolize the need for increased emphasis on locally produced protein foods, both to maintain and improve human nutrition, and also to help to overcome the harsh facts related to balance of payments and an over-all world picture of decreasing per capita food availability, especially protein foods.

CARIBBEAN NUTRITION NEWS AND OPINION

From the 'Sunday Guardian', Trinidad, 12 November 1967:

FAMINE IN THE YEARS AHEAD IS A POSSIBILITY. (A message from Dr. the Hon. M. P. Awon, Minister of Health, on the occasion of National Nutrition Week.)

The problem on which you are concentrating your thoughts and activities this week is not merely a local one, but an international problem of grave importance.

Malnutrition is one of the major sources of worry to the public health administrations in this part of the world as well as in the developing countries of Africa and the East. In most of these countries the population has increased, and is increasing, at a rate which is greater than that at which food production is increasing. In fact in many areas food production has declined.

We, in the developing countries, have known from experience that, for many reasons, some of them economic, it is impossible for us to rely on surpluses of food produced in the developed countries. These are often very useful in severe national emergencies such as famines, but in ordinary everyday usage they cannot begin to solve the problems created by the numbers of inadequately nourished children who suffer severe physical and perhaps mental backwardness through seriously inadequate nutrition, who also find it perhaps more difficult to fight off the infectious diseases to which children are subject even though their degree of malnutrition may be less severe.

Even in our own country, which from this point of view is one of the more fortunate in the Caribbean-Latin American area, this remains a problem, and, if the relationship between population growth and agricultural expansion is not drastically altered, famine in the years to come is a real possibility.

From 'The Advocate', Barbados 11 October, 1967:

VESSEL TO FISH OFF WINDWARDS

The United Nations Caribbean Fisheries Project research vessel Fregata is due to sail out of Bridgetown Harbour today to operate along the Windward Islands from Grenada to Dominica.....

Speaking on the training programme being carried out, Mr. Harry Winsor, the project manager in Barbados, said that there were at present 20 trainees, five of whom have completed their sea-going training and are now doing some additional training in Barbados. Of the five, two are from Trinidad, two from the Dominican Republic, and one, Mr. Basil Alleyne, from Barbados.

Meanwhile, Mr. Warren Rathjen, chief of exploratory fishing with the project, is at present on the vessel Alcyon, which operates out of Jamaica.

From 'The Star', Jamaica, 17 November 1967:

BIRTH RATE

The Jamaican birthrate must be brought down from 38 per thousand to roughly 25. This would mean that our population at the end of this century, according to Professor George Roberts, would be just three million, " a much more manageable growth than the three-fold expansion to five million which can be expected if the present level of fertility continues".

Is this possible? Clearly so. Barbados have managed to reduce their birth rate to 25 per thousand in 12 years. Why can't we? Already there is a decline in the fertility rate of our women which fell between 1943 and 1960 from 4.87 per person to 4.05. And it is noticeable that the higher the level of education is in a given parish the lower its fertility. This means, in the words of Professor Roberts, that " as education spreads throughout the island, fertility will be further controlled".

What is, however, a little disconcerting is that "married folk have more children per person than common law married", and common law married than those who have "visiting" sexual relationships.*

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* Could it be that this is due less to a deliberate choice on the part of unmarried couples than to a tendency to postpone formalising the relationship until such time as there are already several offspring? In this case it would be a cause for concern only in so far as it influenced a woman against family planning from fear that to have anything less than the maximum possible number of children would prejudice her chances of gaining married woman status. - Editor,CAJANUS.

This is no doubt morally satisfying; but it shows that the illegitimacy and population problems are by no means one and the same. Yet the fact that education is already beneficially affecting the birthrate means that family planning, when it gets fully underway in Jamaica, could be completely successful.

From 'The Daily Gleaner', Jamaica, 4 December 1967

TWO MORE FAMILY-PLANNING CENTRES FOR CITY

The director of the National Family Planning Programme, Dr. L. L. Williams, on Friday announced the establishment of two additional family planning centres in the Corporate Area at the Rollington Town Health Centre, Giltress Street, and at Operation Friendship, Spanish Town Road.

The Rollington Town Clinic will be officially launched on December 15. The programme will include lectures, demonstrations and a film show. The date of the opening of the Operation Friendship Clinic will be announced later.

This brings the number of clinics operated by all agencies in Kingston and St. Andrew to 13, and the total number throughout Jamaica to 56.

From the 'Guyana Graphic', 28 November 1967:

SCHOOLS PREPARE TO LAUNCH NUTRITION PLAN

Eight schools are to complete fencing their kitchen gardens by year-end as part of the Applied National Nutrition Programme. This has been agreed at inaugural meetings held by the district committees of the eight pilot projects. The schools will then receive gardening and home economics equipment sent through UNICEF for launching the nutrition programme in the districts.

The schools are located throughout the country: On the Corentyne, Rose Hall Church of Scotland and Manchester Government; on the East Coast of Demerara, Ann's Grove Methodist; in the suburbs of Georgetown, East Ruimveld Government and Lodge Government; on the East Bank of Demerara, Diamond Goverment; and on the Essequibo Coast, Anna Regina Government and Queenstown Anglican School.

Accompanying the Government Nutritionist, and officials of the Ministries involved in the inaugural meetings with the district committees, were two FAO nutritionists here to help organise the programme. They are Miss Keyser and Miss Puga, both attached to the Ministry of Education.

From the 'Trinidad Guardian', 11 December, 1967:

SALTFISH IS NOW BOSS

He was a very wise man who observed that if you live long enough you are certainly going to see the end of the world.

During the Second World War, it was breadfruit. From cellar position among foods used by natives of Trinidad, the breadfruit found itself covered with glory during the hard times of the 1939-45 period.....

And now, in 1967, saltfish is the boss. The cheapest of foods, saltfish has now climbed to become the most expensive, rating well above chicken and other meats. For in special districts, boneless saltfish is officially priced at one dollar a pound.....

First breadfruit, now saltfish. What next?

COMING EVENTS

(Editor's Note:

We wish to announce in each issue of 'Cajanus' conferences, seminars, special lectures and other events which are to take palce within the succeeding few months and which are connected with food and nutrition. Whilst the number of participants is often restricted, particularly when any expenses are involved, there are sometimes occasions when a person from nearby would benefit from attending such an event or part of it and when the organisers would be glad to allow him to do so at his own or employer's expense.
Would the organisers of conferences, seminars etc., who are willing that such announcements as appear below be made in 'Cajanus', please send details to the Editor, CFNI, Mona P.O. Box 140, Kingston 7, Jamaica.)

February 5th to 7th. The CFNI is organising a Conference for Senior Administrators on "Food, Nutrition and Health in the Caribbean", to be held at UWI in Jamaica. Delegates will attend from those islands and territories within the sphere of CFNI's operations. Visiting speakers from outside the Caribbean include Dr. Cicely Williams, Dr. J. Kevany of PAHO Headquarters, Dr. Teulon of FAO, Rome and Miss J. Ritchie, PAHO consultant.

February 20th to 23rd. A Conference will be held at St. Augustine (UWI), Trinidad, on 'Technology in the Development of Small Transitional Economics'. For further information contact Dr. G. M. Richards, Department of Engineering, St. Augustine.

April 19 to 22nd: The Thirteenth Scientific Meeting of the Standing Advisory Committe for Medical Research in the British Caribbean will take place in Jamaica. The main topic of the meeting will be gastroenterology, but there will also be papers on other medical subjects. For further details contact Dr. D. Picou, Tropical Metabolism Unit, M.R.C., University of the West Indies, Mona, Jamaica.

FOOD IMPORTS: WHEAT

It is somewhat a paradox that wheat - for centuries known as "the staff of life" - presents a serious foreign exchange problem to the Caribbean area.The most important of the cereal grains, wheat today provides more nourishment for mankind than any other single food. Indeed, in the West Indies, the flour imported in 1965 was almost equal in weight to the combined consumption of rice and sugar.

Although the ancestor of wheat originated in the Tigris-Euphrates basin, a tropical zone, this cereal has been changed through centuries of breeding and selection into a temperate climate plant. Thus, all wheat products consumed in the Caribbean are imported.

More than 190 thousand metric tons of wheat flour were consumed by the West Indies in 1958. By 1965, this had increased to 246 thousand tons. The projected consumption for 1970 is 290 thousand tons, increasing to 333 thousand tons in 1975. At pre-devaluation prices, the projected demand for 1970 will cost at the point of origin $63.7m W.I., and in 1975 will amount to $73.2m W.I.

Present imports of wheat and flour already represent the foreign exchange of approximately a quarter of all agricultural exports form the area, at pre-devaluation prices. For the island of St. Vincent, the C.I.F.* value in 1966 of wheat products imports ($1.2 million W.I.) is equal to one-twentyfifth the gross domestic product and approximately equal to the imports of all meat, fish and dairy products. This amount likewise approximately equals the value of all agricultural commodities exported from St. Vincent in 1966, except for copra and bananas. In 1965 Jamaica imported 194 million pounds fo wheat flour, the retail value of which is equal to the total contribution of sugar exports to the gross domestic product.

Since all wheat imports come from dollar areas, the recent devaluation of West Indian currencies will accentuate the foreign exchange problem. Population growth is, of course, another contributing factor. Traditionally, an improvement in the standard of living in modern societies has resulted in increased per capita consumption of bread, and wheat-based products. The total trend toward urbanization in the Caribbean will likely also bring about increased per capita consumption of flour, bread and baking goods. In a household

*Cost, Insurance and Freight = cost of produce at port of entry

expenditure suvey conducted by the Department of Statistics of Jamaica in 1963-64, it was found that rural households spent an average of 5.38 shillings per week on wheat-based products, households in the main towns spent 7.91 shillings and households in Kingston spent 8.51 shillings! Thus the prospects are that wheat will become an evergreater factor to consider in terms of foreign exchange expenditure.

Given this situation, what are the alternative courses of action?

I. WHEAT PRODUCTION IN THE CARIBBEAN

Unlike most types of food imports, there seems to be little possibility of efficiently producing either wheat or a similar cereal in the West Indies during the foreseeable future. Increased production of rice, livestock products, fruits and vegetables can be brought about through increased use of fertilizer, better disease and pest control, better marketing and improved management. Apart from climatic requirements, wheat is best produced under mechanized, extensive farming conditions. Thus, other factors aside, wheat would still have to compete with many other crops on the basis of economic considerations for the limited amount of flat land available in the Caribbean for food production.

II. SHIFT DEMAND TO OTHER FOODS

There is always a possibility that the consumers interest in wheat products can be diverted to other foods by promotional campaigns, educational efforts and appeals to patriotism.

Likewise, national food policy, though price or import controls could insure that arbitrarily decided quantities of wheat or flour were imported. Nevertheless, several countries which adopted these techniques to reduce white flour consumption during World Wars I and II found that it was not possible to bring about shifts in consumer preference, and that forced reduction in wheat flour consumption was effective only while controls were rigidly maintained. It seems that white bread, once introduced, becomes firmly entrenched as a dietary staple in all societies.

Apart from this, enriched wheat flour is one of the lowest-cost universally acceptable sources of calories, proteins, essential vitamins and minerals in the Caribbean countries. Therefore, unless nutritionally adequate and lower cost substitutes were available, national nutrition policy would likely take precedence over efforts to restrict wheat importation on the basis of economic considerations.

Since wheat flour is already an important dietary item in the West Indian diet (contributing from 20 - 50% of the available nutrients to most segments of the population), the following table shows the importance of regulations requiring that all flour used by bakeries and consumers be enriched.

III. IN-COUNTRY MILLING OF WHEAT

Wheat product consumption could be maintained at current levels and savings made in foreign exchange expenditure through local

Recommended Nutrient Allowances for a 6-9 year old child and nutrients provided by one pound of unenriched or enriched flour

	Calories	Protein grams	Calcium milligrams	Iron milligrams	Vitamin A International Units	Thiamin Milligrams	Niacin Milligrams	Riboflavin Milligrams
Recommended Daily# Allowance: 50 pound child- 6-9 yrs. of age	2100	52	800	12	3500	0.8	14	1.3
ONE POUND Bread flour, unenriched	1651	53.5	73	3.6	0	0.35	4.4	0.25
ONE POUND Bread flour enriched	1651	53.5	500-1,750*	13-16.5*	0	2.0-2.5*	16-20*	1.2-1.5*

*Enrichment level can be selected within this range.

#Publication 1146 - National Academy of Sciences, National Research Council, Washington D.C. 1964.

milling of imported wheat. The most evident savings for the importing country come from (a) importation of bulk wheat rather than bagged flour, with consequent savings in freight, handling and storage charges (b) local labour is utilized in milling and bagging the flour and (c) locally-produced bags can be used.

In the milling operation, 100 pounds of wheat is processed into 72 pounds of flour and 28 pounds of bran and shorts, both animal feed ingredients. These by-products of the flour milling industry are particularly valuable in the West Indies where high quality animal feeds, so necessary for increased productivity of livestock, are in extremely short supply.

Wheat flour has been milled in Trinidad since 1965, a flour mill will initiate operations in Jamaica in early 1968, and a mill will be constructed soon in Guyana. These mills will be able by 1970 to supply virtually 100% of the flour demanded by the Caribbean market. However, it must be acknowledged that during the first years of operation, foreign currency savings obtained by local mills are largely offset by payments on the imported machinery required.

IV. WHEAT SUBSTITUTES

It is logical that wheat importing countries investigate the possibility of utilizing flours of locally produced foodstuffs to replace part of all of the wheat in bread. In the Caribbean, traditional crops from which flour can readily be produced include banana, breadfruit, cassava and arrowroot. Nevertheless, problems are soon encountered in substituting them for wheat.

Firstly, a loaf of bread baked in the modern manner for the sophisticated housewife represents a minor miracle of chemistry. It must consist of a combination of ingredients which together contribute certain quantities of mass, volume, crustiness, odour, appearance, taste and shelf life to be acceptable to both the baker and consumer. Replacing a worthwhile portion of the wheat flour with another type immediately changes the properties of the loaf. However, this problem has been solved by cereal technologists.

Another problem stems from the nutritional value of wheat flour, which contains 11% protein, sufficient to serve the human adult as the sole source of food. Since flours of the four Caribbean crops mentioned each contain only about one third as much protein (and of poor quality), a bread containing 50% of these flours and 50% wheat flour will thereby accentuate the existing deficiency of proteins in the diet of many families, and particularly for the growing children.

Recently, a research project was organized jointly by the Freedom From Hunger campaign and the Food and Agriculture Organization of the United Nations to attack both the above mentioned problems in one swoop. The objective of this research, done at the Institute for cereals, flour and bread at Wageningen, Holland, is to develop a bread based on cassava flour as the only carbohydrate source, utilizing the protein of peanut flour or soybean flour to maintain the protein level and quality of wheat bread.

The objective of producing a loaf which practically duplicates wheat bread in baking qualities, appearance, taste and

nutritional value has been achieved. Cereal technologists from Brazil, Columbia and Ghana are now in the Netherlands learning the slight revisions required in normal baking techniques. They will soon return to their home countries to seek answers to the remaining questions - complete acceptance by the consumer, and the relative cost of the necessary ingredients for cassava bread as compared to wheat bread.

Cassava and peanuts are already widely produced in the Caribbean, and the prospects for commercial soybean production in the area are brightening. St. Vincent has, of course, been the traditional supplier of arrowroot for the world market. Banana, cassava and breadfruit flours are now being produced on a semi-commercial scale in Guyana, Jamaica and St. Lucia.

Thus, the development of cassava bread promises to be an important technological development for the West Indies. If this does not prove as successful as is hoped, science still has at least two more trump cards, both held by the wheat geneticist:

1. Breeding a high producing variety of wheat which can be grown in the warmer climates, and
2. Developing extra high protein strains of wheat which can be mixed with low-protein flours and still produce a bread of normal protein content.

Thus, the potentially staggering foreign exchange requirements to satisfy the future demands of West Indian for bread and bakery products can perhaps be held within manageable limits after all.

Who knows, the tropic regions of the world may some day be considered as important producers of the flours used in bakery products, just as they are now thought of as the primary sugar exporters!

GENERAL NUTRITION NEWS AND OPINION

From 'The Daily Gleaner', Jamaica, November 24th, 1967:

WORLD POPULATION 3,356 MILLION IN MID-1966.

(New York, Nov 12)

The world's population reached a total of 3,356 million in mid-1966, according to the United Nations Demographic Yearbook, 1966. If it continues to increase at its present rate of growth of about 1.9 per cent per annum, it is expected that the population of the world will have doubled to 6,700 million by the year 2005.

The Demographic Yearbook, made public today, also shows, for example, that:

* The mid-1966 world total is 61 millions higher than the comparable figure for mid-1965. In other words, the population increased by an average net figure of 167,000 every day of the year covered.

* Nearly three-quarters, or 72%, of the earth's inhabitants live in the developing regions. One-half of the total is on the Asian continent.
* In the developing countries, 41% of the population is under 15 years of age, compared with 28% in the more developed countries.....
* Birth rates averaged 40 per thousand population in developing countries in the 1960-1964 period, compared with 21 per thousand in developed regions.....

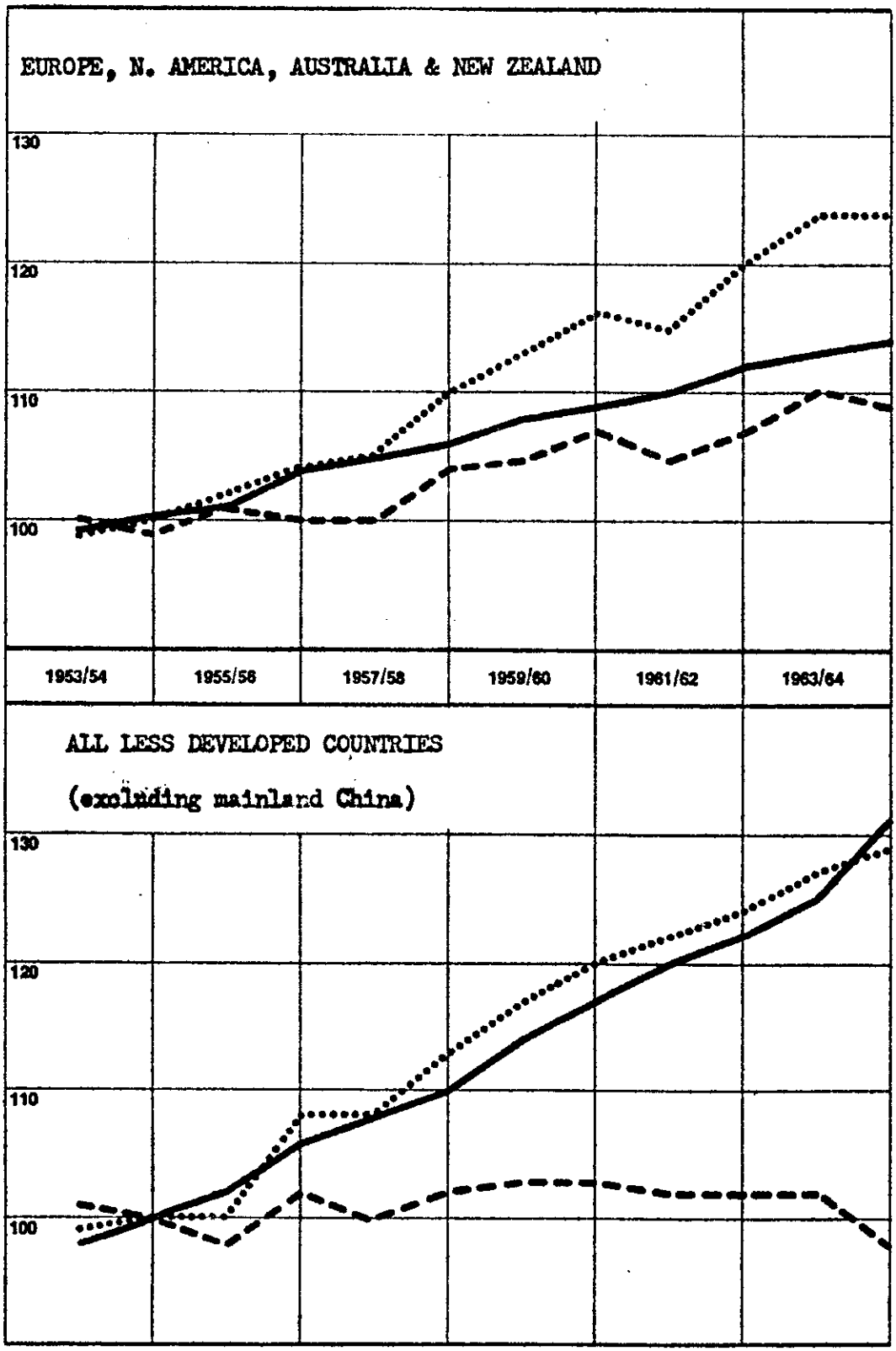
Available evidence suggests that rates of population growth are increasing in both developed and developing countries, the Yearbook states. In the latter, the trend may be accelerating largely because of a fall in mortality rates. In the developed countries, on the other hand, the growth rates appear to be influenced more by changes in fertility, as death rates have changed very little in those countries in recent years.....

The highest annual rate of population growth - 3.5 per cent - is at present found in the Middle Americas, according to the Demographic Yearbook. In 1966 the estimated population of this area was 59 million. The lowest annual rate of increase of population - 0.6 per cent - was found in Eastern Europe, where the estimated population totalled 101 million.....

If their growth rates continue, the population of China (Mainland) is expected to double in the next 46 years, that of India to treble, that of Brazil to quadruple, and those of United States and Soviet Union to double in the same period.....

In a number of developing countries the pace of the decline in infant mortality since 1920 has been far more rapid than was the case in the now developed countries when they had similar levels, the chapter on infant mortaility states. For instance, "in the 45 years preceding 1964, infant mortality in Jamaica declined from 175 to 48, while Sweden required 110 years, from 1825 to 1935, to accomplish exactly the same gains".

Recent trends in Population, Food Production and per caput Food Production



Indices 1952/53–1956/57=100

Population

Total Food production

Per caput Food production

Reproduced by courtesy of O.E.C.D.

READERS' LETTERS

(Editor's Note. We would welcome letters from any reader on any matter relating to nutrition, whether or not arising out of something published in 'Cajanus' previously. We would like to make a regular feature of Readers' Letters. Just to start this feature we reproduce below, thinking it may be of general interest, a letter from Mrs. Southby of Montego Bay to the Director of the CFNI in reply to enquiry from the Director following an artilce by Mrs. Southby in the 'Gleaner'.)

Dear Professor Jelliffe,

Thank you for your letter of 31st October 1967.

Much of the information for the article to which you refer was found in the introduction to "Historic Jamaica" by Frank Cundall, a copy of which could be found in the library of the Institute of Jamaica. The rest I just remembered from a wide range of previous reading. However a book which I have used for previous articles on plants to be found in Jamaica is "Tropical Plants and Gardening", by H. F. MacMillan, F.L.S., published by MacMillan & Co.

These articles of mine were on poisonous plants found in Jamaica, and on 'Bush Teas' as used by the common people. If you think they may be of use to you, I will be happy to send you a copy of each, though I must warn you that I am by no means a scholar, but do this research purely for my own amusement.

Because I realize how vital it is that we find sources of additional food for our rapidly increasing population, I have taken the liberty of sending you two specimens of 'weeds' which 'old time' Jamaicans used in their diet as greens. (These are 'Pusley' which has a small yellow flower and can be found almost everywhere; and "Madame Si' Down", which grows close to the ground or 'sits down'.) Two of the other plants which old timers use as food are susumber, a berry used as a vegetable, usually with codfish, and Bissy Nut for making tea. I suspect that the latter contains a stimulant of some sort, perhaps caffeine. Perhaps the nutritional value of these foods could be investigated. There is of course a vast pharmacopeia of plants formerly used by the common people as 'bush medicine'. I do not think that anyone has as yet written a book on this subject. The little I know I have learned from talking to older people.

Yours sincerely,

Mrs. Herbert V. Southby.

17 November 1967

P.O. Box 140
Montego Bay, Ja.

The role of the UWI Faculty of Agriculture in relation to the food needs of the Caribbean

by

Dr. P. Mahadevan
Dean of Agriculture, University of the West Indies.

What are the food needs of the Caribbean?

If one looked at this question in relation to the imports of food and other agricultural commodities into the West Indies, it would appear that livestock products and cereals are the principal food needs of the area. The most recent statistics available (1964) show that, of the £50 million worth of food and agriculture imports into the West Indian region, about a third was in the cereal category and another third was in the category of livestock products.

But, food needs cannot be determined solely on the values of imports. Although they are, without doubt, a relevant consideration, the composition of local agricultural output and the technical feasibility of producing given foods or crops locally, may be more important factors. Thus, although a substantial quantity of rice is imported into the West Indian islands, and the need to produce more local rice is evident, it is unlikely that all the current imports could be locally produced. Such foods would have to be replaced by others if imports of rice were reduced.

The role of the UWI Faculty of Agriculture

The Agricultural Faculty of the West Indian University is engaged in a major effort to demonstrate to the region that a much greater part of the food needs of the Caribbean can be met from

within the area. This it does in the several ways at its disposal i.e. education, research and extension; the principal way, however, is through its research on food crop production.

The Faculty has been able to demonstrate that, on both technical and economic grounds, there is a case for increased root crop production in the region. Root crops, such as yams and sweet potatoes, are short-term crops of widespread importance in the West Indies; they are extensively grown, there is room for increased production and utilisation of these crops, and they could substitute, in an increasing measure, for other calorific foods currently consumed.

Root crop research in the Faculty is focussed on overcoming barriers to production, and these have been identified as low and inconsistent yields, uneven supply, uncertain market requirements, high labour requirement and the absence of adequate established commercial systems of production. The consumer is interested in cheapness and therefore in low cost methods of production. The Faculty's root crop research programme, like most of its other programme, is therefore clearly defined in economic terms.

The Faculty is also engaged in an intensive research programme on edible legumes. Legumes are being imported in larger and larger quantities every year, despite the fact that most of the legumes can be produced locally. Like root crops, legumes are also relatively short term crops, and the principal objective of the edible legume research programme is to demonstrate that the local production of pigeon peas, red beans and soya bean can be increased rapidly. The interdisciplinary approach at present adopted, aims

at an intensification of work on the agronomic, biochemical, physiological, pathological, entomological, genetic, economic and mechanisation aspects of grain legume production in the West Indian region.

The root crop programme and the edible legume programme are the two principal research interests of the UWI Faculty of Agriculture at the present time. But, as an institution serving many different West Indian territories that contribute to the University, it is also obliged to work on other crops which may have territorial, though not regional importance. Thus, work goes on, on horticultural crops, nutmegs, cocoa, citrus, tomatoes and a whole range of vegetables. But the amount of attention paid to these is considerably less than that paid to root crops and grain legumes.

The future

The Faculty has been giving consideration for some time to the development of two additional research programmes which could help boost agricultural progress in the West Indies. These are a livestock development programme and a cereal programme, which represent areas on which only a limited amount of research is done at present. The objective of the livestock programme would be to provide stronger technical assistance to the livestock development plans of the Caribbean, by means of an expanded training, investigational and demonstration programme based on the UWI Faculty of Agriculture. It is, however, recognised that the available resources are inadequate

for such a programme to be mounted without additional technical support. It is proposed to provide this essential technical support by means of a project operated under the auspices of the Faculty of Agriculture, and consisting of a team of international and West Indian animal scientists, who will be responsible for planning, organising and implementing studies into the key problems limiting the development of the cattle and swine industries of the West Indies.

Attempts to link together regional efforts into a meaningful cereal programme are still in the initial stages. The problems of cereal development have not been seen with as great clarity as the problems of livestock development. It would seem best, in these circumstances, for the Faculty to bring West Indian efforts into the closest possible cooperation with international efforts already in existence, and to provide the necessary added stimulus by injecting a modest amount of support. The Faculty is of the view that International Research Institutes can assist individual countries to create strong research programmes of their own by coordinating research efforts on problems of mutual interest. Corn, sorghum and rice are crops that would fall into this category.

NEWS OF CARIBBEAN FOOD AND NUTRITION INSTITUTE ACTIVITIES

From 6th to 11th of November the staff of the Institute, with the assistance of the St. Vincent's government, of the Save The Children Fund, St. Vincent's and Dr. Robert Bradfield of the University of California, Berkley, and of Dr. Laura Newell of the University of Washington, Seattle, conducted a nutritional survey of pre-school children in St. Vincent. Investigations included anthropometry, clinical examination, the taking of some hair samples for microscopy, home visits to try to ascertain production and utilisation of foods with emphasis on the protein element, and production of data on the availability and prices of foods and on food imports and on exports of agricultural commodities.

From the 4th to 19th December the Institute staff visited again Antigua, Montserrat, Dominica, St. Lucia, Barbados, St. Vincent, Grenada, Trinidad and Guyana. In each territory the staff met workers in nutrition and nutrition-related fields. (It is much regretted that alterations in the boat schedule prevented the visit planned to St. Kitts, and made the visits to Dominica and St. Lucia rather short.) In Guyana, in addition a brief visit was made to several villages the Rupununi district to gain an impression of the nutritional status of young Amerindian children and assess food availability.

A series of investigations is being made into the relative cost in terms of nutritional content of various foods as available to the people of the West Indies.

A joint study is in progress with the Department of Microbiology, UWI Medical School, concerning the relative suitability of acidified and unacidified milk as infant foods from the point of view of bacterial safety.

A bibliography aiming to cover all material published from 1950 to 1967 concerning malnutrition in the young child is in course of preparation and is almost complete.

Information is being compiled on attitudes towards production and towards utilisation of foods which offer good nutritional properties at low cost.

A study is in progress concerning muscle mass in pre-school children.

An investigation is being made into the various factors that operate in relation to child-feeding practices in the area.

WHY DO WE BOTHER TO WEIGH CHILDREN?

One of the earliest birthweights in Western medical literature was recorded by Mauriceau, the French Obstetrician, in 1694, who stated that a liveborn 9-month old foetus normally weighed a substantial 12 lb. 15 oz, adding that he had encountered larger ones in the course of his career (The lb measure used at that period is estimated to be 1.7 oz heavier than the lb measure of nowadays). Not to be outdone by his Gallic confrere, Lobb across the Channel in 1747 noted a birthweight of 16 lb. 7 oz.

The methods employed to estimate these not inconsiderable weights are not known, were these figures inspired guesstimates from the attendants at the delivery? Were the infants swaddled in heavy robes? Were the children actually weighed?

It has been substantially shown (Sylvester 1958) that when christening mitts from the 17th, and 18th centuries were fitted to the hands of 20th century children, in all probability the size of infants delivered in those earlier times approximated closely the size of infants nowadays in the Western world.

We may tend to view with some complacency the probably erroneous statements of these erstwhile physicians, but have we progressed much further in our expertise in weighing neonates and young children?

The weighing machine is one of the relatively most inexpensive and simple pieces of scientific apparatus used in recording the rate of growth in the human race, yet it is the most ill used and abused tool in the medical world, but until a more accurate alternative can

be devised it will remain the main oracle in growth assessment.

The pathos of the situation lies in the reliance of medical personnel on weights recorded in hospitals and clinics. Around this important measure circle the confusing worlds of the low birthweight and post mature babies, and the marasmic and kwashiorkor sufferers, and yet in a busy hospital this responsible task is frequently left to the unskilled and untutored junior nurse who will perform this added chore with as much talent and enthusiasm as she would empty a sputum mug.

One may observe the newborn infant placed on a scale which may never have been checked for accuracy, weighed wearing a soiled diaper or wrapped in a blanket, sometimes still bearing on his umbilical cord a large Spencer Wells clamp. Should enquiries be made as to the availability of a set of known weights with which to test these scales, it will become obvious that this concept is foreign to the nursing staff of the hospital.

When these conditions are encountered one may well ask "Why do we bother to weigh children"? , and what significance can be attributed to this inaccurate little dot on the alleged growth curve of the infant under surveillance.

The importance of accurate anthropometry is not usually included in the curriculum of medical students and nurses in training. Such an approach might improve the value of statistical results published in developed and developing countries.

What should be the criteria of a weighing machine? It should be accurate, yet inexpensive, sturdy yet lightweight, so as to

be easily transportable; preferably recording the weight in kilogrammes, with a range of up to 20 kg (44 lb) and reading to an accuracy of 100 gm (3½ oz); and last but not least safe for the wriggling infant who could, whilst the reading is being done, topple off and be injured in his fall.

The types of machines encountered in most hospitals and clinics depend on two types of mechanisms. Firstly the most popular type, the lever beam balance, either of the platform type suitable for weighing the adult, the schoolchild and the fractious pre-school child, held in the arms of his mother whose weight has already been checked; or the popular standard scale, often supplied by UNICEF, for weighing babies and young children. This latter balance weights up to 16 kgs (35 lb) with 100 gm (3½ oz) increments. Some workers perfer the butcher's steelyard scale, useful in survey work, as it is light, and easily transportable, but a sturdy cloth harness must be supplied in which to weigh the child, and the strong limb of a tree or beam of a house must be available on which to suspend the scale.

Less popular in the medical world are the spring balance scales. Although very simple to use, they tend to become inaccurate with constant use, and the spring may expand in the heat of tropical climates. The ideal scale, incorporating all the previously mentioned features has yet to be designed.

Whatever type of scale is used, the most important feature of weighing any commodity, be it salt fish or a child, is to ensure the accuracy of the machine by calibrating it with a set of known weights starting with the smallest one and working up through the set to the heaviest weight. The scale should be checked daily, and preferably several times a day during a survey. Such events as the vigourous wriggling of a child, cleaning the scale, or moving the balance from place to place will give erroneous results. The balance must be placed on a level firm surface before use. If travelling is envisaged it must be ensured that the locking device has been used.

Children should be weighed in the nude. It is preferable to weigh them before they have partaken of a heavy meal, and after they have performed their excretory functions, but this is difficult to carry out in practice. If metal weights are not available or are too expensive to be provided by the hospital or clinic, small sandbags of known weights, or sealed containers filled with pebbles and clearly labelled with the weight, may be used as a substitute.

Only an honest and intelligent approach to the skill of weighing will render meaningful results, which after all are the goal of all workers in the medical field.

YOUR QUESTIONS ANSWERED

The Editor invites readers to send in questions related to nutrition. The Institute staff will answer them to the best of their ability, either in this regular feature in 'Cajanus', or by post if the reader prefers.

Q. What is Bulgur? How is it best cooked, and what are some of the ways in which it can be used?

A. Bulgur is wheat that has been partially cooked, dried and cracked. It has been eaten since biblical days, and is still extensively used in the Middle East, where it is considered tasty as well as nutritious.

Cracked Wheat Bulgur cooks quickly and has a nut-like flavour. Here is now it is cooked:

2 cups water
½ teaspoon salt
1 cup Bulgar

Heat water to boiling. Add salt and stir in Bulgur. Cover and cook over very low heat for 20 minutes. Do not remove cover while cooking. This yields 3 cups of cooked bulgur.

Bulgur may be used as a hot or cold cereal with or without fruit; as a side dish with stewed peas; as a bake with cheese; in meat or fish loaf; in desserts such as puddings with dried fruits.

Smaller amounts may be added to soups, stews and vegetables.

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Q. What are the main reasons for breast-feeding "failing"?

A. Lactation can be affected by severe maternal illness or marked malnutrition, such as is seen in famines. However, poorly nourished women in traditional circumstances, such as Indian villages, usually feed their babies easily and well, although at the expense of their own reserves.

Successful lactation depends mainly on two maternal reflexes. The first of these is the "prolactin reflex", in which sucking at the breast causes reflex secretion by the pituitary gland of prolactin, which is the hormone responsible for milk production.

The second reflex is known as the "let-down" or "milk-ejection" reflex, in which stimulation of the nipple by the sucking baby causes milk to be squeezed from the alveoli, where it is produced into the terminal milk ducts. The especial importance of this reflex is that it is "psychosomatic", and can be interfered with by anxiety, worry or uncertainty, or, conversely, enhanced by confidence. Breast-feeding has rightly been called a "confidence trick".

Many failures of lactation in mothers, who want to breast-feed their baby and who have time to so do, are due to inter-- ference with the let-down reflex because of lack of confidence. Much of this lack of confidence can be related to lack of familiarity with and apprehension concerning the process of breast-feeding in urban communities, and to subconscious motivations towards artificial feeding engendered by inappropriate and unethical prestige advertising.

* * * * *

Q. What is the food value of green pigeon (gungo) peas as compared with the dry pigeon peas?

A. Throughout the Caribbean dry gungo peas are one of the most economical foods in terms of energy, protein, mineral and vitamin content. One pound of dry peas provides 1550 calories and 92.5 grams of protein; one pound of green peas provides about 500 calories and 31 grams of protein. However, the peas obtained from one pound of green peas with pods provides only approximately 210 calories and 13 grams of protein, due to the weight of the pods. Thus, if nutrient value were the main factor determining price, the green peas with pods would cost only a seventh as much as dried peas, and shelled green peas would be a third the price of the dried peas.

However, they are not so priced, and this makes dried gungo peas the best form in which to buy gungo peas, as well as being one of the nutritional 'best buys' among all available foods.

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Q. Why do Jamaican people persist in eating ackees if they have such dangerous properties?

A. Ackee trees (Blighia sapida) grow in several West Indian islands, but as you suggest only in Jamaica is this delicious food really appreciated. The fleshy golden arillus is a rich source of fat, and when combined with saltfish, and served with rice and peas, a masterly blend of nutritious and highly palatable foods has been achieved.

Ackees are not dangerous, if used when they are ripe, that is when they are allowed to burst open spontaneously. If used in the unripe stage, some toxic substance, isolated by scientists at the University of the West Indies, are known to be released and the amount of sugar found normally in the blood stream is considerably lowered. If untreated, this may cause death. Treatment, which to be effective must be given as soon as possible, is in the form of a sugar solution taken by mouth or administered intravenously.

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BOOK REVIEW

SWEET MALEFACTOR - Sugar, Slavery and Human Society by W. R. Aykroyd. (published 1967, Heinemann, London. 160 pages 30 shs.)

This interesting and lively book is an account of the history of sugar from before its earliest recorded mention by a general of Alexander the Great's army in India to the present prospects for a new International Sugar Agreement. The main part of the book deals with the history of sugar and slavery in the Caribbean and there are also chapters on the development of sugar beet, on rum and the Royal Navy, and on sugar in relation to health. In the latter chapter the author takes a balanced view, not belittling its detrimental effects, especially on the teeth, but believing it premature to express a firm opinion on its possible part in the causation of coronary heart disease.

Perhaps Dr. Aykroyd puts a little too much empahsis on the disturbing and dramatic story of sugar and alavery in the West Indies and too little on sugar production elsewhere after the abolition of slavery. However, he has at least made a most readable book out of what would at first glance seem an unpromising subject. One must particularly praise the style of the author, a former Director of the Nutrition Division of FAO, a style in total contrast to that which is more characteristic of international civil servants, and of which he gives us an hilarious example on page 114. As well as being most informative, "Sweet Malefactor" is more entertaining than most novels, and in truth the book is as easy to digest as its subject.

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COMPETITION FOR RECIPE USING PIGEON (GUNGO) PEAS

Prizes: First Prize - Five Pounds (24 W.I. Dollars)

Runners-Up - One Pound each (4.80 W. I. Dollars)

Terms of Competition: Open to anyone living in the Caribbean area including Guyana.

Recipe should be original or mainly original and should conform to the following:

a. Should be within the economic capabilities of the majority of the population, but with universal appeal;

b. Should be acceptable to the whole family including young children;

c. Should aim at a fair degree of simplicity in preparation;

d. Recipes should be constructed so as to provide 4 adult helpings.

e. Fresh or dried peas may be used;

f. Recipe may be for main dish, sidedish, or snack.

Last Date of Entry: Send recipes to Editor of Cajanus, Mona P.O. Box 140, Kingston 7, Jamaica, to reach him by 15th April at latest.

Judges: The recipes will be made up according to instructions and tested by a panel consisting of a Nutritionist, a Home Economist, a Public Health Nurse and a Social Worker.

Results: Winners will be announced and their recipes published in the third issue of Cajanus (June 1968).

EDITORIAL ANNOUNCEMENTS

This newsletter will be published six times a year, at the end of February, April, June, August, October and December. (For special reasons the first issue is being published a little ahead of time.)

The Editor would be most pleased to receive from readers news about activities related to nutrition in any of the islands and territories in the Caribbean area. We would be particularly pleased if in each island or territory a person (for example the Secretary of a Nutrition Committee or other technical person concerned in nutrition) could be designated or volunteer to keep us informed about nutrition related developments in the island.

In addition the Editor reminds readers that correspondence is very welcome for the "Readers' Letters" and for the 'Your Questions Answered' features. Likewise we would like to receive details of forthcoming events such as conferences and seminars whenever the organisers would wish to publicise them.

The last date on which correspondece can be received for inclusion in the next issue of Cajanus is the 8th of the even-numbered months, viz. 8 April, 8 June 8 August, 8 October, 8 December, 8 February.

THE PURPOSE OF THIS NEWSLETTER IS TO FACILITATE COMMUNICATION OF INFORMATION AND OPINION BETWEEN ALL WHO ARE CONCERNED IN ANY WAY WITH FOOD AND NUTRITION IN THE CARIBBEAN. PLEASE HELP US IN THIS BY WRITING TO US.

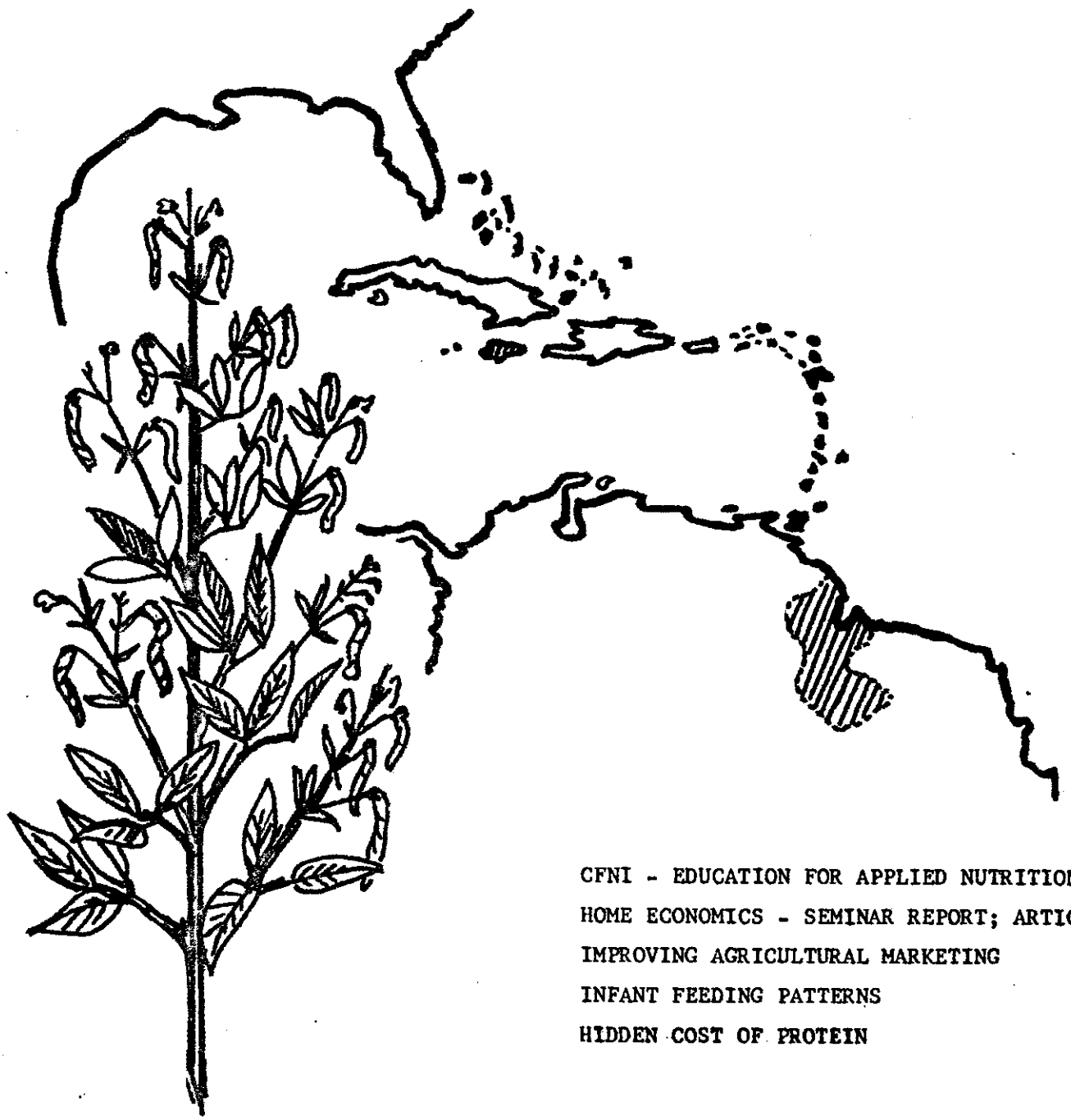
Editor of Cajanus,
CFNI, Mona P.O. Box 140,
Kingston 7, Jamaica.

No. 2 April 1968

CAJANUS

NEWSLETTER OF

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE



C A J A N U S

Newsletter of

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE

Mona P.O. Box 140

Kingston 7, Jamaica

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Opinions expressed in this newsletter are reproduced for the sake of interest and information. They should not necessarily be construed as representing the views of the Caribbean Food and Nutrition Institute, nor of the bodies signatory to the agreement establishing the Institute, namely PAHO/WHO, FAO, University of the West Indies, governments of Jamaica and Trinidad Tobago, the Williams-Waterman Fund.

CARIBBEAN FOOD AND NUTRITION INSTITUTE

(II) EDUCATION FOR APPLIED NUTRITION WORK

A growing awareness of the Caribbean problems of food and nutrition, and their relationships to community health, economic progress and social development, has highlighted the urgent need for ensuring that available modern, scientific knowledge of nutrition reaches and benefits the population at large.

To obtain results in this complex field, there is plainly a need for a coordinated approach to solutions to these problems. To achieve this, an interdisciplinary network of informed policy makers and trained technical personnel is required.

To build up this network, a process of exchange of information and education has to be devised which will (a) extend through the whole administrative-technical gradient, and (b) continue thereafter as a many channelled, many directional flow.

The levels and groups whose informed opinion and active support in planning and in execution is needed including the following:

Policy makers:	Politicians, administrators
Technicians:	Doctors, agriculturists, educators, existing community agents.

Training programmes are especially needed for technical personnel, such as senior public health nurses, agriculture extension workers, home economists and community development workers, who are most likely to be able to influence the work of existing community agents, and hence reach the population. The CFNI six months course is designed especially for this purpose.

The sequence of training activities planned by the Caribbean Food and Nutrition Institute is given in the following Table:

Collaboration of existing training. As far as time permits, it is obviously desirable to try to collaborate in the training programmes of various groups that are already underway. The limiting factor is time and so far CFNI has only involved itself in trying to insert further emphasis on nutrition into the training programmes of medical students and agricultural undergraduates.

Major points in training. All the training programmes envisaged will try to cover the following major points:

1. Interdisciplinary approach. Actual training must be carried out by different groups not only so that they appreciate each others background and potential, but also so that they can learn and work together subsequently.

   Difficulties of this type of training programme are obvious, especially because of differences in technical background of the different groups. Often it may be necessary to devise a common core for all students, with special sessions for those from different disciplines. It is, of course not intended that a uniform product be produced and each discipline will plainly retain an area of specialization.

2. Realism. The training programme must be related to the local ecology - that is, to the climate and geography, to the social economic background, and to the local culture pattern.

3. Priorities. Activities must be channelled towards important priorities - often towards nutritional deficiencies of vulnerable

	Conferences	Inter-disciplinary Community Nutrition Courses	Special Topic Seminars	Collaboration in Existing Training
1968	February Senior Administrators (Jamaica) May Senior Technical Personnel (Trinidad)		July High Protein Processed Foods (Guyana)	U.W.I. Under graduates - Medical - Agricultural
1969		January University Course (6 months + 3 months) (mobile through Caribbean)	Topics dependent on needs	U.W.I. Under graduates - Medical - Agricultural
1970		Intensive Area Courses (2 or more)	Topics dependent on needs	U.W.I. Under graduates - Medical - Agricultural

groups, particularly young children, and, in the Caribbean, towards the need for a programme of diversification of agriculture within the West Indian countries themselves.

4. Practical. Effective learning can be so much more usefully achieved by practical involvement. It is, therefore, imperative that team training be carried out collaboratively in actual areas in the field.

5. Role as teachers. A major aspect of any training programme of this type is that it should prepare people for becoming teachers themselves. They need to know, understand, and be able to practise modern teaching. One of their main tasks will be related to their role as teachers of auxiliaries, volunteers and villagers.

6. Modern methods of nutrition education. An important need is to instill an understanding of modern methods of nutrition education . This will include not only a knowledge of methods and media, but also, more importantly, an understanding of the mechanics of group dynamics and factors responsible for motivation to change.

7. Principles of evaluation. As with any public health programme, it is obviously necessary to try to work out how effective (or otherwise) any activity has been, in relation to its cost in money, time and staff. The principles of evaluation must, therefore, form a main component of any curriculum.

8. Relation to applied programmes. The training received must obviously not be carried out in vacuum, but must be devised so

that it is relevant to the applied programmes that the students will be expected to undertake on return home. Obviously, this will be easier if a group of them are able to attend from one country.

9. Relation to national economic development. The implications of nutrition in economics should be emphasised in the students' training programme. This should include not only the cost of malnutrition to the community and the economics of food policy, but also the important part played in the country's national economic development.

NUTRITION NEWS AND OPINION FROM THE CARIBBEAN

From the Barbados 'Advocate', 11 February 1968:

PRODUCTION OF FOOD CROPS IS MOVING AHEAD. Barbados is making tremendous strides towards diversification of the country's agriculture. Research and agricultural stations throughout the island are continuing experiments of diverse crops with maximum success. Eventually these mini-scale agricultural schemes will give way to more progressive methods on a wider scale thereby ensuring that Barbados, like most young developing nations will make full use of its agricultural resources and create an atmosphere of self sufficiency and greater economic stability.

Onions, tomatoes, cauliflower, paw paws, egg plants, cabbages, carrots, peppers, beans and citrus are some of the crops which are now cultivated at the various agricultural stations in the island and during a tour of these centres, the Minister of Agriculture, Mr. Da Costa Edwards, expressed his satisfaction with the work done at Sayes Court Research Station, Bullens Research Station and Jerusalem Agricultural Station, towards the diversification of agriculture and the growing of food crops.

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Mr. Edwards said: "This effort is the answer to the agricultural diversification of the island. As it is now, food imports into the country are some $34 million. If Barbados could produce sufficient food crops, it means that the country could save about $15 million and could still develop an export market for their agricultural commodities."

From the 'Guardian', Trinidad, 17 January 1968:

PIGEON PEAS: 3 MILLION POUNDS. The Marketing Division of the Ministry of Agriculture expects a yield of 3,000,000 pounds of pigeon peas this year.

An Officer of the Division said that the purchases would begin only in Trinidad. He hoped arrangements would be finalised for purchasing to start in Tobago the following week.

Today Mr. Benito Thomas will fly to Tobago to start making the arrangements for the farmers to sell their peas. Tobago yields an average of 1,000,000 pounds annually.

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Government last year undertook a campaign to export canned pigeon peas to relieve the piling up of stocks, but despite this, there are still stocks on hand.

"Things look very fruitful for the future and everything is expected to work out smoothly" an offical stated. The Trinidad product is competing against canned peas from Africa on the British Markets.

It is hoped that Trinidad will be able to get into the South American Market.

Editorial from 'The Vincentian', St. Vincent, 20 January, 1968:

HEALTH EDUCATION: It would be an understatement to say that lack of education, in its broadest sense, is one of the fundamental handicaps to progress in St. Vincent. This observation has been highlighted and unanimously endorsed at the public seminar on "Some aspects of development in St. Vincent" just completed under the auspices of the Extra-Mural Department of the University of the West Indies.

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Health as a basic ingredient in the total fulfilment of the people's aspirations, suffers these same human limitations, hence the importance of considering this island's need for health education. The WHO Expert Committee on Health Education states "the aim of health education is to help people to achieve health by their own actions and efforts. Health education begins, therefore, with the interest of people in improving their conditions of living, and aims at a sense of responsibility for their own health betterment as individuals, and as members of families, communities, or governments." To put it succinctly, health education aims at helping people to help themselves. Of course, this is easier said then done, especially in an under-developed country where poverty and illiteracy interact to produce children and despair, with the effect of perpetuating a state of stagnation in economic and social development.

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Our needs in health education cover a vast range of subjects - child health, school health, dental health, public health, sex education and family planning, mental health, nutrition and food production. Factual knowledge of these subjects is important, and is available within our local ranks. But the communication of facts is in itself useless without the techniques that will lead to changes in people's attitudes, beliefs and behaviour. This point assumes even greater significance when one is attempting to get a people to "unlearn" a wrong, and sometimes dangerous idea, - an exercise which is doomed to failure unless that wrong idea can be displaced by an authentic one using the right approach.

In a small developing country like St. Vincent where the accent must for a long time be on the preventive aspects of health, professionalism and expertise must be given their rightful place in the teaching of health to the community, in the same way that they are finding their place in primary and secondary education. At a time like this when Government is on the threshold of implementing an Integrated Health Programme it should be remembered that the introduction of a service designed to improve the health or the living conditions of people will not succeed, or only partially succeed, unless it is accompanied by effective health education.

In this context, the St. Vincent Planned Parenthood Association should be congratulated not only for their foresight, which they share with many individuals and groups, but for their action which has resulted in their obtaining, through the kindness of OXFAM, the services of a qualified health educator to assist them in a vital educational process needed for the success of their work. Their recognition of this wider health education need of the community has prompted them to offer the services of their health educator to the departments of Health, Education, and Agriculture for the extension of their programmes.

Health education cannot be considered in a vacuum. The educator and the agency need people with whom and through whom they must function. Health education is not a passive process; it is not all giving. It is essential that the members of the community participate actively, and cooperate in what has already been termed a "self-help" exercise. Finally, health education is not an end in itself. It is an essential communicaton link between the people of a community, a

force that helps transmit to everyone the best ideas in health, and aims, ultimately, at improved conditions of living and healthier outlook on life.

From the 'Daily Gleaner', Jamaica, 6 March 1968:

U.S., JAMAICA SIGN 3-YEAR FOOD-FOR-PEACE AGREEMENT. A Food-For-Peace Agreement to provide 5,563 metric tons of food for Jamaica's school-feeding, infant and maternal feeding-programmes over a three-year period was signed yesterday by the Minister of Finance and Planning, the Hon. Edward Seaga, the Minister of Youth and Community Development, the Hon. Allan Douglas, and the United States Ambassador to Jamaica, Mr. Water Tobriner.

The Food is being made available by the United States Agency for International Development through its Food-For-Peace Programme.

Formerly, Food-For-Peace agreements were negotiated on a one-year basis, whereas a new feature in this agreement is that it will be effective over a three-year period. This Mr. Seaga said, will facilitate better planning and administration.

The food to be distributed consists of cornmeal, wheat flour, non-fat dried milk, rolled wheat, vegetable oil and CSM, a fortified protein rich cereal of corn, soya and milk.

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Also discussed was the question of obtaining assistance in livestock feed and food for various kinds of work programmes. The food for infants and maternal care is administered by the Ministry of Health, while the school-feeding programme is administered by the Ministry of Education.

REPORT OF THE SEMINAR "ROLE OF HOME-ECONOMISTS IN STRENGTHENING NUTRITION PROGRAMMES AND ACTIVITIES".

A one day Seminar "The Role of Home Economists in Strengthening Nutrition Programmes and Activities" was organised by the Caribbean Food and Nutrition Institute on the 29th February, 1968 in Jamaica.

Fourteen home economists (Annex) representing the relevant ministries, institutions and agencies participated.

For some time home economists have felt dissatisfied with the contribution of Home Economics to improvement of nutrition and standards of living, and have desired that the situation be examined with a view to orienting future teaching and programmes towards more realistic and meaningful objectives.

One of the fundamental prerequisites for effective contribution of any group of workers is that they have an understanding and appreciation of the general programme of work of the majority of members of the group. Six papers were presented covering the major activities and programmes with which home economists are associated.

Miss T. Stewart gave an account of nutrition as taught in the primary, secondary, technical and grammar schools, and outlined the school feeding system. Of the problems encountered, the following were of particular importance:

(a) the condescending attitude of the public towards home economics;

(b) the lack of relevance of the GCE syllabus in the area;

(c) insufficient awareness of the malnutrition problems in the community;

(d) poor coordination between workers contributing to nutrition; and

(e) general dearth of supervisory personnel.

Miss G. Hodges narrated the main points of emphasis in teacher preparation. She pointed to the widespread practice of directing the academically poorer student to Home Economics. The need for intimate knowledge of home and community, and the application of theoretical learning to the home environment were recognised to be areas requiring special attention. Role of school meals and school gardens in improving nutrition were also emphasised.

Mrs. D. Campbell reviewed the training provided in Institutional Management at THE College of Arts, Science and Technology (Jamaica). There is a lack of understanding of the contribution of Institutional Management, which is reflected in poor emolument and poor utilisation of the individual trained in this field. While there is an acute need for men trained in this subject, the local attitude to men working in the food service precludes them from entering this field. The complete absence of guidance and supervision of the newly graduated and the poor salaries offered were major flaws in the current set up, the latter being responsible for heavy drain of trained personnel from the island.

Mrs. E. Ford analysing present situation with regard to nutrition activities and programmes, singled out the following factors as being responsible for slow progress:

(a) home economists based eating habits of the community on those of a very small group;

(b) they focused education on improvement of incomes without simultaneous improvement of nutrition knowledge;

(c) failure to study attitude of the population towards improved eating habits;

(d) inadequate knowledge of the several factors that affect food consumption.

Suggestions for overcoming some of the difficulties were:

(a) Revival of National Nutrition Committee which because of its ability to break down departmental barriers would enable coordination that was much required both at field and national levels;

(b) organisation of courses for various categories of workers - imparting current knowledge in nutrition in practical and applicable form.

Mrs. N. Jones outlined the Home Economics programme of the Ministry of Agriculture and Lands. A series of 4-day residential courses for farm women is organised where instruction covers principles and practices of good farming, nutritive value of foods, meal planning and preparation, simple meal service and use of kitchen gadgets. Training is also undertaken in above subjects for 4-H Clubs. While this training serves a highly valuable purpose, it remains a small fraction of what is needed. Much more extensive effort is needed,

but is not possible with the very limited personnel now available for handling this aspect of work.

Miss C. Myrie indicated the increasing need for home economists in Industry today for -

(a) liaison between industry and consumer;

(b) assisting consumer with obtaining optimal use of equipment and maximal satisfaction from other commodities;

(c) assisting industry in more effectively satisfying the needs of the consumer.

There is presently poor recognition of the role of Home Economics in Industry. Much needs to be done in making both the general public and administrators in Industry aware of the contributions of the Home Economists in this field.

The afternoon was devoted to discussions as to reasons for present situation, obstacles encountered and possible means of overcoming some of these obstacles.

The main points of discussion were:-

A. Image of Home Economics

The conference felt that the image of Home Economics was very poor, with little likelihood of improvement in coming years unless a change in content and method were adopted.

Factors which have contributed to this are:

1. An unrealistic syllabus in limited subjects - Cookery and Needlework, the papers for which are set in England. Although the syllabus should have a wider interpretation the time alloted to the teaching of the subjects does not allow for this.

2. Lack of appreciation of the scope of Home Economics by some administrative Heads, those who control finance, as well as the general public.
3. The attitude of some Home Economists themselves who because of their limited knowledge and interpretation, tend to belittle the subject.
4. Lack of adequate teaching facilities.

Home Economics is a science which like all other sciences combines theory with practice. Laboratory facilities are therefore a basic requirement in the teaching of the subject.

B. Relevance of content to situation and needs.

It is an accepted fact that the child's education should be geared to meet the needs of the community. In Home Economics this could be effectively implemented. Home Economists, however, felt that the actual lessons taught were in some respects far removed from the local situation. It was also expressed that findings of research and statistical information are not readily available to assist with teaching, especially with reference to Nutrition. Consequently, outdated information is sometimes used. The opinion was expressed that home visits by all Home Economists would confer much benefit and greatly contribute to making the subject more relevant to local situation.

C. More effective coordination

The group felt that more effective work could be done if each Home Economist was made aware of the contributions of:

(a) Other Home Economists

(b) Workers in allied fields, such as in Bureau of Health Education.

It was felt that this coordination was singularly lacking.

Inservice Training:

The group agreed that apart from the summer Courses organised by the Ministry of Education, very little is being done for inservice training. In the field of Nutrition, the group enquired of the role of the Caribbean Food and Nutrition Institute in providing some of this training.

Increased Job Opportunities:

It was noted that we were losing many of the qualified Home Economists who on return to the island failed to find suitable job opportunities. Some of the contributing factors being:

(a) Inadequate remuneration - especially where persons with similar qualifications to those in other disciplines received lower salaries.

(b) Unawareness of the Commercial and Industrial sector to the need for Home Economists.

Based on above discussion the following recommendations were made.

It is recommended -

1. that steps be taken to improve the image of Home Economics.

Some ways in which this could be done are by the establishment of:

(a) A Nutrition Pool of experts on whom the home-economists can call;

(b) A department of Home Economics at the University of the West Indies;

(c) Provision for greater relevance in content of Home Economics programmes for youth and adults.

(a) A Nutrition Pool

It is now generally recognised that nutrition education requires a broad spectrum of information, ranging from production of foods, through utilisation in the home, to assimilation by the body and effects on health. It is clearly impossible for this body of information to be obtained from a single source.

There is at present no established body or group which can be called upon to provide up-to-date and specific information on the several aspects that constitute the comprehensive nutrition knowledge required. It would be helpful if a Nutrition Pool could be set up of a group of people, each contributing their specialised knowledge as it applies to Nutrition whenever called upon. This would facilitate greatly the running of refresher courses and inservice training which are now lacking.

(b) A Department of Home Economics at the University of the West Indies

A department of Home Economics at the University of the West Indies would add new meaning and dimension to Home Economics. The thinking that Home Economics is not as important as other subjects would gradually be dispelled. This department would serve other Caribbean Islands as well as Jamaica and the programme would be geared to meet the needs of the society.

(c) Provision for greater relevance in content of Home Economics programmes for youth and adults

Content of Home Economics should have more direct bearing on actual needs. For achieving this there will be need for greater awareness of living conditions and patterns of the population, knowledge of the socio-economic situation, resources of time, effort, physical facilities, equipment, and traditional concepts and beliefs about food and disease.

2. that there be greater coordination:

(a) among Home Economists - it is desirable that all home economists know what home economists in other fields are doing in their particular jobs; and

(b) between home economists and other workers contributing to improvement of nutrition - Home Economists should be aware of the contributions of agriculturists, health personnel, Community Development workers, so that a uniform message be conveyed to the public and also so that the specialised knowledge of each discipline could be utilised to make for comprehensive programmes.

3. that the instructional programme be improved - this can be done by periodic updating of home economists on current nutrition information. Two avenues for such updating could be through Cajanus and through activities organised by Home Economics Association. The Nutrition Pool, already mentioned, should prove useful also in this respect;

4. that a descriptive chart be drawn up indicating various groups of the population at whom nutrition education is directed (such as school children, farmers' wives), the resources by way of personnel and funds available for undertaking this education along with the respective terms of reference of these personnel. This would be helpful in avoiding unnecessary duplication and overlap and assist in most effectively deploying limited resources.

Participants in the Seminar on "Role of Home Economists in Strengthening Nutrition Programmes and Activities"

Mrs. Julia Allen	-	Bureau of Standards
Mrs. Muriel Boyne	-	New Day Primary School
Mrs. D. Campbell	-	College of Arts, Science & Technology
Mrs. Pearl Cousins	-	Sugar Industry Labour Welfare Board
Mrs. E. Ford	-	Social Development Agency of the Social Development Commission
Mrs. T. A. Gordon	-	Kingston Technical High School
Miss G. Hodges	-	Mandeville Teachers Training College
Mrs. Novlet Jones	-	Ministry of Agriculture and Lands
Mrs. D. Kircaldy	-	Jamaica Festival Office
Mrs. Marchand	-	Excelsior High School
Miss C. Myrie	-	Seprod Limited
Mrs. D. McKendrick	-	Scientific Research Council
Mrs. Alma Smith	-	Mico Training College
Miss T. Stewart	-	Ministry of Education

COMING EVENTS

May 20th - 23rd. The Caribbean Food and Nutrition Institute will be holding a conference at the University of the West Indies, St. Augustine, Trinidad, on "Recent Trends In Food and Nutrition In The Caribbean". The delegates will be senior technical personnel from fields related closely to food and nutrition, and in the main the conference will be the counterpart of that held at Mona in February for senior administrative personnel.

The third of the four days will be devoted to a research forum, with about 15 or more individuals or groups giving an account of some of their recent research activities, with emphasis on community application in many cases. A good deal of the time of the conference is set aside for planned discussion panels as well as exposition of the various topics.

PROGRAMMES TO IMPROVE MARKETING AND INCREASE FOOD PRODUCTION *

W. G. Stewart

Chief Technical Officer, Ministry of Agriculture & Lands, Jamaica

It is my firm conviction that the most important single obstacle to increased production is the lack of effective and attractive marketing arrangements. I believe that if you want any commodity, including food, to be produced in quantity the most important incentive which you can offer is an attractive and effective marketing system - attractive in terms of the regards which it offers to the producer, convenient in terms of the ease with which he can reach it with his produce and receive payment, and effective in terms of the efficiency with which the product can be placed at the disposal of the consumer. I know that efficient marketing is not the only important incentive to production but I am saying that it is the most important incentive. Set this factor right and most of the other obstacles over which we tend to expend so much energy will straighten themselves out with surprisingly little effort on our part. Ignore this factor and all of the other inducements which we may offer will be ineffective.

It is generally agreed that an increase in the production of food for local consumption is an urgent need throughout this region. Although the economics of these territories have for generations been predominantly agricultural, and they have natural conditions which

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* A paper delivered to the Conference on Food, Nutrition and Health in the Caribbean, held under the auspices of the Caribbean Food and Nutrition Institute at the University of the West Indies, Mona, Jamaica, 5th - 7th February 1968.

are suitable in varying degrees for agricultural production, it is nonetheless true that a substantial proportion of this potential remains undeveloped. Production of plantation crops for export has been accorded priority and the gap between potential and achievement has been most evident in the area of food production to meet local needs. Of recent years there has developed a strong consciousness of this deficiency and various programmes have been put into effect to correct it. But in the face of our rapid population growth and the increased purchasing power of our working classes, it appears that very little impact has been made on the situation. For facts and figures I will, as you would expect, refer to the position here in Jamaica since it is with the Jamaican scene that I am most familiar, but I have no doubt that the same general picture prevails throughout the region. The value of food imported into this island from outside sources during the last five years for which we have records was as follows:

for	1962	£16.2 million
	1963	£17.1 "
	1964	£20.8 "
	1965	£20.4 "
	1966	£22.4 "

These figures speak for themselves. The position would undoubtedly have been far worse had it not been for the efforts which we have made and the programme which we have launched to encourage greater effort towards the production of food. But the effective demand for food increases so rapidly that it is like trying to overtake a runaway horse with a

mule - you gallop at top speed merely to maintain your distance and whenever your pace slackens, whether through your own fault or not, the gap widens.

It is interesting to examine the content of these food imports. For the year 1966, the last year for which we have published records, the main headings were as follows:-

Meat and Meat Preparations	--	£3.73	million
Dairy Products, Eggs and Honey	-	£3.52	"
Fish and Fish Preparations	-	£3.56	"
Cereals and Cereal Preparations	-	£7.96	"
Fruits and Vegetables	-	£1.41	"
Feeding stuffs for Animals	-	£1.25	"
Other, Miscellaneous	-	£0.99	"
TOTAL		£22.42	"

Proteins and cereals account for £18.77 million out of the total £22.42 million. Now it is not all items within these broad categories of food which can be produced locally, or which can be advantageously replaced by substitute local products. I use the words "advantageously replaced" advisely, because import substitution in respect of food is not as uncomplicated a matter as popular opinion suggests. Let us consider the case of codfish for example, which accounted for £1.48 million of our import food bill in 1966 and which is the chief target of popular interest in import substitution. Whenever this subject is discussed codfish is bound to be mentioned first. If we examine, however, the price of codfish to the consumer and its protein content as compared with other protein foods at current prices, the following emerges:-

1	shilling	spent	on	skim milk	will	purchase	67	grams	protein
1	"	"	"	cod fish	"	"	50	"	"
1	"	"	"	lean beef	"	"	24	"	"
1	"	"	"	eggs	"	"	20	"	"
1	"	"	"	pork	"	"	16	"	"

In view of the fact that our diets in this part of the world tend to be high in carbohydrates and low in proteins, particularly animal protein, and the further consideration that our per caput income in Jamaica is just about £153, logic seems to indicate that we should look with favour on the most economical sources of protein. There are, of course, other things to be taken into account, but I cite this example of codfish in order to make the point that import substitution is not the simple, uncomplicated issue which it is popularly suggested to be.

Having said this, however, let me hasten to say that I strongly support the view that we should endeavour to produce at home as much of our requirements of food as is economically feasible and/or socially justifiable. Indeed, I consider this to be one of the primary responsibilities of our agricultural sector. We are not at present fulfilling this responsibility.

How then does a country set about to determine what action should be taken to achieve this objective? It seems to me that there are a number of steps to be taken in logical sequence if this problem is to be tackled intelligently.

First of all present consumption of the various categories of food must be examined in detail and quantities determined or estimated.

What for instance is our present total consumption of milk and dairy products? How much of this is produced locally and how much is obtained from outside sources? Is the present consumption of these products on a *per caput* basis adequate for maintenance of proper nutritional standards and if not, what should our total consumption be in order to attain such standards? Using our present rate of population growth and the anticipated increase in purchasing power, what is our projected demand for these products in five years' time? Have we got adequate and suitable land resources for producing this quantity of milk and dairy products? What particular areas of our farming country are best suited to dairy farming and therefore warrant special concentration of incentives and extension effort in that direction? In view of the fact that we have under-par consumption of these items, and a local demand which exceeds local production, what are the reasons why people do not consume more dairy products, and why don't the local farmers produce enough even to meet current demand? Why is there under-production in the face of an unsatisfied local market right here at home. It is my view that answers to these questions can be found if they are purposefully sought, and only when they have been found can we begin to devise an intelligent development programme for the dairy industry. Indeed, when these questions have been answered we already have clear guidelines as to the lines along which such a programme should be organised.

I have made particular reference to milk and dairy products. I think it is an appropriate example to use because all Caribbean territories, with the possible exception of Puerto Rico, are in a position of under-consumption and under-production of these commodities. We all are in need of intelligent programmes of development in respect of milk and dairy products. However, what I wish to get across to you is a method of approach which in my view is applicable across the broad, not merely to milk and dairy products. An intelligent development programme for any area of agricultural endeavour must be preceded by careful and objective analysis of demand and potential resources, and an honest assessment of the limiting factors which have stood in the way of achievement in the past or which may obstruct progress in the future. Without such analysis we cannot properly set targets or determine what needs to be done to achieve them. It is my opinion that failure to carry out this type of preparatory analysis has been largely responsible for the disappointing results which so many of our development programmes have produced.

Another point which I would make most strongly is this - it is essential to have clear recognition and honest acknowledgment of what the true objectives of a development programme are. Labels can be most misleading. For instance, a scheme for subsidising pumpkin growers may be publicised as having the objective of increasing the production of pumpkin, whereas, in actual fact, when you examine the way in which the whole thing is administered, it turns out that the real objective is to help the poor pumpkin grower in

his struggle for survival against the rising cost of living and thereby to induce him to remain on his farm. But the scheme is labelled Pumpkin Development Scheme and you and I cannot tell by means of the label alone what sort of scheme it really is. Futhermore, because of literal interpretation of the label, the success of the scheme will eventually be assessed by economic yard-sticks, and it will in due course be pronounced to have been a failure. In actual fact it has not been a failure at all, because it has achieved its real purpose. The pumpkin grower has been helped, and he is still on his farm instead of having joined the ranks of the unemployed in the Metropolis. This is my third message, therefore, that the real objectives of a programme must be clearly recognised and frankly acknowledged, so that an appropriate working plan can be prepared and realistic assessment of results can be made.

Assuming then, that the real objective of a food stuffs development scheme is the expansion of food production, what are the ingredients of success for such a scheme? First of all a decision must be taken as to what foods we wish to encourage farmers to produce. The basis on which this decision is taken will differ from territory to territory, depending on local circumstances and on the answers which are given to the questions raised in the preparatory assessment which I have advocated earlier in this paper.

Secondly, a decision must be taken as to where production of each category of food will be encouraged. This gets us involved

right away in the controversial question of zoning of production. To my mind zoning is an essential feature of any development programme in agriculture. Production of each commodity should be zoned, so that each item is produced in those areas which are best suited to it both ecologically and in point of location. There is no sense in encouraging the production of bananas at Blue Mountain Peak; the ecological environment is wrong and, even if it were not, the location is wrong in terms of distance from the shipping port. Zoning does not have to be done by legislation or by enforcement; it can be effectively done by judicious use of incentive and dis-incentive. Offer to the farmers in the Blue Mountain highlands all reasonable incentives towards producing carrots and folding lettuce - give them production subsidies for these crops, establish conveniently located buying centres to purchase them, instal in the district extension officers who are particularly expert in the culture of vegetable crops on steep hill-sides - these are all on the incentive side. On the other hand give no subsidies in this area for the production of corn, do not purchase corn at the buying stations in the area, let the farmer who insists on growing corn in these hills take the responsibility for delivery of his own produce to the market in Kingston - these are on the dis-incentive side. No legislation or regulation is necessary; the farmer will soon find out what it is to his advantage to produce, and effective zoning will have been achieved.

Thirdly, a realistic assessment must be made of the resources required, apart from land and human resources, for carrying out the programme, and provision must be made for these items to be available. It may be capital for providing credit to farmers; it may be planting material; it may be supplies of fertilizer and insecticides; it may be livestock feed. All of these are usually required and must be made available in adequate quantity.

Fourthly, due thought must be given to the gathering of new knowledge and the training of farmers in the skills which are required to enable them to participate effectively in the programme. This means research and extension. If we decide for instance to develop the production of soya beans in Jamaica, we must know whether the varieties which we now have are the best for our purposes, and in order to do this we must introduce as wide a range of types as possible for consumption trials. We must also know what are the best methods of field culture for soya beans under Jamaican conditions - the methods used in Texas may not be best for us. Having got this information, we must organise effective means of passing it on to the farmers in areas where we propose to encourage soya bean production. Research and extension must go hand in hand as essential ingredients of any successful agricultural development programme.

Fifth, last and most important - marketing. I end as I began. In the final analysis the success of any development programme depends on the farmers and their assessment of the advantages and prospects involved from their point of view. The farmer must be satisfied

that what he is being encouraged to do will be profitable to him, that what he is being asked to produce he will be able to sell without too much difficulty and at a profit. In this respect he is no different from any other businessman. If the development programme is to succeed, therefore, it must include clearly defined arrangements for puchasing from the farmer those commodities which he is being specially induced to produce, at prices which are defined in advance of the particular planting season or production period and which are guaranteed for that particular period. Confidence on the part of the producer is the very essence of success for any agricultural development programme. Confidence will not be engendered by uncertainty as to disposal of the product, or by fluctuating prices which can be reduced in the middle of a cropping season when it becomes evident that a plentiful harvest is likely to be reaped. We cannot expect to have it both ways. If the farmer is to take his chances on the market, then we must take our chances as to whether or not he produces what we want him to produce. If we wish to direct his activities in any particular direction, we must offer him reasonable guarantees of being able to dispose of his products without loss to himself. The subject of efficient marketing of agricultural products is a complex one, on which many books have been written, and it is impossible to discuss it in depth in this paper. Suffice it to say that the whole pipe-line of disposal and distribution must be cleared of blocks and impediments. If this is not done, either the

farmer will be left holding the bag (in which case he will not be prepared to take part in any future development programme) or surpluses will develop in the marketing system which will have to be dumped. We have had ample experience of such situations in this region - localised surplusses and spoilage in one area while shortages are being experienced in another. Most foodstuffs are perishable products which must either be consumed without delay, or stored under carefully regulated conditions, or transformed by processing into products which can be held over for future consumption. Efficient marketing requires thought, ingenuity, and careful organisation. Fortunately for us, these are talents with which Homo Sapiens has been generously endowed.

NEWS OF CFNI ACTIVITIES

From February 5th to 7th the conference on "Food, Nutrition and Health in the Caribbean" was held at the University of the West Indies, Mona, Jamaica. The delegates were mainly senior administrators (e.g. Permanent Secretaries). They came from Antigua, Barbados, Bermuda, Caymans, Dominica, Gren da, Jamaica, Montserrat, St. Kitts, St. Lucia, St. Vincent and Trinidad & Tobago. The conference was opened by Dr. H. Eldemire, Jamaica's Minister of Health, and the six sessions were devoted to such topics as the scope of nutrition, its present-day state in the Caribbean, the complex causation of malnutrition, the economics of nutrition, and educational approaches to the problem.

The presentations included many which are probably of interest to a wider audience, and some are being published in this and - space permitting - future issues of Cajanus, and some are being published in the Journal of Tropical Pediatrics. The CFNI is very grateful to all speakers and chairmen who devoted time and effort to make the conference the success which it appeared to be, and also to the Dean and staff of the Medical School for much assistance, particularly in making available the auditorium.

On February 29th a one-day seminar was held with leading home economists in Jamaica. Because the discussions of this seminar probably have some relevance to home economics in other parts of the West Indies, a full report of this seminar is given elsewhere in this issue - (pages 12 - 21).

CFNI staff participated, by kind invitation of the Ministry of Health, in a one-day meeting with Medical Officers of Health in Jamaica, held at the MRC Epidemiological Research Unit at UWI Mona. (The topic in the discussion of which CFNI staff participated was immunization, in view of the favourable effect on pre-school child nutrition which successful comprehensive immunization could be expected to have.)

Travel by CFNI staff members lately has included visits to INCAP, Guatemala, to PAHO Headquarters, Washington, and to Haiti, by the Director and the Williams Waterman Research Fellow, and visits to St. Kitts and PAHO Zone Headquarters by the Medical Nutritionist.

From April 9th to 11th inclusive CFNI staff will, by kind invitation of the Dean of the Faculty of Agriculture, be participating in a seminar on nutrition for agriculture students at St. Augustine, Trinidad.

HOME ECONOMICS IN THE CARIBBEAN - TIME FOR A CHANGE?

Instruction in Home Economics is offered in schools throughout the Caribbean. These courses are excellent channels through which to raise levels of living and particularly to bring about the much needed improvement in nutrition. The enormous potential for bringing about the desirable changes in food habits that will make for improved nutritional status is however not being fully realised. What are the reasons for this?

One fact is abundantly clear. The subject has come to have a very poor image. It is seldom regarded as a means of stimulating better levels of living amongst the population, but rather as a convenient outlet for students unable to cope with mathematics or who is making poor progress in English, then what better could she be suited for than home economics is the widely prevalent attitude. This has resulted in the C stream students being the ones who are invariably directed to the subject. Furthermore, there is poor comprehension among the general public as to what teaching in home economics might entail, and what it might contribute. Most often it is associated with mere manual aspects of preparing food, sewing clothes, or doing needlework rather than with an understanding of and competence in foods and nutrition, clothes and home improvement. It is well known that many parents consider it injudicious for their children to spend valuable school time on skills which in

their opinion could just as well be learnt at home.

What does teaching in the subject consist of? The major emphasis in many of the islands is on Cookery and Needlework. Teachers indicate that any nutrition that is brought in is only incidental. The syllabus in Cookery is almost a mirror image of that used in the industrialized countries. Two factors are responsible for this:

(a) The students are prepared for an external examination, the G.C.E., the syllabus and examination for which are drawn up in England and designed primarily for students from that country. The content is therefore often irrelevant and unsuited to the needs of these areas. A classic example given by teachers of what must be taught to fulfill the major objective of passing the exam are preparation of Yorkshire Pudding, 'Spotted dick' and Gooseberry pie. That these are unlikely to figure in the local culinary repertoire is of little consequence. Many teachers are conscious of this drawback, but are helpless as long as the external examination constitutes the goal towards which the students work.

(b) With the lack of facilities for University training in Home Economics in the area, many of the teachers have had to seek this training elsewhere, usually in the metropolitan countries.

> This necessitates their learning in situations and circumstances that are widely different from those generally prevalent here, with foods and methods of preparation that are not commonly used in the West Indies, but are used by populations whose attitudes, beliefs and ideas about food, health and disease vary considerably from those of the people in this area. True, they imbibe the basic principles of nutrition, but the onerous and difficult task of applying these principles in a different setting falls heavily and entirely on their shou ders. They get little assistance with this aspect during their training, as only recently has there been an interest and awareness amongst home economists in training institutions abroad of conditions, food consumption, ways of life and problems in developing creas. What of assistance in this task on their return to the home country? Here too, there is little or no help and guidance to which they could have recourse. The absence of a University centre that could provide the greatly needed support is much to be regretted.

As a consequence, the home economist often resorts to what most of us in that situation would do - transposing of the information acquired without the necessary adaptation. Perhaps one should not overlook the fact that there is also a tendency to consider many of the situations obtaining in the industrialized countries as being intrensically superior and this occasionally results in a reluctance to see the need for modification.

Home Economics programmes in the Caribbean tend to follow the model of earlier times. The content has not kept pace with newer knowledge of social change. For example, is there sufficient appreciation of whether nutrition problems in this area are similar to those in the developed countries? Are the vitamin and mineral deficiencies which receive major emphasis in the developed countries, as much of a priority problem here as the widely prevalent protein-calorie malnutrition? What appreciation is there of the extent and and magnitude of this condition and the age groups particularly vulnerable? While we know how to construct balanced meals, and satisfy a child's protein requirements in circumstances where there is no dearth of protein foods such as milk, cheese, meat and fish, do we know how to achieve this in circumstances of low purchasing power and poor availability of animal foods? Are we justified in continuing to teach in terms of first and second class proteins when research has proved that a judicious mixture of vegetable proteins can give as good results as animal protein?

There is a tendency for many of us to feel that the rising per caput income should justify us setting our targets at the ideal level. But do we give sufficient recognition to the fact that with increasing per caput earnings there is also a simultaneous and often comparable cost of living, which offsets the increase in income that we might have counted on?

The questions that home economists must constantly ask are - What proportion of the population can meet the advice given them? What are the reasons for their failure to do so? Is it because of economic circumstances or because of recommendations being in conflict with living conditions and food consumption patterns pertaining in the group? Where tradition rather than education determines food utilisation in the home, an understanding of the forces behind the tradition must be comprehended before positive approaches toward re-education in food utilisation can be undertaken. It is only recently that the social and cultural factors responsible for the aetiology of malnutrition have been receiving attention. This field is not yet figuring as prominently as it should in training of home economists, but must certainly play an increasingly important role if we are to know the populations we work with, in order to get maximal returns from our teaching.

There appears to be a somewhat disproportionate emphasis on aesthetics of food preparations such as decoration of cakes and fancy expensive cookies as compared to the vital nutritional knowledge and basics of consumer economics that could be imparted and used with profit. Here of course, the home economist is caught in a dilemma. There is currently much homage paid by the public to cakes and cookies and this is what everyone wants to learn in home economics classes. There is much less interest in nutritional aspects. So the home economist finds hereself trying to cater to felt need of the public, and simultaneously incorporating some of the essential kowledge they ought to have. Perhaps in her desire

to please she unwittingly balances a little more heavily on the former. Only recently is the need to adequately satisfy all three elements that operate in selection and preparation of food - prestige, nutrition and economy being sufficiently recognised, and much more needs to be known as to means whereby this can be achieved.

Now let us consider the age-old problem of attitudes towards local foods and traiditonal dishes. Almost throughout the developing areas, there is an inclination to belittle local foods and highlight imported foods. Practical classes in Home Economics would lend themselves admirably as a channel through which local foods and traditional dishes could be given the boost they are much in need of, but there is a tendency to soft peddle and often sacrifice these to the more prestigious imported foods and more sophisticated, often less nutritious and frequently impractical preparations that are borrowed from other cultures. For example, one frequently finds in home economics and 4-H practical exercises the peach is the fruit of choice in the face of abundant quantities of papaya and mango, which are considered delicacies in developed countries. The carrot is extolled for its contribution of vitamin A, while the plentiful supply of the popular pumpkin is forgotten, and the expensive and nutritionally overrated lettuce - elevated to its exalted position by the tourist industry - is advocated in preference to the abundant amaranthus. By the same token cakes and souffles figure prominently amongst demonstration dishes, but seldom do pepperpot soup, 'stewed peas', boileen', or 'cookup' find a place.

It is well known that food production in the area is such that there are periods of glut and periods of dearth. Much food is wasted in the former period which could well be preserved and utilised in times of poor availability. Home Economics classes devote some time to jam and jelly making and occasionally to some canning of fruits and vegetables. There is however no indication that these techniques are being adopted by the general population to any appreciable extent. Little is known as to what the obstacles are, whether the equipment proves expensive, whether there is something about preserved foods that people don't like or whether alternative methods of preservation, salting, smoking, drying and pickling are preferred, and should perhaps be tried. This is an area that needs considerable research before any substantial progress can be made.

For years, home economics has been considered strictly the domain of girls, so much that class schedules are arranged so that while girls take home economics, boys take industrial arts. There is need to breakdown this barrier and encourage boys with an aptitude and interest in subjects like nutrition, food processing, food production, catering etc. to take these subjects. This is necessary not so much to teach them the skills as to foster and develop attitudes necessary for the development of better home and family life.

There is no denying that facilities for practical training are being made available whenever possible. Home Economics Centres and Kitchens have been put up for this purpose. These are well

equipped and often contain expensive gadgetry. With increasing demands on diminishing budgets, one wonders if sizeable economies cannot be effected by having less expensive and less modern equipment, and the funds so saved utilised to enlarge the number of centre. The aim for excellence, a reluctance to make-do with anything but the best, and a growing conviction that a considerable number of families have access to this superior standard, makes compromise for second or third best difficult if not impossible.

In some people's minds the term Home Economics, seems to immediately project the vision of a well trained maid. This is probably due to the keen awareness of the escalating tourist industry, the success of which depends to a considerable extent on the grade of service available. Home Economics is seen as playing an important role in the effective training of the various categories of workers needed for this industry. This attitude toward Home Economics may be summed up as follows:- It is a subject for specific category of workers, but not one that could be taught to all homemakers so as to bring about an improvement in the general level of living.'

A word about the present position in the area with regard to this discipline. Professional advancement in this field is limited. A home economics teacher cannot qualify for the mainstream of head teacher or principal. The reason for this is lack of experience in general subjects and administration. There is, therefore, little job satisfaction, which makes for an unsatisfactory situation with regard to the teacher as well as the Community. Unless the situation be remedied it will be increasingly difficult to come by adequate

number of home economics teachers in the area.

The somewhat static nature of current home economics programmes could be attributed in part to the lack of a University Centre in the Caribbean. The initiation of such a Centre would greatly assist in -

(a) Appropriate training of various levels of home economists for the area;

(b) providing guidance and direction necessary for home economics programmes and activities;

(c) organising refresher courses and inservice training; and

(d) developing educational material with newer research findings translated into practical measures for improved nutrition.

The potentialities inherent in teaching a generation of young women to select and prepare an adequate diet for a family, to be aware of modern concepts of child rearing and to be intelligent consumers could be realised if the curricula in home economics were reorganised, adapted to the environment of the population and the teacher given the support and recognition she deserves.

This article has been a rather critical and forthright appraisal of the defects which many Home Economists themselves feel are present in the current situation in this subject in the Caribbean. It should not be construed as belittlement of the good work which is being done by many such teachers at present. Moreover, the newsletter is meant to be a forum for free discussion and if the article is somewhat provocative it is because it is hoped it will elicit a response in the form of correspondence for publication in subsequent issues, and thus initiate a debate which may have constructive results.

GENERAL NUTRITION NEWS AND OPINION

THE IMPENDING WORLD PROTEIN CRISIS - U.N. GENERAL ASSEMBLY TAKES ACTION

The gap between the world's food needs and food production, particularly in regard to protein, is causing an increasing degree of concern and anxiety which is not limited to FAO, WHO and UNICEF among the UN family of organizations. Now the General Assembly itself has acted, or at least is preparing the ground for action. A resolution -2319 (XXII) on Increasing the production and the use of edible protein - was adopted by the General Assembly last December. This resolution includes some general recommendations and also specifically requests governments to inform the Secretary-General (U Thant) by 1st July 1968 of activities in their countries related to increasing production and consumption of protein. It also calls on the Secretary-General to consider what action may be appropriate at the regional level to deal with the impending crisis and to submit a report to the next session of the General Assembly.

In pursuance of his obligations under this resolution the Secretary-General, through the Under-Secretary-General for Economic and Social Affairs, has sent out a questionaire to the governments of all member-countries of the U.N. We think it may be of interest to our readers, especially those in government service, to detail the fourteen areas in which the Secretary-General seeks information:

1. What are the present and proposed activities in your country to increase protein production from conventional plant and livestock sources?

2. What are the present and proposed activities in your country to increase protein availability from marine and fresh water fisheries sources?

3. What are the present and proposed activities in your country to reduce the waste of foods contributing to protein supplies?

4. What are the present and proposed activities in your country to accelerate the development and growing of genetically improved plants of high protein value and improved agronomic characteristics?

5. What are the present and proposed activities in your country to expand the use of oil-seed meals as direct sources of protein for human diets?

6. What are the present and proposed activities in your country being considered regarding the production and marketing of acceptable fish-protein concentrates for human consumption?

7. What consideration is being given to the feasibility in your country of research and development of protein from singlecell sources suitable for animal and human consumption?

8. What consideration is being given to the present and future of your synthetic amino acids or protein concentrates in your country to improve the nutritive value of cereal and other plant proteins?

9. What are the present and proposed activities in your country to support the promotion and distribution of suitable protein foods for human consumption?

10. What are the present and proposed activities in your country relating to the development and support of regional and national centres for research and training in agricultural technology, food science, food technology and nutrition or other appropriate fields?

11. What is the present and proposed status of centres for the animal and clinical testing of new protein foods in your country?

12. What is the present and proposed support for training of personnel in the fields of marketing (including distribution and promotion), market research (including socio-cultural surveys of consumers), and systems analysis to assist the marketing and promotion of new protein foods?

13. What are the present and proposed numbers and levels of training of personnel in nutrition, food science and food technology, and other fields important to the production and consumption of protein foods?

14. What are the present and proposed steps for your Government to review and improve its policies and its legislation and regulations regarding all aspects of food and protein production, processing and marketing so as to remove unnecessary obstacles and encourage appropriate activities?

In addition, comments are sought on a recent report, "Feeding the expanding world population", *and further suggestions from governments about implementation at the international level of the proposals in this report.

The Caribbean Food and Nutrition Institute hopes that governments of member countries of the U.N. by their cooperation in answering this questionnaire, will contribute to the completeness and usefulness of the Secretary-General's report to the next General Assembly session, and that actions will follow this which will help to avert the very real threat which is apparent to all who examine present and projected levels of protein production compared to protein needs.

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*Feeding the Expanding World Population: International Action to Avert The Impending Protein Crisis. Published by United Nations, New York, 1968 price $1.50 Sales No. E.68.XIII.2

SCIENTIST RECOMMENDS FISH FARMING FOR FOOD-SHORT NATIONS

Readers may recall that in the last issue of Cajanus we reproduced part of an editorial from the Trinidad Guardian in which the writer marvelled at the changes which occur in prestige and popularity of foods, and cited as an example the relative positions of chicken, once a luxury, and now a common food, and the humble saltfish, which has now become a prized item, retailing in some areas at over a dollar a pound. Perhaps the following information will give the writer a clue as to yet more surprises still in store!

U.S.I.S. NEW YORK, 15 January 1968 - Lobsters, oysters, clams shrimp - gourmet foods the world over - can be grown readily and cheaply by the thousands of tons in the food-short, protein-deficient developing world, a noted marine scientist asserts.

Shellfish farms can be started without a large cash investment and with unskilled labour by employing known methods of modern pisciculture: intensive cultivation of shallow coastal waters and inland ponds in much the same way the Japanese have developed pearl farms.

An area the size of New York's Long Island sound or Spain's Galician Bays could produce in a year a fish yield equal to the World's total annual fish catch.

Pisciculture can help greatly in alleviating the world food shortage, Dr. John H. Ryther, Chairman of the Biology Department of Woods Hole Oceanographic Institution, Woods Hole, Mass., told the 134th annual meeting of the American Association for the Advancement of Science.

"The prospects are particularly attractive in Southeast Asia where protein deficiencies are most critical and where thousands of square miles of undeveloped shoreline, estuaries and coastal swamps are available.

Use of bays and estuaries for shellfish culture and building tidal ponds from mangrove swamps for rearing shrimp and a variety of finfish, he said, " can be readily accomplished."

By using the best techniques already in use in Japan, China and the United States, he said "impressive yields may be obtained."

"One ton or more per 0.4 hectare of shrimp or fish may be harvested annually from tidal ponds with little or no supplemental feeding or other care. Three-dimensional hanging culture techniques are capable of producing more than 10 tons or oysters and 100 tons of mussels (excluding shells) per hectare per year.

"The 500,000 hectares of mangrove swamps which have been identified by the Philippine government as available for pond construction could, if used for that purpose, produce an annual crop of milkfish (a highly regarded local food fish) nearly equivalent to the total fish landings of the United States.

"An area roughly the size of Long Island sound available to the raft culture of shellfish could produce annually a quantity of mussel meat equivalent to the commercial fish landings of the entire world.

* * * * *

PATTERNS OF INFANT FEEDING IN JAMAICA

W. P. T. James

Medical Research Council, Tropical Metabolism Research Unit,
University of the West Indies, Mona, Jamaica.

The pattern of feeding within a community is not only of sociological interest, but can play an important part in determining the prevalence of different diseases in the population.

In Jamaica one of the most important health problems is the high incidence of malnutrition affecting young children. Malnutrition is a major cause of death amongst children in the first four years of life. The mortality in this age group is falling much more slowly than in any other age group in the island and malnutrition seems to be playing a proportionately larger role.

It is therefore important to examine the characteristics of infant feeding in Jamaica to see whether there are cultural as well as the well known economic factors contributing to malnutrition.

Breast feeding can supply all the infant's needs from birth until he is six months old, and can play a valuable role thereafter as long as supplements, e.g. iron and vitamins, are available. An infant is likely to thrive well as long as he is breast fed, and the danger comes when breast feeding stops and some form of artificial feeding is substituted. The younger the child, the greater are his nutritional needs and the greater his dependence on his mother for food and care. Therefore, the earlier breast feeding stops, the more likely is the child to

suffer from any inadequacy in the method of feeding.

Jamaican mothers usually stop breast feeding their children between the ages of five and eight months. When mothers are asked to state the ideal length of time for breast feeding, their replies vary from nine to twelve months of age. There appears to be only a small discrepancy between the ideal and actual length of breast feeding in Jamaica but more careful enquiry shows that the discrepany is much greater than this and likely to increase further.

Over half the mothers seen at Hospital were feeding their most recent children for shorter periods than their first or second child. Whilst this may be a reflection of her inability to spend time breast feeding her youngest child when she has several other children to care for, the reduction in the breast feeding period for recent children fits in with the clinical impression that mothers are feeding their children for a shorter time now than 10 years ago.

Although a child may be breast fed for up to six months, the mother is rarely able to continue complete breast feeding for all this time. Breast feeding at night may continue for six months but day time breast feeds stop very much earlier. In urban Jamaica artificial feeds during the day are started when the baby is only six weeks old. Night time breast feeding is usually limited to two feeds, so that the stimulus to breast milk production derived from feeding itself, is also reduced to a minimum. A vicious circle then starts and the child, realising that there is very little breast milk, loses interest and comes to depend on artificial feeding. One of the commonest explanations given for early complete bottle feeding is that the child "weaned himself";

This in fact is not just lack of interest in breast milk but almost certainly results from the infrequent breast feeds.

The reasons for mother introducing artificial feeds at six weeks of age are very important but still obscure. A common problem is the necessity for a mother to return to work without her child. There is also a widespread feeling that it is good for a child to partly bottle feed in case the mother has to move and leave the child with a relative.

A higher proportion of urban mothers have hospital deliveries and attend clinics where information on infant feeding should be readily available. This is unfortunately not always beneficial: nearly all mothers attending clinics are now being given free samples of proprietory milks by non-government nurses, recruited by individual firms to sell their products which are from three to eight times the cost of an equivalent dried shim milk preparation. These "milk nurses" often dispense milk indiscriminately; mothers who have satisfactorily established breast feeding are handed an expensive and attractive tin of milk. With the widespread propaganda for proprietory milks all mothers are convinced that they are better than dried skim milk. The advertising, combined with an acute awareness that the upper classes feed their children satisfactorily on proprietory milks, ensures the marketing success of the most expensive brands. The stimulus to buy proprietory milk is reinforced by periodic visits to home by the "milk nurses". A Jamaican family may then be faced with the unnecessary burden of spending a quarter or more of the family income on milk for one child. This is, of course, rarely

possible so that a variety of cheaper brands are tried and the feeds become progressively more dilute.

Once artificial feeding has been introduced, the infant is exposed to infection from contaminated bottles, etc. The mother rarely feeds the infant herself so that the responsibility for adequate feeding and the hygienic preparation of milk falls on an older child or a less interested relative.

From the age of three months, children are also given cornmeal porridge into which milk is stirred. When the milk supply is limited, condensed milk is substituted and the amount added is judged by the sweetness of the porridge. Since condensed milk has a lot of additional sugar in it, the amount needed to sweeten porridge is small, and the quantity of milk protein provided is often negligible.

Additional protein-containing foods are introduced at a late stage in Jamaica. It is considered unwise to feed any child under the age of one with "food" i.e. solid food. If he is fortunate a child receives crushed potato, vegetables or just "tea" in addition to the porridge up to the age of one. Soup is often introduced early but most of its nutritional value, e.g. in fish, is strained off before it is given to the child. Green bananas are eaten at a later stage; over 75% of mothers, in a survey conducted by Dr. Ashworth of the M.R.C. Unit, consider that bananas are superior to liver in iron content and nutritional value.

These last examples serve to illustrate the importance of ignorance and superstition in determining the type of diet for the young child. The gradual reduction in breast feeding, however, appears to be the result not only of ignorance but of intensive advertising or proprietory milks. This in the context of Jamaican nutrition is not only unnecessary but may be harmful, paradoxically leading to poorer milk intakes and more malnutrition.

YOUR QUESTIONS ANSWERED

Q. Is it really necessary to give orange juice to babies or is this just a fad?

A. In the early months of life a breast fed baby does not require any additional ascorbic acid in his diet.

Orange juice is often recommended in hospitals and clinics, because it is a palatable source of vitamin C for the young infant who is not breast fed. Orange juice has acquired over the years a certain prestigeful status, but there is no magic in the orange per se. Any fruit juice containing vitamin C may be used in the prevention of infantile scurvy. Before recommending the use of fresh fruit juice, however, one should bear in mind, that if it is prepared under unsanitary conditions, the benefits of its vitamin content will be overshadowed by the resulting attacks of diarrhoea caused by this bacterial solution.

Babies who are fed animal milk formulas need the addition of vitamin C. If suitable fruit juices are too expensive, or not available, and if unsanitary conditions prevail in the home, ascorbic acid tablets may be used instead dissolved in the feeds. The recommended dosage is as follows, 30mg a day for the first year, and 35mg a day between the ages of 1 and 3 years.

Q. I was recently advising a mother-to-be at Ante-Natal Clinic to take plenty of protein foods during her pregnancy and when breast-feeding her baby, and I mentioned meat, fish, eggs and milk. She told me she was a vegetarian. What should I advise her about her diet?

A. It depends partly on what kind of vegetarian beliefs she has. Almost all vegetarians can take milk and a few may eat eggs. If she is a lady who can take milk only, and not eggs at all, we must advise her to try to consume in one way or another the two pints of milk daily recommended to pregnant women. (All of two pints, by the way, are not really necessary for a lady who has daily other animal proteins as well. One would be enough in such a case) We must also advise her to eat every day some legumes (gungu peas, red beans, split peas, black-eyed peas) and also some cereals (rice, wheat/bread). We especially recommend mixtures of legumes and cereals together (e.g. rice and peas). The reason for this is that different essential amino-acids may be lacking in different legumes and cereals, but those lacking in one are largely supplied by others, so that these mixtures, being complementary, have a greater protein value than the individual items by themselves.

It is also important that this lady takes her iron supplement. If she is unable to get enough milk, it is also just possible that she may need an iron-vitamin B^{12} supplement.

Q. It is commonly believed that milk and cheese cause constipation. Is there any truth to this?

A. This is not true. Milk and cheese are easily digested and leave little residue. If the diet is lacking in the foods that provide bulk, constipation can result, regardless of whether milk and cheese are eaten.

Q. Bananas are plentiful and relatively cheap, is it a good food for young children? If so how much and in what form may it be given?

A. Bananas are not only well accepted, but easily handled by children.

It is a food high in carbohydrate with some amounts of other nutrients.

In the Caribbean two aspects of child feeding that need particular attention are an increase in protein intake and increase in frequency of meals. Neither of these are easy to achieve in the circumstances of the less well-to-do families. With large numbers of mothers finding employment outside the home, the money available for purchase of protein may be greater, but chances of having more than one meal a day are poor. It therefore becomes necessary to find ways whereby the main meal can be supplemented by a series of easy to prepare subsidiary meals. The banana lends itself admirably as a base for these subsidiary meals, and if supplemented by a protein source will take care of the child's needs more effectively than black tea, that is widely used at the present time. The protein source could be skim milk powder or roasted peanuts. Some recipes incorporating these foods are given below.

Banana Split

1 small banana
3 teaspoons Dried Skim Milk powder

Mix dried skim milk powder to stiff paste with a little water; split banana lengthwise and sandwick together with milk paste.

Peanut Butter Banana Sandwich

1 small banana
2 dessertspoons roasted peanuts ground to a paste

Split banana lengthwise and sandwich together with peanut paste.

Banana Fritters

4 bananas (small)
1 egg
1 tablespoon flour
Oil for frying
1 tablespoon sugar
salt - a pinch

Mash bananas and mix with egg and flour; drop spoonfuls of the mixture into a heated pan with a little oil. After 1 minute turn and cook the other side for 1 minute. Dredge with sugar. Makes 8 fritters for 3 or 4 children.

Two or three bananas per day may be given to a young child.

THE HIDDEN COST OF PROTEIN

Of the three basic requirements to sustain human life - food, clothing and shelter - man living in the tropical regions must be concerned about food. Indeed, numerous studies have shown that man living under subsistence conditions in the tropics devotes most of his labour to obtaining and preparing food. A household expenditure survey conducted in Jamaica in 1963 - 64 disclosed that the Kingston families interviewed spent an average of 46% of their cash income on food and the rural families an average of 57%. During the 1961 Nutrition Survey, it was found that the average family interviewed in Trinidad spent 61% of its cash income on food. 61% was also spent St. Lucia, but the percentage increased to 70 in Nevis, 83 in St.Kitts and 94 in Anguilla. One can assume that the proportion of income spent on foodstuffs by most West Indian households at the present time remains somewhat within this range.

When man's food production or purchasing power is limited, his diet seems to be unconsciously based on those foods which provide a large number of calories at relatively low cost, i.e. high in carbohydrates.

As he moves up the economic ladder, his selection of foods shifts towards items which are higher in protein, fat, the essential vitamins and minerals and price. Thus, the average family in even the most affluent nations still spends about 20% of its disposalbe income on food.

For example, the 1961 Nutrition Survey of Trinidad and Tobago showed that about 10% of the calories in the national diet came from animal protein sources. The 1958 food balance sheet for Jamaica indicated that about 12% of the caloric intake at that time was from animal products. In comparison, the 1960 North American diet obtained 37% of the calories and 68% of the protein from animal protein sources - obviously a much higher proportion than is necessary.

However interesting national averages might be, let us now turn to the individual caribbean family situation, where food economic and nutrition problems may either originate or be avoided. Although a high percentage of the population in this area is classified as "rural", most of these families seem in fact to behave as urban families living in a rural setting. That is, much of their food is purchased and home food often sold, with the proceeds used for the purchase of alternate foodstuffs. "The probability that the West Indian diet is deficient in protein for the vulnerable age groups has been well documented".

What are the reasons for inadequate protein consumption by these family members? Is it that protein is too expensive, that people do not know of the importance of proteins, that people select the wrong food sources of proteins, or that food attitudes and preferences tend to exclude protein from the diet? We, of course, cannot hope to answer these questions here but let us make a brief study on the cost of protein, to see what role this factor may play.

The figures presented in Table I are based on averages of food prices obtained in nine territories in April, October and early November, 1967. They are admittedly sketchy in that prices of many food items were not obtained, the price of each item listed was not obtained in all places and it was not possible to consider price differences due to seasonal variations or location within each territory. Nevertheless, the relative price of each food item as a source of protein was found to be so similar in all territories that one observes a definite pattern. The food items were compared on the basis of cost (in West Indian dollars) per 20 grams of protein and 1,000 calories, the recommended daily allowance of these nutrients for a one-year old child.

Before considering the implications of these data, one must remember that all proteins are not comparable in nutritional value. Each protein consists of many amino acids, of which ten are essential for the infant, eight for the older human. The nutrient value of the protein in each food is equivalent only to its content of these amino acids. Ground provisions are low in protein content, and this protein is low in many of the essential amino acids. Cereals tend to be low in two (lysine and threonine) and the pulses low in methionine. Animal protein is high in all the essential amino acids. Fortunately, by properly combining these sources of protein in a diet, one can quite easily achieve the proper balance of amino acids to satisfy the requirements of the human body.

COST OF FOODS IN THE CARIBBEAN RANKED IN ASCENDING ORDER OF COST PER 20 G. OF PROTEIN

Cost Per 1000 Calories		Cost Per 20 Grams of Protein
.25	Dry Skim Milk	.05
.22	Pulses	.06
.10	Cornmeal - Wheat Flour	.08
1.20	Salt Fish	.10
.13	Rice	.12
.25	Macaroni - Rolled Oats	.15
.60	Sardines	.18
.55	Fresh Milk	.20
.60	(Fresh Beef, Goat, Mutton (Cheddar Cheese	.20
1.80	Fresh Fish	.20
.25	Bread	.20
1.10	Chicken Necks and Backs	.20
1.20	Corned Beef	.20
.55	Dry Whole Milk	.23
.25	Sweetened Condensed Milk	.23
.55	Evaporated Milk	.25
.90	Minced Beef	.25
.25	Ground Provisions	.28
.40	Fresh Pork	.35
2.20	Broilers	.35
.60	Irish Potatoes	.40
1.10	Frankfurters, Sausages	.40
1.60	Fresh Eggs	.40
.80	(Milk-Based, Cereal-Based (Infant Foods	.51
.80	"Health Promoting" Foods	.56
.29	(Plantain, Green Bananas (Ripe Bananas.	.59
4.87	Infant Foods - Strained Meats	.69
4.58	(Infant Foods - Strained Vegetables (and Meat	2.08
.55	Arrowroot	13.00
.09	Sugar	INFINITY
.15	Margarine, Cooking Oil	INFINITY
.80	Glucose	INFINITY

Thus, in a situation where the cost of foods is an important consideration, the housewife can daily achieve a minor miracle for the nutritional health and well-being of her family by including some cereals, pulses and animal proteins in the menu.

Reviewing the table of protein costs, it becomes evident that if properly informed and motivated, the housewife can add more high quality protein and more calories to her customary menu at no increase in food expenditure. For instance, she can obtain more protein, vitamins and calories from dry skim milk, dry pulses, rice, wheat, flour, cornmeal, oatmeal and bread than ground provisions and save money in the process. Or, if she considers fresh fish to be the only cheap animal protein, she can advantageously also include fresh beef, goat, mutton, fresh milk and cheddar cheese in the menu.

Here, one also sees at what economic cost the Caribbean mother has adopted sophisticated infant feeding practices based on the proprietory and 'health promoting' foods. Her baby would usually be healthier if he received breast milk, which costs little, supplemented by appropriate foods from the regular family diet. Even if circumstances dictate that the mother discontinue breast feeding early, the judicious use of lower cost sources of protein would permit her to nourish the child properly at one-fifth to one-seventh the cost of the "status", "convenience" and "health promoting" foods.

Shifting our attention from the family to the national level, these data strongly endorse the research and development programmes

underway by the Caribbean governments, U.W.I. and agricultural producers associations to bring about increased and more efficient production and distribution of pulses, animal protein and root crops. Pulses are very low cost, excellent protein foods, well liked by all income groups. While one apparently cannot justify on nutritional considerations these efforts dierected toward the root crops, it must be recognised that they are important staples. With improved and more nutritious varieties, production and marketing methods, there is no reason why they should not become much more competitive in price with the imported cereals as sources of nutrients. In this regard, a serious review of the present and future possibilities for increased cereal production would seem to be called for in view of the impressive advances made recently in other tropical areas.

Although most locally produced animal products are not cheap, neither are they as expensive sources of protein or calories as one is lead to believe by the market prices and letters to the newspapers from consumers. Furthermore, food production and import figures show a steadily growing market for fresh, frozen and tinned animal products of all categories. Improved production, processing and marketing techniques will result in benefits to the national economies, livestock and poultry producers, middlemen and consumers in the form of lower prices.

Until local protein production satisfies requirements, it will be important from a public health viewpoint for the Caribbean govern-

ments to maintain food import policies which encourage consumption of low cost protein imports such as dry skim milk, pulses, saltfish, wheat flour, cornmeal and rice by assuring that these foods will be available to the consumer at reasonable prices.

The required enrichment of all imported and locally milled cornmeal, rice, and wheat flour, with B-vitamins and iron to established levels should be a part of food policy since the traditional diets are deficient in these nutrients and enrichment costs are insignificant. Enrichment, and possibly fortification, of these foods with specific nutrients can often be a government's best health investment in terms of cost/benefit ratio.

Food import policy favouring importation of dry skim milk rather than the more costly dairy products can effect important foreign exchange and family food savings. As an example, the protein in 1.3 million pounds of dry whole milk (25% protein), which has a C.I.F. value of $1 million, can be replaced by 1 million pounds of Vitamin A enriched dry skim milk (35% protein) which has a C.I.F. value of $250,000. This represents a foreign exchange saving of $750,000.

The housewife, who pays from $1.3 to 2.0 million for the dry skim milk, depending on the brand she chooses, need pay only $400,000 for the dry skim milk. We must admit that dry whole milk provides more calories but these can be obtained in 300,000 pounds of locally produced vegetable oil, costing $150,000. Thus the net saving to the consumer would be $750,000 - $1.45 million. Recombining of non-fat

dry milk powder with water and vegetable fats in several Caribbean Islands to augment fluid supplies and the Child Welfare Association programme of half-cream milk distribution in Jamaica are based on this principle. Several of the well-known proprietory infant foods are mixtures of dry skim milk and vegetable fats.

At this point, we wish to endorse Miss Helen Fox's proposal that the price structure for locally produced milk should be based on the solid non-fat content, rather than paying a premium for high butterfat content. People purchase milk as a source of protein and the solid non-fat content is an index of the protein content. While judging milk on the solids non-fat content would be more realistic from the consumers' point of view, it would also be helpful to the producer. The cow requires much more energy (calories) to produce a gallon of high butterfat milk, as fat is a concentrated source of calories. Since the forages in tropocal areas are low in energy, this means that the dairy farmers must provide much more concentrate feeds to a cow producing high butterfat milk. As concentrates are expensive in the area, the premium paid for increased butterfat content probably does not compensate the farmer for the additional concentrates required to produce high butterfat milk.

We are now in an era when economics is a household word. Every new activity of government and private business is "costed-out" in terms of input requirements versus expected output or benefits.

Most families have a budget. The Caribbean housewife is plainly aware of today's food costs and apprehensive of the effects of devaluation. Since everyone is already economics and budget conscious, should not food economics information be transferred to the family by the Ministries of Finance, Agriculture, Health, Education and Community Development through their nutrition-related activities? Hopefully, this information, if properly presented, would encourage and assist the housewife whose food habits are constantly changing anyway, to give her family appealing, nutritious and lower-cost dishes rather than just something new.

Likewise, training programmes of agriculturists, economists, educators, social scientists, food industry personnel, and all levels of medicine should include the facts of life about food which is so related to both the physical and financial well-being of the individual.

Discussions regarding actions to be taken by each Ministry in response to important changes in the relative costs of foods can best be done through National Nutrition Committees. Here, each relevant Ministry has a spokesman through which information and opinions can be channeled. Certainly, in the Caribbean, food economics information is an essential tool in pursuing national food policy and economic development plans, as well as in carrying out government activities directed toward the betterment of each individual. CFNI is anxious to provide any possible assistance in endeavours addressed toward this objective.

BOOK REVIEWS

It is timely indeed to find two new cookery books published which are soley devoted to the use in the human dietary of the often neglected and unappreciated bean.

Governments and International Agencies share alike the urgent problems facing them, an ever widening protein gap and expanding populations in desperate need of this commodity.

These two books may help to awaken consumer awareness and encourage teachers in the field of nutrition to propagate more widely the use of these excellent sources of protein.

THE BENEVOLENT BEAN. 1967. (Doubleday & Co. Inc. Garden City, New York, $4.25), has been written jointly by Dr. and Mrs. Ancell Keys, both well known in the fields of Nutrition and Cookery.

This book is useful and entertaining, providing much historical background on the types of beans available, their use throughout the ages from Neolithic man to present 20th century inhabitants. Amusing anecdotes infer that beggars and emperors alike have benefited from their consumption of beans.

A brief note is provided on the commoner species used. A section on dangerous legumes is included, which culminates in describing the untimely death of the Greek philosopher Pythagorus (6th Century B.C.) at the hands of his enemies, on the very edge of a bean field he dare not traverse, because of his probable favism (a very rare allergy to the pollen of the bean vicia fava, found among Mediterranean peoples).

This book extols legumes as a source of proteins and of unsaturated fats, and their use is highly recommended for those concerned with the saturated fat and cholesterol levels of their blood stream.

The 200 recipes include the use of peas, lentils, peanuts, chickpeas, varieties of beans from the Phaseolus species, and embraces the use of the soya bean in its varied forms, dry seed, curd, flour, and the newer textured vegetable proteins made from this protein-rich bean.

The recipes are interesting, appetising and on the whole easy and inexpensive to reproduce. The quantities of ingredients to be used are carefully recorded and values for proteins, calories, fats and poly- unsaturates are given for each recipe.

Many of these valuable recipes could be used with benefit in school feeding programmes and could also be taught to town and village mothers for the feeding of the vulnerbale pre-school child.

Lastly status seeking hostesses will find in this comprehensive book the recipe for a sweet sour bean dish served at the court of the Roman Emperor Vitellius in A.D. 69. Who could ask for more?

The Complete Bean Book by Victor BENNETT. (PRENTICE - HALL) Englewood Cliffs, N. Jersey, 467, Printed in U.S.A. $7.75.

The preface to this book has been written by Senator E. Dirksen who uses the opportunity to praise fullsomely the versatile bean.

Because of their palatability and low fat content, the pleasures of eating the flavoursome bean can be shared by weight watchers, dieters and gourmets alike. The valuable protein of legumes has, in his opinion, sustained many a marathon speaker let loose on the Senate floor. Mr. Dirksen ends the tale of the bean's virtuosity by stating "that without the bean the earth would have long slipped into orbit and disappeared among a galaxy inhabited by bean-eaters".

A brief account of the historical background of the bean family is provided and a glossary of the beans used in over 400 recipes will be found, as well as precise instructions on quick and effective methods of preparing dried beans prior to their cooking.

Mr. Bennett must be complimented on the wide selection of dishes he presents, which range through soups, entrées, casseroles and side-dishes, as well as pastries, desserts and breads, and for the cultural spectrum they encompass. Succulent dishes from Italy, Portugal and France mingle with delicacies from Egypt, Korea, Japan and the U.S.A. Usefully, the number of servings which each recipe will yield is also stated.

Most of the recipes are directed to a sophisticated gourmet audience with leisure, good shopping facilities and to whom expense is not a prime importance.

It is an attractive book to own and could go far in raising the status of the ill-named "humble" bean to is rightful and important place among the much prized and needed protein foods.

LEGUMES IN HUMAN NUTRITION by DR. W. R. AYKROYD and MISS J. DOUGHTY 1964, FAO Nutritional Studies No. 19. Rome, Printed in Italy.

This eminently readable book will appeal to a wide audience.

The authors have effectively covered the legume story from its very beginning in prehistoric time to 1964 when the book was written.

As the story develops one is led elegantly and efficiently through the historical background of the Leguminosae family, (over 13,000 species) and the production (Total world production excluding the mainland of China and USSR, 34.18 million metric tons FAO estimates 1960-61) and consumption of these legume seeds in various parts of the world. In the Caribbean for instance, legumes play on the whole quite an important part supplementing diets which are mainly based on rice, wheat bread and maize, but not reaching as yet the proportions eaten in Mexico and Central America where the high consumption of beans is part of an ancient culture.

Although some 80 legumes are mentioned, emphasis is placed on 18 important species, which include naturally the pigeon pea (Cajanus cajan) which is thought to be one of the oldest cultivated plants in the world.

It would appear that since the debut of agriculture men have lived mainly on cereals, fruits and starchy roots with the occasional addition of animal protein. Generalisations made from data available through diet surveys would tend to show that now-a-days peoples keeping to this regimen eat in addition 30 - 70 g of legumes daily.

For a food to provide maximum nutritional impact, its digestibility must be considered; in the case of legumes this will naturally depend on the quantities eaten, the state of the digestive tract of the consumer, and the methods of processing and cooking used. A global picture is given showing the ingenuity of man devising means to improve the palatability and digestibility of legumes. The soyabean is a good example . It may be eaten raw as sprouted bean, processed and used as curd, as cheese (tofu) as sauce (shoyu) and paste (miso) and also as tempeh, used as "milk" or in the form of highly processed flour, which is included now-a-days in many a sausage, pie and bread loaf. A spray dried product saridele, has also been used in infant feeding. Ground nut preparations such as flour, biscuits and fungus-digested nutpress cake (ontjom) are mentioned.

An important chapter deals with the effect of processing on the nutritive value of legumes, such as decortication and soaking. Here a practical note is introduced as, if legume grains are soaked in cold water in their skins, no loss of nutrients occurs and the addition of sodium bicarbonate will hasten the softening process and reduce cooking time by one third.

Legumes become useful sources of vitamin C if allowed to germinate for 24 hours, and after 48 hours niacin and available iron values are also much increased.

The antioxidants which are formed when legumes are fermented have a valuable preservative action, but more important still is the breakdown of legume proteins into easily utlized amino acids which will enhance their assimilation and thus their nutritive value; tempeh and idli are quoted here.

The effective storage will be minimally deleterious to the nutritive value of these legume grains, if moisture control and cleanliness are maintained.

Toxic substances are not forgotten and the dangers of lathyrism, favism and of the more recently discovered toxin producing fungus (Aspergillus flavus) of the groundnut are mentioned.

Great emphasis is rightly placed on the composition and nutritive value of legumes. Generally speaking, most legumes contain about 60% of carbohydrate, which is mainly starch. They are low in fat (1-2%, except for the higher values in groundnuts and soybeans). They are good sources of folic acid and iron (7mg per 100g of the latter); are richer in calcium than most cereals (100 mg per 100g); are fairly good sources of niacin (2 mg per 100 g, with a high of 16 mg for the groundnut) and or thiamine (0.4 - 0.5 mg). They contain small amounts of carotene and in their dry state are almost devoid of Vitamin C. Their salient feature is the high protein content. Attention is focussed on their amino acid composition and especially their value

when combined with other proteins. Usually good sources of methionine and cystine, some legumes are deficient in tryptophane and isoleucine, but most of them have a high lysine content which most cereals lack. It is most important to realize that a protein will make good the amino acid deficiencies of another protein, only if the two of them are eaten together or almost simultaneously, and if legumes are to produce maximum effect in supplementing cereal diets, the legumes must be eaten daily with the staple.

The important early research work undertaken in Africa by the late Professor Dean and others, and also in India, which assessed the value of vegetable protein diets in the treatment of protein-calorie malnutrition, neatly bridges the gap between past history and the present world situation. The authors face, logically at this stage, the need to convince agriculturists to grow more vegetable proteins to feed the hungry nations of the world. Not only are legumes a quality food for the human race, but their importance in enhancing soil fertility, their use in animal husbandry (utilising press cake, leaves and stalks as fodder), and in pisciculture (using grains as fish food) cannot be overlooked.

In which countries should stress be placed when emphasizing the need for better legume supplies? Certainly countries dependent on a diet of starchy roots or plantains and countries in which cereals feature as a staple and where the daily per caput supplies are less than a desirable 45. Nutrition education should play an important

part in these countries with a per caput consumption in excess of 45 g. in order to ensure a more uniform protein distribution. The use of commercially manufactured products such as groundnut flour and the possibility that certain legumes could be used to make protein isolates for human consumption is also considered.

Lastly, at which segment of the population should education in the eating of pulses be directed? A world wide study of infant feeding practices (Jelliffe, 1955) has shown that legumes in many parts of the world formed a negligible part of infant and pre-school feeding, mainly because they were thought indigestible and sometimes toxic to children. It is therefore of prime importance to educate the mothers of these small children, and also pregnant women who are the most vulnerable groups in a population. But nutrition education must be realistic, it must be given not by word of mouth alone, but by practical and intelligible simple cookery demonstrations using foods, especially legumes which are locally grown. An appendix to this book provides 27 recipes which could be used by adults and adjusted for children.

A balanced approach is required when considering the protein requirements of a country, and geographic, agronomic, economic and social factors must be taken into account.

Legumes are easy to cultivate, give a large yield of protein per acre, they are relatively cheap and could, therefore, be available to budget conscious groups. They are well established in the dietary of industrialized nations and this pattern could be followed in less developed countries. If storage facilities could be improved and a better knowledge of the use of insecticides and inorganic fertilizers be acquired in developing countries, it might be feasible to make consumption of legumes at the appropriate level possible throughout the whole year.

This book contains a wealth of information on the highly relevant subject of how to improve the nutritional status of millions of individuals in a protein starved world and should find a place in every school and unit which considers itself involved in nutrition education. The engaging and lively style in which it is written makes this scientific publication a pleasure to read.

POPULATION AND NUTRITION IN THE YEAR 2000 *

by Jean-Michel van Gindertael

Any period of history has meaning only because of the people who live in it. The year 2000, which is only 32 earth-sun revolutions away, is likely to be marked by the number of people, by a huge increase in the human family. According to the best available evidence, the present world population of 3500 million will by then have doubled.

This will of course not be the earth's first population shock wave - we can point, for example, to the peopling of the empty lands of North America or Siberia in modern times or, in reverse, to the vast depopulation caused by the Black Death in the Middle Ages. But now the increase is on such a scale that the whole of mankind will be involved - all of us, no matter what corner of the globe we inhabit.

This new solidarity is perhaps but the counterpart to the threat of massive destruction by atomic weapons, but, no matter whether the human race is on the brink of annihilation or of further multiplication, this sense of solidarity exists.

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*This is one of a series of articles put out by the Pan American Health Organization, Washington D.C., regional office of WHO, on the occasion of World Health Day, April 7th 1968, the 20th anniversary of WHO.

The world's population has been increasing steadily for centuries, but the growth is accelerating. According to the experts, the world's entire population was only about two or three hundred million at the beginning of the Christian era. It took 16 centuries, i.e. until the renaissance, to double in size. But by 1850 the total had reached 1000 million, and 2000 million by about 1930. The pace continues to quicken, creating an impetus condemned by many as foolish and unconsidered, for they argue that the earth cannot feed an infinite number of mouths. Even now, in the year 1968, only a few privileged countries enjoy an abundant or indeed over-abundant food supply.

It may however be wrong to see the problem in a pessimistic light, for it has not been demonstrated that our planet will be unable to nourish a much larger population. The British econmist Colin Clark has asserted that, by making the most of science and technology, it would be possible to produce enough amino-acids to sustain 45,000 million people. This figure is challenged by other authorities, however, for a world population of such dimensions would throw unbearable strains of a different nature on our resources. Not only would it necessary to cultivate every inch of available land - further space would have to be found, in itself agriculturally unproductive, for new towns, new roads, all the other bits and pices needed on account of man not living "by bread alone". It must not be forgotten, however, that there are many countries today

which cannot develop their agriculture efficiently because of low population density. It is not always the most densely-populated countries which have nutrition difficulties, Malnutrition occurs in New Guinea, for example, where there is only one person per square kilometre, as well as in scantily-populated areas of South America and Africa. On the other hand, densely-populated countries like Belgium and Holland have ample food supplies.

The equation linking overpopulation and hunger can only be understood if a number of other essential factors are taken into account. These factors include the level of economic development, education, climate, and the quality of the soil. There are also some highly industrialized countries which rely largely on food produced elsewhere. But a developing country which has to make huge purchases of wheat or other foods abroad in order to meet the needs of people, inevitably weakens her foreign exchange position thereby putting a brake on her own industrial and agricultural development and puts off the day when she will be independent of foreign exchange economic aid. The food situation in many countries is also worsened by religious taboos, by lack of nutrition education and by vast though preventable wastage (rats, for example).

Education has a very important part to play. Too often we find malnutrition, even hunger, in regions where in theory food should not be scarce. When, for some local reason, there is a ban on eating eggs or fish or certain kinds of meat, people often substitute things

which are low in vitamins, iron and amino-acids, and therefore are not sufficiently nutritious. Very often these dietary deficiencies aggravate the condition of persons already weakened by parasitic diseases, such as bilharziasis and ancylostomiasis. In Africa, for example, deficiency diseases, such as kwashiorkor, are widespread. Their early stages have been diagnosed in 30 per cent of children in the weeks following weaning, and they cause thousands of death every year.

Fortunately, modern science is potentially capable of meeting the challenge of a population of 6000 million or 7000 by the year 2000. But to do so, total world food production would have to be increased by 170 per cent., and products of animal origin by 200 per cent. The production increase required in the developing countries, where nutritional deficiencies are most frequent, would have to be of the order of 500 per cent. (i.e. six times the present output).

There would also have to be a radical adjustment (will it ever be achieved?) of world trade sweeping away the present division between "rich" and "poor" countries. We could take another step in the right direction if consumers could be persuaded to change their food habits to some degree. Governments could make an important contribution by subsidizing certain food products which are rich in protein. Groundnuts, oilseed and even some industrial residues now used in their raw state as cattle fodder could be specially treated for human consumption.

A cautious optimism thus seems justified. Certain amino-acids can already be manufactured synthetically, though in small quantities, but we are still a long way from the point where they could usefully be incorporated in actual diet. Studies have also been made of the possibilities of using plankton, seaweed, yeasts, even bacteria operating on chemical products with a petroleum base. Sea farming also offers interesting possibilities. During a recent conference on development, it was suggested that large-scale breeding grounds be established where fry would be safe from their natural enemies, and fed until big enough to fend for themselves. They would then be released in the fishing grounds outside territorial waters, systematic restocking would be carried out within the framework of international agreement.

Some experts at the conference even suggested that the sea-bed which, to all intents and purposes, is a vast compost heap, might be exploited. Remote-control horrowing equipment might be used, or even compressed air, which would turn over the sediment and bring rich, nutritive materials closer to the surface.

But it is not enough simply to find more food. Man also needs shelter, education, welfare and a social life. He needs not only the means, but also a reason to live. All this may still be within the bounds of achievement in a world of 7000 million people, as predicted for the year 2000. But all our hopes would be submerged if the present geometric rate of progression were to continue: some 40 years later there would be a population of 12,000 million. Children now being born may well live to see the year 2040.

The mind has difficulty in grasping such possibilities, and many may dismiss the figures as mere abstractions. We try to persuade ourselves that some providential deus ex machina will slow down the world's population growth over the next decades, we argue that, as regards developed countries, the birth-rate is reasonable in the United States of America, moderate in France, and insufficient in such countries as Belgium and Hungary. It does appear that the rate of increase in the industrialized countries started flattening out as soon as a certain level of economic development and social well-being was reached. But by a quirk of fate it is in those countries where existence is most precarious that the population is expanding most rapidly.

A number of explanations have been advanced by sociologists. The most persuasive is based on the steady improvement of man's health over the past hundred years. This is perhaps to be ascribed not so much to medical progress as to general advances in hygiene, ranging from the purity of water to working conditions in factories, without forgetting the important role of compulsory schooling for all children. In the absence of statistics, we have no means of knowing the full ravages of mother and child mortality before the beginning of the Twentieth Century. What we do know, however, is that even in recent times in Europe, it was taken for granted that of a family of six or seven brothers and sisters, three or four would die in childhood.

On the other hand, in an economy where child labour was quite legal and children were exploited without the slightest scruple -

see pages of Dickens - the large family offered a primitive kind of social security at a time when official systems were non-existent. Farms were unmechanized, and needed armies of workers, while in the cities the apprenticeship system was a substitute for schooling, and relieved the father of a family of his material responsibilities as early as possible.

While this social pattern has almost vanished in the developed countries, such is far from being the case in the economically less advanced countries which are desperately trying to catch up the hundred years' advance that industrialization and increasing social justice have bestowed on North America, Europe, the USSR, Japan, Australia and New Zealand. But until industrialization arrives, the developing countries adhere to the traditional family pattern, even though we are now in an era where a child born anywhere in the world has a better chance than ever before of achieving his normal life-span.

That infantile mortality is decreasing is obviously to be welcomed, and we must see to it that over the next decades a common standard of health is achieved for all mankind, something which is far from being the case at present. The fact remains that health work is ahead of economic development, and if this gap persists, it will be detrimental to both.

It took India hundreds of years, from the dawn of her history until the present day, to bring her population to 500 million. But if the population continues to increase at its present rate, another 500 million

will have been added between now and the end of the century i.e. in about 30 years. It is hard to imagine the gigantic investments needed to create a viable economy that would yield adequate reinvestments in the form of housing, hospitals and roads for a population that has doubled in size. Yet even if all the aid now available from the highly developed nations were devoted to India alone, it would still not be enough to meet present needs.

Should there be fewer children? Some countries say yes as far as they are concerned. In other countries where the population pyramid is already out of shape and where the progress of medicine by increasing the average life-span threatens to make it top heavy there should be more children. Birth control is advocated in some countries, condemned in others, and in yet others is a matter of indifference. Clearly, in 1968 at least, ther can be no world-wide solution.

We must hope that advances in scientific knowledge will ease the pressures which soaring birth-rates are already now creating in some of the developing countries. The year 2000 is likely to be difficult, the more so since the population explosion is linked with an inexorable process of urbanization which, in spite of its many unpleasant aspects, will probably affect at least two-thirds of mankind. There seems little doubt that in the sphere of health, too, we will encounter setbacks, perhaps even some defeats. All the more reason for us to throw all our skill and knowledge into the advancement of science, in the hope that it will help us to win this peculiar race against time.

EDITOR'S ANNOUNCEMENTS

COMPETITION FOR PIGEON (GUNGO) PEAS RECIPE

The last date of entry for this competition (first prize £5, runners-up £1 - see CAJANUS No. I for details) has been put forward to May 31st.

The Editor renews his cordial invitation to readers to send questions for our "Your Questions Answered" column, and again solicits letters for a "Readers' Letters" feature. We earnestly hope that our readers will participate in making this newsletter a forum for discussion and debate between all in the Caribbean whose work and interests relate to food and nutrition.

No. 3 June 1968

CAJANUS

NEWSLETTER OF

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE

CFNI - FIELD INVESTIGATIONS

A - K 1000

NUTRITION AND ECONOMIC GROWTH

BREAST FEEDING

FOOD PROBLEM OF DEVELOPING COUNTRIES

C A J A N U S

Newsletter of

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE

Mona P.O. Box 140

Kingston 7, Jamaica.

CONTENTS

Opinions expressed in this newsletter are reproduced for the sake of interest and information. They should not necessarily be construed as representing the views of the Caribbean Food and Nutrition Institute, nor of the bodies signatory to the agreement establishing the Institute, namely PAHO/WHO, FAO, University of the West Indies, and the governments of Jamaica and Trinidad/Tobago, nor of the Williams-Waterman Fund.

CARIBBEAN FOOD AND NUTRITION INSTITUTE

(III) FIELD INVESTIGATIONS

The purpose and aims of the Caribbean Food and Nutrition Institute (CFNI) was the subject of an article in the first issue of this newsletter, and its training activities were dealt with in the second issue.

The basic philosophy of the Institute is that the community nutrition level in the Caribbean, as anywhere, is related to numerous, complex interacting ecological forces which can be indicated in the following highly over-simplified "equation" or formula:

C N L	Economic Level	Educational Level	Food Availability	Aspects of Health	(Conditioning) (Infections) (Preventive) (Services)

Population Size

The multifactorial nature of food and nutrition problems plainly necessitates an interdisciplinary approach to solutions. This strategy is interwoven into all CFNI activities, including research, and is attested to by the joint international sponsorship of the Institute by PAHO/WHO and FAO, and by the range of training and professional backgrounds covered by present staff, and still more in those envisaged for the future.

The CFNI also has to take into account the geographic and research realities of the region - that is widely scattered islands, with a limited number of centers of advanced knowledge concerning different aspects of food and nutrition unevenly distributed through them, but with intervening areas with much more limited technical knowledge and resources.

Plainly, the CFNI has a bridging role, not only between such traditionally artificially separated disciplines as agriculture and health, but also between centers of modern knowledge and information and the Caribbean at large.

With limited CFNI staff and with restricted resources of all types in the Caribbean, the policy and programme of the Institute is intended to be geared to priority community problems in the field of food and nutrition. It seems logical, therefore, that its research activities should be mainly directed towards the scientific measurement of the size, nature, distribution and relative urgency of these problems, with the assessment of their causation (by what may be termed "wide-spectrum epidemiology"), and with operational research directed towards the quantitative evaluation of the cost-effectiveness of food and nutrition programmes intended to ameliorate the situation. These would include interdisciplinary nutrition education programmes and studies designed to evaluate the methodology of protein feeding programmes for children in the community.

Lastly, and by no means least, the CFNI's present, and still more future, role means that the expectations and felt-needs of the governments of the area must be important molding forces in the form, shape and direction in which the Institute's activities develop. Conversely, it may be hoped that CFNI activities, including those in research, will feed-back to governments and may, when appropriate, help to modify opinion and programmes.

The research involvement of CFNI must, then, be considered in light of its over-all objective, its interdisciplinary philosophy and within the constraints and opportunities of its geographic and organisational framework.

These plans may be considered under three headings: (1) research coordination, (2) research training, and (3) research activities.

(1) RESEARCH COORDINATION. The CFNI has a definite, although often informal, role to play in coordination of research, or at least, in dissemination of ideas and information through the area. Its staff are frequently mobile through the different islands, and have a double entrée to different groups as an inter-Caribbean body because it is under the direction of PAHO/WHO and FAO and because of the Institute's association with the University of the West Indies. Already many opportunities have arisen both to channel information from centers of knowledge to those in the field, and also to make research scientists aware of parallel work related to their field being undertaken elsewhere in the Caribbean.

In addition, seminars and conferences to be undertaken by the Institute may be expected to help in the coordination of research knowledge, as, for example, with a meeting being held in Guyana in July 1968 on the development of protein foods for the Caribbean.

(2) RESEARCH TRAINING. Training in the methodology of scientific applied research, especially of an interdisciplinary nature, will run through all Institute educational activities, with special relation to the need for its incorporation in in-service activity on return home.

Thus, in the nine months "long course" in Community Nutrition, to be initiated in January 1969 for candidates from health, agriculture, education and community development, basic research methodology will be covered, including the need for the collection and analysis of accurate unbiased information, and such statistical concepts as sampling and the

calculation of the significance of results, both using manual methods and employing instrumental assistance, including the computer.

This approach will be reinforced during the course by visits to selected research units in the area that are working in different aspects of food and nutrition. In addition, students will undertake research in the course of their training, during a period when CFNI staff and students will carry out an interdisciplinary field survey together in a Caribbean country, and during the last three months of the course when an in-service field research project will be undertaken by each student under CFNI's supervision in their home country.

(3) RESEARCH ACTIVITIES. The research activities of CFNI will be related to priority practical problems. They will be interdisciplinary, collaborative and capable of prompt feed-back to evaluate, guide, modify and initiate appropriate preventive programmes.

Collaborative Research. This will be undertaken in a variety of ways. Firstly, as it is not a function of the Institute to involve itself in more elaborate laboratory research, the cooperation of existing centers, preferably in the Caribbean, will be solicited if investigations of this type are required as a component of a field research project. Past examples are given in Table I.

Purpose of Study	CFNI Activity	Research Unit Activity	
		Procedure	Unit
(1) Arm Circumference as a Public Measure of Protein Depletion	Arm Circumference Measurements (correlated with other anthropometry)	Lean Body Mass (Radioactive Potassium)	Tropical Metabolism Research Unit, Jamaica (Professor J. Waterlow)
(2) Cost/Nutrient Assessment of Caribbean Foods	Collection of Data from nine islands	Analysis of Various Proprietary Foods (with no previous available information)	Scientific Research Council, Jamaica (Miss H. Fox)

The joint study with the Tropical Metabolism Research Unit is to be extended in the near future to include a correlation of anthropometric measurements, lean body mass (radioactive potassium) and various biochemical tests of PCM (including serum albumin, the amino-acid imbalance test and the hydroxyproline excretion test) in young children with mild-moderate or marginal malnutrition.

Secondly, collaboration will also be built up with Caribbean or external centers, units and schools to develop cooperative projects of shorter or longer duration. At the simplest level, this may entail staff visiting the area for short-term joint projects.

To-date, several of these have been undertaken, as with a comparative community survey correlating anthropometry and scalp hair morphology in poorly nourished young children in the island of St. Vincent, and with a two-month socio-cultural study into village concepts of the etiology and therapy of marasmus in Jamaica.

Proposed for next year will be a joint field study undertaken with the Rockefeller Schistosomiasis Research and Control Center in St. Lucia into possible inter-action between endemic schistosomiasis and malnutrition in school children.

Also, wherever possible, CFNI field research will be carried out in active collaboration with appropriate government services. For example, the CFNI staff carried out a "Rapid PCM Survey" in October 1967 in St. Vincent together with representatives of the health, agriculture and education services of that country, as well as voluntary agencies.

In this study, the prevalence of protein-calorie malnutrition of early childhood (PCM) was assessed in the whole island using anthropometric measurements, at the same time as protein availability and utilisation in the country as a whole and in families was assayed. Collaborative involvement at the planning stage and during implementation have since been reinforced by feed-back of preliminary findings to a meeting of the St. Vincent's National Food and Nutrition Committee, attended by CFNI staff.

Another example of mutual collaboration and involvement by government and CFNI is in relation to the FAO/WHO/UNICEF Applied Nutrition Program which is to be started in Barbados in the near future. The Institute has been involved in joint planning of the pre-program survey, so necessary for its subsequent evaluation, and will be assisting in its implementation and later assessments of its effectiveness.

Lastly, and importantly, CFNI field research will always be undertaken with the advice of, and in collaboration with, other PAHO/WHO and FAO colleagues working in the area, including ZONE I Headquarters staff, Country Representatives and appropriate U.N. technical advisers working in food and nutrition-related fields.

As an example, currently a UNDP Groundwater Survey team is working in rural Jamaica, including an agro-economic unit, which has carried out a statistically representative survey of land tenure, family structure, economic circumstances and crop production by small holders and subsistence farmers. CFNI has been able to collaborate in this project by assisting in the nutritional evaluation of the crops grown in relation to the nutrient needs of the families in the area.

THE ROLE OF COMMUNITY DEVELOPMENT WORKERS

Extract from an address by the Prime Minister of Trinidad and Tobago, Dr. the Rt. Hon. Eric Williams, at the Inaugural Session of the Caribbean Seminar on Community Development and Local Government, March 18, 1968.

"----- It is clear that the diversification of our economies will of necessity require changes in our thinking and behaviour patterns. The development of what may now be a cottage industry into a viable and economic industry, will of necessity require complementary skills in processing, packaging and marketing, and in a national determination to buy local. These corollary skills and concepts must be taught to our people now, and this is the role of adult education and community development as we see it in Trinidad and Tobago.

One of the problems with which we will be faced in the light of the larger markets for the product of local industries as a result of Caribbean economic unity will certainly be in the area of over-production and more seriously still in that of a lowering of standards. This latter problem lies to a certain extent in the field of consumer education with which Community Development Officers must necessarily be concerned. If consumers are prepared to reject low standards then the manufacturers will of necessity have to keep his standard high or go out of business.

The re-orientation of West Indian society must in the long run depend on a re-orientation by West Indian peoples of attitudes and values,

many of them two and three hundred years old, which might have served the territories in good stead in the plantation era, but which today are entirely at variance with our free democratic and progressive way of life.

Another regional problem which calls for the education of the adult population and which constitutes a major and urgent talk for all Community Development Officers in the region is the control of our population growth. An awareness on the part of our peoples of this urgency, in all territories, is essential if we are to press onwards with our programme for better living. Unless we can bring our population into some relationship with our material resources in the next decade, then we may find ourselves just where we are today, despite the herculean regional efforts which are being made on all fronts by all the Governments of the region to provide an adequate standard of living for our people.----"

* * * *

JORDAN'S PILOT CORN PROJECT A SUCCESS, CAN SAVE GOVERNMENT $0.5 million.

From the 'Guyana Graphic', 5 April 1968: Minister of Agriculture Robert Jordan's special pilot project for the growing of Jamaica hybrid corn to replace the importation of five million pounds annually for the stockfeed industry, has proven a resounding success.

Nearly 300,000 pounds were reaped on Wednesday from a 65-acre plot at Mibicuri, Black Bush Polder on Corentyne, at a field day demonstration showing the benefits of the hybrid species and the use of the corn harvester.

The returns were more than double the average yields from other species. An average of 4,000 pounds per acre was recorded as compared

with 1,200 pounds. per acre for the other species.

Speaking of the benefits of developing the corn programme, Mr. Jordan told farmers there was an assured market for the stockfeed industry which would mean an annual saving of nearly $0.5 million by replacing five million pounds of imported corn with local produce and reducing the present subsidy to the stockfeed industry.

Mr. Jordan hopes to extend local production from 2,000 to 4,000 acres within a two-year period. He declared: "We will not rest until we have several areas under corn to provide the fodder necessary for our livestock industry".

More than 200 schoolchildren of the Mibicuri Government School who took part in the demonstration, are to write end-of-term essays on "Why Guyana should grow more corn." Winner of the essay competition will receive a book prize to be donated by the Minister of Agriculture who was impressed by the children's enthusiasm.

* * * * *

THIRTEENTH SCIENTIFIC MEETING OF STANDING ADVISORY COMMITTEE FOR MEDICAL RESEARCH IN THE COMMONWEALTH CARIBBEAN.

This meeting was held at UWI, Mona, Jamaica, 19th - 22nd April, 1968. Two sessions were devoted to Gastroenterology, the third to Infectious Disease, and the last to Laboratory and Clinical Investigations.

In fact all sessions contained papers of considerable interest to nutritionists, among which were:

Gastrointestinal function in malnutrition, W.P.T. James, (T.M.R.U., UWI, Jamaica).

Malabsorption and malnutrition in rural Haiti, F. Klipstein, (USA).

Some metabolic changes in the livers of malnourished infants, G. Scullard and G. Alleyne, (T.M.R.U., Jamaica)

Jejunal biopsy studies in malnutrition, B. R. Sparke and W.P.T. James, (Jamaica).

The arm circumference as a field index of protein calorie malnutrition of early childhood, D. B. Jelliffe and E.F.P. Jelliffe (CFNI, Jamaica).

Those desirous of further information could communicate with the authors directly or through Dr. D. Picou, Tropical Metabolism Research Unit, University of the West Indies, Mona, Jamaica.

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PLANNED PARENTHOOD REPORT

From the 'Vincentian', 9 March, 1968: At the last Annual General Meeting of the Planned Parenthood Associated the following persons were elected to the Executive Committee:-

President	Dr. A.C.K. Antrobus
Vice President	Mr. W. H. Lewis
Secretary	Mr. R. I. Samuel
Treasurer	Dr. S. A. Sutherland
	Dr. S. D. Gun-Munro
	Mrs. J. H.Cox
	Rev. E. C. Wiltshire

At the meeting the President presented his Annual Report for 1967. In this report the following Population Data was revealed:-

	1963	1964	1965	1966	1967
Total Live Births in St. Vincent	3637	3678	3770	3771	(3531)
Total Live Births Kingstown	1362	1317	1389	1458	(1314)
Birth Rate	43.1	42.7	42.9	42.0	(40)
Infant Mortality Rate	96	75	69	73	(65)
Total Population	85,550	87,250	88,701	90,622	92,000.

The Report also stated that live births in 1967 is not only the lowest figure for the period under review, but the lowest for any one year since 1954. It represents a drop of over 6% from the 1966 births; and in the case of Kingstown the drop is about 10%.

The birth rate of 40 per 1000 and infant mortality rate at 60 is still, however, the highest in the British Caribbean.

The Association which has had just overr one year of organized activity now entered its third year of activities.

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A NOTE ON NUTRITION PROGRAMS AT PRESENT IN OPERATION IN VENEZUELA

(by courtesy of PAHO/WHO Zone I Office)

The Nutrition programs at present being carried out in Venezuela are the responsibility of

1. the Ministry of Health & Social Welfare,
2. the National Institute of Nutrition,
3. the National Institute of supplementary feeding for school children, and
4. the University.

1. (a) The Ministry of Health through their maternal child-care Division, have a technical and teaching organization (national Institute of Child Care) which is able to give training at different levels to technical personnel in the health phases of physical education of children.

(b) There is a campaign against gastroenteritis being carried out at Dehydration Centers.

(c) Nutritional attention to children under 2 years is carried out by means of the "Child Care Centers", with an educational origin, and during which the distribution of powdered milk and "P.L." (a product composed of skimmed milk enriched with minerals and vitamin B complex and Vitamin A) takes place. These stations belong to the Division of Maternal & Child Care the Ministry of Health. Coverage of the child population under 2 years is 1.5%.

2. (a) The National Institute of Nutrition is responsible for the nutritional attention to pre-school age children (2-5 years), prenatals and persons with nutritional deficiencies (adults). These programs cover approximately 5% of the child population ranging from 2 to 5 years of age.

(b) Since 1967, the services of nutritional recovery are being organized throughout the national territory. At present there are three Recovery Centers with an approximate capacity of 100 children. These Centers depend directly on the National Institute of Nutrition.

(c) In addition to the above, the Institute, through the rural health services, protects pregnant mothers by distributing to them iron sulphate tablets and multi-vitamins. The latter vitamins are also distributed to adults with certain deficiencies. The number of pregnant women covered by this service corresponds to 8% of the population of the country.

(d) For a number of years, personnel of auxiliary level have been trained in the area for this type of work, and are classified as "Nutrition Instructors" who have under their charge the supervision and nutritional education at the level of the local health areas. An intensive course on nutrition for pediatricians was organized this year in conjunction with the Ministry.

(e) Since the early days of the Institute, the program of the Popular Dining rooms has existed and constitutes in brief, the system of subsidiary nourishment with a tendency to better the food problem of the worker. These dining rooms run on a chain system open to the public and meals are sold at B^S 1.50 ($0.33) each. The number of meals served for the year 1966 were 11 million.

3. The National Insitute of Supplementary Feeding for school children operates with the object of improving the nutritional condition of the school population through a lunch program for scholars. This Institute served 410,363 meals to children in 1964 through 2,250 popular dining rooms. It is estimated that for 1968, lunches will be served to one million scholars. This corresponds to 50% of the school age child population.

4. The Central University of Venezuela carried out work in the training of personnel in the nutrition field through the School of Dietetics and the School of Public Health:

(a) The School of Dietetics has been training dieticians since 1957. Duration of the course is three years. Up to the present, 178 professionals have been graduated.

(b) The School of Public Health has a Nutrition Department having the responsibility of imparting nutrition instructions in the different courses carried out for doctors, nurses, health inspectors, et al.

(c) As a result of the Conference given in Caracas July 1966, under the auspices of the OPS/OMS regarding the formation of Nutritionists-dieticians, and taking into account the scarcity of this type of personnel in the country, the University of Zulia created an additional Nutrition and Dietetics school this year. Duration of such a course will be 4 years and the first graduations will take place in 1972.

AK-1000: A PHILOSOPHY OF FEEDING THE PRE-SCHOOL CHILD*

by
Sam C. Smith
(Vice President-Grants
Research Corporation, New York City)

The nutritionist who seeks to devise complete solutions to problems of malnutrition will wind up with some beautiful paper schemes which never get translated into action. But the problems are so pressing, the needs so great, that one must do the best he can with what he has to work with in light of prevailing conditions. A partial solution is better than none at all.

Needs are virtually unlimited, but resources to deal with them are not. It is then a matter of defining priorities and tackling them as means permit. In all parts of the developing world where food is in short supply, the pre-school child is least well-fed. From weaning until about five or six years of age, malnutrition and its consequent complications exact a dreadful toll. Adequate, which is not to say optimal, nutrition during these critical years is a realistic goal and one which should receive the highest priority in a nutrition program in any developing country. It is possible to hold the line in the face of a desperate situation until such time as improved education and economic conditions can take effect. A mortality rate of up to 50% or higher as a consequence of malnutrition among pre-school age children in the less-favoured countries is an appalling

*Based on a talk given at a Conference organized by the Caribbean Food and Nutrition Insitute in February 1968.

statistic which does not have to be.

In food-short areas major attention must be directed at protein and calories. All other deficiencies are of secondary importance and will to a large extent be corrected in the course of focusing on the main problem. An obvious step toward alleviation of the critical shortage of protein is to assure maximally effective use of the protein currently being produced. In the areas which we are considering economic conditions make it very difficult to bring about any substantial increase in consumption of high quality animal protein. On the other hand, wiser use of currently-produced plant foods is often both economically and culturally feasible. Formulation of low-cost blends of legumes and cereals in which the various components compensate for each other's amino acid deficiencies so as to produce a food of relative high biological value is well-known. Some of these are, however, rather complex and expensive and beyond the economic means of some population groups and the technical capabilities of some countries. The principle is a valuable one, however, and can be utilized in even the most hard-pressed situations.

Dr. Kendal W. King, professor and head of the department of biochemistry at Virginia Polytechnic Institute (VPI), and his associates have applied the principle in Haiti with very encouraging results to date. They were faced with these harsh facts: a population that is 90% rural and 98% illiterate; a total food outlay per person, including home-grown foods, of nine cents (U.S); no stores, as such, supplying the rural areas.

In considering a blend of local foods for pre-school age children, the following criteria were adopted:

1. Common foods - readily available throughout the year in both rural and urban areas; flavour and texture acceptable to children and rest of family; adaptable to conventional cooking methods and recipe variations; sustained acceptance and freedom from toxic factors.

2. Only two components - for utter simplicity in preparation and minimum cost so that mothers can be taught how to prepare mixtures in their own homes; adaptable to commercial manufacture of limited technology so as to provide a pre-packaged food for institutions or others able to afford the processing cost and so that enrichment with vitamins and minerals will be practical; pre-packaged food can be promoted among the financially-able population lending prestige value.

3. Sufficient protein and calories - to prevent development of or to cure protein-calorie malnutrition when supplemented with cheap, available foodstuffs.

A "perfect food" was never sought. The goal was a good basic food of minimum cost which, when supplemented with as much animal protein, fruits and vegetables as the budget would allow, would support reasonably good growth and development of a child even though not ideal.

Phase one of the project was to collect samples of all cereals and legumes available in the country. In cereals, the island republic produces rices, corns and sorghums. Principal legumes are various beans, peas and peanuts. The researchers then determined the chemical compositions of these products, particularly with regard to their protein content, their annual production figures and their market cost.

A key factor in these studies was that cereal proteins have a deficiency in one or more amino acids which reduces their nutritional value. It was necessary to study Haitian beans, peas and peanuts to add to the cereals to compensate for the amino acid deficiency and raise the total protein level to around 12 to 15 per cent. This percentage, in reasonably good quality, is sufficient to maintian a child in fairly good health.

Dr. King's team found that blending 30 per cent beans (Phaseolus Vulgaris) with 70 per cent cereal (maize, rice or sorghum) could be expected to produce good infant food. Peas and peanuts did not, and only certain of the beans.

In the second phase of the project, two years of laboratory research using rats was conducted on the VPI campus to determine whether the proteins contained in the blend were as good in practice as the chemical studies indicated and to be sure there were no toxic effects.

The program now reached a crucial point, actually testing the blends in Haitian youngsters. This research, Phase Three of the project, was conducted under close supervision of Haitian doctors. The results were dramatic. The blends proved to be nutritionally better than had been hoped, nearly as good as milk. There were no ill effects, such as digestive upset. Marasmus and kwashiorkor, simply faded. Moreover, the children involved like the blends.

Now the VPI researchers knew what to tell peasant mothers to mix to give their children an adequate diet. The blends were designated AK-1000. This is a play on the name of a traditional Haitian corn dish called akasant or AK-100. Thus AK-1000, or akamil, was intended to indicate an even superior food.

But getting the message to these illiterate people was not an easy task. Books and pamphlets are useless, and the grinding poverty dictates that only very simple projects can be attempted.

Thus was born a network of Community Mothercraft Centers**. Initially, 11 such rehabilitation centers were launched in the country and this figure has grown to 15 with still others projected.

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* King, K. W., Fougere, W., Foucald, J., Dominique, Gladys, Beghin,I.D. (1966) Arch. Latinoamer de Nutricion, 16, 53-64

**"Community Mothercraft Centers" by Kendal W. King, Technical Publication No. 13, 1967. Virginia Polytechnic Institute, Blacksburg, Virginia.

Under the plan, all children in a chosen village are given medical examinations and the 30 most malnourished are invited to come to the centre with their mothers six days a week. Typically the centre is a village house rented for the purpose and supervised by a girl with a high school education who has special training in nutrition.

Each day, three or four of the mothers stay with the girl and assist her in preparing three well-balanced meals for the children, using only locally-available foods. All day the girl discusses child care and nutrition with the mothers as they work. No modern conveniences are permitted. The centre must be as nearly like the homes of the women as possible.

After four months, the children are "graduated", and the next worst 30 children are admitted.

The country mothers need only to supplement a diet of the bean-cereal blend with fresh vegetables and fruits to supply vitamins A and C. Fruits and vegetables are plentiful and quite cheap. Animal protein is encouraged to the extent permitted by the food budget.

The packaged version of AK-1000 is being sold in urban areas. Since fresh fruits and vegetables are not easily obtained in more densely populated areas, calcium, phosphorus, iron and B vitamins are added. Fifteen recipes are included with each package of AK-1000. These are traditional dishes, such as dumplings, gruel and stews, that are appealing to adults. The product is not promoted as a food for the poor, which would be self-defeating, but rather as a wholesome, nutritious food for all people.

The Haitian experience is cited as a practical measure which can be adapted to any locale as circumstances dictate. It is not a perfect or ultimate solution, but it is a promising step forward out of the illness and misery which engulfs much of the world. And, as the Chinese philosopher, Lao-Tsze, so aptly observed: "A journey of a thousand miles began with a single step."

* * * *

"....Under what circumstances will the members of a democracy wish to have more or fewer children? This question cannot be answered by armchair speculation, or by medical research, or by small bits of 2-cent research projects. A concentrated effort on 'alternative thinking and experimentation' with adequate financial support, extending over several decades, will be required," --A. J. Jaffe, Science, Feb. 2, 1968, p. 481.

COMING EVENTS

The Caribbean Food and Nutrition Institute is organising a conference in Georgetown, Guyana 29 July - 1st August 1968 on "Protein Foods For The Caribbean". Among the subjects for presentation and discussion at this conference in addition to background information on the subject in its Caribbean context, there will be such matters as current and potential availability of protein resouces, past experiences and world developments with specific protein foods, general principles of their development, formulation and testing, and the role of feasibility studies and of marketing. It is anticipated that staff of various governments and of UWI will take part along with FAO and PAHO/WHO staff. Further details may be obtained from Dr. J. McKigney, Deputy Director, Caribbean Food and Nutrition Institute.

From August 26th to 29th the Western Hemisphere Nutrition Congress will take place in San Juan, Puerto Rico. It is organised by the American Medical Association in cooperation with other US, Latin-American and Canadian Nutrition Societies, and described by the organisers as "an inter-disciplinary congress to encourage the application of new research findings to the solution of nutrition problems in the hemisphere". Titles of sessions include Nutrition and Human Development, Food Production, Distribution and Economics, Recent Advances in Nutrition Research and Applied Nutrition Programmes in the Caribbean, Iron Deficiency Anaemia, Vitamin A Metabolism and Deficiency, and Applied Nutrition Programmes in the Americas. Further details may be obtained from Department of Foods and Nutrition, American Medical Association, 535 N. Dearborn Street, Chicago, Illinois, 60610, USA.

In Guyana, a Nutrition Training Programme is being arranged by the Nutrition Committee for representatives of the Ministries of Health, Education, Agriculture and Community Development from the areas which are to participate in the next phase of Guyana's Applied Nutrition Programme. The course will be held from August 19 to September 6. Anyone desirous of further information should contact - Mrs. V. Bright, Nutritionist, Ministry of Health, or Miss N. Gibbs, PAHO/WHO Office, also situated in the Ministry of Health.

READERS' LETTERS

From Mr. G. A. Southwell, Chief Agricultural Officer, Grenada.

Dear Sir,

The CFNI is to be congratulated on the very successful Conference held in Jamaica in February. The lectures and discussions conducted by experts in the various fields of Food and Nutrition were stimulating and I enjoyed participating in such an informative meeting.

During the discussions I drew attention to the need for improving the effectiveness of the agricultural extension worker as an agent of change. Undoubtedly the urgency for increased production of local foods of better nutritive value is fully recognized. The University of the West Indies' programme of food crop and livestock research is being geared to meet the challenge and it is to be expected that more scientific knowledge on food production in the West Indies will be forthcoming. But, as an agriculturist who has devoted most of his professional life to the cause of extension education, my concern is that the gap between proven farming facts and those actually applied by the man on the land, will continue to widen.

Mr. Don Mills of Jamaica, in his paper referred to the difficulties the extension worker faces in persuading simple rural folk to adopt modern methods of farming. After some twenty years in this field of agricultural endeavour, I feel that we have not made enough headway in influencing our farmers to change more rapidly their attitudes, knowledge and skills. One of the reasons for this, I think, is because we have been contented to "play it by ear". To date, we have done little more than 'super-impose' most of the traditional extension tools of developed countries on the different cultural and economic conditions that exist in a developing country. Not enough planned effort has been made to adapt these to the farming situation existing in the Caribbean.

Modern agricultural extension is becoming more of a science and less of an art, and since the acceptance or rejection of innovations by farmers of developing areas can be a crucial factor in economic growth, a foundation for rapid agricultural progress can therefore be laid by instituting a programme of Extension Research.

What is needed in the Caribbean, I feel, is research of a socio-economic nature aimed at obtaining a better understanding of the West Indian farmer, farmer groups and rural communities, as the basis for developing a system of Extension Education especially suited to our educational, cultural, social and economic conditions. Operational research of this nature is now conducted by a number of recognised institutions, the University of Hohenheim in Germany and the University of Queensland in Australia being the most outstanding examples that have come to my attention.

At the 1966 Caribbean Conference on Agricultural Extension held in Jamaica, I suggested that the Region consider a unified effort to obtain the services of a team, consisting possibly of a social anthropologist, a rural sociologist and an agricultural economist, to conduct socio-economic surveys in all the territories in a search for more effective and dynamic extension education methods. The Conference agreed on "the urgent need for Extension Research geared to the needs and problems of rural communities" and went on to embody in one of its resolutions "that Governments of the Caribbean Region and the appropriate International Agencies be invited to give special consideration to the need for the establishment within the Caribbean area of an International Agricultural Extension Development Centre to provide the services indicated....."

Almost two years have since passed and, to my knowledge, there has been no statement made on the 'follow up' action taken by the Conference organisers on this resolution. With the threat of a population explosion hanging over the area, we can no longer afford to be indifferent to this need. If we are to tackle scientifically the problems associated with accelerated acceptance of technical change in our rural areas, the time is now.

The question is, what regional body or bodies should take the initiative in the establishment of an Agricultural Extension Development Centre? It has been suggested that this would properly be a function of the UWI Faculty of Agriculture at St. Augustine, Trinidad, who are currently developing agricultural extension activities. The University of Puerto Rico has also been suggested, since the Division of Field Studies and Training of its Agricultural Extension Service has for some years been engaged in extension research in that country. My own view is that the CFNI is perhaps the most appropriate institution, since (i) it is committed to a policy of fostering multidisciplinary approaches, (ii) workers in the other nutrition-related fields would stand to benefit also from research of this nature, and (iii) provision is already made in its programme of work for assistance "in bringing about the adoption of desirable agricultural production practices in the Caribbean" through field investigations into farmer attitudes to change.

Perhaps some of your readers might have suggestions to offer.

Yours etc.,

G. A. Southwell
Chief Agricultural Officer, Grenada.

24 April, 1968.

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From Professor Kendal W. King, Virginia Polytechnic Institute

Dear Sir,

Thank you for a copy of the first issue of 'Cajanus' which arrived today. Congratulations on the production of this newsletter. I can see numerous ways in which it can have a good role to play.

Two small points came to mind as I read. One concerns the enrichment of wheat flour. When the practice was introduced in the US as a war measure the philosophy was to return to the fininshed flour the amounts of riboflavin, niacin, thiamine, and iron that were removed in milling. At the time, that was all that was legislatively acceptable. Now, perhaps, the general attitude to enrichment has changed. Could we not consider for the Caribbean requiring enrichment so that 50 or 100 grams of flour meet the daily requirements of an adult? This would be basing the level of enrichment on a public health basis, the rationale being to assure that the amount of bread usually eaten by people in the Caribbean would meet their needs for the nutrients in question.

The second point concerns the role of peanuts in the food future of the Caribbean when we already know from the data of T.C. Campbell here at VPI that peanuts in Haiti and Santo Domingo at least are loaded with aflatoxins. My feeling in the past has been that it is wise to avoid the peanut in new food developments until contamination of the crop can be insured against.

Yours etc.,

Kendall W. King
Head & Prof. Dept. of Biochemistry & Nutrition
Virginia Polytechnic Inst. Blacksburg, Virginia, USA.

March 26th,1968.

GENERAL NUTRITION NEWS AND OPINION

SEMINAR ON TRAINING FOR APPLIED NUTRITION PROGRAMMES

A seminar on the training of personnel for Applied Nutrition Programmes and Infant Feeding was held 11th - 16th March, 1968, in Mexico City. The Seminar was sponsored by the United States Agency for International Development, and the Mexican Government's National Institute for the Protection of Children and National Institute of Nutrition.

Recognising the need for auxiliary nutrition personnel for effective implementation of nutrition programmes, the Seminar endorsed the urgent need for training of non-university level personnel to meet this need. The educational level and professional background of these workers, the training they will need, the centres where this might be undertaken and the assistance, both financial and technical that will be required were discussed and recommendations made as to how best the objectives of adequate and efficient staffing and operation of Applied Nutrition Programmes may be achieved.

In view of the current proliferation of Applied Nutrition Programmes, attention to this subject is most timely.

THE ROLE OF SCIENCE AND TECHNOLOGY

by

Nevin S. Scrimshaw

From 'Foreign Agriculture', US Dept. of Agriculture, 9 October, 1967

"The present rate of application of technical knowledge to food production in the developing countries is obviously too slow and will remain so unless new elements enter the situation" stated Mr. Scrimshaw.

"Among those elements must be greater progress in introducing effective family planning programs, in applying scientific and technical knowledge to increase the production of conventional foods in reducing the enormous waste of food to insects, rodents, and spoilage: and in developing new, unconventional sources of protein."

He said two approaches merit the highest priority in the problem of providing more protein. "One is the increased production of conventional plant, animal, and fish sources of protein by providing fertilizers, pesticides, improved animal breeds and varieties of seeds, appropriate farm equipment, training and extension programs, credit facilities and all of the other measures responsible for the success of food production in the industrialized countries. This requires agribusiness resouces not yet available in most developing countries. The other is the development and application of effective means of population control.

"A third imperative need is for massive mobilization of resources and effort to reduce preventable waste, which amounts to well over

25 percent of the food produced in many developing countries."

Professor Scrimshaw added. "It will be absolutely essential to supplement conventional sources of protein with unconventional ones" such as fish protein concentrate, single cells, and oilseed meals. He cautioned, however, that the most promising and palatable new protein-rich foods will remain laboratory curiosities unless they are successfully produced and marketed.

"Low cost and immediate availability give oilseed proteins first priority in the development of new unconventional sources of edible protein to meet world needs. Fish protein concentrates merit second choice, since they are closer to achieving large-scale industrial production than single-cell protein and have been approved for human use. Single-cell protein deserves at least third priority. Despite formidable technical problems remaining, there is little doubt that wholesome and nutritious single-cell products can be developed and produced in almost unlimited quantities within a decade.

"However," Professor Scrimshaw said, "even at a conservative estimate synthetic foods which meet protein requirements by supplying the proper proportions of essential amino acids are not likely to become significant before the end of the century. They are almost certain to be more costly to produce for a long time to come than the other new protein sources described. Thus, a crash program for the development of synthetic protein-rich foods is not recommended. However, fundamental research leading toward wholly

synthetic foods should be modestly supported for its eventual contribution.

"I am convinced that the developing countries must be helped to help themselves primarily by the investment and know-how of private industry and the channeling of support through the internatinnal agencies of the United Nations family for education, professional training, basic research and other activities requiring action and competence on the part of governments. The private sector and the public sector must each become as effective in developing countries as they now are in industrialized ones.

"The enhancement of governmental competence in the less developed countries can best be achieved by greatly strengthening existing international agencies through a major increase in resources from all the industrialized countries.....It is particularly important that the actions of the US Government and of US agribusiness result in an improved capacity of the developing countries to feed themselves. Industry's vision and capacity for creative leadership will have a significant influence in determining whether the world will prosper or starve."

A.I.D. PREPARES TO USE FISH PROTEIN FOOD SUPPLEMENT

WASHINGTON -- The US Agency for International Development (AID) has announced signing of the first contract to a private firm to produce fish protein concentrate for Food-for-Freedom programs.

The product will be used to provide additional protein in foods distributed through the Food-for-Freedom programs under Public Law 480.

Development of fish protein concentrate was recommended by the Foreign Assistance Act, which urges that 2,500,000 dollars be used for that purpose in the current fiscal year. AID is preparing to finance a marketing project on the product in Chile.

AID's fist contract for production of the food supplement went to Alpine Marine Protein Industries, Inc., of New Bedford, Massachusetts. First delivery of the fish protein concentrate is expected in early 1969.

According to AID, tests in Chile and Peru have shown that one-third of an ounce of fish protein concentrate added to an infant's daily diet provides normal growth.

Food for Freedom programs, administered by AID, provide commodities for school lunch, child-feeding, food-for-work and similar activities.

U.S.I.S.
3 May, 1968.

HEAD START PUBLISHES POLICY STATEMENT ON MULTI-VITAMINS

from Newsletter of the American Academy of Pediatrics, May 1st, 1968.

Several Head Start* consultants have requested an official policy statement regarding the use of multi-vitamins for children in Head Start programs. The official statement from the Washington Office of the Organization for Economic Opportunity made on August 7, 1967, follows:

1. Head Start should provide a food service and nutrition education program that meets the vitamin requirements of its children without recourse to multi-vitamin supplements. For this reason OEO funds should not be used to purchase multi-vitamin preparations for routine administration to Head Start children.
2. OEO funds may be used to purchase vitamin supplements only when these are prescribed by a physician for an individual child because of a specific individual health or nutritional needs.
3. Even when multi-vitamin supplements are available to Head Start programs at no cost to OEO, such supplements should only be used if both the physician and nutrition consultants agree that they might be helpful, and only if their use is accompanied by a nutrition education program that emphasizes the importance of obtaining vitamin needs through foodstuffs rather than through supplement.

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* Operation Head Start - a US federal health programme for pre-school children.

NUTRITION AND ECONOMIC GROWTH*

by

Don Mills
Director, Central Planning Unit, Jamaica

Food is essential to life -- and the production of food is the most basic of economic activities. The development of an adequate food producing sector is a key factor in economic development and also a first requirement. For the ability to provide the bulk of food requirements efficiently is a boon to economic growth and diversification and ensures a sturdy population which can put muscle into the task of development.

Production of Food

Let us look at some of the facts concerning agriculture and food as they relate to our economy.

In Jamaica in 1960 four out of every ten members of our working population were engaged in agricultural work. This means of course that a very large proportion of our total population are dependent on agriculture -- i.e., the families of these farmers and farm workers. In addition to this, many other activities -- in transport, distribution, processing, for example, obtain business from the agricultural sector, and thus provide additional employment.

By contrast to our position, however, there are countries with a very low percentage of agricultural workers -- e.g. the United Kingdom with a 3.8 per cent, Belgium with 6.1 per cent, the Netherlands with 9.8 per cent, Germany with 11.6 per cent.

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* A paper presented at the conference on 'Food, Nutrition and Health in the Caribbean' organized by CFNI and held in Mona, Jamaica, February 5 - 7, 1968.

I do not know how many persons in the agricultural labour force in Jamaica are engaged in the production of food for local consumption. But clearly this must be relatively high compared with the countries listed. The implications are then that here we have a very large number of persons who depend, as a means of livelihood, on the production of food.

The total of this 40 per cent produced in 1966 some £37 million worth of agricultural products in terms of contribution to gross domestic product at factor cost (current prices). This was equivalent to 11.8 per cent of the total gross domestic product.

The £37 million is made up as follows:

Sugar and other main exports	... £15.0 million	- £15.0 million
Domestic Agriculture	... £12.7 ")	
Livestock, etc.	... £ 6.1 ")	£21.0 "
Fishing	... £ 2.2 ")	
Forestry	... £ 1.2 "	£ 1.2 "
		£37.2

So that of the total output of £37 million, very roughly something like £21 million represents the contribution of local food production.

A number of other things seem clear from this.

Our agriculture could not be very efficient in general -- if it takes 40 per cent of the labour force to produce 12 per cent of the country's total product. (For this means that the remaining 60 per cent of the labour force produce 88 per cent of the total product). The average farmer in the United Kingdom, for example, can produce enough to feed many more times the number of people than a farmer in Jamaica can feed.

From all this it is clear that the rest of the economy in the United Kingdom can afford to subsidise the agricultural sector to an extent that we cannot.

Distribution of Food

The production of food is not the only aspect of the relationship between nutrition and economic growth that interests us. The efficient distribution of foodstuffs by way of a good transport system and adequate marketing facilities is a very necessary element in the matter. We cannot claim to have had these to an adequate extent. We have relied in some countries for long on the traditional systems of marketing which can hardly be said to have been efficient, and one has a feeling that both the farmer and the consumer have got less than they deserved.

The improvement in marketing facilities which has been taking place by way of the introduction of supermarkets has left the marketing of local foods in relatively the same condition as before. Marketing of meat has improved in urban areas but the traditional higgler continued to market most of the root crops, vegetables, etc.

Governments in recent years in some Caribbean countries have stepped in and established marketing boards, which are attempting to provide outlets for local produce, to encourage production and give the farmer a better deal through a system of guaranteed prices, while ensuring that the consumers' interests are protected.

Imports of Food

Many Caribbean countries have not been able to get the production of foodstuffs to keep pace with the rising demand, based on increasing populations and rising income levels. Imports of foodstuffs have increased from year to year. In Jamaica these totalled £22.4 million in 1966 out of a total import bill of £115 million. To the extent that the foodstuffs imported cannot be grown in these islands -- the cereals for example -- this presents one set of problems and questions -- for example the earning of foreign exchange to pay for these imports.

To the extent that they can be grown here we are faced with questions as to why they are not being grown, or why local supplies are inadequate. In Jamaica we have been importing large quantities of corn-meal, vegetables, meat, fish, milk and other products and there is no doubt that a significant part of our import bill could be saved by production here of some of these foodstuffs.

The trade in imported food represents one of the original bases of the Jamaican economy. The country was run for centuries as a producer of raw materials and foodstuffs for export. To keep the population alive food was imported (along with other consumer goods) and the merchant class developed on the basis of this two-way trade. Thus this area of economic activity has been relatively well developed. Indeed, it has been developed at the expense of the food production sector and of the facilities for distribution of the products of that sector.

We seek to remedy this now by changing the balance in agriculture towards a greater concentration on the local market, and by improving the facilities for marketing the products locally. The recent devaluation

gives us additional cause for pursuing such a course -- as we have been importing a large part of our food requirements from those countries which have not devalued their currencies -- namely the United States of America and Canada.

Secondary Industries

Another aspect of the relationship between nutrition and economic growth is the development of secondary industries on a basis of agricultural materials. We are accustomed to this in the Caribbean particularly in the case of the sugar industry. But there have in more recent times been important developments in the field of food processing which have boosted the growth of secondary industries in the area.

In Jamaica, for example, the manufacturing sector has grown to become the largest contributor to gross domestic product at factor cost, this contribution amounting in 1966 to about £47 million or 15 per cent of the total of £318 million. Of this £47 million the sugar industry (including rum production) was responsible for £6.2 million. The processing of other foodstuffs contributed £9.6 million. Other alcoholic beverages -- i.e. apart from rum, contributed £2.9 million and non-alcoholic beverages £1.3 million. Altogether the processing industries -- if we include the beverages -- were responsible for a contribution of some £20 million to gross domestic product, or over 40 per cent of the total attributed to the manufacturing sector. Of significance too is the establishment of factories which provide products for use in agriculture -- for example the packaging and container industries, and fertilizer plants.

By these means the agricultural sector, of which food production is a part, is contributing to further economic growth.

Consumption of Food

Food is essential to life and it is therefore entirely to be expected that the poorer the person -- or the country, the greater would be the preoccupation with food. As we find that a poor man spends most of his money on food, so the poorer the country the higher the percentage of income spent on food by its people.

Let us look at Jamaica's position in this matter. In 1966 as a community about £80 million or one-third of our personal consumption expenditure was on food (and another £21 million or 8.5 per cent on beverages -- both alcoholic and non-alcoholic).

In 1959 the figures were 39 per cent and 7.1 per cent. We find much lower figures in the better-off countries -- just as in Jamaica we would see that wealthier persons spend a relatively small part of their incomes on food. As the economists tell us, the capacity of the human stomach is limited. Thus our latest household expenditure surveys show that in the Kingston Metropolitan area the average working-class household spent 46 per cent of its income on food, while the corresponding figures for main towns and for rural areas are 55 per cent to 57 per cent.

These figures represent a decline from the past, and as one would expect, the percentages continue to fall as the per capita income rises. Of course, as income rises a continuous shift takes place towards higher quality -- and by and large more expensive -- foods. This can be seen in the consumption tables for countries like Jamaica where meat and dairy products are the fastest growing items.

In these circumstances increases in income are reflected in significant increases in expenditure on food, and to the extent that this rising demand cannot be met from local sources, imports of food increase.

Lagging local production of foodstuffs has resulted in marked pressure on prices and in some countries the retail price index for food, which is heavily weighted by local commodities, has risen at times more rapidly than that for other consumer goods.

General

The purpose of economic development and economic growth is to provide an adequate and rising level of living for the community, to ensure the satisfaction of basic material needs in terms of food, clothing, shelter and personal security, and to allow the development of the personality and the enjoyment of the non-material benefits of life.

Firstly priority must be given to the basics -- and food and nutrition are the most basic needs. They appear on both sides of the development ledger -- as an aim through the development of agricultural output, and as a means or input, for adequate nutritional levels are essential for a healthy and efficient people. Some interesting studies are being conducted at present to show the effects of malnutrition on productivity.

The pursuit of this aim of improving the supply of food as part of the development programme is a complex exercise. It involves many factors which have to be integrated in the process of planning and plan implementation. For example, it involves:-

(a) the availability of land to those anxious and able to farm;

(b) a basic educational system which produces a population capable of approaching agriculture in modern terms and of absorbing and applying up-to-date techniques of commercial agriculture;

(c) the conservation and effective distribution and use of the country's water resources;

(d) the existence of an adequate road and transportation system;

(e) a marketing system that ensures adequate returns to farmers as well as benefits to consumers.

The paradox is that the developed countries have reached the stage where some of them are producing a surplus of agricultural commodities, including food, and are forced to channel some of this surplus to developing countries by way of bilateral and multi-lateral food-aid programmes. So, while these developed countries produce too few people (or at least, have brought their populations to manageable proportions) and produce a surplus of food, many under-developed and developing countries produce too many people and too little food.

The question is how is this situation to be corrected? In the past it has been corrected in part by the transfer of people -- that is, by heavy migration for example from Europe to the Western Hemisphere. Migration on such a scale is out of the question now, and developing countries have to learn to cope with their population problem by other means.

The second approach is the transfer of food from the more efficient producers to the less efficient. Normal trade of this kind has existed over the centuries, but now we have a new phenomenon -- and that is the transfer of surplus food from developed countries through food aid programmes. This must be at best a temporary device.

The third possibility is the transfer of technology. Technical Assistance Programmes exist in great abundance both through the international channels and by bilateral arrangements. The transfer of technology is extremely difficult and takes time. Nevertheless, in the final analysis it is the only answer. As Professor Dumeau of the FAO has said --"It is better to help people produce than to give them food".

Finally let us look at some of the questions which arise in this matter of the relationship between nutrition and economic growth.

- What are the present levels of income in the community concerned?
- What levels of living, of consumption, and in particular what levels of nutrition does this provide or allow?
- What are the prospects for economic growth in the next few years?
- What will be the growth of population in this period?
- To what extent will economic growth outpace population growth and income-levels rise?
- To what extent will the rise in the general level of income be shared by various sections of the population?
- To what extent will this be reflected in higher levels of nutrition?
- Finally, to what extent will this improvement be matched by higher levels of output of local agriculture?

All of this offers a challenge to the farming community in countries like Jamaica. It also offers a challenge to the administrators and technicians in the field of health, in planning and in other spheres. It is not merely the problem of the nutritionist or of the health services; it is at the heart of the problem of development and economic growth.

NEWS OF CFNI ACTIVITIES

Seminar for Agricultural Students

From April 9 to 11 inclusive CFNI staff, with the permission and assistance of the Faculty of Agriculture, UWI, held a three-day seminar at St. Augustine for senior agriculture students. The seminar was entitled "Agriculture and Human Nutrition in the Caribbean" Sessions dealt with the following topics: The Scope of Nutrition; Causes of Malnutrition; The Public Health Importance of Malnutrition in the Caribbean; Food Economics, Diets and Ecology; Seeking Practical Solutions to Nutrition Problems; and a panel discussion on Nutrition in Agricultural Business.

Attendance was good, especially in view of other calls on the students' time, and from evaluation sheets completed on the last day it appeared that most of them who attended were interested and appreciative. The Institute thanks Professors Mahedevan, Cope and Tai for their help; Dr. Neville Byam for showing the students two children with severe malnutrition and explaining their background, and Professor Edwards, Dr. Sammy and Dr. Holman Williams for their participation in the panel of discussion.

CFNI Seminar in Trinidad.

From May 20 to 23 inclusive a CFNI seminar was held at St. Augustine on "Recent Trends in Food and Nutrition in the Caribbean". The seminar was held in the Chemistry and Soil Science Building of the Faculty of Agriculture, in what is now CFNI's Trinidad centre,

which thus came into use for the first time on this occasion. The seminar was opened by the Hon. Dr. M. Awon, Minister of Health, Trinidad and Tobago. Delegates, who were mainly senior technical personnel in the various ministries and departments whose activities are related to nutrition, numbered eighty and most of the countries in the CFNI area were represented, as were PAHO and FAO, and of course UWI.

A more detailed account of the conference will appear in the next issue of Cajanus (No.4) which is due to appear in August.

Technical Advisory Committee

The first meeting of CFNI's Technical Advisory Committee was held on May 25 at St. Augustine. Members were Professor P. Mahedevan (chairman). Dr. W. Aykroyd (UK), Dr. N. Byam (Trinidad), Miss H.Fox (Jamaica), Miss D. Hollingsworth (UK), Mr. H.McConnie (St. Vincent), Dr. K. K. P. N. Rao, Mr. I. Kelton, Miss I Foster (all of FAO) and Dr. Bertlyn Bosley (PAHO/WHO) attended as observers.

WEIGHING SCALES: AN APPEAL FOR INFORMATION AND OPINION

The dominant nutrition problem in the world is the group of conditions known collectively as "protein-calorie malnutrition of early childhood (PCM)" , or "protein-calorie deficiency syndromes". Assessment of the prevalence of PCM in the community can be most practically undertaken by weight-for-age measurements of statistically selected groups of young children; while early PCM can be most usefully detected by serial weighings recorded graphically.

It does therefore seem strange that very little attention appears to have been given to the design of scales with suitable characteristics for the usual working circumstances found in health centres, in average hospitals and on rural surveys in most developing countries.

The ideal scale would probably be based on the beam-balance principle, and would have the following characteristics:

i) low cost;

ii) scale markings of not more than 100 gm. or 4 oz.;

iii) sturdiness and ability to maintain its accuracy in adverse conditions (e.g. when being transported over rough roads on surveys);

iv) easy transportability by hand (weighing as little as possible, compact, with carrying handle and locking device);

v) clear readability (scale markings facing observer and with different colours for the two units -- e.g. kilogrammes and 100-grammes, or pounds and quarter pounds);

vi) weighing surface, with a rail round, suitable and safe for a baby to be placed on and for an older subject to stand on;

vii) weight range up to 90 kg. or 200 lbs (to permit weighing frightened, struggling pre-school children in the arms of mother or attendant).

Specific comments and advice concerning experience with different types of scale would be most welcome from nutritionists, doctors, nurses and from manufacturers, through these columns, as the Caribbean Food and Nutrition Institute is currently engaged in trying to develop a suitable design for actual tropical circumstances.

THE FOOD PROBLEMS OF DEVELOPING COUNTRIES -- PART I

From the 'OECD' Observer' No.31, December 1967

(This article is being reproduced in two parts; the second part will appear in Cajanus No. IV. It is based on a report on this topic by the Secretary General of OECD to the OECD's Ministers Meeting on 30 November, 1967.)

It is a matter for concern that in the first seven years of the 1960's the following phenomena have coincided :

Food production in the developing countries has grown more slowly than demand;

The area of good new land that could easily be brought under cultivation in developing countries has been sharply reduced;

The population of developing countries has been growing at an increasing rate;

Surplus stocks of grain in North America have roughly speaking been exhausted through exports to less-developed areas;

Development aid from the richer countries has on the whole stagnated;

The debt burden of many developing countries has been rising fast.

It is evident that the problem of how to satisfy the rapidly growing demand for food in the developing countries concerns not only these countries themselves, but also the more wealthy nations.

The Outlook for Food

The unprecedented increase in the population of nearly all less-developed countries that has taken place, especially in the 1950's and the present decade, is likely to go on till the end of this century and to some extend even beyond it. Even if family planning

makes considerable progress, the population of the developing countries is likely to continue to grow much faster than that of the developed industrial societies for many decades. Fortunately, per capita incomes are also increasing and will, we hope, increase faster in the future, but in poor countries a large part of any addition to personal incomes will be spent on food. It is, therefore, likely that in the foreseeable future demand for food in the developing countries will grow rapidly, more rapidly than the production of food.

This is because, in contrast to the last few decades when the amount of land under cultivation in the developing regions increased fairly rapidly (accounting for more than half of the increase in production in Latin America, the Near East and Africa and for more than 40 per cent in the Far East), there will in future be little possibility for further increases in the area under cultivation, especially in the Far East. Thus the amount of agricultural land per capita will decline. It is likely that by the year 2000 each person in the farm population of the developed countries will have about twenty times as much land as the average person in the farm population of the developing countries. Compared with the Far East alone it would be 50 times as much.

It is true that production can be increased, even with a low land-to-labour ratio, by raising agricultural yields. Japan, for example, has obtained considerable success in such labour intensive agriculture with very little land per agricultural worker, and it may

well be that the development in a number of other countries will follow a pattern somewhat similar to that of Japan.

Introduction under favourable conditions of new varieties of maize, wheat and rice that have been developed in countries like Japan, the United States, Mexico and Taiwan, can yield much more than most traditional crops (though the new techniques must be modified and carefully adapted to local conditions of soil and climate). Moreover modern techniques can be applied to so-called agro-allied activities - production and distribution of fertilisers, pesticides and weed-killers, irrigation installations and means of storage and transport of agricultural products and fertilisers.

It would, however, take a rather spetacular speeding up of the increase in yields to make production grow as fast as demand in the developing countries, especially if allowance is made for the improvement in consumption per capita that should accompany general economic growth. Moreover modern techniques penetrate rather slowly into agriculture because of the very large number of farmers who have to learn and adopt these techniques.

Thus, although most of the increased demand for food can,- and should - be met by expansion of agricultural production in the developing countries themselves - and such expansion deserves a high priority in development planning - it is unlikely that productivity will increase as rapidly as demand.

It follows that food imports into some developing countries will rise faster than food exports from other such countries so that the

group as a whole will be a net importer of food to an increasing extent, probably for a rather long time to come. Already many developing countries have become net importers of food from the developed areas, and this will become increasingly so.

This is not serious in itself. Food production in the developed countries is likely to grow so fast that it can easily meet the demand for imports into developing countries; in the longer run the developing countries should be able to increase their exports of manufactured and semi-manufactured goods as the industrialised countries have already done. They will then be able to pay for their imports of food.

What is serious, however, is that for quite a few years to come a number of developing countries are likely to face a difficult balance of payments situation. To develop they must import large quantities of capital goods. If at the same time they have to import increasing amounts of food and also as seems likely, serve a rising external debt, shortage of foreign exchange may force them to keep the economy growing slowly so that neither production in general, nor export capacity, can expand enough. The burden on the balance of payments will be especially heavy when there has been a poor harvest because of insufficient rain, as in India in 1965 and 1966.

It is here that the real danger lies. Later on it is at least conceivable that rising productivity and slower population growth will make the situation easier, but it is possible that the whole develop-

ment process may be jeopardised in the next, say 10 to 15 years because of a shortage of foreign exchange earnings with which to import capital goods for investment. What can the wealthy nations do to prevent this from happening?

A Serious Effort Should be made to Increase the Flow of Aid

Unless the gross flow of aid continues to increase, the annual amount of repayment will be larger than the inflow of new aid, and the developing countries would become net exporters of capital to the rich countries. Yet the flow of development aid has on the whole been stagnating since 1961 if deduction is made for the amortisation of existing loans.

What is needed is more aid, at least until exports of the developing countries have risen sufficiently so that they can pay for all their imports, including food. The best solution would be to increase substantially aid in the form of cash in order to enable the receiving countries to decide what they want to buy. It may, however, be easier for the donor countries to provide more aid in the form of food.

Food aid has been of considerable importance since 1954 when legislation on the matter was passed in the United States (P.L.480). Other countries like Australia and Canada have used deliveries of food in their aid programmes, and a multilateral "World Food Programme" has been established by the United Nations and the FAO. A further step in the direction of multilateralism has been taken under the Kennedy Round in the GATT where a number of countries undertook to

furnish 4.5 million tons of wheat annually in the three coming years.

Food aid has in common with other kinds of tied aid that it not only helps less-developed countries, but also supports the exports of the donor country. Tying of aid can lead to deflection of trade that is not always desirable, and one cannot be sure that it serves the most urgent needs of the receiving country. On the other hand, tied aid is normally better than no aid at all, and the main argument for a certain amount of aid tying is that it permits the flow of aid to become bigger than it would otherwise have been.

There can be no doubt that food aid has increased the total flow of assistance rather considerably. In the years 1961-1965 the United States alone has provided under government-financed programmes on the average 13.65 million tons of wheat, 0.56 million tons of rice and 1.96 million tons of coarse grains annually, plus certain quantities of other food items. In 1965, food aid represented 33 per cent of the United States' gross aid disbursements and more than 20 per cent of the total flow of aid from OECD/DAC countries.

Food aid was of course particularly easy to give as long as it could be taken out of surplus stocks already accumulated, but in the donor countries, and especially in the United States, the situation has changed in recent years. Surplus stocks have been declining since 1961 and at present are no longer in excess of the desirable working level. This means that food aid in the biggest donor country now has to come out of current production, to be paid for by the government, and the United States Government has, mainly for that very reason,

permitted a substantial increase of the area under wheat and rice since 1966. This of course means that from now on food aid represents much more of a real sacrifice for the main donor country than in the past.

But if surplus stocks are no longer available, there is still surplus capacity. In fact, large areas of farm land are still lying idle in the United States, and in the developed countries in general production of a number of important food items tends to outrun demand.

Recent studies within the OECD have shown that on the assumption that policies are not radically changed, the developed countries combined are likely to see their production of cereals increase to an extend that will permit them to satisfy their own demand and at the same time increase their net exports to other parts of the world substantially. In fact, the surplus available for exports is likely to exceed the quantity that would be imported by the developing countries.

There is also likely to be an exportable surplus of milk and milk products in the developed countries as a group. Milk can be turned into milk powder, and skim milk powder is already used to some extent in development aid programmes. It is valuable because it contains nutritionally important animal protein. However, the surplus is likely to become particularly large - and even embarrassing - concerning the butter fat content of the milk. It is therefore of considerable importance that recent experience has shown that whole milk powder, with the cream in it, can be preserved better in a tropical climate than has been generally recognised.

Some of the developed countries also have idle capacity for the production of fertilisers. It is therefore proposed that developed countries as part of their aid policies should have an additional programme, comprising grains, milk powder and fertilisers. Combining food aid with fertiliser aid would underline the priority now given to the growth of agriculture in developing countries.

Such a programme would have to be administered carefully. Since the flow of grains and of milk powder furnished as aid would be part of the markets for these products, it would be important to avoid market disruption, harmful both to farmers in developing countries and to legitimate commercial exports from developed countries. Participating countries should therefore consult on the timing of purchases and of aid deliveries. This plan may involve holding in reserve certain stocks, particularly grains, so that an emergency situation can be met. The food aid programme should not, however, lead to such an increase in production that large surplus stocks, threatening market stability, are accumulated.

There is one final point to make in connection with food aid. The partial failure of the monsoon in India in two consecutive years has shown how important it is to have a World Food Reserve. World stocks, especially of wheat, but probably also of rice, should therefore always be kept above a certain level. If they are reduced below that level in a bad year, they should be restored, in principle, in the following year.

This cannot be the responsibility of one single country. An arrangement could be attached to the International Wheat Agreement, so that the burden of keeping a certain buffer stock would be shared by the participants according to some formula to be agreed upon.

Agricultural Policies of the Developed Countries

In all modern countries there is strong pressure for support to agriculture. This is mainly because agriculture is a relatively declining industry which therefore defends itself against the forces that are reducing its position in society. The total amount of such support today -- including both higher prices for the consumer and budgetary payments to farmers -- is bigger than the flow of development aid. This price support has retarded the rationalisation of agriculture and the reduction of farm population which are necessary for a further increase in farm incomes in the developed countries. Moreover it does not really help the small farmers in the way that they intended. With the rapid increases in production-per-man-hour now taking place, agriculture in the rich countries will no longer need to receive such support in future. It is therefore proposed that price support be gradually reduced. The money thus saved can be used partly to finance an increase of development aid and partly to support further measures to rationalise agriculture in the developed countries themselves, including help to those who give up small farms and to those who need retraining because they seek employment in non-agricultural activities.

Food aid implies support to farms in the donor country and it can therefore reduce the need for other support measures. There is now, therefore, a unique chance to obtain a rationalisation and simplification of agricultural policies in the developed countries and at the same time help the developing countries more effectively.

YOUR QUESTIONS ANSWERED

Q. Is it safe to use goat's milk in infant feeding? Is it as nutritious as cow's milk?

A. Goat's milk has been used traditionally for infant feeding in many parts of the world where for ecological or economical reasons cattle could not be kept.

Because of the danger of brucellosis, goat's milk has fallen into disrepute. In some areas goats are kept solely as a source of meat or as a prestige symbol, or used as part of a bride price. If breast feeding is not possible and a substitute milk is required goat's milk may be used as long as it is obtained from a clean, reliable source, where goats are milked under hygienic conditions. It should always be boiled before use. The content of protein, fat and lactose in goat's milk approximates closely that found in cow's milk, but it also has low values in iron. The quantity of boiled goat's milk given should be adjusted to the child's age requirements, and a daily source of ascorbic acid provided. The infant should not be kept on a diet of goat's milk alone, as a milk anaemia could develop, as it would with any other milk diet.

Q. Oxalates present in dark green leafy vegetables render calcium unavailable. Is it any use then to advocate the use of foods like Calaloo and Spinach?

A. Oxalates are known to inhibit calcium absorption in view of the low solubility of calcium oxalate. There appears however to be no evidence that the levels of oxalates in the amounts of dark green leafy vegetables that can be consumed by humans are of particular importance. On the other hand, dark green leafy vegetables contain substantial amounts of carotene, considerable amounts of vitamin C, iron, niacin and riboflavin, as well as useful amounts of protein of an amino-acid pattern complimentary to that of staple foods. Thus the benefits conferred by the food far outweigh what little detrimental aspect there may be. Therefore there is no doubt that dark green leafy vegetables - because of their valuable supplementary effect to diets - should be strongly recommended.

Q. What is the present informed opinion concerning the use of "bush teas" for young children?

A. This is a difficult question to answer as "informed" opinion just does not have enough reliable information.

Over 200 bush teas were listed in the early 1950s for Jamaica alone and the precise pharmacological and nutritional composition of these is mostly unknown.

Disadvantages of bush teas are twofold - firstly, they may be toxic, and secondly they may be used in substitution for food. That

certain examples are poisonous is now well proven, as with the species of Senecio and Crotalaria, which have been shown to produce liver cirrhosis in children.

However, a search through all herbal pharmacopoeias (including) for example, the 18th Century London Pharmacopoeia) shows that a few of the items included are active, a few harmful and the majority inert.

The same probably applies to the bush teas of the West Indies. Their "image" has certainly suffered by the fact that they are called (rather derogatorily) "bush-teas" rather than herbals, or infusions (as in France). Also, as will be appreciated, universal "tea" is in fact, prepared from dried leaves of a bush.

Bush-teas may in fact be valuable in some instances. They may contain therapeutic principles, as, for example, was demonstrated for the traditional English bush-tea made from raspberry leaves, recently shown to be active in stimulating uterine contractions. One wonders whether soursop leaves do in fact have any pharmacologically measurable sedative effects, as considered in some Caribbean islands?

Other considerations are that bush teas are cheap (more so than the expensive latter-day quackery of similarly needless proprietary medicines, as for example, those of the gripe-water variety). They may sometimes be a source of water-soluble nutrients, especially vitamins, and, as they are prepared with boiled water, they ensure a clean water intake for the young child.

Probably the most sensible attitude to adopt is one of non-condemnatory caution. It may be possible in communities where bush teas are traditionally rooted to try to lay stress on ones known to be innocuous, such as those prepared from leaves of the lime tree or mint plant.

Possibly readers of CAJANUS might give their views.

BREAST-MILK AND THE WORLD PROTEIN GAP*

The decline of breast-feeding in the Western world has been a notable phenomenon for over 50 years, and a similar change in behavior pattern has also become increasingly established among the well-to-do élite in many developing tropical countries.

Of much more consequence, in recent decades this decline in breast-feeding has also been occurring with lower socioeconomic group mothers in many tropical towns and peri-urban areas, as documented in San Fernando, Trinidad by Symonds and by Jelliffe et al., in Kampala, Uganda by Welbourn, and in Beirut, Lebanon by McLaren. This is in marked contrast with the uneventful permissive prolonged lactation which is the rule in traditional village communities (Jelliffe, 1955)

Reasons for Decline in Lactation Performance

The main reasons for this decline usually appear to be unrelated to adequate maternal nutrition or ill health (Jelliffe, 1956; Oomen, 1960), unless this is extreme. They seem rather to be bound up with economic, cultural, psychologic and social influences paralleling urbanization and sophistication.

First, under modern urban circumstances there is an increasing de-domestication of women. Consequently, and in conformity with Western cultural taboos concerning "modesty" with regard to breast-feeding and the dominance of the breast as a sex symbol, most working mothers in towns would not be permitted to breast-feed their babies at their place of employment, even were this feasible practically.

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*This article, by D. B. Jelliffe, is reproduced from Clinical Pediatrics, 7, 96-99, February 1968, with permission.

Second, the example of economic "superiors" who are successfully bottle-feeding their infants, and the increasing pressure of locally inappropriate advertising in village shops, the newspapers and on the radio creating the feeling that breast-feeding is archaic and that the use of cow's milk, given with a feeding bottle, is both modern and statusful (Jelliffe, 1965). As a consequence even among non-working urban mothers who attempt to breast-feed, the seeds of uncertainty and doubt have often been sown, with subsequent interference with the psychosomatic "let-down" or "milk-ejection" reflex, which is the main key to success or failure (Newton, 1961).

Two Groups and Infant Feeding

For practical purposes, there are two main citizen groups in the present-day tropics as far as the feeding of young children is concerned, although, of course, many fall between these two extremes.

The first, the "privileged", consists of the usually well-to-do minority of whatever ethnic group, who have a house with an adequate kitchen with running water, storage space and even occasionally refrigeration facilities; who earn sufficient money to be able to buy higher-priced protein foods, such as milk, in adequate amounts for their young children; and who have received enough modern education to be able to understand and carry out artificial feeding practices based on quantities and dilutions, and especially appreciate the need for cleanliness. Infant feeding for this group can, with minor modifications for local customary pracitces and available foods, follow standard methods, employed in Europe and North America.

The second group, the "under-privileged", who make up the vast majority, live either in villages or scattered homesteads in rural areas, or have flocked as new townsmen to "septic fringe" slums or, if more fortunate, to low-rent urban housing estates.

It is those in this group who often have little or no modern education, very little spending money, dirty fly-ridden kitchens with few cooking pots, limited fuel and storage facilities, and an inadequate contaminated water supply. This is the group whose children develop malnutrition, and who require priority attention with regard to practical and practicable advice on infant feeding.

Hazards of Artificial Feeding

Under average conditions in most developing countries, artificial feeding is extremely hazardous and often impossible for the following reasons:

(a) Expense

For the ordinary family, the cost of adequate quantities of any form of cow's milk (even if available) is usually prohibitive. For example, in Uganda to feed a three-month-old baby with sufficient quantities of full cream powdered milk would take about one-third of a laborer's basic wage.

(b) Hygiene

Both in rural villages and in slum areas, the low level of home hygiene makes the clean preparation of feeds and their storage

almost impossible. Dirty water may be brought from a nearby pond or spring. Feeds are liable to be contaminated by dust or insects. Limited fuel and utensils may make frequent preparation of feeds very difficult.

(c) Education

Most tropical mothers will not have been reared in the somewhat "mathematical" atmosphere, customary in the Western world, and many have had little or no formal schooling. They will, therefore, often find difficulty in following instructions as to the mixing of different types of artificial feeds.

Under these circumstances, artificial bottle feeds inevitably means the use of over-dilute milk, heavily contaminated with bacteria, with a high probability of a downward spiral into marasmus and infective "weanling diarrhea" (Gordon et al., 1963).

Advantages of Breast Feeding

In all parts of the world, breast-feeding has certain advantages. The composition of human milk has presumably become adapted for the human infant over thousands of years. It contains antibodies against certain infantile diseases, while the close and biologically natural contact and interrelationship between mother and newborn may be expected to assist in the development of beneficial emotional links between mother and child.

However, for the average rural or slum family in tropical countries, the advantages of breast-feeding are far more clear-cut and imperative.

For them, the main significance of breast-milk is that it is clean, uncontaminated, easily available and requires no culinary preparation. Likewise, it is economical, provided the mother has a reasonable consumption of vegetable protein food.

Also, above all, it is a rich, economically irreplaceable source of good quality protein, and on breast-feeding alone, the baby receives all nutrients required for the first four to six months of life; while, at the same time, postponing the risk of "weanling diarrhea", an ever present menace in the heavily contaminated home environment (Gordon et al., 1963).

Consequence of Decline

The decline of breast-feeding is increasing in urban areas of many tropical countries with very serious consequences, which deserve wider awareness.

First, an increasing incidence and mortality from truly infantile malnutrition may be expected, particularly marasmus -- infective diarrhea syndromes but also kwashiorkor in the first year of life (Symonds, 1958). An additional significance of this lowering of age incidence is that the infant's brain may be most susceptible to damage, potentially permanent, as a result of malnutrition in the early months of life (McCance, 1964).

Second, the economic and food production aspects of widespread lactation failure seem absolutely unappreciated by national food planners. In fact, if the majority of women in a particular country

did not breast-feed their babies, very large quantities of high protein substitute suitable for young infants, probably animal milk, would have to be produced locally or imported, with expenditure of foreign currency.

Reversal of Trend

Attempts to-date to reverse the trend away from breast-feeding have had virtually no impact, and indeed, have not been tried seriously.

The following approaches may be practicable:

(1) Raise the Status of Breast-Feeding

Bottle feeding is spreading largely because mothers feel that this gives them both status and modernness. To counteract this, status may be given to breast-feeding by involving prominent local ladies in the community in the health education program (e.g. the President's wife), or by stressing the recent move towards breast-feeding by an increasing number of well-educated American ladies. The latter group, known as the La Leche League (LLL), produce a monthly bulletin which can be very useful in showing a modern group of women in an affluent society, who believe that breast-feeding is worthwhile (Jelliffe, 1966).

(2) Health Education to School Girls and Antenatal Mothers

If breast-feeding is proceeding normally in a community no health education at all may be required, except perhaps in relation to the dangers of artificial feeding. In fact, under these circumstances, the more attention that is drawn to the process of breast-feeding the greater the likelihood of the development of anxiety and

doubt in place of previous untroubled confidence.

By contrast, in areas where breast-feeding is on the decline, health education may be directed towards this subject, particularly for school children and for mothers during the prenatal period. For the latter group, undoubtedly the best audio-visual aid is a mother who is already succcessfully breast-feeding her own baby.

Again, motivation lies at the heart of the problem. The excellent growth and health of breast-fed babies may be less influential than stress on modernness and economy.

(3) Legislation

For working mothers in tropical towns, the possibility of legislation deserves consideration, to provide creches at factories, or even some form of "lactation bonus" during four to six months of breast-feeding.

(4) Control of Unsuitable Advertising

In the present "age of mass persuation", it is readily apparent that commercial advertising is having an increasing impact on family life in tropical regions, especially in urban areas. Much of this appear to be excellent and, indeed, is helping to encourage parents to more healthful and modern ways of living.

However, at the same time, much advertising, especially of inherently excellent, but overly expensive, infant foods, has been transported en bloc from affluent countries, in which totally different cultural, educational and economic circumstances are to be found.

In particular, the ill-considered advertising of costly tinned milks for infant feeding is to be deplored in the tropical countries where breast-feeding is still usual.

While these food products are usually of good quality and have been well-tried in child rearing in prosperous educated groups in various parts of the world, for the majority in most tropical countries, they are impossibly expensive, so that only homeopathic doses can be afforded. At the same time, they dissuade mothers from breast-feeding and create the image of bottle-feeding, with artificial formulas, as a status symbol of progress and emancipation, whereas, in the educational and environmental circumstances of the tropical village or poor urban area, the ill-cleaned bottle and its encrusted rubber teat with its supply of highly diluted milk and concentrated suspension of bacteria is more often a death warrant.

The health educator has two courses open to him in relation to such commercial advertising which, on mature consideration, he knows to be harmful in this respect. First, he may orient his own efforts towards neutralizing the unwitting "ill-health educator" that is being generated. This is what is usually done, but represents, as far as finance, organization and expertise are concerned, and unequal contest between the heavy-weight of commercial advertising and the fly-weight of health education.

As a second alternative, more logical, but of immense difficulty is the need to "health educate" commercial infant food firms operating in tropical countries. At the present they are causing an

increasing amount of harm, when by basing their policy on the actual facts of the situation, they could produce great benefit and probably achieve much greater profits.

At the core of the problem must be the realization that the main need for tropical countries for young children is not a milk preparation to be reconstituted as a liquid and misfed from an infected bottle in competition with breast milk, but rather a cheap, inexpensively pacakaged high protein, high status food for use by the whole family, but especially intended for young children in the weaning period, either as an additive mixed with locally available foods, or prepared as a gruel or in a paste form.

The desirability and the feasibility of vetoing inappropriate advertisements of infant foods appearing in the press, radio, stores and television has been often suggested, but is extremely difficult to put into practice. Government agencies usually control the radio and television, and require the income from advertisers; while examination of advertisements would need some form of censor board, and neither staff nor finance would be available for this.

However, it should be stressed that there are many more infants dying of marasmus and infective diarrhea in tropical towns, partly as a result of incorrect advertising of milk products, than there are adults succumbing to concer of the lung from tobacco smoking in the Western world, where in some places legislation has been devised to modify advertising.

Conclusion

Breast milk is not regarded seriously as a food by most nutritionists or food planners, perhaps because it is not served on a plate, or grown, or bought; although, ironically, its excellence is scientifically endorsed by its use as a standard with which other proteins can be compared.

Problem

The basic problem is "Can the present trend away from breast-feeding in tropical countries be reversed or prevented?"

If a laiser-faire attitude of inevitability is taken, a vast and increasing flood of infantile malnutrition must be expected - that is malnutrition in the first year of life, mainly marasmus. Medical administrators will have to plan for this certainty, bearing in mind the usually prolonged and expensive hospitalization needed for the therapy of the "marasmus-diarrhea complex" (often about $300 per infant).

It will also imply the acceptance of the need to produce very large quantities of substitute high protein food suitable for young babies, probably, therefore, animal milk. The potential magnitude of production required is suggested by the fact that present-day breast-milk consumption in India can be estimated to be over twenty-five million liters daily, which would need the output of some five million lactating cattle, if cow's milk were needed as a replacement.

Replacement with animal milk would not only involve questions of production and economics for the particular country. It also has to be viewed in the context of a currently decreasing per capita world food production, especially protein, in relation to a rapidly increasing world population - that is to the widening "protein-gap" between global needs and supplies, especially involving tropical regions, and with its main impact on young children.

The conclusion seems inescapable. The decline in lactation in developing regions is a priority public health nutrition problem - a retreat rather than an advance - that tends to widen the world "protein-gap", both by removing an existing protein food and by requiring a replacement.

Combined physiologic, sociologic and epidemiologic research into the etiology of lactation failure is long overdue, in tropical communities, and a small percentage of the funds devoted to the production of new protein weaning foods and to other necessary and important methods of increasing world production and use of edible protein needs to be diverted in this direction.

NOTICE

CARIBBEAN FOOD AND NUTRITION INSTITUTE LONG COURSE IN COMMUNITY NUTRITION

Purpose

The CFNI course in Community Nutrition is an interdisciplinary training programme, recognised by the University of the West Indies, for personnel from health, agriculture, education, community development and other nutrition-related fields.

It will be concerned principally with the practical application of modern scientific knowledge of food and nutrition to the solution of problems in the Caribbean.

Provisional Programme. The course will comprise the following approximate sequences:

i) formal training in Jamaica, including lectures, seminars and field visits - 3 months;

ii) field experience with CFNI staff in selected Caribbean countries for practical work under supervision, for visits to nutrition-related programmes, and for an inter-disciplinary survey in one country - 6 weeks;

iii) formal training in Trinidad, consisting of lectures, seminars and field visits - 6 weeks;

iv) written examinations;

v) individual field study in the form of an applied project on return to duty in home country, with final report of activity - 3 months.

The candidates' suitability for University recognition will be assessed by his standard of work throughout the course, by the results of written examinations, and by appraisal of the report of the field study.

Eligibility. The following are eligible for admission to the prescribed course of study:

i) graduates of an approved University; or

ii) persons who hold an approved technical or professional qualification awarded by an approved body, and who have at least 5 years practical experience or other qualifications of special relevance to the course, including those working in the fields of education, nursing, home economics, agricultural extension, community development, medicine and public health.

Method of Application. Forms will be available from the Ministries concerned with health, education, agriculture and community development. PAHO/WHO Fellowship application forms and two UWI application forms have to be completed by each applicant and sent to the PAHO Country Representative for the country or area for forwarding to the Director, CFNI, P. O. Box 140, Kingston 7, Jamaica. Application forms should reach the Director, CFNI by July 31, 1968.

Selection of Candidates. Thirty Fellowships are available for the first course (January 1969). Selection of applicants will be made by PAHO and FAO, advised by CFNI.

Consideration will be given to various factors during the selection process, such as the probable future role of the applicant as a trainer of staff or as an organiser of an interdisciplinary applied nutrition programme; the desirability of having several persons from one island training together as a team; and the potential role of persons in present or proposed programmes of particular importance to the resolution of nutrition problems in a country.

Conditions of Award of Fellowships. The Fellowships will cover finance for air travel during the course, a book allowance, the University tuition fee and a stipend calculated in accordance with the current cost of living allowance.

The stipend will be paid to all candidates working outside their home country. When candidates are working in their own country and staying at their own home, they will receive an incidental expense grant to cover lunch and local transport. Exceptions will be made for candidates working in their own country who have to lodge away from home.

Accommodation, usually at a guest house priced within the stipend, will be arranged for candidates when working outside their home country. Candidates may stay at home when working in their own town, unless special circumstances make this impossible.

Obligation. As with other PAHO/WHO training programmes, candidates awarded Fellowships are required to remain in Government employ for three years after completion of the programme.

Addresses of PAHO/WHO Country Representatives

1. Bermuda, Bahamas, Cayman Islands, Jamaica: P.O. Box 37, 21 Slipe Pen Road, Jones Town P.O. Kingston 12, Jamaica.

2. Antigua, Barbados, British Virgin Islands, Dominica, Grenada, Montserrat, St. Kitts, St. Lucia, St. Vincent: P. O. Box 506, Jemmotts Lane, Bridgetown, Barbados.

3. Trinidad: P. O. Box 898, 49 Jerningham Avenue, Port-of-Spain, Trinidad.

4. Guyana: P. O. Box 724, Brickdam, Georgetown, Guyana.

BOOK REVIEW

CONTROL OF ASCARIASIS. REPORT OF A WHO EXPERT COMMITTEE. WHO TECHNICAL REPORT SERIES No. 379. GENEVA. 1967 *

With the progressive control of major endemic diseases which occurred previously in tropical regions, more emphasis can now be given to helminthic infections and their effect on the human host.

It is timely indeed that the recent findings of the WHO committee on Control of Ascariasis has been published as it will undoubtedly provide suitable guidelines for preindustrialized countries whose health planners are concerned with the prevalance of ascariasis in their territories and its impact on the general health and nutrition of the population.

In 1943, a WHO Expert Committee considered the possibility of using ascariasis as a "test" infection for the evaluation of control measures and decided it would be an eminently suitable choice as the disease is widespread, amenable to control, as has been shown in Japan, and can be eradicated as effective drugs are available for treatment.

When the geographical distribution is considered, broadly speaking one out of four persons in the world is affected. In industrialized countries in the absence of specific control measures local prevalence rates range from less than 1% to more than 75%. No figures are quoted for prevalence rates in the Caribbean islands.

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*Obtainable from H,M. Stationery Office, 49 High Holborn , London W. C. 1. (price 6/-) or from Columbia University Press 136 South Broadway on-Hudson, New York, 10533, (price $1.00).

The age groups in which prevalence and intensity are most pronounced are the pre-school and young primary school children who have no natural or acquired immunity and whose behaviour and sanitary practices differ from those of more responsible adults. This difference however is less marked in areas of high transmission in countries in which programmes of intensive treatment for infective children has been instituted. Little difference in human sex prevalence is seen until age and occupation are considered, if human faeces are used as fertilizer the agricultural worker will be more at risk.

Ascariasis is commonly found both in urban and rural areas. Entire families may be affected due to the similar mode of life shared by all members of the group. The educational standard of the mother can play a part in controlling the degree of infection among her children and often urban areas with overcrowding and inadequate facilities may be more seriously affected than the country districts.

From the public health point of view, individuals with heavy worm burdens are more of a menace to the community than those carrying a lighter load of worms.

In this report, biological and epidemiological parameters are studied in detail. Intensity of infections can be determined either by faecal egg counts, counting of worms at postmortems or after anthelmintic treatment. The difficulties encountered using

these techniques are discussed, emphasis being placed on the necessity of using rigorous statistical methods in interpreting faecal egg counts and methods of evaluating soil contamination. The viability of ascaris eggs in contaminated soil is studied. The most practical indication of prevalence is the relative number of people passing eggs in their faeces at a given time. Variables such as sex, age, occupation, socio-economic status must be taken into account in population sampling and epidemiological data.

Techniques of stool examinations are described in detail - including the direct smear, cellophane thick smear and concentration techniques, and their relative value is discussed.

A practical note on methods of collection and transport of stool samples is also included.

An important chapter deals with therapy, dosages and drugs and techniques for mass drug treatment. The dosing cycle must be organised in such a way that the worms which have not reached maturity will be attacked, thus reducing the potential egg output. The drug of choice would appear to be a flavoured syrup of piperazine citrate, which is chemically stable, efficaceous, easy to administer, minimally toxic; but a plea is made to manufacturers to reduce the price of this syrup, or health departments may have to produce their own formulation.

For an eradication programme to be effective, three main broad approaches are required: the treatment of the infected population combined with measures to prevent environmental contamination with

human faeces and simultaneous education of the public in personal hygiene. A sociological survey is also required to establish the pattern of customs, beliefs, dietary and sanitary practices in the population to be treated.

There exists a great need for further research in various aspects of ascariasis, such as improving techniques in detection of infection estimation of quantitative worm burdens, patterns of worm replacement pathways of infection excluding the gastro-intestinal tract, the role that the pig ascaris (A.suum) may play in human infection also techniques or improved control, using environmental measures including architectural design of housing and landscaping of adjacent play areas for children. More research is also needed on mass chemotherapeutic techniques and into the use of improved anthelminthics which could deal not only with the ascaris, but also the hookworm and the whipworm who are often its constant companions.

Because of the widespread importance of ascariasis emphasis has been placed so far on the public health aspects of the disease. If one considers the harmful effects of ascariasis on community health, one must include the economic aspect (cost of treatment, loss of working time, loss of skill due to absenteism from school); the direct effect, causing overt morbidity and mortality. Here the well known surgical complications must be included which may result in fatalities (intestinal obstruction, volvulus, intussusception, biliary duct blockage and peritonitis) respiratory

disorders caused by migrating ascaris larvae through the lungs, neurological occurrences, allergic phenomena and associated infections due to the wanderings of the peripatetic larvae are also manifestations of this disease.

CAJANUS is a newsletter devoted to imparting, it is hoped, pertinent nutritional information, so let us now consider the impact of the ascaris on human nutrition both from the "worm's eye view" and the biased opinion of its reluctant host.

Anyone interested in nematode work will have noticed the frequently excellent nutritional status of the sleek and glossy ascaris. Obviously a good supply of nutrients has not been denied it. The "vital statistics" of this elegant worm are on an average 3g in weight with a variable length of 25 (9.8 inches) to 45cm (17.7 inches). If not suddenly displaced by an anthelminthic its life span is approximately one year. The female of the species has a better survival rate. 48.5% of the worm's dried weight is composed of protein and 20% of the roundworm's energy is derived from protein though the actual requirement of the young worm is unknown. If one considers the average number of eggs, approximately 200,000, that are laid by the female daily, one can attribute to the ascaris remarkable powers of protein synthesis. The worm has also been shown to absorb food and possibly protein through its intact skin.

Under normal conditions 24% of the dried weight of the roundworm is composed of glycogen. Starch splitting enzymes and glycogen have been identified in its intestinal tract, and as a facultative anaerobe it obtains 80% of its energy from carbohydrate metabolism. It can absorb fructose, galactose and glucose through its cuticle. About 10.9% of the worm's dry weight is composed of fat, but there is probably no evidence that it can metabolise lipids. Quantitative microbiological estimations have shown that high concentrations of pyridoxine, thiamine, nicotinic acid and pantothenic acid are found in the ascaris. It is also suggested that for normal growth it requires either Vitamin B 12 or the animal growth factor, and ascorbic acid has been found in its body fluid. With knowledge of the worm's anthropometric measurements, its dietary habit and sex life we may now turn to its methods of survival.

In order to survive the worm produces an anti-enzyme, ascarase which prevents it being digested by the hosts intestinal secretion. Ascarase which has an anti-pepsin, antitryptic activity may not only protect the parasite but neutralizes sufficient of the host's enzymes to interfere with the digestion of food. Hence this could seriously affect the nutritional status of children with kwashiorkor in whom pancreatic secretion may already be diminished due to a protein deficient diet.

It has also been shown both in vitro and experimental animals that a toxic substance is liberated by the ascaris which acts on the smooth muscle of the intestine causing contractions and colic

often with vomiting and diarrhoea. Such bouts of "intestinal hurry" in malnourished children will impede adequate food absorption and may be an important factor in the aetiology of malnutrition. It has been estimated that in children infected with an average of 26 worms approximately 4g of protein are lost a day from a diet containing 25 - 50 g protein. Therefore if a large number of worms are present, a considerable cumulative amount of protein will be deviated from the host. Trauma and superficial ulceration of the intestinal epithelium may occur due to direct chemical irritation from aldehydes produced by the parasite and further interference with food absorption ensues when the powerful denticulated mouth of the parasites catches up small areas of intestinal mucosa, and when the parasite mass causes direct blockage of the intestinal villous surface in young children whose intestinal lumen is already narrow.

As well as depleting its host of protein and interfering with the absorption of food because of its own needs, the ascaris causes vitamin deficiencies in its host. Vitamin C deficiencies may occur in patients with ascariasis. If a test dose of this vitamin is given, infected children will excrete a significantly lower amount than non-infected children. Some studies also relate vitamin A deficiency to the action of the ascaris. Children with night blindness showed a rapid recovery from symptoms after deworming.

It is therefore most important to consider seriously the ill effects of ascariasis on the vulnerable young child who leaving

safe, uncontaminated, protein-rich dietary of breast milk, is faced with an often inadequate regimen, which he will himself contaminate with hands, dirtied by his exploratory excursions on the soiled floor of the house, the garden and alas, all too often, in some countries, the surroundings of child welfare and paediatric out-patient clinics, where because of inadequate sanitary facilities, long hours of waiting, promiscuous defaecation of infected children occurs, and the worm free children will become infected in these ill-equipped,understaffed preventive and curative centres.

The report of the WHO Expert committee concludes that the control of ascariasis is urgently needed in many countries. It recommends that in areas with appropriate resources control measures be initiated at the national level. In less fortunate countries control measures should not be delayed but could be started at regional or even district level. The ascaris control programme should be the responsibility of a special unit of the central health service, and local public health facilities should be used for the execution of this programme. It is well recognised that in countries with a serious ascariasis problem, financial resources may not be available but international organisations (WHO, UNICEF, WORLD FOOD PROGRAMME) should give high priority to the support of ascariasis programmes.

EDITOR'S ANNOUNCEMENTS

Closing date for entries in the Competition for Recipes using Pigeon Peas was May 31st. Over 20 recipes have been received. During June a panel of judges will test all the recipes and the results, with the winning recipes, will be published in Cajanus No. 4 (August issue).

A competitor from Trinidad, who sent on 6 May by registered air mail recipes for a pigeon pea stuffing and a main dish, forgot to enclose her name and address. Please would she get in touch with the Editor as soon as possible so that her entry may be included.

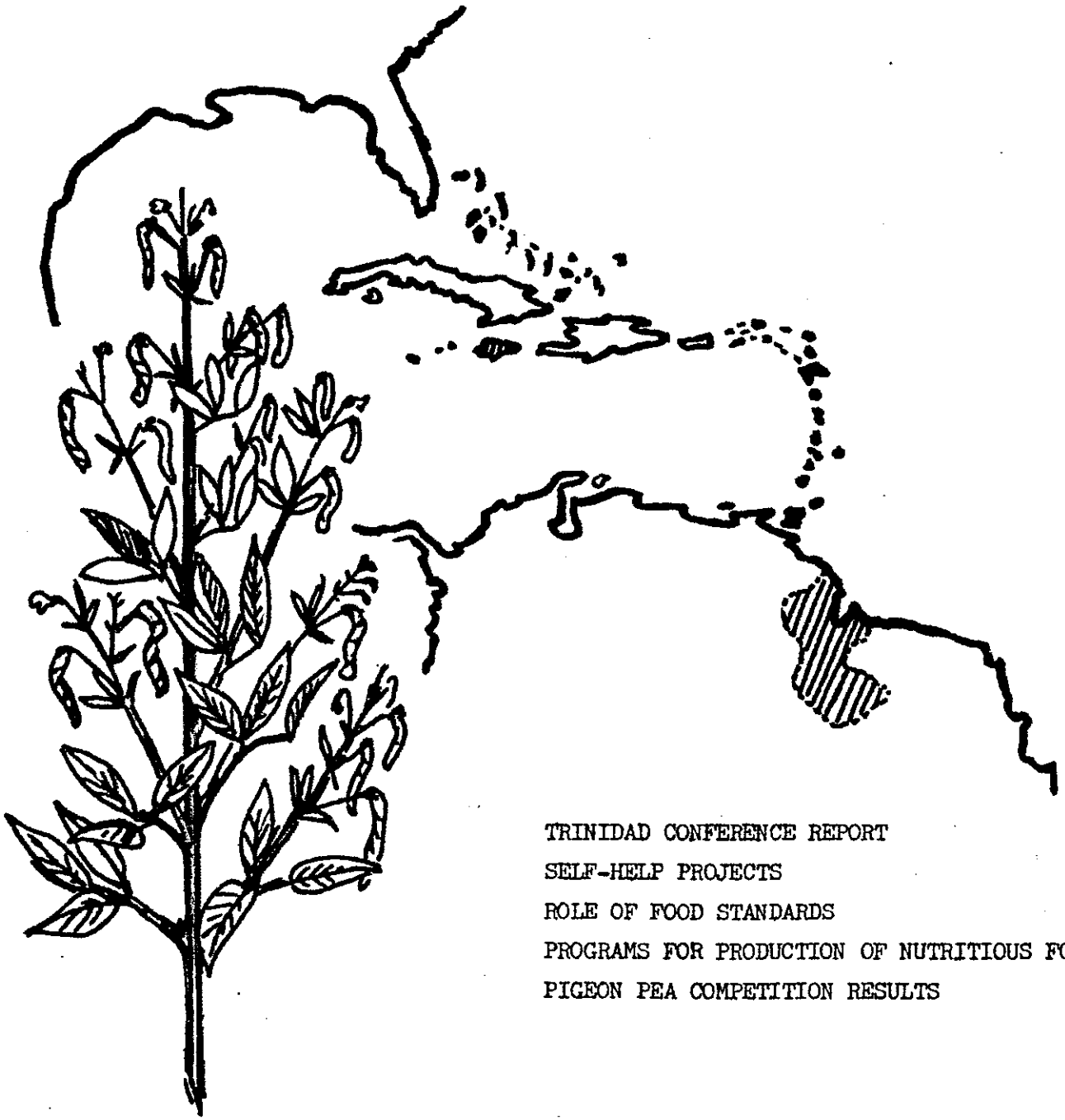
We are beginning now to receive letters from readers and also questions for the "Your Questions Answered" feature. We thank our correspondents and urge our other readers to follow their example.

No. 4 August 1968

CAJANUS

NEWSLETTER OF

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE



TRINIDAD CONFERENCE REPORT

SELF-HELP PROJECTS

ROLE OF FOOD STANDARDS

PROGRAMS FOR PRODUCTION OF NUTRITIOUS FOODS

PIGEON PEA COMPETITION RESULTS

C A J A N U S

Newsletter of

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE

Mona P.O. Box 140

Kingston 7, Jamaica.

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Opinions expressed in this newsletter are reproduced for the sake of interest and information. They should not necessarily be construed as representing the views of the Caribbean Food and Nutrition Institute, nor of the bodies signatory to the agreement establishing the Institute, namely PAHO/WHO, FAO, University of the West Indies, and the governments of Jamaica and Trinidad/Tobago, nor of the Williams-Waterman Fund.

REPORT OF A CONFERENCE ON

"RECENT TRENDS IN FOOD AND NUTRITION IN THE CARIBBEAN"

held at the Caribbean Food and Nutrition Institute,
St. Augustine, Trinidad, May 20th - 23rd 1968.

The Conference was opened by the Honourable Dr. M. Awon, Minister of Health, Trinidad & Tobago. In his address Dr. Awon spoke of Trinidad's needs in the nutrition field, welcomed the establishment of the Trinidad centre of the Caribbean Food & Nutrition Institute and wished the delegates a successful and fruitful meeting. Dr. K.K.P.N. Rao of FAO, Rome and Dr. B. Bosley of PAHO/WHO Washington, briefly conveyed the greetings of their respective organizations and the Director of CFNI, Professor D.B. Jelliffe thanked the Minister for opening the Conference.

SESSION I: THE SOCIO-ECONOMIC BACKGROUND. Chairman: Professor P. Mahadevan. Rapporteur: Dr. F. Ramsey. Mr. K. Leslie spoke on Food & Nutrition in the West Indies. The Contribution of Domestic Supplies. The population of the West Indies had increased by 25% since the second world war, the per caput income by 75%, and domestic agricultural production by just over 1% per annum. The increased demand for food has been thus largely met by an increase in imports. The reasons for this inadequate performance are largely historical, rooted in the position of the West Indies as a producer of export crops which used the best land, and in the trade preferences which placed locally produced food crops at a disadvantage. Low productivity per acre, partly the

result of indifferent management, has held back livestock development till recently. Up to the present time most domestic food production has been in root crops with their high calorie yield and low demand on skill and attention. Pulses have taken second place to root crops. It is illogical that in an essentially agricultural area one-fifth of all imports should consist of food, and this is especially so when the prospects for the export crops which pay for these imports are by no means certain.

Mrs. L. MacDonald presented a paper on Urban Families and Their Sources of Food and Income. The West Indies is not homogeneous in level of development or in food supply. Price of food is unusually high in Jamaica, but everywhere inefficient distribution through peddlers or higglers increases the price. The ICNND Survey of 1962 in Trinidad and some of the islands showed clearly that certain low-income and vulnerable groups were receiving far less than recommended allowances. Income is a main differentiating factor, and as it increases the proportion of the income spent on food in general decreases, but that spent on animal protein rises. Average income in urban areas is 1 1/2 to 2 1/2 times greater than in rural areas, so that urban/rural differences play a large part in different consumption patterns. In some areas, such as Trinidad, ethnic differences also cut across this pattern. In Trinidad working classes spend about 44% of income on food, high by world standards about average for developing countries and lower than some other places in the Caribbean.

Dr. R. Cook dealt with Demographic Trends. He illustrated the rapid growth of population in the world in general in the present century and in the developing countries in particular, and showed the counterpart of this in the Caribbean area. The high natural increase rates were the result largely of lowered death rates, and as these were unlikely to go much lower than their present level, then in the absence of large-scale emigration the future population of the West Indies would depend largely on the size of the birth-rate. A decline in the birth rate of 10 per thousand could make the difference between an area population of 14 million in 50 years time and of 9 million. Among the practical consequences of the present situation of the Caribbean area with regard to population dynamics were (a) a low worker/dependant ratio (b) a school population increasing more rapidly than school places could be found for them (c) considerable difficulty in making domestic food production rise rapidly enough to avert steep rises in food import bills.

Mr. O.L.G. Alves spoke on National Economic Viewpoints. We are faced with a legacy of food habits supported by certain well known socio-economic factors. Consequently cheap starchy foods still form the bulk of the diet which results in low productivity. One of the reasons for low protein production is that the capital which must be injected into its production is high and at risk during the long period needed to get a good financial return on the investment. Efforts are being made to transform the economy through crop diversification and import substitution. Processing of foodstuffs is badly needed as a form of investment but there is an absence of the necessary expertise. For various reasons,

there is still a lack of a balanced diet and we are yet to find cheap protein foods. In the meantime enrichment of foodstuffs offers some grounds for hope. There is a real danger that future production of high protein foods may be sold in the best markets abroad and the West Indian consumer may be unable to purchase anything but foreign rejects.

Professor D.B. Jelliffe then dealt with the Inter-relationships of Nutrition and Infection. Human malnutrition is a complex process and is multifactorial in origin. When the nutritional status of children is poor, infections become more severe, have a higher mortality rate, produce more side effects and are more prolonged. However, with the arrow pointing in the opposite direction, nutrition becomes affected by infections. This comes about because during infection nutrient needs especially for protein are increased; less nutrients are available to the body because of diarrhoea vomiting or loss of appetite; traditional home remedies may lead to further dietary restrictions and the host is in competition with organisms and parasites for the food which the child is getting. Preventive programmes must therefore consider not only food production, food availability and socio-economic factors, but also the interrelation of infections and nutrition. In the Caribbean infections of respiratory and gastro intestinal tracts and roundworm infestation are important.

Dr. J. MacDonald then ably summed up on the Sociological Aspects of Food & Nutrition. The discussions over the desirability of plantations versus small holdings were concerned with more than politics or efficiency. The larger plantations can negotiate better prices for

their crops, the smaller farmer, in spite of the marketing boards, is obliged to take what he can get. West Indian society is open and its rural population cannot be compated to the isolated traditional peasant classes of other larger developing countries. The rural populations are becoming metropolitanised. Any uneconomic spending on subsidising smallholders ought to be compared to the cost of accommodating the rural poor in the cities.

SESSION II: THE PREVENTION OF PROTEIN-CALORIE MALNUTRITION OF EARLY CHILDHOOD. Chairman: Dr. O.H. Siung. Rapporteur: Dr. L. Harney.

Dr. F. Ramsey spoke about Locally Relevant Infant Feeding Practices. In the present economic situation many mothers have to return to work early, with resultant early weaning of child. Someone else therefore looks after the child and what it receives in the way of food depends on the beliefs of the person caring for the child.

200 mothers attending Child Health Clinics in Barbados were interviewed in order to learn: what was the basic diet used by mothers in the low income bracket; what education is needed to correct deficiencies in the diet; and how the diet could be improved without increasing its cost.

From this survey it emerged that -

1) Average infant received one breast feed per day and 2 bottle feeds of milk preparation;

2) Skimmed milk was used much less frequently than the more expensive proprietary brands of milk;

3) Oranges were used often but not the locally-available cheaper sources of Vitamin C such as the Barbados cherry.

The diets were costed and diets costing E.C. 12¢, 39¢ and 59¢ per day were found to be inadequate. A diet costing 66¢ per day was found to be adequate. More education is needed to promote greater use of skimmed milk, peas and beans, fish, both fresh and salted. We must also stress the value of foods not being used, as for example ground nuts, mango.

Dr. K. Antrobus delivered a paper about Preventive Approaches to Infectious Diseases. The approach should be with special reference to the area concerned. In the Caribbean, he felt, the approach was with special reference to malnutrition. His observations were based on 4 years' experience in St. Vincent, and dealt with pre-school children. We should consider diseases which were both common and preventable. In a small follow-up study of cases of malnutrition it became apparent that the effects of whooping cough and measles on malnourished children were more serious than is usually believed.

The best approach was to vanquish both malnutrition and infectious disease, but that is easier said than done; but at least immunization coverage really ought to be improved. In St. Vincent full immunization of all babies could be done without much extra work for staff at Child Welfare centres. And the cost was inexpensive, 4¢ per child for D.P.T. and 14¢ per child for Polio vaccine.

Discussion centered around comparison of the relatively small costs of prevention of infectious diseases by immunization with high

costs of hospitalization. One speaker mentioned a hospital in the Caribbean where there were 90 - 100 cases of diphtheria per year at a cost of over $25,000 per annum, whereas for a lesser sum all the children aged 0-4 years in that island could be immunized with triple vaccine. Immunization schedules and the possibility of carrying immunization services to the home were discussed.

Dr. McKigney dealt with The Cost of Protein Infant Foods. The average Caribbean family spends a high percentage of its income on food. The diet tends to be deficient in protein, particularly for the young child. Thus, it is important that the mother, and those who guide or influence her thinking, be cognisant of the cost of protein in foods.

Information sheets distributed by the speaker showed great variation in the cost of protein. Numerous staple foods especially cereals, are economical sources. On the other hand, many foods are very expensive as sources of protein, particularly those used in infant feeding. The cost of these foods apparently has no relation to nutrient content, particularly since some of the more expensive types contain little or no protein. However, the mother is influenced in many ways to use these proprietary infant foods. It was recommended that all persons in nutrition-related programs become more aware of food economics and encourage the housewife to use lower cost sources of protein in feeding the young child.

Dr. R. Cook spoke on: Cost-Effectiveness of Child Nutrition Programmes. Calculation of cost-efficiency in child nutrition programmes was necessary in order to determine priorities and to select

which kind of programme to adopt, but we have very little of the kind of information which is needed concerning either costs of effectiveness. Almost all general nutrition programmes are child nutrition programmes because they exert their maximum effect on the most vulnerable group.

Nutrition programmes and services fall into two main groups those connected with treatment and those connected with prevention. Ten different kinds of preventive programmes were listed, and the kind of data required in investigating cost-effectiveness was reviewed. When we have this information we can then try to compare the cost to the community of the present situation of malnutrition with cost of that degree of prevention of malnutrition which our studies would lead us to expect. The paper was a plea for a more businesslike and mathematical approach to cure and prevention of malnutrition.

SESSION III: RESEARCH AND COMMUNITY NUTRITION. Chairman: Dr. F. Ramsey. Rapporteur: Mr. S. Barnes.

Dr. N. Byam spoke on Anaemia in Trinidad. In a survey conducted in Trinidad and Tobago it was shown that iron deficiency was the main problem, especially affecting pregnant women (83% below 12 gram %). Iron enrichment of a staple food, such as wheat flour, seems the most promising approach, but absorption of the iron compound used must be tested first. In addition, low serum B 12 values were found among children 5-9 years and pregnant women, 26% of whom were below the lower limit of normal. This means that the customary practice in

developed countries of giving folic acid supplement in last trimester to prevent megaloblastic anaemia of pregnancy would be inappropriate and perhaps harmful in this community.

In protein-calorie malnutrition there is an abnormal amino-gram, as shown by an increase in certain non-essential and a decrease in certain essential amino acids. A small sample of anaemic women showed patterns similar to PCM. Pregnancy did not appear to affect the pattern. There was no essential difference between megaloblastic and normoblastic anaemia as regards to the pattern. If these results can be confirmed, this would constitute evidence of protein deficiency as an aetiological factor in human microcytic hypochromic anaemia.

Dr. A. Ashworth reviewed Research Activities in the Tropical Metabolism Research Unit, Jamaica. These mainly concern malnutrition in infants and young children. Much of the Unit's work has been on the clinical and biochemical effects of malnutrition. Research related to the electrolyte imbalance, the factor associated with most hospital deaths, has shown low accompanying plasma and albumen value which are related to increased plasma volumes and decreased plasma osmolarites. Total body water is increased even in non-oedematous cases so that it is possible for a child with clinical dehydration to have intracellular over hydration. It is therefore dangerous to treat a malnourished dehydrated child in the same manner as one would treat a well-nourished dehydrated one, lest in the presence of impaired cardiac and renal function one produces heart failure and pulmonary oedema. In relation to the electrolyte work, the Unit has carried out studies which show

a possible relation between malnutrition and potassium depletion, and in severe depletion the Unit has found that there is a loss of potassium from the brain.

In studies to determine the etiological factors which relate malnutrition to gastroenteritis, it has been found by the Unit that (1) the actual structure of the intestinal mucosa is grossly abnormal in malnutrition; (2) in malnutrition there is a general depression in enzyme levels; (3) the intestine is smaller and less distensible so that the speed of flow of fluid down the intestine is more rapid; and (4) in malnutrition there is a decreased capacity to split lactose and sucrose and there are defects in absorption. Absorption is poorest in relation to lactose and sucrose, but even glucose absorption is impaired. As a result of these studies the Unit has treated severe cases of diarrhoea with lactose-free preparations with considerable benefit.

In studies of problems of the fatty liver the Tropical Metabolism Research Unit is trying to determine if impaired glucose utilisation may be a causative factor.

Miss Helen Fox spoke on Nutritional and Dietary Status of Jamaican Pre-School Children, describing an all-island survey directed towards finding out at which ages Protein-Calorie Malnutrition mainly occurred, at which age was mixed feeding properly instituted; what were the levels of deficiency of protein, calories and riboflavin; what differences in nutritional status and dietary patterns were there between urban and rural children. The main findings were that urban children

have a lower calorie intake than rural children and also less well-fed than rural children in respect of riboflavin and protein, with an improvement in respect of protein and a decrease in respect of riboflavin as children get older, using FAO Safe Practical Allowances as criteria, deficiency in calorie levels remaining much the same. However, urban children do get a larger amount of animal protein in general except fish, so that the variety of their protein was greater. Full mixed feeding was established a year later in urban area, but again with greater variety than in rural areas. With rural children the protein was mainly derived from starchy roots and fruits, and salt-fish, with little from milk or pulses.

There was marked PCM in 3% of children aged 6 months to 3 years, but oedema only in 2 cases out of over 600. In some areas there is fluorosis, with fluoride content of the water 5 times higher than recommended.

Dr. M. Ashcroft gave a paper on Cross-Sectional Growth Studies. After explaining the nature of these he described some results of the many studies carried out by himself and the Epidemiological Research Unit, with local assistance, in most areas of the Caribbean, mainly among school children. It was shown that, for example, Jamaica school children were at present in height and weight somewhat between the levels of London children of 1905 and 1959. There has been marked improvement in Jamaica levels since an earlier study in 1951. Girls seem in a relatively favourable position as compared to boys in Jamaica. There are certain racial differences, with children of Chinese origin

being much smaller than the rest, with no real difference between children of African and European origin. Similarly in Guyana there is a difference between weight and arm circumference between children of African and East Indian origin, even though Infant Mortality is 20 - 30% less in East Indians. The speaker believed that these biometric differences were truly racial, and genetic. Comparing the various territories in the Caribbean, rural Jamaica is about the worst in regard to nutritional status of school children, with Bermuda at the top, with heights being nearer to standard than weight.

Mrs. E.F.P. Jelliffe spoke about Anthropometry in Rapid PCM Surveys. Attention has been focussed to date mainly on classical marasmus and kwashiorkor, but increasing concern is felt concerning the moderate or marginally severe but chronic cases, much more numerous, who may suffer from some permanent physical or intellectual damage later. The following methods may be used in assessing PCM in the community: clinical examination, biochemical tests, and anthropometry. Anthropometric measures are simple to take, objective and easily reproducible if the correct procedure is used. Weight, a measure of body mass, though often used by medical staff, may be unreliable because of the practice of using less experienced nursing personnel to carry them out and, too, because of the inaccuracy of the weighing scales which are infrequently checked. More suitable weight scales ought to be devised for weighing all age groups. Age is another problem. In cultures in which little importance is placed on the exact age of the child a chronological calendar of events suitable to the

local situation may be devised beforehand, such as seasonal planting or reaping of crops, yearly festivals or political events. If the precise age is not known certain ratios and "year constant" measurements may be suggested in communities where the approximate age to the year can be assessed. These are, the chest-head ratio, the weight for length and weight for head circumference and the arm circumference measurement. The latter shows most promise. Results from anthropometric measurements in field surveys may be reported in 3 ways: (1) with means and standard deviations (2) in relation to percentiles, or (3) in ten per cent levels below a selected standard. This last method is that which is recommended and will be used by CFNI.

Dr. I. Johnson spoke about Food Balance Sheets. Knowledge of the availability of different foods is an extremely important element in planning nutrition and agriculture programmes. To simplify the collection of this kind of information the food balance sheet is used. Food balance sheets are statements showing the quantity of food which is available for human consumption by the people in a specific area (usually a country) during a specific period (usually a year). The accent is on available food, since food balance sheets do not attempt to assess the quantities of food actually consumed by the population, an almost impossible exercise, especially as it is difficult to differentiate between regions, age groups and intra-familial distribution.

There followed a series of four papers on research carried out by the University of the West Indies into production on various crops. Dr. R.W. Radley spoke on The Potential for Soyabean Production. The

major production problems are as follows in this order of priority (a) selection of a variety adapted to local soil and climatic conditions; (b) assessing importance of sowing date (c0 determination of spacing requirements in local circumstances (d) crop protection, weeds, insects, disease, (e) response to fertilizers. A large number of small field experiments have been and are being carried out. Some major results are (1) For Trinidad a variety yielding 2200 - 2600 lbs/acre has been selected, standing well in rain and with high oil content. For Jamaica a decision will be reached soon, and we have promise of excellent yields (2) Planting date in Trinidad will have to be April/May or September/October (3) Spacing should be similar to that in U.S.A. (4) Progress has been made in finding solutions to crop protection questions, and (5) It has been found that response to phosphate is remarkable on the local soils in Trinidad. We have therefore a recipe for the interested farmer. However they remain at least as great problems in demonstrating commercial profitability. We should take a long-term view to the mid 1970's and early 1980's. The key probably lies in the consideration of the whole rotation in which soyabean will be grown. It will probably be a maize/soyabean rotation.

Dr. W.V. Royes read a paper on The UWI Pigeon Pea Breeding Project, which was started in 1956 (even at that time with protein shortage in mind) by Dr. H.J. Gooding and taken over by the speaker in 1960. Up till 1964 there had been no costed trial which had shown other than a loss, mainly due to excessive reaping costs. The breeding

project is leading towards a number of changes in the nature of the plant (which seems to be in its present state effectively a wild species). Among the changes sought are a shorter plant; a flat-topped bush with the pods in clusters at the ends of branches instead of all along the length; increase in pod weight with increase in pea/pod ratio; decrease in number of abortive ovules; early and determinate bearing; and lastly high yield. Much has been achieved to date, and much experience gained which may be of use, with other crops in assisting us to attain that rapid progress which tropical nutrition demands of tropical agriculture.

Mr. P. Haynes described the Root Crop Programme of UWI, which has been established for just over a year. The reasons for wishing to increase and make commercially feasible root crop production are that there is substantial import of Irish potatoes, that we do require carbohydrates in our mixed diets, and that there is a very large amount of wheat imported. While at present on a protein basis root crops could not substitute for wheat, it is possible that where fortified with additives they may partly do so. The problems met in the project are (i) low and inconsistent hields of yams and sweet potatoes (ii) uneven supply (iii) uncertain market requirements (iv) absence of an established commercial marketing system in root crops. More intensive production would probably release land for other agricultural enterprises.

Professor E. Tai gave an account of Fruit and Vegetable Research. In comparison to more highly developed countries the consumption of fruits and vegetables is quite low in the West Indies. The aim of the

research at UWI are (i) to extend growing seasons (e.g. with avocado pears) (ii) to devise means of propagation for rapid multiplication so that they can be economically produced (iii) enhance utilization of such crops by improving storage, transportation to market and preparation for marketing. Several examples were given of the ways in which these problems were being tackled with various crops.

SESSION IV: RESEARCH AND COMMUNITY NUTRITION (continued). Chairman: Professor E. Tai. Rapporteur: Dr. M. Ashcroft.

Dr. L. Harney presented a paper on Family Planning in Barbados. The Family Planning Association was launched in 1954 and the first clinics were held in 1955. The staff at that time was 5 but has expended to 19 at the present time supported by an annual government subsidy of $42,500. The clinics are held at government health centers and run by specially trained nurses and doctors on a voluntary basis. Various forms of contraception are offered at prices much below those in the stores. Research is needed into the motivation and reasons for preferences for the different devices. The Family Planning Campaign has been accompanied by a good deal of publicity.

In 1955 the birthrate for Barbados was 33.1 per 1000 and by 1966 it had fallen to 25.9 and has fallen to an even lower level in 1967. Several factors are surely involved in this fall, and it is likely at least that the activity of the Family Planning Association is amongst these factors. To what extent, we would very much like to know.

Dr. K. Antrobus, spoke about Field Research in Child Nutrition in St. Vincent, which has been sponsored over the past 4 1/2 years by the Save the Children Fund. Patients aged 6 months to 2 years were referred from 3 clinics if, according to a number of criteria, they appeared to be likely to suffer from malnutrition. A total of 647 patients was seen of whom 530 were below the 3rd percentile on the Harvard standards. Special efforts were made for those referred; they were supplied with 1 lb. per week of a soya-bean preparation and were given advice on its use and on child feeding in general; home visits were made if necessary and access to hospital was made easy. 42 deaths (6%) occurred. The malnutrition was divided into severe, moderate and mild according to the degree of weight loss, and the rates of recovery were determined. Although in general those with mild malnutrition recovered more quickly than those in a severe state, there was a wide variation in the rates of recovery. An analysis of several factors was made in an attempt to pinpoint those which might be associated with a slow recovery. The standards of care during the day, illnesses, deaths among siblings and the mother's attitude were found to be among the relevant factors determining rate of recovery, and the study showed that there was a complex of factors which cannot always be unravelled separately.

Dr. F. Ramsey outlined the results of A Follow-up of PCM in Barbados. In 1966, 143 cases were admitted and of those 36 (25%) were re-admissions. The total cost to the hospital of 4,627 patient-days, each costing an approximate sum of $27, was considerable.

The number of re-admissions was disheartening and therefore efforts were made to follow-up and make home visits on every discharged patient. The results of this were encouraging. Although in 1967 there were 159 admissions for malnutrition staying an average of 50 days in hospital only 13 (8%) were readmitted and of those most were admitted for causes other than malnutrition. These results, gained with little outside assistance, well demonstrated the importance of following-up cases of malnutrition in their homes. Although follow-up is time-consuming, the results may in the end be more economical than merely treating patients in hospital and discharging them without special effort subsequently.

Dr. A. Shuman discussed the Basic Information Required for Agricultural Development. The kind of information required can best be understood if we consider the various steps which have to be followed in planning for agricultural development. These are (1) definition of overall national and economic objectives; (2) definition of these as they affect agriculture; (3) review of the present agricultural situation, a kind of stock-taking; (4) projection of demand for agricultural commodities; (5) target-setting in all the components (6) selection of strategy and specific measures; (7) programming budgeting and pre-testing the plan for technical and economic feasibility; (8) implementation; (9) continuous evaluation and adjustment. All these steps, then, require much information from agricultural census, research and surveys and from current statistics. In developing countries the data is likely to be very incomplete, but planning

must begin with whatever is available, with provision made for the necessary research and surveys.

Mr. V.O. Ferrer spoke on Integration of Field Research Into The Production of Nutritious Foods. We are fortunate in the Caribbean that we can consider the production of nutritious foods rather than merely the production of any kind of food that will ward off starvation. At this juncture in our planning it is most timely that we begin to consider nutrition instead of, as has been the case in the past, mainly the economic aspects. However the production of nutritious foods must firstly satisfy criteria of profitability to producer; philanthropic or patriotic considerations are not likely to prevail if this is absent. Secondly, the foods must be accepted by the public. Thirdly in a society where the majority of the population spend a very high proportion of their income on food, the unit price of the product will have to be low if the product is to make much impact. Basically this means higher unit yield for relatively lower imput costs. But this is not an easy concept to put across, perhaps because of fear of producing surpluses. Guaranteed prices shift problem of disposal from farmer to government but does not solve it. However unit price is not enough; the newer concept put across by Dr. McKigney, of price per unit of protein and calories, is very revealing and deserves much more consideration. Our land resettlement policy in the past had tragic faults, happily mainly remedied since then. Settlement is costly now, but is likely to be less costly than cheaper methods which fail. In regard to demand, it is likely that rise in per capita income itself, increases demand for animal

protein, and we need only supplementary stimuli. For Trinidad it is probable that we are approaching a period when we cannot afford not to have a Bureau of Standards and resources in Food Technology.

Dr. M.P. Singh spoke on the Evaluation of Agricultural Development Projects. To date in Trinidad no formal evaluation studies of the highly sophisticated and structured type have taken place. Suggestions made for such studies on projects in the 5-year plan include (a) it can be made only if the objectives have been specifically set out. (b) We must evaluate both quantitative and qualitative results; with a drawing of lessons for future improvement. The ultimate value of evaluation is that it enables a decision on what to do with a programme, whether to continue it as it is or to introduce changes. Thus it should be concurrent rather than a post-mortem, and be preceded by the bench-mark study at the commencement of the project. Control areas are desirable, to estimate changes which have taken place irrespective of the project.

Finally, Dr. G. Sammy spoke on Food Technology Research at U.W.I., Trinidad. Food should be considered in four aspects: production, presentation and processing, marketing and utilisation. Production has been emphasized mainly, and marketing is just now finding a place at the University, presentation and processing (food technology) is a very recent arrival, and utilization (home economics) has yet to find a place in U.W.I.. However, only by taking all into account can we arrive at a realistic solution of our food and nutrition problems. Equipment and funds are as yet limited, an optional course in Food

Science and Technology being offered to final year chemical Engineering students. Only existing equipment of other departments at the moment can be used, and studies on sweet potato and yam flour have been done, and acceptability trials on sweet potato flours have had promising results.

SESSION V: NUTRITION DAY CENTRES. Chairman: Mr. Gerald Chen. Rapporteur: Dr. K. Antrobus.

Dr. Reddy, in her presentation on The General Need for Nutrition Day Centres, indicated that the pre-school child was most at risk from nutrition that was of poor quantity and quality. This was aggravated by the mother seeking employment outside the home, which resulted in poor day care of these children. At present a great proportion of malnourished children receive little or no treatment, nor is there enough education of mothers to prevent relapses among those who have received medical attention.

Nutrition Rehabilitation Centres, for mild and moderate PCM and discharged hospital cases, were needed to educate mothers, thus serving in a preventive and therapeutic role, and should make use of foods and utensils familiar to the mothers. In the residential-type centre mothers would help with food preparation and have a comprehensive education in child care. This was vastly cheaper, even at $1.00 per patient per day for three months, than the hospital cost of treating PCM for six weeks, which exceeded $900 (T.T.).

Full evaluation of such programmes needed to be done in order to facilitate future planning.

Miss M. Greene's topic of SCF Day-Care Centres - Present and Projected in the Windward Islands focussed mainly on the Child Welfare Training Centre and Day Nursery in St. Vincent. There, 76 children between six months and five years of age received day care amidst good physical facilities, under competent supervision, and in an atmosphere that was intimate and relaxed. A routine that involved three meals a day, a wide variety of play activities and rest was described in some detail; and the overall development of the whole child was stressed. Eight students were trained each year in Child Care, their practical experience including work in Children's Nutrition Ward, in other day nurseries and in home visiting. There were several active mother's Clubs whose activities ranged from making preserves to doing carpentry.

Sister Maria Houthoofdt described the Infant Jesus Community and Day Care Centres, Dominica. Over the period 1960-1967 more than 1200 children with malnutrition were treated at the Infant Jesus Nursing Home. A change in the pattern of community needs led to its replacement by the St. Ann's Community Day Care Centre popularly called "The Creche". About 100 children between the ages of three months and 4 years attend at a cost of $1.00 per child per week to each mother which amounts to only one-quarter of the running costs. There is an adult education programme, including a family-counselling service, and monthly meetings of parents at which a wide variety of subjects are discussed. Results have shown improved standards of health, discipline

and morals - a happier life for children, and many women "freed from the vicious circle of concubinage". Six pre-schools for some 500 children aged 3 to 5 years are also run, and a programme to encourage house-mothers and elder women to assist in day care has had a promising start.

Dr. W. Fougere spoke on Nutrition Rehabilitation Centres in Haiti. Malnutrition in Haiti, was estimated at between 68% and 85% among pre-school children. Even after hospital treatment there were many readmissions because of the high relapse rate of the condition. A modestly equipped Rehabilitation Day Centre for 30 children was started in 1964 on a six-days a week basis; each child received a 1300 Calorie/40G protein diet at a daily cost to the Centre of 9 cents (U.S.). Results of treatment of all degrees of malnutrition including kwashiorkor were very good, as demonstrated on charts showing dramatic weight gains, and compared most favourably with the high cost and mortality of hospital treatment. Progress at home varied with the education of the mother rather than with her economic status. These centres could be more aptly named "Mothercraft Centres".

Dr. S. Plaza began her presentation on Day Care Centres in Urban Latin America by stressing the importance of the "quality of survival" in the lives saved by nutrition programmes. There was need for Nutrition and MCH Services to work closely together; the role of breast-feeding needed reinforcement; and the relationship of infection and malnutrition needed more intensive study.

In Latin America Day Care Centres were equated with pre-primary education sponsored largely by education departments. Other data presented by the speaker included national infant mortality rates (range 40-95); natural increase rates, in a few cases exceeding even 3.5% per annum; and the coverage of pre-primary education, from 0.5 to 9.5% of eligible population. One million Latin children attended 15,000 centres staffed by 30,000 teachers. There was incomplete cooperation between nutrition and education centres, and a high percentage of malnourished children were in centres devised to maintain them rather than to correct the problem of malnutrition.

The discussion which followed was led by Mrs. G. Clyne, who outlined the similarity of the problem in Grenada to that of other West Indian Islands, quoting a few vivid examples. There were 8 small nurseries and 40 clubs for home economics at the village level.

SESSION VI: APPLIED NUTRITION PROGRAMMES. Chairman: Mr. Ian Kelton. Rapporteur: Miss Helen Fox.

Three main speakers outlined the Philosophy and Aims of Applied Nutrition Programmes. (Dr. B. Bosley) the use of Modern Techniques of Persuasion (Mr. S. Barnes) and the need for Community Participation in the A.N.P. (Mr. T. Balakrishnan). Six participants (Dr. N. Byam and Miss Warner - Trinidad; Mrs. V. Bright - Guyana; Miss M. Bourne - Barbados; Miss Turner - St. Kitts; Miss D. Low - St. Lucia) then outlined such programmes planned or in force in their country and a general summing up was made by Miss I. Foster of some of the salient points covered in the country reports.

The main aim of an Applied Nutrition Programme is to assist existing agencies to initiate and co-ordinate educational activities to effect improvement in the nutritional status of selected groups of the population. Many presentations took account of the difficulties which had been encountered in achieving the long and short term goals and, from these, suggested ways of improving the planning and execution of programmes to achieve the goals.

The role, responsibility and effectiveness of the National Nutrition Committee was felt to be an important aspect in achieving success. Some points raised were -

1) the need for the committee to be so constituted that it could influence government policy-making in the area of food and nutrition. This required an awareness of the role played by politics in the decisions of administrators.
2) All disciplines involved in the ANP should be represented on the national committee and members must realize the need for effective cooperation among themselves before demanding it of others.

Many persons stressed the need for more adequate assessment of the problems and for planning in relation to local conditions such as particular prestige values, social pressures, religious influences and group ideas. The importance of involving the community in the planning as well as the execution of the project was underlined and ways and means of achieving this given -

(a) By whole family involvement and school based approaches linked to it;

(b) The use of community centres which have ongoing programmes and where all types of demonstrations could be carried out and a forum set up for group learning through radio and television, with meaningful subsequent evaluation;

(c) Operations through local associations and organizations - religious or social;

(d) Maintaining an up-to-date information corner.

It was pointed out that success in these programmes would depend on the development of skills in the application of knowledge and of ways and means of effecting coordination. In this regard it was pertinent to study modern techniques of persuasion and to give careful thought to the selection of the motivator since this person must sell himself before selling his educational goods.

In the main speeches and in the summation the necessity for periodic and continuing evaluation of each programme was stressed. This exercise was shown to be dependent on clearly defined objectives in the initial stages and of carefully selected indicators of progress. Some indicators have been outlined in the report of the Latin American seminar on planning and evaluation of ANP which was given to each delegate. It is important that the results of such evaluation should be used to improve the impact of the ANP.

SUMMARY

It is apparent that, unless politicians and administrators are convinced of the need to make their ANP a part of the normal structure in the selected areas, other personnel must be found and paid to implement the programme.

Careful selection should be made to ensure that these personnel combine leader characteristics with a preparedness to identify themselves with the community and thus assist its leaders into an awareness of its problems and their responsibility in meeting them.

The cost, in terms of personnel and actual expenditure, is therefore an important item in the implementation of ANPs and is often overlooked or soft-pedalled during initial discussions. Some savings can doubtless be achieved by starting in a small way and phasing the programme activities.

Two questions appear to be very relevant and may well be asked by any administrator: -

1) How well does the pilot areas maintain its activities when assistance is removed?

2) Is there any evidence that these pilot areas are influencing other neighbouring communities to initiate such activities themselves?

SESSION VII. ACHIEVING A RATIONAL AND EFFECTIVE FOOD AND NUTRITION POLICY. Chairman: Dr. K.K.P.N. Rao. Rapporteur: Mr. E.J. Hamilton. Basic Considerations were first outlined in brief by the Chairman as follows:

1. National Food and Nutrition Policy is a matter for each government to decide;
2. Food and Nutrition Policy is rational and effective only if an integral part of national development policy;
3. Equally important to the formulation of a policy is the formulation and implementation of a plan of action.

Dr. B. Bosley outlined the International Viewpoint. Food production during the remainder of this century must not only result in quantitative improvement of the diet. It is important that government administrators and planners recognize the present precarious food and nutrition situation. Under normal circumstances, food supply falls within the purview of agriculture. However, when food supply is insufficient, part of the responsibility suddenly shifts to health. Therefore, the health agencies must define nutritional requirements and identify the problems to agriculture and economic planning groups. All countries must take a determined approach to population nutrition. Pan American Health Organization is working with governments in this area in developing national health plans, within which nutrition plans will be incorporated. A proposed nutrition data retrieval and analysis centre would be of great assistance.

Dr. K.K.P.N. Rao spoke about the Role of Food Consumption Surveys. Basic data, particularly on food consumption, is required in order to formulate effective policy. Food balance shheets must be supplemented by food consumption surveys in order to define the nutritional situation of different segments of the population.

Through the Indicative World Plan, FAO is now compiling complete data on food production, availability, consumption and composition throughout the world. The Caribbean is the next region to be included in this plan. FAO has developed two publications outlining the procedures to be followed in obtaining the minimum required information for the formulation of food and nutrition policy. They are "Programme of Food Consumption Surveys" and "Manual on Household Food Consumption Surveys". Both can be obtained from Dr. McKigney of Caribbean Food and Nutrition Institute.

Professor P. Mahadevan presented a paper on Agricultural Aspects. Those countries where food supply has fallen behind demand must strive to meet three requirements;

1. produce sufficient food of satisfactory nutritive value to satisfy the growing population,
2. sustain acceptable rates of economic growth;
3. achieve rational and effective food and nutrition policy.

Case histories were presented of how three countries - India, Kenya, Mexico - each under a different set of circumstances were able to meet these requirements.

Professor Mahadevan concluded that: (a) it is possible for developing nations to achieve a scale and efficiency of food production which allows them to maintain a satisfactory pace of economic development. (b) There is little justification for the view that a process of cultural change must be initiated before important changes in agricultural production are possible. (c) Countries which have achieved annual growth rates of 5% or more are those which have provided the necessary incentives and infrastructure.

Dr. M.G. Lines spoke on - The Role of Food Standards in Trinidad. Food standards are in force in Jamaica, Guyana, Trinidad and Tobago and Barbados. Food standards, or Codes of Practice, can contribute towards better nutrition if based on adequate knowledge of the food habits and consumption of the population. A food standard can then be drafted with the advice of nutritionists to assure that quality and the desired nutritional goals are attained. Continuing liaison between nutritionists and those enforcing or drafting food standards is essential. An organization with adequate facilities for the inspection and analysis of foods is a third requirement. The FAO/WHO Codex Alimentarius international standards are recommended as a guide for the drafting of any new food standards.

Dr. N. Byam dealt with the Health Aspects. In the implementation of food and nutrition policy, it has in the past often been impossible to reconcile the interests of the producer and needs of the consumer.

In the Caribbean, formulation of food and nutrition policy is a new endeavour. Through a National Nutrition Coordination Committee

it is possible to combine the viewpoints of Health, Education and Community Development with those of the Economists and Agriculturists in formulating food policy.

Although protein is the first limiting factor in the diet, attention must also be focussed on calories. Obesity and diabetes, both intimately related to calorie intake, are public health problems of growing importance in Trinidad.

While dried skim milk supplied through donations programmes has been of great assistance, this is not a product which promises to be appropriate to the area in the long term. Therefore, the Trinidad Nutrition Unit is testing the use of Fish Protein Concentrate in feeding programmes. This work was described.

Framing of food policy should include regulations governing permissible advertising of foods, drugs and those items which are claimed to be a combination of the two (e.g. "tonic" or "health" foods).

Mr. C. R. Ottley spoke about - Community Development Aspects.

The present approach to Community Development is that government and the people decide what they feel is needed for "better living" and both work jointly to achieve this. Community Development attempts: (a) to stimulate social change, (b) to stimulate the community to accept responsibility for its own well-being, and (c) to encourage the community to develop initiative.

When the people have started the process of development toward better living, nutrition workers will find fertile ground for the seeds of improvement in food habits. However, the battle to achieve improved

nutrition must be waged on two fronts - in the home through knowledge of habits and attitudes; and in the school through education.

Finally, Miss I. Foster dealt with Education Aspects. Nutrition education is not successful if knowledge alone is increased. Nutrition education in schools should be based on knowledge of the community and complemented by programmes directed towards the parents, which elicit their participation. The aim should be to build on, add to or modify established food habits. The objectives of a nutrition education plan should be part of an overall national development plan.

SESSION VII was followed by a one and a half hour "Any Questions" session. Delegates had contributed these questions during the course of the Conference, and the Chairman, Miss D. Hollingsworth, selected them from the box, and put them to speakers and members of the audience as she felt appropriate. Eight questions were answered, dealing with food production; digestibility of beans, women's voluntary organizations, agricultural marketing; the present status of Home Economics, the medical management of PCM; the justification for CFNI's existence; and PCM in history. In effect the session meant that there was an added opportunity for further discussion of points which delegates felt deserved further consideration, and the change from formal presentation of papers and discussion, to the informality of this session made for a most stimulating liveliness. Some questions which there was not time to deal with at this session, will be answered

in future issues of 'Cajanus'.

It was not thought appropriate that this Conference should pass formal resolutions and make formal recommendations. The final session therefore, consisted of the presentation of reports on the previous seven sessions by the rapporteurs. Dr. W. Aykroyd was Chairman. Each ten minute presentation was followed by ten minutes of discussion. As each paper during the Conference itself was followed by discussion, not reported here for reasons of space, this final session and the "Any Questions" Session which preceded it did give an opportunity to all delegates to put forward their views.

The session concluded at 5.00 p.m. on May 23rd, with votes of thanks.

LIST OF DELEGATES & CONSULTANTS

TRINIDAD

Professor P. Mahadevan, Dean,
Faculty of Agriculture, U.W.I., St. Augustine.

Dr. G. Sammy, Food Technologist,
U.W.I,, St. Augustine.

Mr. Kenneth Leslie,
Department of Agricultural Economics, Faculty of Agriculture,
U.W.I., St. Augustine.

Dr. William Radley, Research Agronomist
Faculty of Agriculture, U.W.I., St. Augustine.

Mrs. Joyce Inniss, Domestic Bursar,
U.W.I., St. Augustine.

Mrs. S. Searle,
U.W.I., St. Augustine.

Dr. Lawrence Wilson,
Faculty of Agriculture, U.W.I., St. Augustine.

Mr. Acton Camejo,
Faculty of Social Sciences, U.W.I., St. Augustine.

Mr. Malcolm Cross,
Faculty of Social Sciences, U.W.I., St. Augustine.

Dr. J. MacDonald,
Faculty of Social Sciences, U.W.I., St. Augustine.

Mrs. L. MacDonald,
Faculty of Social Sciences, U.W.I., St. Augustine.

Dr. R. Romain, Permanent Secretary,
Ministry of Agriculture, Port of Spain.

Mr. Gordon Laurence, AO1 (St. George District Office),
Ministry of Agriculture, Port of Spain.

Mr. Clifton Dindial, AO3 (North),
Ministry of Agriculture, Port of Spain.

Mr. E.J. Hamilton,
Ministry of Agriculture, Port of Spain.

Mr. V.O. Ferrer, Senior Agricultural Economist,
Ministry of Agriculture, Port of Spain.

Dr. I. Kelton, Food & Agricultural Organisation of the U.N.
Port of Spain.

Miss I. Foster, Food & Agricultural Organisation of the U.N.
Port of Spain.

Dr. A. de Alth, World Food Programme Project Officer,
19 Keate Street, Port of Spain.

Dr. N. Byam, Director, Nutrition Unit,
Ministry of Health, Port of Spain.

Mrs. Cynthia Mahabir, Nutrition Unit,
Caribbean Medical Centre, Port of Spain.

Miss Julia Rose, Nutrition Unit,
Caribbean Medical Centre, Port of Spain.

Miss L. Horne, Senior Dietician,
Ministry of Health, Port of Spain.

Dr. Joyce Yee, Family Planning Association, Port of Spain.

Dr. R. McDowell, Paediatric Department,
General Hospital, Port of Spain.

Dr. R. Ramkissoon, Paediatric Department,
General Hospital, Port of Spain.

Mrs. Mary O'Keefe, Chief Public Health Nurse,
Ministry of Health, Port of Spain.

Dr. M.G. Lines, Food & Drug Department,
Ministry of Health, Port of Spain.

Dr. M.P. Singh, Project Director,
Ministry of Agriculture & Fisheries, Port of Spain.

Mr. G. Phillips, Assistant Secretary,
Ministry of Agriculture & Fisheries, Port of Spain.

Dr. O. Gonzales, Chief Technical Officer,
Ministry of Agriculture, Port of Spain.

Mr. O.L.G. Alves, Acting Senior Economist,
Ministry of Finance, Port of Spain.

Miss E. Warner, Ministry of Education, Port of Spain.

Mr. E. Timothy, Vice Principal,
Eastern Caribbean Farm Institute, Centeno.

Mr. T. Balykrishnan, c/o U.N. Office, Port of Spain.

Dr. C.R. Ottley, Director,
Community Development, Port of Spain.

Mr. Hubert Wood, Chief Fisheries Officer,
U.N., Port of Spain.

Mr. K.D. Gayudeen, Director,
Eastern Caribbean Farm Institute, Centeno.

Dr. S. Khanna (Miss)
c/o PAHO/WHO Representative, Port of Spain.

Dr. Lynn Brinkman, Nutrition Unit, Port of Spain.

Mrs. Cleopatra Romilly, President Women's Group,
Port of Spain.

Miss M. Sealey, Supt. Home Economics,
Ministry of Education, Port of Spain.

Mr. Albert Skair, Secretary,
Public Health Inspectors' Association, Port of Spain.

Mr. R. Barrow,
Ministry of Community Development, Port of Spain.

Dr. T. Mohammed, Paediatrician,
San Fernando Hospital, San Fernando.

TOBAGO

Dr. Cecil J. Cox, Regional Director
Health Centre, Scarborough,
Tobago.

ENGLAND

Miss D. Hollingsworth, Head, Nutrition Section,
Ministry of Agriculture, Fisheries & Food, Great Westminster House, London.

Dr. W. Aykroyd, Queen Anne House, Charlbury,
Oxford.

PASB - Washington D.C.

Dr. B. Bosley, Nutrition Advisor.

Dr. S. Plaza, Maternal & Child Health Advisor.

FAO - Rome

Dr. K.K.P.N. Rao, Chief Food Consumption & Planning,
Food & Agricultural Organisation of the U.N., Via delle Termi di Caracalla.

ZONE I - Caracas

Dr. Reinaldo Grueso, Nutrition Advisor.

JAMAICA

Dr. Irving Johnson, Chief Economist,
Ministry of Agriculture & Lands, Hope, Kingston 6.

Miss Helen Fox, Scientific Research Council, Hope, Kingston 6.

Dr. M. Ashcroft, Epidemiological Research Unit,
U.W.I., Kingston 7.

Dr. A. Ashworth, Tropical Metabolism Research Unit,
U.W.I., Kingston 7.

Dr. Vernon Reyes, Research Agronomist,
U.W.I., Kingston 7.

BARBADOS

Mr. Seymour Barnes, Public Health Educator,
c/o PAHO/WHO Representative, Bridgetown.

Dr. L. Harney, Assistant Senior Medical Officer, Bridgetown.

Dr. F.C. Ramsey, Specialist Paediatrician,
Queen Elizabeth Hospital, Bridgetown.

Miss M. Bourne, c/o Ministry of Education, Bridgetown.

GUYANA

Dr. Adnan Shuman, FAO Advisor on Agricultural Planning, Georgetown.

Mrs. Veronica Bright, Coordinator, Applied Nutrition Program,
Ministry of Health, Georgetown.

Miss Mildred Johnson, Home Economics Education Officer,
Ministry of Education, Georgetown.

Miss Nora Gibbs, c/o PAHO/WHO Representative, Georgetown.

GRENADA

Mrs. G. Clyne, Chief Nursing Officer,
Ministry of Social Services, Culture & Community Development,
St. Georges.

HAITI

Dr. W. Fougere, Director, Bureau of Nutrition,
P.O. Box 707, Port au Prince.

ST% KITTS

Miss A. Turner, Nutrition Officer, Basseterre Health Centre.

DOMINICA

Miss D. Low (PASB), c/o Nutrition Section,
Ministry of Health, Roseau.

Sister Maria Houthoofdt, c/o Infant Jesus Centre, Roseau.

Mr. Allan Guye, Director of Agricultural Extension,
Ministry of Trade & Production, Roseau.

ST% VINCENT

Dr. K. Antrobus, Paediatric Specialist, Save the Children Fund, Kingstown.

Miss Monica Green, c/o Save the Children Fund, Kingstown.

Mr. H. McConnie, Director of Agriculture, Kingstown.

GENERAL NUTRITION NEWS AND OPINION

MOTHERS IN THE CHILDREN'S WARD

by

John Biddulph

Paediatrician, Port Moresby

Reproduced from 'Maternal and Child Care' Vol. IV, No. 37, May 1968

(This subject was a topic of discussion at the recent CFNI seminar in Trinidad, and we present this little article as a continuation of that debate).

In Papua - New Guinea it is exceptional to find a sick child in hospital without his mother or other relative to look after him. Medical workers who have been trained in technologically advanced countries find much to learn from the traditional child-rearing practices to which the Papuan child is subjected.

The health worker, provided he has no false sense of cultural superiority, realises that many of these traditional child-rearing practices are "incomparably more biologically based than those of Western society". There has been no need in Papuan society for a Platt Committee Report on the Visiting of Children in Hospital.

Another superior traditional child-rearing practice is universal breast feeding. As babies are almost all breast fed it follows that the mother must remain in hospital with her baby to continue breast feeding.

One of the worst medical crimes in a developing country is to separate the breast fed infant from his mother. So dangerous do we consider the use of a bottle in the feeding of infants in a village environment, that we prohibit the use of feeding bottles in the Children's Ward at Port Moresby.

In the uncommon situation of a baby not being breast fed, we teach the mother or other relative how to make up the milk in a cup, how to feed the baby with a cup and spoon, and how to keep her hands and the cup and spoon clean.

The Papuan baby is breast fed on demand. At night he sleeps snuggled up to his mother's body with his mouth in close proximity to his mother's breast. He suckles as he wishes while the mother sleeps.

When overseas nursing sisters staffed the ward there used to be an evening ritual of separating the baby from his mother and placing the baby in a cot. When Sister had turned her back the babies returned to their mothers' side, though occasionally a small mother would fit herself into the cot with her baby. Since Papuan nursing sisters have taken over the ward this nightly battle has ceased.

Mothers in the ward have other values besides continuing to breast feed their babies and providing much-needed psychological support by their continuing presence. Mothers are the safest and most natural means of keeping the baby warm. As the baby sleeps in close proximity to the mother's body he is kept warm during the night when the temperature may drop.

The mother provides a free 24-hour nursing service for the child. Besides feeding and cleaning her child, and keeping him contented, she can notify the staff of a change in his condition. She can also be taught to watch a drip.

In addition, while her child is sick, the mother is highly motivated to health education. Besides individual health education as appropriate, mothers and other relatives are gathered together at a set time twice a week for health education demonstrations. These are run by the Resident and Charge-Sister, both of whom are Papuan, and have proved both successful and popular.

Mothers, without doubt, are untidy in the ward. They often fight among themselves. They may interfere with treatment, pulling out oxygen catheters, intragastric tubes or intravenous drips. These latter catastrophes usually occur when the staff have failed to take sufficient time to explain the treatment being given to the child. Also the mother may remove the child from hospital earlier than the doctor considers wise.

These disadvantages are far outweighed by the tremendous benefits conferred by mothers remaining with their sick children in hospital.*

It is hoped sincerely that Papuans will continue to hold fast to those traditional child-rearing practices which are biologically superior to those currently practised in Western society.

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*Jelliffe, D. B. (1966). In: 'Medical Care in Developing Countries', ed. Maurice King, OUP, London.

SOME CAJANOQUOTES ON ADVERTISING

1. Contemplative

From 'Nutrition for Today for Tomorrow', Agricultural Extension Service, University of California, April 1968.

LET'S BRING BACK THE REAL CONSUMER

A consulting firm, specializing in marketing and consumer research, has been holding Consumer Dialogues in many cities. In San Francisco, the panel of homemakers was moderated by Mr. William Nigut, president of this firm. With permission, here are the highlights of an article he wrote in a recent magazine with the above title.

During the past decade, advertising, marketing and consumer media executives have tried to mold the American homemaker in their image -- what they would like her to be. There are two distinctive types of homemakers Mr. Nigut believes.... the real, live, honest-to-goodness homemaker and the advertising, marketing and consumer media executives' mythical homemaker.

The illusory homemaker, so beloved by the executives, is young, lovely, intellectual, sophisticated, versatile, affluent, and happily married. She cannot be seen in stores shopping for food.

She lives only in ads and editorial copy which proclaim that "today's modern homemaker" is "surprisingly young"... "alive, beautiful, intelligent, reaching, interesting"... "wise, hip, skeptical -- a new

breed of sophisticate"... "a woman in motion"... "the Goddess of the market place," yet she is also "a sportswoman who enjoys outdoor life and homelife with equal enthusiasm" and "who combines the versatility of a decathlon champ with the wise intuition of a university scholar."

Now, what are the real homemakers like?

First, not all homemakers are married. There are some eleven million widowed or divorced American women. Their number helps to account for the fact that, today, a woman is the head of one in every five U.S. households.

Next, homemakers are not "surprisingly young". They are, in fact, surprisingly mature. Only about three out of ten are less than 35 years old and, contrary to the impression created by product advertising, there are about twice as many homemakers over 44 as there are under 35.

The 27 1/2 million homemakers who belong to the Alka Seltzer (not mini-skirt) generation are ignored by advertising and marketing executives because the U.S. supposedly has become a nation of the young with half or more of us less than 25 years old.

Is she affluent? Sure she is, providing that living on $5,000 in these inflationary times is considered affluent. One out of three white urban homemakers and two out of three non-white urban homemakers are the managers of households with annual incomes of less than $5,000... or less than $2,100 in terms of the 1939 dollar. Six out of ten households have annual incomes of less than $7,000... or less than $3,000 in terms of the 1939 dollar.

According to the U.S. Labor Department's newest figures, there are 33 million working women (age 16 or older) in the U.S.

2. Savage

From Personal View, by P. Trevor-Roper, in British Medical Journal, 20 April 1968

There, at every morning's post, are the reminders of those rapacious drug firms, whose intrusive advertisers seem to flaunt their . . amorality over the breakfast-table. It is not so much that the drug firms are profiting at the community's expense, for they are hardly alone in that, nor indeed the plain nuisance-value of receiving these shoals of lotters or of having our reading interrupted by interleaved irrelevances; but it is the depreciation of the value of truth that I feel is so socially damaging. For our public is being conditioned by these prolific advertisers to accept that written statements more often than not have no relationship to fact, and we are being driven back into the world of myth and witchcraft, out of which any beastliness may accrue.

The fact that advertising agents are generally such agreeable people -- usually creative writers manqués -- who must market these untruths to pay for their unmarketable poetry, only makes the problem sadder.

* * * *

NEW U.S. PROGRAM AIMS AT IMPROVING FISHING CATCHES

From U.S. Information Service, 10 May 1968

More food from the sea may be the result of a novel space age program of cooperation between a U.S. Department of Interior research vessel and weather satellites in orbit.

The program is to begin off the coast of West Africa late this year. If successful, it could lead to similar projects efficiently supplying commercial fishermen with invaluable predictions on favoring fishing conditions and larger catches, according to Interior Secretary Udall.

The Bureau of Commercial Fisheries ship "Undaunted" has been chosen as the first marine research vessel to work with Nimbus satellites in a feasibility study on monitoring oceanic fronts from space. The vessel operates out of Miami, where it is attached to the Bureau's Tropical Atlantic Biological Laboratory.

Oceanic fronts, present in specific areas of the world, form boundaries between water masses and appear to act as concentrating mechanisms for surface-schooling fish like the tuna.

The study is part of a program funded by the National Aeronautics and Space Administration (NASA) and administered by the U.S. Navy oceanographic office to determine what useful oceanographic data can be collected by space-craft.

Under the experimental arrangement, the "Undaunted" will use standard equipment to gather fishery, oceanographic and meteorological data. The regular equipment will be augmented by a new automatic picture

transmission receiver abroad the ship.

The Receiver will get meteorological photos of the study area each day by direct broadcast from NASA Nimbus satellites orbiting the earth at about 1,120 kilometers. Daylight pictures will be received via a visible wavelength; night transmissions in infra-red wavelength.

The daily routine of oceanographic vessels consists primarily of occupying scientific "stations." Each station entails stopping the ship to collect samples of marine life and sea water for analysis either abroad or at the home laboratory. Hundreds of such stations, some requiring up to four or five hours inspection, would be necessary to cover an area as large as that shown in a single photograph taken from a satellite.

Bureau of Commercial Fisheries scientists hope that the broader coverage offered by spacecraft picture transmission, combined with routine oceanographic observations, will prove a more effective and more rapid method of surveying the ocean.

THE ROLE OF FOOD STANDARDS IN NATIONAL NUTRITION POLICY*

by

Michael G. Lines, B.Sc., Ph.D., F.R.I.C.
Assistant Director of Food and Drugs
Ministry of Health
Trinidad & Tobago

Laws to regulate the quality of foods are enforced in many countries.

Whilst they originated in the nineteenth century from the concern of the medical profession and public at the adulteration then practised, and were intended to suppress adulteration and fraud (e.g. sand in sugar, lead chromate in curry powder, lime and water in milk), the growth of food chemistry, food technology, and nutritional knowledge has changed the emphasis of food standards legislation in ways which may best be illustrated by examples of different types.

Type 1. Descriptive of source and processing: e.g. milk from cows may be the raw material for processing into butter, ghee, or cheese.

Usually such standards prescribe compositional and physical properties which are critical for detecting adulteration, and most of the older standards are of this type. Thus dairy product standards will specify fat, moisture and protein contents, and the physical properties of the fat.

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*A paper delivered at the CFNI Conference on Recent Trends in Food and Nutrition in the Caribbean, held at St. Augustine, Trinidad, May 20 - 23, 1963.

Type 2. Negative or restrictive:- these prohibit the use in foods of ingredients known to give either immediate or chronic poisoning, or restrict the amount of such toxic substances.

Thus we have standards prohibiting the use of coumarin as a flavouring agent, and restricting the amount of arsenic, copper, lead, and zinc in foods. In the case of pesticide residues, the advanced countries who have set restrictive tolerances for these residues use a level corresponding to about one-thousandth of the level at which chronic toxic effects are detectable in animals. If we regard poisoning as the opposite of good nutrition, we see that such standards are some contribution to positive health.

These two foregoing types are the older sort of food standard.

Type 3. Positive or permissive: in which the use of safe good additives is permitted under certain conditions to preserve food or make it more attractive in colour, texture, or flavour, or in which the addition of nutritionally valuable constituents is insisted on.

Thus we have permitted lists of food additives (colours, preservativos, emulsifiers, etc.) and for certain foods the addition of vitamins or minerals is allowed or demanded, e.g. in condensed milk, flour. This type of regulation is one which can profitably be employed to improve national nutrition, provided that adequate background information as to deficiencies and eating habits can be obtained.

Type 4. Regulating Information:- This may cover advertising as well as the labelling of foods to give the consumer adequate information as to what he is buying.

In some countries, where nutritional information is widely publicised in magazines, newspapers, and other media, and where the public is conscious of such terms as 'low-calorie', 'high-protein', and 'unsaturated fats', the claims that may be made for foods are appropriately regulated to correspond to the levels of the constituents for which claims are made. Thus in Canada, the daily intake of a food and its vitamin content determines whether the advertiser may describe it as "an excellent dietary source" or "a good dietary source", and the diseases to which reference may be made in promoting any of these foods are strictly limited. There is also a limit below which the presence of a vitamin may not be claimed, and a maximum limit for vitamin contents in reasonable daily intake. Similar provision is made for minerals, cholesterol, calories, and essential aminoacids.

In view of the fad for 'health foods' which is growing in this country, we might do well to follow the Canadians to some extent along these lines.

Type 5. Codes of Practice:- In some countries, provisions covering the processing of food may be contained in a legal standard. As laws change more slowly than technology, this may have the effect of preventing progress, or may leave loopholes whereby a food produced by a different process is left unregulated. To avoid this, some countries, notably the United Kingdom, have the device of "Codes of Practice" which

includes all the desirable features of processing, raw materials, hygiene and sanitary practices, etc., in a document which is not part of the law, but which is recognised by the courts as authoritative advice which should be followed to obtain a product of acceptable quality. Omission of any step in a Code of Practice would mean that the product is not of acceptable quality. There is provision for this type of code in the Trinidad and Tobago Regulations, with respect to conditions for producing pasteurised milk. Any aspect of processing which could preserve or enhance the nutritional value of a food could be included in a Code formulated by manufacturers and the authorities, and such Codes can be changed quickly to take notice of improvements in technology.

Now, how can these food standards or codes of practice contribute towards better nutrition?

Firstly, we need to know what the favourite foods of the population are, how they are prepared, and whether the nutritionally-deprived groups have any likings or prejudices different from the rest of the population. We also need to know what are the deficiencies in each group that need to be corrected. This is the work of nutrition surveys. A food standard may then be drafted with the advice of the nutritionists requiring the addition or fortification of a missing constituent in one or more of the foods used by the group or the population as a whole. A permissive standard may not be enough. Similarly, if the population is fond of a food with a high content of a harmful substance, the maximum level for the substance in this favourite food might be specified so as to reduce the risk. If a protein food is to

be made by several manufacturers to remedy a protein deficiency, specifications for its production can be put into a standard, or a code of practice, to ensure that quality and the desired nutritional effect are achieved.

Secondly, the nutritionists should be in touch with those enforcing or drafting food standards. In Trinidad and Tobago, the Food Advisory Committee advises the Minister of Health on all matters affecting the quality of all foods for man, and included on this Committee is a representative from the Nutrition Laboratory which is carrying out nutritional surveys and research for the Ministry of Health. So that we in the Food and Drugs Division benefit from his advice and guidance on nutritional points. On the recommendation of the Nutrition Council, draft regulations for the vitamin and mineral contents of flour to be used in bread and confectionery have been prepared, whilst the nutritional aspects of the composition of cooking oils and margarine have also been taken into account recently.

Thirdly, there should be an organisation with facilities for analysis, and inspection of foods. Our laboratory has been doing this for the past eighty years, and under the Food and Drugs Ordinance 1960 powers of seizure, confiscation, and heavy penalties have been provided, which are powerfully effective in persuading manufacturers and importers, retailers and wholesalers, to improve their ways.

So far as I know, in the Commonwealth Caribbean, food standards are in force in Jamaica, Guyana, and possibly Barbados, as well as in this country. While they may have been adopted to prevent adulteration or maintain quality of exported goods, the use that can be made of them

for the purpose of improving nutrition should not be overlooked. If any new standards are drafted, I would advise that the international standards being drafted by the FAO/WHO Codex Alimentarius Commission be taken as a guide. These contain almost everything that can affect the quality of a food from any aspect, and, being not only the work of experts, but intended for international use, are of importance in other fields besides nutrition. However, the emphasis on nutritional quality, safety, and hygiene is very heavy, and anyone drafting new standards for the first time will find these Codex Alimentarius standards a valuable source of information.

I hope I have left with you the impression that we are concerned with more than simple adulteration in food standards work, and hope that cooperation with nutritionists will help us to be more effective in protecting the public against the sale of foods of low quality, in all senses of the word, and against the sale of preparations for which much is claimed, but which perform little that ordinary good, well chosen food could not.

NUTRITION NEWS AND OPINION FROM THE CARIBBEAN

INTRODUCTION OF NUTRITION EDUCATION AT ERDISTON TEACHER TRAINING COLLEGE, BARBADOS

By courtesy of Permanent Secretary, Ministry of Education, Barbados

In January 1968 a meeting was held attended by the Principal of Erdiston College, the Education Officer, the Inspector of Nutrition and an FAO expert and associate expert. This meeting recommended that a course in nutrition education should be required of all students, be a subject of examination, and extend through the two years. They drew up a preliminary outline of the course which comprises about 50 hours total spread over five terms. The objectives of the course are to teach the students about the relationship of nutrition to health in individuals, especially children; about the value of local foods; nutrition problems of Barbados; the world food problem, the need for the participation of teachers in nutrition education, and modern methods and techniques of teaching about nutrition. One notes that after teaching on the scientific basis of nutrition knowledge the second part of the course deals with some very real and practical problems which affect Barbados along with most other Caribbean countries.

Courses are now progressing satisfactorily, conducted by ministry staff and with assistance from the FAO associate expert. The organizers are to be congratulated on a course which combines scientific teaching with a refreshingly practical and topical response to current needs and problems.

* * * *

ANOTHER SUCCESS FOR JAMAICA HYBRID CORN

U.S. Information Service 9 May 1968

Corn more than ten feet tall is being harvested on a 625-acre plot in the Dominican Republic province of Puerta Plata, to demonstrate the benefits of proper seed, mechanized farming and cultivation. Hopes have been high that the yield would be at least double the national average of about 30 bushels per acre. The tall corn plants were in marked contrast to the spindly corn on adjacent small holdings where farmers have clung to the traditional ways of raising a crop.

Editor's Note: Readers may remember a news item from the Guyana Graphic in Cajanus No. 3, page 9, in which a pilot plot in Guyana also produced twice the average yield per acre using this hybrid corn. Mr. Jordan, the Minister of Agriculture, was enthusiastic about the prospects of import-saving. This hybrid corn was developed on their plots in Jamaica by Dr. S. M. Sehgal and associates, of the Pioneer Hi-Bred Corn Co. of Iowa, U.S.A. It has a possible future commercially in a maize/soya rotation (see page 15 of this issue). Of course, such a combination of vegetable proteins with their complementing amino-acids is highly desirable from the nutritionist's angle, but even without the alternating soya crop the protein value of corn is higher than that of any of the main crops of the Caribbean.

STREET VENDORS AND NUTRITIOUS FOODS

A reader's letter from the 'Dominica Chronicle' 20 January 1968

Sir,

I have just come across a lengthy description of the old mawby seller of Barbados and wonder why we cannot have something similar here.

I recall too, your columnist VIVAX throwing out the suggestion that some enterprising street vendor copy a St. Lucia idea of a stock of hard-boiled eggs to supply stevedores and other workers on the job with something much more nutritious than the coke presently the only thing obtainable.

I wonder why it is not possible for some person to make a start of crushing a dozen or so fresh oranges and offering the juice from an iced container even to householders early in the morning in time for breakfast. I know many such cannot be bothered with the messy job and settle for a tin of juice even if this is imported and a lot less tasty. And I am sure a square of frozen juice would be much more beneficial to the young school children than the coloured and sweetened water they presently buy.

Isn't there some way in which health authorities and sanitary inspectors could cooperate to put this idea across.

Entrerenew, Roseau, Jan. 13, 1968.

P.S. from Editor, Cajanus. Those who sell food (or rather cokes and sweets) to children during the school lunch hour should also be encouraged to offer something much more nutritious than is usual at present - e.g. flavoured iced milk shakes made with dried skim milk; rolls or rotis containing a good mixture of animal and vegetable protein.

GOVERNMENT ATTACK ON DISEASE - 10 YEAR HEALTH PLAN LAID BEFORE PARLIAMENT

From the 'Trinidad Guardian' 20 April 1968

A two-prong attack on several diseases, which could soon become major threats, is to be launched by Government, according to the 1967-1976 First National Health Plan presented in the House of Representatives yesterday.

The plan calls for a large-scale immunisation programme to tackle "the threat of an increased susceptibility of the population to certain preventable diseases, which today are not considered among the major problems of the Health Service."

The diseases, which unless tackled now will, with the rapid increase in population, break out and then demand "extraordinary and urgent measures", are: Diphtheria, Tetanus, Smallpox, Whooping Cough, Acute Poliomyelitis and Tuberculosis.

To avoid any outbreaks in these diseases, Government plans large-scale immunisation in two phases: an attack phase "to obtain the desired level of protection in the community" and a maintenance type of programme.

The immunisation programme, will involve vaccinations and chest X-rays, making full use of the Mobile Health Units.

Other aims of the plan are a new division of epidemiology to control diseases or health hazards in the population: a medicare programme that would stress continuity in activities related to the care of the sick and protection of well individuals and a Division of Environ-

mental Health as part of the Ministry of Health.

The plan also outlines proposals for the re-conditioning of existing hospitals and health centres and new construction of buildings or plants.

SELF-HELP PROJECTS - PHILOSOPHY AND ACHIEVEMENTS

by

Miss Sybil Patterson, Assistant Chief Community Development Officer, Guyana.

In developing countries planners are nearly always confronted with the difficulty of not only setting out priorities, but being unable also to find enough capital for development. Because of this, Government and people have had to resort to different methods whereby national goals once set could be achieved and the living standards of its people improved.

Centralised planning is the fashion in developing countries, but this method of planning is usually accompanied by the problems of resentment, problems which accompany any new project or innovation in fact any change - any development. If however, the people for whom the change is planned are involved in the exercise of planning and action, experience has shown that resistance is less severe.

Development therefore, would succeed only in so far as the cultural level of the people, their acquired skills, and the extent of their participation in the process will allow.

Increasing emphasis on participation and partnership make the community directly aware of its responsibilities, make a people less apathetic and bring about also a change in attitudes.

How then can one plan for an integrated approach which would make full use of two main factors of development - capital and labour. Even

when capital can be raised it can still remain a scarce and limiting factor. In a developing country where the human factor is not fully employed, persons who are under-employed and unemployed could be mobilised to aid development.

What method could a government employ in order to procure development, satisfy the needs of a community, make as full use as possible of the human resources,and at the same time achieve its national objectives? One method is by means of Self-help.

SELF-HELP: What is it?

The process involves the voluntary labour of members of a community given over a period to the service of all members of the community, on programmes which the community decide are necessary for the improvement of their standards of living, thereby making their community a better place in which to live and a better place in which to make a living.

SELF-HELP PROJECTS:

Self-help in Guyana forms part of the Community Development process.

The self-help process has three main components:

1. Research
2. Action
3. Education.

and on these three basic principles a project is conceived.

RESEARCH & ACTION:

Communities discuss and decide on priorities and apply for financial support from government for their project after they have worked out a plan for action.

The action plan must define clearly the length of time the project would take to be completed by the members of the community.

They must assess the extent of their resources in terms of skill, finance etc.. Further, they must work out a plan for action which would indicate the volume of work to be done either by paid or voluntary labour or by both.

These steps having been worked out they must now establish an organisation to see the project through. When the project is approved the materials and technical advice are supplied from public funds.

Although the components at 1 and 2 involve a great measure of discussion, and indeed "education", this third principle is much more involved. It is through the education the individual receives, as part of the group process in self-help that the philosophy in self-help becomes meaningful. This philosophy will ie developed further in the later paragraphs.

ACHIEVEMENTS:

What types of facilities have been provided by self-help effort over the last three years in Guyana?

The Self-help School Building Programme has made available 21,724 new school places, with 1,000 places for the teaching of Home Economics and Handicraft.

For improved communication 18 air fields and landing strips have been constructed, 30 miles of roadway re-conditioned, and 18 bridges built.

In the field of Health and Sanitation - 8 health centres have been constructed and 17 communities have received potable water supply.

In agricultural development 532 farms have been rehabilitated, and 155 garden plots established and one factory built for processing of cassava.

Recreational facilities have been improved and training given to many self-helpers as they work as carpenters, masons, and plumbers, under the guidance of skilled technicians.

The above represent some of the completed projects built through self-help efforts throughout the length and breadth of Guyana, and these projects reflect the needs of the people in the area where these programmes have been carried on.

Voluntary labour through self-help therefore not only provides the means whereby facilities the people deserve are built, but the cost to government is usually halved, and the savings to government made available for other purposes. As for example the number of new school places needed by 1972 was estimated at 30,000; to date 21,724 have been built. By contract government pays approximately $125.00 per child place and by aided self-help, i.e. government provide the materials and technical supervision, and the community provide the labour - the cost per child place (10 sq.ft.) is approximately $60.00. It can be seen therefore, that through local initiative, organisation, and widespread

involvement in self-help action, a self-help project capitalises on the local resources in manpower, materials, land and money etc.. While it promotes physical improvements, social and economic development is also achieved. The process places the main emphasis on human development - the only sure way to provide for the long-range durability of economic development and physical improvements.

PHILOSOPHY:

Why should there be so much activity in school building?

Let us look at the education system, where in 1876 it was enacted that compulsory Primary education must be provided for every child in Guyana between the ages of 5 - 14.

By this Education Act, it becomes the responsibility of the State to provide school places for the growing child population. Time was, when a question was put to a community as to the dilapidated state of the school building, the reply was "Why should we provide self-help? The Government should build the school."

This dependence on Government for the provision of services slowed up the process of improvement in a developing community, since at no time was capital enough to meet all the demands for goods and services, and as the backlog grew larger it created a serious social crisis, i.e., there was great overcrowding in schools and the double shift system was introduced in many areas.

It required then a change in the method of planning and poople were told that in order to solve the situation the provision of facilities for education in the various communities must be their concern,

as well as that of government. The response to this was the construction of 43 schools with accommodation for 21,724 children over a period of three years.

What has been learnt from this achievement and what is the attitude of Guyanese today, towards the satisfaction of 'His' needs?

Today the people in the country - those who govern and those who are governed now look at development as a responsibility which is "Ours" not "Theirs". It is this attitude of partnership and joint responsibility which self-help has evoked in the hearts of the individual, making true the statement "We are our brother's keeper."

Through the process by group action individuals have learnt to understand each other better, and relationships with communities and indeed in the country is undoubtedly better. Through the process also communities have discovered their potential, individuals have acquired new skills on the job as they volunteer their labour, and conscious efforts have been put into the training of youths on the job, in areas of carpentry, plumbing and masonry.

The facilities now provided are those provided by the people, and one can see the pride with which communities care for and maintain their facilities which they have helped to create.

CONCLUSION:

The formula of self-help for improving living conditions of the people of Guyana has made a substantial contribution to the community and services of the country. It seeks daily to better the lot of the individual and to give the community a finer economic and social equilibrium.

The process of self-help has enabled communities to carry out within their own system of values and within the context of National Development Plans, deliberate efforts to provide new forms of living and to be integrated into the life of the nation.

The achievements have not only been physical, but rather a way of life. - This form of community effort has reached a point of service and partnership which in the long-run makes change acceptable.

READERS' LETTERS

From Mrs. P. Macpherson, Upalong, Jack's Hill, Kingston 6, Jamaica.

Dear Sir,

I wish to make two observations arising from articles in Cajanus 2.

1. Both in W.G. Stewart's paper (P25 - 26) and in the article, "The Hidden Cost of Protein" (Table P.62 & P.65), the importance of salt cod fish as a relatively inexpensive source of protein is indicated. This I do not dispute. However, my observations of the eating habits of poorer Jamaicans lead me to question that the protein intake from salt cod fish per person per day (one cooked meal being usual) is significant. The very fact of the pungency of salt cod fish makes a small quantity an adequate "salt'ing" flavouring for a meal. Two ounces of this fish, "roasted" for a few seconds in an open fire, or "picked up" with pepper and customarily "dressed" with coconut oil, will feed a large family - in addition, of course, to the starches which are available to the particular household. I submit that salt cod fish is used by the poor principally as a flavouring agent. This is not equally true of another popular (but considerably more expensive) dish, curried goat, where the meat is used to provide some of the bulk of the meal. But dishes such as these are luxuries in the group to which I refer. My suggestion, therefore, is that in the very households where protein lack is most serious, although salt cod fish is likely to be the favoured protein, the quantity actually consumed will be extremely small.

2. It seems obvious that much could and should be done to promote the use of dried milk. The cheapest form available to the general public (as far as I know) is packaged in plastic bags which are sold in shops and supermarkets without a label and with no instructions for reconstitution. Perhaps CFNI or some other nutrition-concerned body could prevail on the distributors or retailers to enclose in each packet simple instructions for dilution. Without this information, gastric upsets - particularly in infants - might result, and condifence in the use of fried milk might thus be undermined.

Yours truly,

Pam Macpherson.

30th May 1968.

(It is quite true that relatively small quantities of saltfish are used in meals, and we thank Mrs. Macpherson for mentioning this. It should be borne in mind when comparing saltfish with other foods on a protein-value basis. On the other hand, dried saltfish contains approximately 130 grams of protein per lb. and goat carcass 65 grams of protein per lb. Thus, protein-wise 2 ounces of saltfish is equivalent to 4 ounces of goat. This does mitigate a little the effect of using only small quantities of saltfish.

The whole question of the packaging, presentation and marketing of dried skim milk, (and even dried whole milk too) is one which is certainly deserving of some thought and action very soon. It is apparent from investigation by CFNI staff that at least in some islands dried skim milk, both commercially sold and donated by international agencies, accounts for a very sizeable proportion indeed of the protein intake of the people in general and the children especially. One very much hopes that the CFNI seminar, being held in Guyana - 29 July - 1 August, on Protein Foods for the Caribbean, will come up with some practical ideas for improving the distribution of this literally vital product and improving the way in which it is used - Editor, Cajanus.)

From Mrs. K. A. Richards, 7 Solomon Lane, Dominica

Dear Sir,

I have been privileged to read the first two numbers of your newsletter and I would like you to know how much I appreciated them. They were certainly very informative. The article entitled "The Hidden Cost of Protein" was especially revealing to me.

I said that I had been privileged to read the newsletters because, but for the fact that I work at the Ministry of Education and Health, I doubt if I would ever have heard of the newsletter unless I were a specialist in the field of nutrition. I am of the opinion that the newsletter deserves wider publicity and distribution. Perhaps a cheaper edition could be considered to achieve the desired coverage without increasing costs unduly.

Sincerely yours,

K. A. Richards.

7 May 1968.

(We do have a amiling list of about 800 at present, mainly in the Caribbean area. This is not bad going considering that the newsletter has been in existence only for 6 months or so. It is of course distributed gratis. Our distribution is a little patchy, however, according to whether the relevant ministries in each island responded or not to our request for the names and addresses of interested persons for our mailing list. Our circulation in Dominica, for example, is not very wide. We invite people who wish to be put on the mailing list to send us their names and addresses. Also anyone whose copy is incorrectly addressed is asked to tell us so that we can put it

right. Again if ever it happens that anyone does not get their copy regularly, let us know.

As for cost, we are putting it out at present for about 1sh 6d. (18¢ U.S., 36¢ E.C.) a copy. This is really quite inexpensive, though this does depend on herculean efforts by our office staff. We do not think it suitable to put a price on the newsletter and we prefer to continue distribution gratis, as the money gained by attempting commercial kind of circulation would be small, if any. Besides, this kind of "technical coordination", keeping our thousand or so readers in touch with each other and with recent developments and current opinion in nutrition-related fields, is one of the main functions of the Caribbean Food and Nutrition Institute and so is a legitimate charge on our budget as long as it fulfils that function.

Thank you for your suggestion about less elaborate forms of newsletters. We will bear this in mind. Meanwhile we hope our circulation in Dominica, and also in Bahamas, Bermuda and Cayman Islands, will increase. - Editor, Cajanus.)

COMING EVENTS

From August 26th to 29th the Western Hemisphere Nutrition Congress will take place in San Juan, Puerto Rico. It is organised by the American Medical Association in cooperation with other US, Latin-American and Canadian Nutrition Societies, and described by the organisers as "an inter-disciplinary congress to encourage the application of new research findings to the solution of nutrition problems in the hemisphere". Titles of sessions include Nutrition and Human Development, Food Production, Distribution and Economics, Recent Advances in Nutrition Research and Applied Nutrition Programmes in the Caribbean, Iron Deficiency Anaemia, Vitamin A Metabolism and Deficiency, and Applied Nutrition Programmes in the Americas. Further details may be obtained from Department of Foods and Nutrition, American Medical Association, 535 N. Dearborn Street, Chicago, Illinois, 60610, USA.

In Caracas, Venezuela, from 1st to 4th September the First Congress of the Latin American Nutrition Society (S.L.A.N.) will take place. Proceedings will be in Spanish in the main, but simultaneous translation will be provided. Among the session titles are: Socio-Economic Aspects of Food Production; Food Production and Demographic Problems; and Nutrition Education, all in reference to Latin America. Further information can be obtained from Dr. J.E. Dutra de Oliveira, President of S.L.A.N., Faculdate de Medicina USP, Riberao Prato, Sao Paulo, Brasil.

We would like to announce the forthcoming publication of a new quarterly, "Caribbean Farming". The first issue will be published in two or three months' time. Carol Rockord, an agricultural journalist in Jamaica, will be general editor, and Dr. G. Chapman of the UWI Faculty of Agriculture will be technical editor. The magazine will be well illustrated, and is intended for progressive commercial farmers, government workers in agriculture, extension workers, commercial representatives and research workers. UWI Faculty of Agriculture is closely associated with the magazine. The aims of the magazine are:

to give definite instruction and advice on agricultural practice;

to keep readers informed on research work in progress;

to provide a means of exchanging information and datisfying requests for information;

to publish other useful information - book reviews, abstracts of theses, notes on conferences, etc.

Intending subscribers may write to Carol Rockord, c/o R.J.R., 35 Lyndhurst Road, Kingston 5, Jamaica. 4 issues will cost about $3.50 E.C. or 16/-.

INTEGRATION OF PROGRAMMES FOR STIMULATING INCREASED PRODUCTION OF NUTRITIOUS FOODS*

by

V.O. Ferrer, Economist, Ministry of Agriculture,
Trinidad and Tobago.

Before I address myself to the subject of this paper there are two minor observations I would like to make if you would allow me. The first is that it is perhaps a matter for rejoicing that we here in the Caribbean live in an area where the emphasis can be placed on providing nutritious food and not simply on "total" food. Saying this makes me recall an international conference of Agricultural Economists which I attended some years ago where considerable heat was generated after an eminent economist from a highly developed country had put forward the thesis that in an underdeveloped country with scarce financial resources it was perhaps better to concentrate these scarce resources in the hands of the few best able to make use of them, for providing food of high quality and value. This thesis was vigorously assailed by an economist from South East Asia who argued that in places where a great majority of the population live in the daily shadows of starvation, the problem is one of growing more and more food to fill empty bellies, and that in a situation of that sort the nutritious qualities of the food are of secondary consideration only. Such a situation, I may say, was not entirely foreign to those of us who experienced the threat to our life lines by enemy submarines during the early forties.

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*A paper delivered at the CFNI Conference on Recent Trends in Food and Nutrition in the Caribbean, held at St. Augustine, Trinidad, May 20 - 23, 1968.

The second observation I would like to make is that this seminar is very timely since it should serve to emphasize for us here in Trinidad and Tobago the necessity to take fuller account of nutritional considerations now that we are on the verge of formulating our third five-year development plan and programme.

I think it is correct to say that in our past plans, we have been motivated mainly by economic considerations; for example, the need to conserve foreign exchange, correct balance of payments problems and provide increased job opportunities for a rapidly growing labour market.

Accordingly, our approach consisted, to a large extent, in making a critical examination of the list of our food imports, selecting areas from this list which were considered feasible for substitution, having regard to ecological, agronomic and economic factors, and which not only showed high unit cash values but also promised to exert a substantial impact on the huge food bill.

These were the areas selected for a general assault and, I think I am correct in saying that the fact that the areas selected were also those which gave products of fairly high nutritional value was, in the main, fortuitous.

However, and this brings me to the subject of my paper, I think you will agree that programmes for stimulating increased production of nutritious foods must, if they are to have any measure of success, satisfy three important criteria.

In the first place, the producer who forms the first link in the chain must be satisfied that the income he will derive from participating in the programme will be a satisfactory one. Philanthropic or national considerations are not likely to exert much influence for long if he finds that the game is not worth the candle, so to speak. This, of course, presupposes a society like ours where he is free to exercise his choice.

The second consideration relates to the question of consumer acceptance of these foods. Customs and food habits usually exhibit a high degree of resistance to change and very often make nonsense of well intentioned programmes. The high nutritional value of a food is no guarantee that it would find general acceptance in the diet. One knows quite well the story of the manufacturer of pet foods who spent a considerable sum on research and promotion of a food of high nutritional value for cats. He was dismayed to find that sales did not come up to expectation and arranged for a survey to be carried out. The survey showed that the cats would have nothing to do with this food, because they did not like it. Human behaviour is not too dissimilar.

The third important consideration is of course the unit price of these foods. Since programmes of this sort in under-developed and developing countries usually have as their objective the improvement of the level of nutrition of the masses whose expenditure on food forms the highest percentage of the family budget, it is easy to recognize the importance of having the unit price of the product bearing

some relationship to the limits of this budget if the product is to make any serious inroads in the consumption pattern of the persons to whom it is mainly directed.

What this means in practice is simply increased unit yields at proportionately lower input costs so that the producer obtains his income expectations more from the volume of the product from a given area than from the price. This, of course, presupposes a willingness to accept this concept and to adopt measures which will bring it to fruition. I may say here that experience in these parts shows that there is generally never a high degree of enthusiasm to accept this concept and that it is one of the hardest to get across, so to speak, to primary producers.

Whether it is that the programmes that are launched for increased production do not at the same time emphasize sufficiently the aspect of lower cost or whether it is that the movement forward from a subsistance type of farming to commercial production creates a state of mind to which this concept is anathema is not fully known. My guess is, that these two factors in combination provide only a partial explanation of the problem and that the real answer lies in the fact that producers generally may have a greater awareness of elasticities and inelasticities of demand than, perhaps, we credit them with. I personally know of farmers in a particular area of Trinidad from which the bulk of a certain root crop is obtained, farmers who for a long time deliberately refused to increase the production of the root crop because of a bitter experience from producing in a year

previously what turned out to be an unmanageable surplus of the crop.

This reluctance can of course, be corrected to a large extent, by Government offering as we have done here guaranteed prices for unlimited quantities of the commodity provided it is in a marketable condition or contract prices for certain specified quantities. This device shifts the problem of disposal from the producer to Government but does not solve it. We shall come back to this point later.

The unit price aspect we have been discussing refers, as you will observe, to the price per unit of weight or other physical measure of the product. It does not take into account the more sophisticated aspect of price per unit of protein or calories which the commodity contains. Indeed, this latter concept is relatively new to those geographical areas and has been given, I would say, little or no consideration up to now.

Dr. McKigney, in an article in the second issue of 'Cajanus', has made some calculations on those bases of the general run of foods which make up the average diet of the peoples in the Caribbean. These calculations are very revealing to us here in Trinidad for they show that the areas of substitution in the food bill which we have selected for special emphasis in our development programme are, on the whole, precisely those which are relatively high priced per unit of protein or calorie content.

From what has been said earlier, I think it is safe to conclude that programmes designed to stimulate increased production of nutritious foods need to be as broadly based as possible and must take account not

only of the supply aspect but of the factors which influence demand in any given context. Moreover to ensure any measure of success, there is need for an integrated commando type assault on all fronts, embracing many disciplines both intra sectorial and inter sectorial.

We here in Trinidad and Tobago have made several attempts in various eras to formulate programmes for increasing production of food. A brief description of these attempts may not be amiss here.

In the late 20's and early 30's the slogan was "1 or 2 acres and a cow". Following this concept we proceeded to settle people on land with little regard to the nature of the soil and its capabilities, with minimum provision of the necessary infrastructure, with credit facilities geared more to administrative convenience than to helping the producer at the appropriate time and with little or no organized marketing facilities. The end result was in the main tragic; most of them failed and the few that have survived are nothing more than museum pieces.

The second phase emerged in the late 30's and early 40's after the outbreak of the 2nd World War. Shortages of all kinds developed and there was urgent need to feed ourselves from our own resources or face the alternative of starvation. Cost was not important, land was cleared indiscriminately and the cry went out to "dig for victory". With high prices prevailing for foodstuffs and a marketing organization combing the country to collect any surpluses above home requirements, the response was immediate and, in many instances, spectacular. Articles of food which in normal times, were despised became staple diet. Producers incomes soared but consumers were fed. However, with

the cessation of hostilities and the return to peace-time conditions, these "war gardens", as they were called, began rapidly to disappear and soon passed into the realms of history. Needless to say that the balance sheet of this war effort, after the din of war had subsided, showed a legacy of heavy liabilities in the form of despoilation of land the effects of which are still being felt today. In this case, however, it may perhaps be argued that the end justified the means.

The third phase was conceived in the late 50's and began to crystallize in the early 60's. Profiting from past experiences, it was decided to abandon the previous approach of handing out parcels of land to farmers and expecting them to work miracles, more or less by their own devices. The new approach is epitomized in what is commonly referred to as the Crown Lands Development Programme. Briefly, this approach consists of the following:

(a) the judicious selection of land areas suitable for development;

(b) the determination of a norm of net income which is likely to persuade the future settlers to stay on the land and make full time farming an orderly way of life;

(c) the determination of enterprise or combination of enterprises, the product mix, as we know it, likely to provido that norm;

(d) the provision of the necessary infrastructural facilities;

(e) the provision of farm land and other capital assets in varying stages of development;

(f) the establishment of various institutional facilities to service these farms;

(g) a scale of repayment over a sufficiently long period;

(h) a more rational approach to the selection of candidates to participate in this development;

(i) evaluation of the enterprises on a continuing basis.

I need hardly say that this form of development is costly in absolute terms but, if the goals set are achieved, in the long run it may turn out to be cheaper than other forms of development that have been tried in the past.

Suffice it to say here that the programme was subjected to considerable scrutiny by the experts attached to the internatinnal lending agencies from whom the bulk of the loans for the scheme was obtained and they gave the green light to it presumably because they considered the method of approach reasonably sound.

This type of assault on the problem is new to us and we hope to learn as we go along. It is too early yet to determine accurately whether we have moved in the right way but the signs are already promising.

So much for the supply aspect. A word now about the demand aspect and its concomitant, the disposal of the supply. Here I think, we are falling somewhat short in that we are not massing sufficient resources to diagnose and find solutions to the problems that are inherent in demand and disposal.

Programmes to increase supply should be integrated with programmes to create, sustain or increase demand. This usually requires

a great deal of what may be termed utilization research, which would include consumption pattern studies, demand and income elasticity studies, storage, processing and consumer acceptance.

As mentioned earlier, customs and food habits do not change easily; we live in a country which has traditionally been accustomed to live on imported food and have developed a pattern of food consumption and taste to which our trade statistics bear eloquent witness. But, I do not think this pattern is by any means sacrosant.

The question is what programmes do we need to create and expand demand for nutritious foods. We are perhaps fortunate in that our per capita income is rising and in such situations one tends to find the population exhibiting without much stimulation an increasing desire for more nutritious foods. Indeed, we are sometimes referred to, somewhat derisively I suspect, as a developing country with tastes and habits of the affluent. If that is so, at least it means that a good base is already provided and that all we need now perhaps are the extra stimuli.

Should this stimulus take the form of a concerted educational programme directed towards the yough to effect the change in food habits we consider desirable? And would a school lunches programme incorporating these foods accelerate this change?

What part has training in Home Economics and in the preparation of these foods to play in such a programme? This would naturally include consideration of firstly the time at the disposal of the modern housewife, a large majority of whom have to work away from home to

supplement the family income, and secondly the declining availability of skilled domestic help in homes.

Or should the stimulus come from extensive advertising and the use of the usual marketing and sales promotion gimmicks in such common use these days? Commercial advertising and other sales gimmicks are far from inexpensive and the question would naturally arise as to whether the product can stand high promotion costs. If not what part would Government play in the promotion programme?

Should it only confine itself to the use of the "Negative List" or fiscal measures to assist this programme? These measures are growing in importance here but up to now they are being used mainly as devices for effecting savings on foreign exchange. There is growing evidence however that they are beginning to exert an effect on food habits.

Finally, should the stimulus include the establishment of a Bureau of Standards and a Food Technology Organization? In a society which is approaching a high degree of sophistication, establishments of this sort are usually considered indispensable institutions. Cost considerations would enter here but it may well be that the country canrot afford not to have them.

These are some of the questions which I think can be posed and which should offer fruitful fields for investigations and clarification. Happily a start has been made by the CFNI and the UWI and we can only hope that this work prospers so that we may be provided with answers to help us formulate programmes with clearer rationales.

From what has been said above, brief though it is, I think it is true to say that the problem confronting us contains a denominator common to many disciplines. When such a common denominator is present it usually provides the basis for successful integration. This, in turn facilitates the commando-type assault referred to earlier and ensures a greater measure of success.

YOUR QUESTIONS ANSWERED

Q. I have heard it said that the avocado pear is a rich source of protein. How much truth is there is that? (from K.A. Richards, Dominica.)

A. The avocado pear is not a rich source of protein, its protein content being only 1.5 g. per 100 g. of edible portion. However, the pear does have a relatively high content of fat and some vitamin A precursor and ascorbic acid. This, along with other features indicated below make it a useful item in infant feeding.

The pear is a cheap, easily transportable food which needs no cooking, and provides a highly palatable, sterile, compact source of calories. The living and feeding pattern being what it is in the Caribbean, foods with these attributes play a valuable role in infant feeding. If the pear can be mashed with some dried skim milk powder, roasted ground peanuts, or other high protein food, its value in child feeding is further enhabced.

Q. Is it true that carrots consumed as carrot juice is not as good nutritionally as if it were consumed in a stew containing some fat, because of Vitamin A being a fat soluble vitamin?

A. The addition of fat to a fat free diet or to one very low in fat may improve the availability of carotenes. . . this may be of significance in very low fat diets, it is doubtful whether it is of any

consequence in dietaries of the Caribbean in which around 28% of calories are from fat. However, the degree of cellular rupture is of major importance in rendering carotenes available. Thus the carotene of carrot puree and juice is used more efficiently than that of carrots cooked in larger pieces and much more efficiently than that of raw carrots.

Q. <u>You sing the praises so much of the pigeon pea, would you please say what is the protein content of the pigeon pea as compared with other pulses?</u> (from K.A. Richards, Dominica)

A.

Chick pea	18.2%
Pigeon pea	20.9%
Kidney bean (red pea)	22.1%
Cowpea	23.4%
Lentil	24.2%
Peanut	25.6%

Although slightly lower in protein content than most pulses consumed in the Caribbean, the pigeon pea was chosen by CFNI as a representative symbol of this group of this group of traditional and highly nutritious foods which are much under-rated. Of the group, the pigeon pea is most widely distributed and best suited as a crop for small farms and home gardens because it thrives in infertile soil, is drought resistant and is not susceptible to diseases and insects.

THE FOOD PROBLEMS OF DEVELOPING COUNTRIES -- PART II

From the 'OECD Observer' No. 31, December 1967

(This article is being reproduced in two parts; the first part appeared in Cajanus No. III. It is based on a report on this topic by the Secretary General of OECD to the OECD's Ministers' Meeting on 30 November, 1967.)

Increasing Private Investment in the Developing Countries

The flow of private investment capital from developed to developing countries has on the whole been rising in recent years, though it was lower in 1966 than the year before, partly due to the tight monetary conditions in a number of countries.

In the near future special attention should be given to investment that can help to increase food production, especially in the "agro-allied industries", and in particular the fertiliser industry, which is so important for food production. For rather a long time to come a number of developing countries will have to import large quantities of fertilisers, but the more productive capacity in these countries can expand, the better (and the rapidly increasing demand for fertilisers in the developing regions is a good basis for such investment). It has been proposed that a fund for the guarantee of investments in the agro-allied industries of developing countries be set up within OECD. This proposal is now under study in the Organisation.

It goes without saying that investment in other industries will also be useful, in particular when it can be the basis of exports

of manufactured goods from developing countries. Abundant labour at low wages will be available in most developing countries for many years; besides, the developing countries represent markets for industrial products that are likely to expand considerably in the decades to come.

If the inflow of private capital has not so far reached more spectacular dimensions, it is probably in the main for two reasons. One is that although there is abundant and very cheap labour, the supply of qualified labour is often rather limited. The other is that the environment is not always satisfactory. The first obstacle can be overcome to an increasing extent as general education and professional training improve, and the investing firms are often making a valuable contribution in this respect by organising training for their staffs.

The environment is a more complex matter. There may be political instability and sometimes reticence or even hostility vis à vis foreign investment. There may be cumbersome administrative procedures and it may be difficult to get machinery repaired, and so on.

These obstacles, too, can be overcome, especially when the government in question understands the importance and the advantage of foreign investment in its industry. On the whole the climate for such investment seems to be improving slowly. This should continue in the years to come, provided political upheavals on an important scale can be avoided.

Aid for Research on Agricultural Methods and New Types of Food

In many cases only the developed countries have the resources necessary for improving agricultural production. Therefore assistance to agriculture will become more and more important in aid programmes. It is necessary that the developing countries be enabled to undertake the rearch required to expand agricultural production and to train research workers of their own.

There is a need for both fundamental and applied research as a basis for developing appropriate techniques. Until now most such research has been carried out with a view to the problems of the temperate zones. This means that our general knowledge of tropical agriculture is far from sufficient. There is also a need for adaptive research so that techniques developed in one area can be geared to natural conditions in others. Finally, extension services must be made effective.

Donor countries can support such research activities financially and by furnishing equipment and materials. Part of the fundamental research can take place at universities and research centres in developed countries, but developed countries and their universities or research centres can also help in setting up institutions for research and training in developing countries. The Development Assistance Committee of OECD has recently discussed a proposal for an international system of co-ordination of agricultural research under which selected world centres would concentrate on broad basic and applied research in the fields of crop and animal production. They would

develop new plant types and study the problems of disease control, fertiliser application and so on, and they would train scientists who could then work in regional, national and provincial centres. This proposal deserves further consideration.

A particular responsibility should be recognised by all developed countries regarding research in the field of innovation in food production. This innovation concerns not only the quantity - high yielding grain varieties, breeds of animals that give more milk, eggs or meat relative to the quantity of fodder consumed than do traditional breeds. It also concerns the quality of food and in particular the content of proteins. It is in protein content that the diet in most poor countries is the most unsatisfactory. But, as incomes rise, if all the demand for food proteins were to be satisfied through animal husbandry, this would meanan enormous pressure on the earth's crop-producing capacity, since it takes about seven calories of feed crops to produce one calory of animal food. Hence there is need for research to find alternative sources of protein or of the amino acids which make animal protein so valuable as a foodstuff. Already research is being carried out on how certain varieties of maize and other plants can be made to contain more of the critical amino acids and on the use of certain high-protein content oilseeds such as soya beans and cotton seed as food additives.

In addition, the feasibility of producing protein-rich non-agricultural food is being explored. One possibility would be to catch and prepare for human food small fish and sea animals that are now

eaten by larger fish and other animals, only part of which are eaten by men. Research has been going on for many years on the cultivation of certain algae in artificial surroundings where, since they are capable of utilising the energy contained in sunlight or artificial light much more intensely than plants in the fields, many could be produced in a small space. The innovation in protein production that is considered most promising for the moment is probably the feeding of single cell organisms - bacteria or yeasts - on petroleum. In the last analysis such production would be based on the organic remains of animals and hence would be living on capital left from an earlier period, just as the use of petroleum as fuel means living on such capital, but for a long time to come large quantities of single cell protein could be produced in this way. Research in the field has been undertaken mainly by private enterprise, especially the Esso/ Nestlé group and British Petroleum. It is also feasible to feed the single cell organisms on other substrates than petroleum - molasses, the wastes from various plants such as potato tops, wood material from forest wastes, or other organic substances which contain carbon. Methods to extract certain proteins from leaves are being studied, and leaf protein has already been used as chicken food in Israel.

Of greater importance in the long run than producing proteins may be the problem of how to supply enough calories overall if the total population of the earth is going to reach the level of as much as 14 to 15 billion. It is conceivable that wood can be converted

into food for men or feed for animals, but it would be a more radical departure from traditional methods than those so far discussed. The most radical innovation of all would be to produce food without using plants : what the plants do is to synthesise cardon dioxide from the air with a number of other materials obtained from the soil through use of the energy contained in sunlight.

Is it conceivable that the same process could be made to take place in laboratories or even in factories, using either solar energy or other energy sources? Today food cannot be produced in this way, but it is possible to produce on an industrial scale certain amino acids which can then be used to fortify foodstuffs or feeding stuffs in various ways.

Thus a number of techniques may be developed by which food can be produced in an untraditional way. A common feature of them all is that they would make us less dependent on the quantity of good agricultural land available; the more food production becomes industrialised, the more will it depend on other factors than land, namely on labour, capital and knowledge. For a number of years to come, the emphasis in these areas must be on research - expensive research requiring highly competent scientists and often costly instruments and materials. Nor is it enough to know if and how the products considered can be produced. The questions as to what extent they are digestible and whether they can have harmful effects on the organism if consumed in considerable quantities over a longer period must be examined also.

Population Policy

The unique population growth that can be expected in the next few decades will slow down sooner or later, but it is of paramount importance that it does not last too long because the food problem - as well as various other problems of modern society - will be much more difficult to solve if the population increase of the next century proves to be say 10 billion than if it is only 5 billion.

In the long run the only acceptable growth rate for the world's population is 0. Even a very low positive rate will lead to an impossible situation in the course of a few centuries. The average birth rate of the more developed regions was 20 per 1,000 population in 1960-1965 and that of the less developed regions was 40.4. Both these averages will have sooner or later to come down to the neighbourhood of 10 which is the level that the death rate seems to be moving towards. The gross reproduction rates have recently been about 1.3 in France, 1.8 in the United States and more than 3 in some developing countries. They must eventually come down to little more than 1. The implication is that restraints to keep procreation down will progressively have to be intensified even in most developed countries and much more so in virtually all the less developed areas.

The various methods now in use to keep procreation well below the biological limit can be classified under the following headings : abstinence, including late marriage, the rhythm method and at the limit coitus interruptus; contraceptive methods; induced abortion and sterilisation.

If a significant intensification is called for, it seems that neither abortion nor sterilisation are desirable on a very large scale. The discussion will therefore in all likelihood concentrate more and more on various methods belonging to the first two categories. If any of these methods are to be used much more intensely than now, it will raise a number of questions. Quite naturally human behaviour in these matters has been influenced not only by cultural traditions in the broader sense of the word, but also to a large extent by moral and religious considerations. It is therefore a great importance how the major religious communities in the world are trying to guide their adherents in this often difficult field. If there is any general rule it is probably that abstinence is considered the most acceptable method on moral grounds while doubts, hesitation or opposition are expressed concerning contraception and abortion, sometimes also coitus interruptus.

In practice, a number of countries pursue population policies that permit or even support contraception or abortion. The fact that most people in some of the countries concerned belong to one or more of the major religious communities (Islam, Hinduism, Budhism, Shintoism, and various Christian confessions) has not prevented this. It should be added, however, that many individuals are practicing some of these techniques in conflict with the laws of their country or the guidance of their religious community or both, a fact that should be noted because it adds to the psychological difficulties of a person faced with a delicate choice if there is a conflict of conscience involved.

Research, information and public discussion should help to reduce existing differences of opinion, individuals and authorities taking as far as possible all relevant circumstances into consideration. Ways of thinking that were meaningful in former times when mortality was high may have unforseen consequences if they are maintained in a different kind of world.

There is a special reason to mention the Roman Catholic Church because of its influence in many countries and because it is known that here the matter is up for consideration in a more formal way than is normally the case. A commission appointed by Pope Paul VI has studied the various aspects of the problem and has submitted its conclusions to His Holiness. However, in an address given on 29th October, 1966, the Pope said that these conclusions could not be considered as final and he thus had to give the matter further study. This has delayed his answer and will do so for some time to come.

One can therefore expect new guidance from the Church. It is to be hoped that this guidance will make it possible for Catholics to make their contribution to the necessary slowing down of population growth without coming into conflict with the Church.

Sometimes certain methods, especially abstinence, are considered "natural" while others are considered more "artificial". These expressions should be used with great care. There is an inborn, hence "natural" inclination of all living beings to procreate to such an extent that they multiply. If multiplication of the various species of animals and plants is kept within certain limits, it is because the species compete with one another, for space and for food. The possibilities for life

on the earth are not unlimited, and therefore the share of each species is limited by its competition with other species.

For human beings the possibilities, though great, are also limited. Therefore, their numbers have to stop growing and become virtually constant at an appropriate time. If this is not to be taken care of by high death rates as in the past, men must learn to keep their procreation down to a level that does not mean multiplication. This in fact is against human nature, as hitherto conceived. Human nature can change, and it probably will during centuries to come. The problem now to be tackled is, however, to reduce the rate of procreation radically in the course of some decades. This being so, any course of action will to a certain extent be felt as "unnatural", i.e. artificial. In this situation there can probably be no doubt that exclusive recourse to one single method will do more harm to human nature than a more flexible policy, permitting the psychological and other pressures to be reduced by having access to a variety of methods. The importance of education is no less in this field than in others concerning development. It should be added that in developing countries where the standard of education is frequently still rather low it seems particularly dangerous to increase the psychological pressure by having recourse to one single method only.

An increasing number of developing countries are trying to develop rational and conscientious policies to enlighten their populations and to help parents who want to limit the size of their families, but there is often a shortage of medical and paramedical staff and also of appropriate equipment. Developed countries can help in both respects.

NEWS OF CFNI ACTIVITIES

On May 15, CFNI staff members met the Barbados National Nutrition Committee under the chairmanship of Dr. A.V. Wells, Chief Medical Officer. The purpose of the meeting was to discuss a nutrition survey to be conducted by Barbados personnel, possibly with other assistance. This survey is intended to establish baseline data for the planning and evaluation of the Barbados Applied Nutrition Programme which is at present being established.

On May 16, CFNI staff members met the St. Vincent National Nutrition Committee under the chairmanship of Dr. P. Esmonde, in order to present to the Committee a preliminary analysis of the results of a rapid PCM survey conducted jointly last November by CFNI staff, St. Vincent Government staff and Save the Children Fund.

From July 1 - 5 inclusive CFNI staff conducted a one-week course in nutrition at UWI, Mona, for senior nursing sisters from Jamaica. This was part of their 16 weeks of advanced training, which is organised by the Ministry of Health. CFNI is grateful to have had this opportunity to be of assistance.

Dr. S.K. Reddy, Nutritionist/Home Economist is engaged in organising a study of infant feeding practices in collaboration with the Social Development Commission of the Ministry of Youth and Community Development, Government of Jamaica and the Sugar Industry Labour Welfare Board, Jamaica.

The objective of the study is to obtain baseline information on feeding practices prevalent in the area, and to assess the effectiveness and efficiency of utilising staff already in the field, such as parish supervisors of Social Development Commission, and Community Development officers of the Sugar Welfare Board in obtaining the information sought.

BOOK REVIEW

Born to Hunger by Arthur Hopcraft. Pan Books Ltd., London (215 p.), 5s. (Paperback) or 35s (hardcover edition by William Heinemann Ltd., London).

Mr. Hopcraft was commissioned by the United Kingdom Committee of the International Freedom from Hunger campaign to look at the condition of some of the underdeveloped countries and at the effect of various efforts to uplift them.

The subject of population overtaking food production has become a hackneyed theme. The author recognises that additional parade of statistics will hardly serve to increase people's interest. The more noughts in the figures the more numbing their effect on the minds. People are not much alarmed when told that India is adding 12 million people to its population every year, unless they are also shown what a peasant mother can manage to put into the cooking pot. To know the per capita incomes of Bolivia or Botswana is less informative than to poke your head into a mud hut or to see how far a farmer's children have to walk to fetch the family water.

The author presents a frank and perceptive appraisal of a large range of problems of underdevelopment and concludes, "the privations of hunger and extreme poverty produce much the same pain and exhaustion in whatever country they are suffered, but the reasons for them can be very different, and so can the way of removing them."

The book is a scholarly work of depth and documentation which covers the reproductive capacity of the human race, the ill effects and

misery caused by hunger and poor sanitation; the religious and social taboos, illiteracy, ignorance, lack of knowledge and wrong knowledge, low family incomes and poor quality of agriculture, unemployment and creation of urban shanty slums with drift from rural areas, lack of modern technology and mechanisation. Despite the often repeated statement that the rich are getting richer and the poor get poorer, the process gathers inexorable momentum. The only means of retarding this even widening gap is by a concerted effort both by developed and developing nations. Added to all this is the skepticism and confusion of weak administrations rendered weaker by non-coordinated assistance from a multitude of sources.

The problems encountered are the most basic ones to persuade people to use latrines, to keep bodies, clothes and homes and surroundings clean, and to feed children a more balanced diet of what food is available. Paradoxically however the improvement of home environment has a low priority with authority, and where training exists it is insufficiently related to the needs of the situation.

The book provides a realistic presentation of the problem of hunger, the complexity of the situation in which it must be tackled, and deserves the attention of professionals, laymen and legislators alike.

RESULTS OF PIGEON (GUNGU) PEA RECIPE COMPETITION

On the mornings of the 3rd and 5th July the Caribbean Food and Nutrition Institute in Jamaica was a most mouth-watering place. It smelt as good as, and perhaps better than, the kitchens of the Trinidad Hilton or the Blue Mountain Inn, as Dr. S. Reddy and her sister Padma, with teams of proficient local ladies and some of the Institute's staff prepared the dishes described in the entries to the competition.

The tasting and judging was done by about forty people, including many invited home economists and even a visiting UNICEF team was roped in to taste. All were marked according to taste and the other criteria.

The winners are:

First Prize: (£5; 24 T.T. $) for "Pigeon Pea au Gratin"
Sheila Joseph-Dillon, of Tobago

Runners-Up: (£1; 5 T.T. $) for "Gungu Pea Recipe"
Mrs. J. Royes, of Kingston, Jamaica

for "Pigeon Pea Pudding"
Mrs. Evelyn Fraser * of California

The winner scored the highest marks for taste and also fulfilled the other criteria of being economical, acceptable to the whole family and simple to prepare.

The runners-up were also rated very high on taste, but the Gungu Pea Recipe was said to be a little dry and perhaps baking rather than frying would have remedied this, and the Pigeon Pea Pudding was thought

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* Would Mrs. Fraser please send her full postal address.

to be a little expensive for general use.

The Institute thanks all who entered for the competition. The winning recipes are given below, and the complete set of recipes can be obtained by anyone who wishes from Dr. S. Reddy, CFNI, P. O. Box 140, Kingston 7, Jamaica.

1) Winner: Pigeon Peas Au Gratin

Ingredients:

2 cups green pigeon peas
1 onion chopped
1 oz. margarine
½ pt. milk
salt and pepper to taste
2 ozs. salt pork
1 sweet pepper chopped
1 oz. flour
2 ozs. cheese (grated)
1 tblsp. buttered crumbs

Method:

Boil pigeon peas with salt pork until tender.
Chop onions, sweet pepper and salt pork
Crush pigeon peas
Melt margarine in heavy sauce pan, add flour
Gradually add milk to make a thich white sauce
Add grated cheese. Stir gently. Add other ingredients
Pour into greased pyrex dish, sprinkle with buttered crumbs.
Bake in a moderate oven until golden brown
Serve hot with a vegetable salad.

2) Runner-up: Gungo Pea Recipe
(Side dish or snack)

Ingredients:

2 cups boiled gungo peas (dry)
½ cup finely picked herring (smoked red herring; remove bones)

Seasoning - salt
pepper
1 onion
3 cooking tomatoes
flour

Method:

(1) Either boil dried gungo peas in just sufficient salt and water with finely chopped onion and tomatoes. When soft, pour into sieve and thoroughly drain off excess liquid. (Save liquid for soup) or, use left over peas from a stew.

(2) Mash gungo peas with back of large spoon (or mortar and pestle if available) until individual peas are not recognisable. Flour both hands and place a teaspoonful of flour in the palm of one hand. To this add one tablespoonful of mashed peas and roll into a ball. Keep hands well floured and press ball flat on palm of hand.

(3) Place strips of herring in centre of this flattened peas, sprinkle liberally with balck pepper, fold, seal edges by pressing together. Press mass until 3" - 4" long.

(4) Roll in flour and fry in hot fat until outside is crisp.

(5) Serve hot. Makes 8.

3) Runner-up: Pigeon Peas Pudding

Ingredients:

½ cup dried peas
1 pint milk
2 tbsps. butter
4 tbsps. grated cheese
1 or 2 eggs
salt and pepper to taste

Method:

Soak peas overnight. Grind finely. Add all ingredients and let stand for 30 minutes. Pour into a greased pie-dish. Bake in the moderate oven till set and golden brown about one hour.

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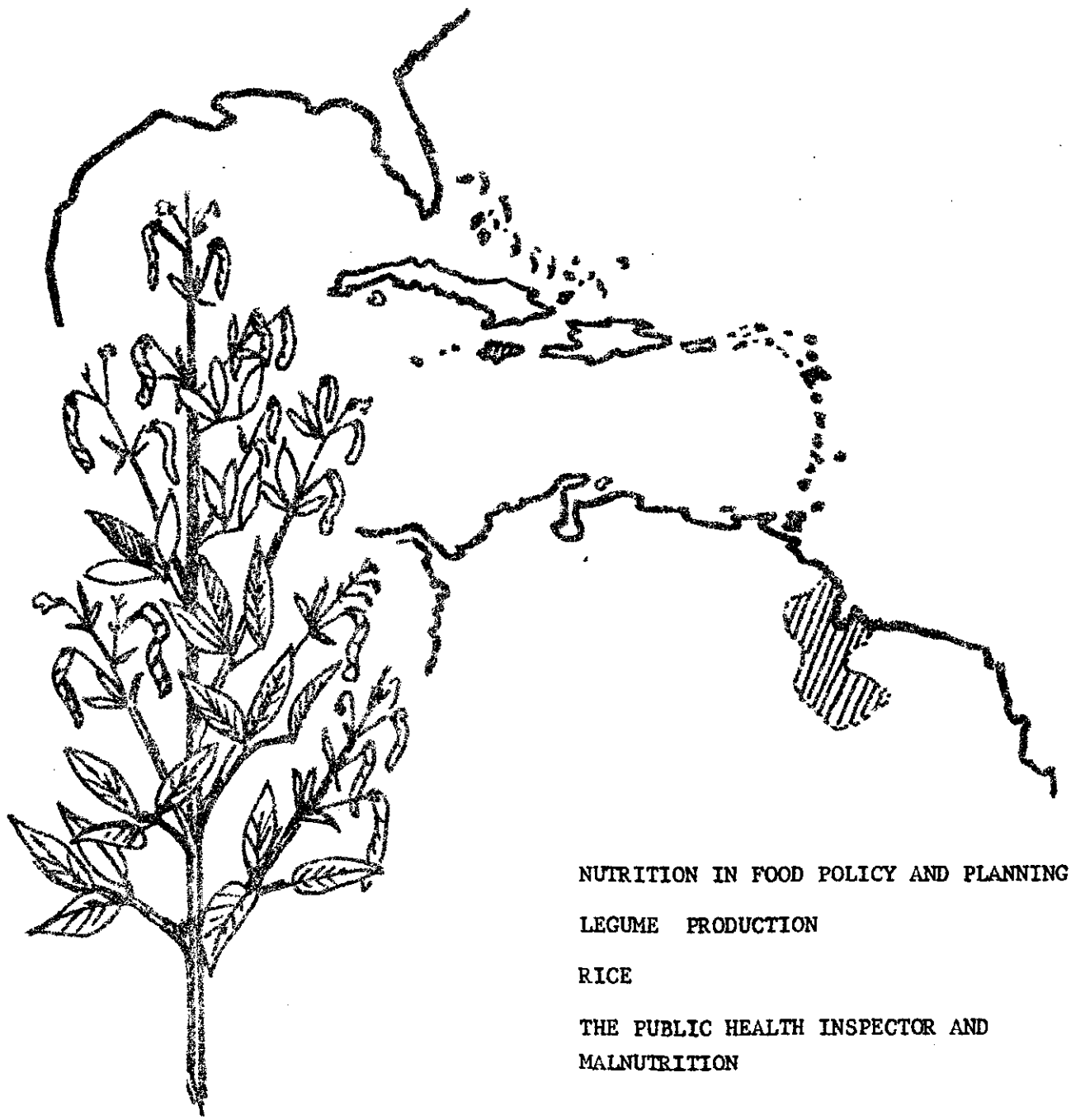
CAJANUS

NEWSLETTER OF

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE



NUTRITION IN FOOD POLICY AND PLANNING

LEGUME PRODUCTION

RICE

THE PUBLIC HEALTH INSPECTOR AND MALNUTRITION

C A J A N U S

Newsletter of

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE

Mona P.O. Box 140.

Kingston 7, Jamaica.

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NUTRITION IN FOOD POLICY AND PLANNING*

While it required an estimated 500,000 years for the world's population to reach 400 million (about 1800), during the following 200 years it will have multiplied to 15 times that figure. At the present time, each 6 days the world finds itself with 4 million more persons, the current population of the West Indies. The growth rate in the Caribbean - 2.5% per annum - exceeds the world rate of 1.9%. With the present rate of growth, this area will have a population of 14 million by the year 2020. If reduced to the current growth rate of Barbados, the number might increase to only 9 million during that 50-year period.

Traditionally the agricultural economies of the Caribbean have been oriented toward export crops and large quantities of foodstuffs have been imported. In recent years, per capita food imports have risen rapidly, from US $17.50 in 1938, to $46 in 1956, and up to $72 in 1964, although 70% of the population is rural.

A recent study done by the Institute of Social and Economic Research+, University of the West Indies, indicates that imports of food and feeds represented two-thirds the value of agricultural exports

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*Paper presented at a CFNI seminar on Protein Foods for the Caribbean, Georgetown, Guyana, July 29th - August 1st, 1968.

+All food import and export figures and projections in the present paper refer to the area covered in the ISER study, namely: Barbados, Guyana, Jamaica, Trinidad, Leeward and Windward Islands.

in 1958 and will increase to three-fourths the export value by 1975. These projections were based on an assumed population increase of 2.4% and per capita income increase of 3.0% per year which are close to the actual trends.

For several commodities, the import projections have already proven to be too conservative. For example, Jamaica alone in 1966 imported 5 thousand tons of dry skim milk (50% more than the estimated total area demand for 1975), and in 1967 Jamaica and Trinidad together imported 25% more corn than was projected for the whole area in 1975.

The economic effects of food imports will depend greatly on their price relationships with agricultural exports. Price prospects and markets for the export crops are not promising. On the other hand, world prices of the cereals and animal proteins can be expected to increase sharply in view of the per capita food availability trends. Large exports of cereals in the past 20 years have exhausted the surplus stocks in North America and Australia. The growing needs by the developing nations can be met by the producing nations but the cost will rise.

World prices of animal products traditionally rise faster than the general index of agricultural commodities. A sharpening of this trend has occurred recently. For example, the average per pound price of mutton exported from New Zealand has increased 80% since 1950, while the general index prices have not changed during this period. Meat and milk prices (and meat imports) in the US have increased 20% since 1965. The 1963 world meat deficit of 0.5 million tons is expected to be 5.0 million tons, ten times greater, by 1975! It is predicted

that red meat will be a luxury item for the North American consumer by 1975. If so, the Caribbean consumer will either be eating less imported meat or be paying much more for it.

Let us now consider the nutritional implications of this dependency on imports. Three-fourths of the total available protein is imported. This should be viewed in the light that significant amounts of protein imports are through donations programs, including up to 50% of the dry skim milk in some countries. A sudden cessation of this protein supply would require emergency government action to avert serious nutritional consequences in the vulnerable groups.

An awareness of both the nutritional and economic implications of the present food supply situation is expressed in the development programs of the various territories. However, nutritional considerations have truly been incorporated into food policy and economic development planning in very few countries of the world as yet, and the Caribbean is no exception. Indeed, this new dimension of the planning procedure would ideally be based on much more precise information than is currently available. This includes, in addition to reliable population, agricultural and industrial statistics, up-to-date information on food availability, food consumption and the nutritional status of the population.

Food balance sheets have been developed for several countries. These give a broad picture of total food supply and the amount available for use by the population. However, it is well known that they are

far from precise and, of course, provide no information on the differences in distribution of food between rural and urban populations, socio-economic classes, or age and sex groups. Thus, food consumption surveys are essential complements to food balance sheets.

Even while this basic information is being gathered, the nutritionist can assist the economist in formulating development plans. First of all, he can convert available demographic, climatic and anthropometric data into quite practical per caput and national nutrient requirements. With these physiological requirements defined, the economist can utilize demographic growth, income growth, rates of urbanization, and household expenditure survey data to project future food demand.

At this point, the nutritionist can assess the validity of projected level of demand estimates by comparing their per caput nutrient content with requirements. The estimates may be deemed unacceptable because the demand figures represent deterioration in the nutritional value of the diet, or because the proposed levels for specific nutrients are physiologically unrealistic. Here, both the economist and nutritionist must be careful lest the projected demand estimates, although satisfactory from their respective points of view, be too much at variance with the consumers changing food preferences.

Food represents one-fifth the cost of all imports to the Caribbean. This being the case, government is strongly motivated to judge the desirability of individual import commodities on the basis of their

foreign exchange requirements. Food import policy is another area where nutritional considerations can be helpful to the economist in his desire to utilize most efficiently the available resources. For instance, the large dollar requirements of saltfish and wheat flour importation became immediately evident following the recent devaluation. However, saltfish, flour, dry skim milk and pulses provide from 3 to 10 times as much protein per unit cost as other foods. Furthermore, these food items are widely used by the lower income families, who already spend most of their income on food.

Those responsible for food policy and food standards legislation also need to be aware of the extremely low cost and important health benefits accruing from proper food enrichment. Enrichment of wheat flour, cornmeal and polished rice (whether imported or locally milled) with the B-vitamins, calcium and iron is the most effective way of assuring adequate intake of these nutrients by most of the populace. Likewise fortification of all dry skim milk with vitamin A is highly desirable. On the other hand, adding vitamin D to milk, often used as justification to charge the consumer 2-3 cents more per quart, is completely unnecessary in these sunny lands, nor does the addition of a few vitamins to a mixture of sugar and flavouring with a little milk powder produce a "super-food" which will cure or prevent nearly every imaginable ailment, as the advertising for tonic foods so often claim.

Governments have contributed substantial resources during the past two decades toward distribution of dry skim milk from international food aid sources, thereby encouraging its use in infant feeding.

DSM provides the best quality protein at the lowest cost but sociologists and food marketing people tell us that only the highly motivated mother purchases the product because it lacks status and is sold in a non-descript package, usually found in a somewhat battered box on the lowest shelf in a store. This being the case, government would reinforce existing food policies and make an important step toward conservation of foreign exchange and improved nutrition of the young child by seeking some means of marketing dry skim milk in an attractive tin. I understand that the additional packaging cost would only be 4 - 5 cents EC* per pound.

With the stated objectives of promoting increased food production and improved nutrition, Caribbean governments are devoting considerable efforts to development of the agricultural sector. However, without having some quantifiable estimate of the nutritional outputs per unit of total resources utilized, it is exceedingly difficult for the planner to be consistent in allocating priorities to projects which contribute maximally to both goals.

Table I, lists the approximate actual and potential yield of protein and calories from one acre of land used for several cropping systems in the Caribbean, namely: selected export crops, mixed farming, animal production (including pond fishing), pulses and cereals. Several root crops and vegetables which can yield relatively high total amounts of nutrients per acre are also listed. In this table, the crop yield (column II) has been translated into terms of days protein (column III) plus energy (column IV) requirements for an active adult male to obtain

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* $1. EC = 50 cents US = 4/2d

a simplified index value (column V) which can be used by agronomists, nutritionists and economists.

Table II, presents preliminary figures on the total resource cost per acre of land utilized under Caribbean conditions for the production of some crops listed in Table I. Available comparisons indicate that, here, as in other parts of the world, modern methods of producing cereals and pulses represent the most efficient allocation of resources to nutrient production.

The data in Tables I and II become more meaningful to the economic planner if viewed within the framework of prices paid by the consumer per unit nutrients provided by each foodstuff. Table III provides this information.

Comparison of these tables brings out three salient points:

1. Contrary to general belief, most foods which are widely used in this area will provide an adult's gross protein requirements at lower cost than the caloric requirements.
2. The cereals and pulses, which apparently have the greatest potential for maximum nutrient produced per acre and resource input, are in general the consumer's lowest cost sources of both protein and calories; and
3. Animal production generally does not result in high production of either protein or calories on a per acre or per unit resource input basis.

This latter point, of course, is well known and does not negate the important role which efficient animal production can always play in

agriculture. Nevertheless, these comparisons emphasize the need for cautious selection of projects where government funds are directed toward increased production of animal proteins on arable lands, particularly if the project is to be justified on nutritional or economic grounds.

With the exception of several root crops and vegetables grown in Trinidad, where gross production per acre is probably approaching potential, Table I indicates the wide gap between actual and possible yield of most enterprises. Although the vegetables shown have large outputs of nutrients per acre, they could not in practice serve as important sources of food protein or energy because of their high water content and high nutrient cost. The data on sweet potatoes also indicate that the gross yield figures represent up to a 100% overestimation of the edible nutrients produced.

One gets the impression that four traditional crops - rice, "peas" (pigeon peas and red beans) and peanuts - perhaps merit more attention in agricultural development planning than is generally given in the Caribbean.

If annual rice production could be increased to the 15,000 pounds per acre promised by the new variety IRI-8, only one-third of the 1.9 million acres available cropland would be required to supply the basic caloric and protein needs for 14 million people in the year 2020.

"Peas" and peanuts display great potential in terms of increased productivity and are uniquely suitable as a cash crop for the small

farmer. They can also serve as an important source of protein to supplement his basic diet. High protein varieties of corn, rice, sorghum and wheat, now being developed for the tropics offer another means of improving the diet of both the rural family and urban consumer.

This nutrition/economics overview lends support to current interest of agricultural researchers and planners concerning corn and soybeans. The potential for corn production has been demonstated in several islands and will be reported on later in this meeting. Recent UWI research with soybeans also indicates their production potential to be exciting. A satisfactory corn-soybean rotation system for the West Indies could do much to bring about an agricultural revolution, as it has in other parts of the world.

The growing role of oilseed proteins in human nutrition has particular application to food planning in the Caribbean. A recent survey done by Miss Fox's group on infants and young children throughout Jamaica shows that in all age groups studied, protein intake was nearer to safe practical allowances than caloric intake. Garrow, Picou and Waterlow stress the importance of a high caloric content in diets for children recovering from malnutrition.

While large scale production of peanuts and soybeans in the Caribbean would undoubtedly be geared initially toward the traditional processing channels of vegetable oils for the human diet and press cake for animal feeding, a large potential market exists for use of full-fat pulses in high protein-high energy foods for infant and

family feeding. Another traditional oil crop - the coconut, is an important potential source of protein for human nutrition. Research now underway promises to permit extraction of 50 pounds of high quality edible protein for each 100 pounds of oil produced.

These recent developments, plus the exciting long-range prospects of obtaining plentiful protein at low cost from the sea, single celled plants and petroleum residues, and extremely cheap calories through organic chemistry, indicate the need for food policy and planning to be flexible and open-ended.

Another oilseed protein product, which may prove to have special merits in the Caribbean setting, is the meat substitute based on soybean protein. These foods, now on the market, compete favourably with meat in terms of appearance, flavour, texture, nutritional value and price, and do not require refrigeration.

This brings us to the agro-industries - those producing goods or services required by the farmer, or those utilizing his produce as raw materials. The former assist him to increase his efficiency of production and improve the quality of his produce. The latter provide him with a stable market base, convert farm produce into food products demanded by the consumer, and in the process can often reduce the price spread between the farmer and consumer.

Funds from the public sector can often be most effective in getting more and better quality food to the consumer if channelled to the infrastructure required by agriculture-allied industries and to the development of these industries themselves, rather than directly to agriculture.

This may be particularly true in the Caribbean where the industrial base for the food chain must largely be developed from scratch and where even rural families are important consumers of processed foods. In the industrialized nations, approximately 40% of all manufacturing employment is provided by those industries using agricultural products, an important consideration in a labour surplus area!

If government takes the initiative with regards to stimulation of food production and improving nutrition, the planning function requires the participation of a mixed group of specialists to assure fairly efficient utilization of the resources available and to avoid too many unforeseen bottlenecks in the long series of activities which must be synchronized. Where, in order to achieve the targets established, major changes are being introduced simultaneously at nearly every stage of the food chain, from land tenure through infant feeding practices, close liaison between the members of this multi-disciplinary team is urgently needed on almost daily basis.

This could be done in several countries through a technical committee within the existing framework of the National Food and Nutrition Committee. In view of the prominent role to be played by the agricultural sector (as producers and consumers) in programs directed toward improved food supplies and nutrition, the representatives of this Ministry to the National Committee should be backstopped by personnel covering the entire spectrum of agriculture, perhaps through a food and human nutrition unit or department.

However, whatever mechanism is employed, it has now become essential that nutritional considerations be an integral part of the food policy and planning process.

TABLE I

Number of Days Protein and Energy Requirements for Moderatively Active Man produced by One Acre of various Food Crops*

I CROPPING SYSTEM	II YIELD ACRE/CROP (POUNDS)	III DAYS PROTEIN REQUIRE-MENTS	IV DAYS ENERGY REQUIRE-MENTS	V ** DAYS PROTEIN + ENERGY REQUIREMENTS	VI MONTHS OF LAND USE
	EXPORT CROPS				
BANANAS - SMALL FARM - JAMAICA	1,960	95	171	266	12
BANANAS - GOOD YIELD - JAMAICA	7,200	350	629	979	12
BANANAS - COMMERCIAL - HONDURAS	12,445	604	1,087	1,691	12
COPRA - EXTENSIVE PRODUCTION	1,000	467	1,001	1,468	12
COPRA - INTENSIVE PRODUCTION	4,000	1,868	4,004	5,872	12
SUGAR - SMALL FARMS - JAMAICA - NO FERTILIZER	1,695	-	938	938	12
SUGAR - SMALL FARMS - JAMAICA - AVERAGE	3,390	-	1,867	1,867	12
SUGAR - ESTATES AVERAGE - JAMAICA	6,700	-	3,704	3,704	12
SUGAR - RECORD PRODUCTION - HAWAII	11,000	-	6,087	6,087	12
	MIXED FARMING				
SMALL HOLDERS - JAMAICA - 1967		745	817	1,562	6
SMALL HOLDERS - JAMAICA - 1967		759	1,095	1,854	6

*Based on daily nutrient requirements of approximately 70 grams protein, 3,000 calories.

** For annual yield per acre, please take into account column VI, months of land use.

	II	III	IV	V	VI
	ANIMAL PRODUCTION				
MILK - SMALL FARMS - JAMAICA	456	104	46	150	12
MILK - AVERAGE - JAMAICA	1,220	277	122	399	12
MILK - IMPROVED PASTURE - JAMAICA	6,000	1,363	257	1,620	12
MILK - RECORD PRODUCTION - ENGLAND	11,300	2,567	484	3,051	12
BEEF - UNIMPROVED PASTURE - JAMAICA	55	54	16	70	12
BEEF - IMPROVED PASTURE - JAMAICA	259	224	86	310	12
BEEF - IRRIGATED IMPROVED - U.S.A.	770	690	376	1,066	12
POULTRY - EGGS, Potential - W.I.	789	564	162	726	12
POULTRY - BROILER, Potential - W.I.	861	603	135	738	12
SWINE - Potential - W.I.	1,017	387	549	936	12
FISH - POND, AVERAGE PROD. - JAMAICA	1,000	536	72	608	12
FISH - POND, IMPROVED - JAMAICA	2,000	1,072	143	1,215	12
FISH - POND, POTENTIAL - AFRICA	4,000	2,143	286	2,429	12
	PULSES				
RED PEA - UNIMPROVED - WEST INDIES	700	1,021	363	1,564	3
RED PEA - IMPORTED SEED, U.W.I. - JAMAICA	1,200	1,607	622	2,229	3
RED PEA - COMMERCIAL PRODUCTION - COLOMBIA	1,600	2,334	830	3,164	3
PIGEON PEA - UNIMPROVED - JAMAICA	480	634	248	882	7

	II	III	IV	V	VI
PIGEON PEA - UNIMPROVED - U.W.I. - JAMAICA	1,400	1,850	724	2,574	7
PIGEON PEA - IMPROVED - U.W.I. - JAMAICA	2,400	3,171	1,241	4,412	4
PEANUT - UNIMPROVED - JAMAICA	600	1,010	512	1,522	4
PEANUT - IMPROVED - JAMAICA	1,620	2,729	1,381	4,110	4
PEANUT - COMMERCIAL PRODUCTION - MOROCCO	3,500	5,895	2,984	8,879	4
SOYBEAN - U.S. AVERAGE, 1964	1,650	3,646	1,005	4,651	3
SOYBEAN - TRINIDAD AVERAGE - VARIETAL TRIALS	2,200	4,802	1,341	6,203	3
SOYBEAN - JAMAICA - BEST VARIETY - TRIALS	3,000	6,630	1,828	8,458	3
SOYBEAN - 2 CROPS (U.S.AVG.) 1 CROP CORN (60 bushels)		9,231	3,788	13,009	12
SOYBEAN - CORN - RED PEA ROTATION		9,135	3,939	13,074	12
	ROOT CROPS AND VEGETABLES				
CASSAVA - INTENSIVE PRODUCTION - TRINIDAD - GROSS	10,994	570	1,614	2,184	6
DASHEEN - " " " "	11,582	1,202	1,437	2,638	6
EDDO - " " " "	10,711	1,111	1,329	2,440	6
SWEET POTATO - INTENSIVE PRODUCTION - UNIMPROVED - TRINIDAD - GROSS	2,485	220	347	567	6
SWEET POTATO - IMPROVED PRACTICES - U.W.I. GROSS	6,200	549	866	1,415	6
SWEET POTATO - IMPROVED PRACTICES - U.W.I. MARKETABLE	3,400	301	475	776	6

	II	III	IV	V	VI
TANNIA - INTENSIVE PRODUCTION - TRINIDAD GROSS	10,145	1,053	1,259	2,312	6
YAMS - " " TRINIDAD - GROSS	13,290	1,552	1,750	3,302	7
IRISH POTATO - COMMERCIAL PRODUCTION - JAMAICA - GROSS	9,175	1,011	971	1,982	4
CARROT - JAMAICA - GROSS	7,000	499	392	891	3
CARROT - POTENTIAL	16,350	1,009	878	1,887	3
CABBAGE - INTENSIVE PRODUCTION - TRINIDAD	22,286	1,445	573	2,018	4
WATER CRESS " " "	75,000	7,608	1,879	9,487	3
	C E R E A L S				
CORN - SMALL FARMS - JAMAICA	488	259	236	495	5
CORN - BEST 10 OF 400 SMALL FARMS - JAMAICA	1,506	897	808	1,705	5
CORN - HYBRID - JAMAICA - SINGLE CROP (60 bu.)	3,360	1,939	1,768	3,707	4
CORN - HYBRID - JAMAICA - THREE CROPS (POTENTIAL)	10,080	5,818	5,305	11,123	12
CORN- " - U.S.A. - SINGLE CROP RECORD	17,024	9,825	8,960	18,785	4
RICE - JAMAICA - AVERAGE	1,510	725	843	1,568	5
RICE - GUYANA - AVERAGE	2,050	984	1,144	2,128	5
RICE - SPAIN - AVERAGE	5,930	2,846	3,309	6,155	5
RICE (I.R.I.- 8) - 3 CROPS	15,000	7,200	8,370	15,570	12
WHEAT - MEXICO - AVERAGE	2,470	2,241	1,233	3,474	5

Table II - Total Resource Cost per Acre of Land Utilized for Various Food Crops

COUNTRY	ENTERPRISE	YEAR	Costs per Acre (in $E.C.)		
			Variable Costs	Indirect Costs*	Total Costs
Scotland	Cereals	1965			98
U.S.A.	Soybeans	1967	40	80	120
Jamaica	Hybrid Corn	1967	97.60	62.88	160.48
U.S.A.	Hybrid Corn	1967	103.50	80	183.50
Jamaica	Beef	1962			212-296
Jamaica	Dairy	1967			324-392
Trinidad	Sweet Potatoes	1964	412	60	472
Trinidad	Irish Potatoes	1964-1966-	460-536	60	520-596
Jamaica	Sugar Cane-Estates	1964-1965			529-624
Scotland	Irish Potatoes	1965			642
Trinidad	Yams	1964	669	60	729
Trinidad	Cabbage	1966-1967	696	60	756

*Rent, depreciation, interest.

TABLE III

Average Cost of Foods in the Caribbean as sources of Protein and Calories*

$ E.C. per 3000 Calories +		$ E.C. per 70 grams Protein +
.75	Dry Skim Milk	.18
.66	Pulses (Dry)	.21
1.77	Tripe	.25
.30	Cornmeal - Wheat Flour	.28
1.02	Pigs Trotters	.28
3.60	Saltfish	.35
.39	Rice	.42
.93	Peanuts in shell	.49
.75	Macaroni - Rolled Oats	.53
1.80	Sardines	.63
1.65	Fresh Milk	.70
1.80	Fresh Beef, Goat, Mutton	.70
2.04	Cheddar Cheese	.74
5.40	Fresh Fish	.70
.75	Bread	.70
3.30	Chicken Necks and Backs	.70
3.60	Corned Beef	.70
1.41	Peanut Butter	.77
1.65	Dry Whole Milk	.81
.75	Sweetened Condensed Milk	.81
1.65	Evaporated Milk	.88
2.70	Minced Beef	.88
.75	Ground Provisions	.98
1.20	Fresh Pork	1.23

$ E.C. per 3000 Calories +		$ E.C. per 70 grams Protein +
6.60	Broiler Meat	1.23
1.80	Irish Potatoes	1.40
3.30	Frankfurters, Sausages	1.40
4.80	Fresh Eggs	1.40
.87	Plantain, Green and Ripe Bananas	2.07
18.24	Water Cress ¢	3.64
16.74	Cabbage ¢	7.14
10.38	Carrots ¢	9.10
.27	Sugar	INFINITY
.45	Margarine, Cooking Oil	INFINITY
.99	Butter	INFINITY

NOTE: The price of protein and calories is not additive. For example, 28¢ spent for Cornmeal or wheat flour will purchase 70 grams of protein and 2800 calories.

* Based on 1967 (pre-devaluation) prices obtained in Antigua, Barbados, Dominica, Guyana, Jamaica, Montserrat, St. Lucia, St. Vincent, Trinidad.

\+ Approximate daily allowance for an actively working man.

¢ Current prices - Jamaica.

NUTRITION NEWS AND OPINION FROM THE CARIBBEAN

DEVELOPMENTS AT THE JAMAICA SCHOOL OF AGRICULTURE

Several developments now underday simultaneously at the Jamaica School of Agriculture can be expected to make a significant contribution to agricultural development and a better life for rural families in Jamaica.

JSA has offered only the Diploma Course in Agriculture since its establishment in 1910. This September JSA became co-educational and initiated a program leading to an Associate in Science Degree in Agriculture (A.Sc.). An expansion program, allowing an increase in enrollment from 168 to 485 students, is also underway.

While the diploma course is to be continued, one immediate advantage to the student who takes the A.Sc. is that he will only be required to do one year at the Faculty of Agriculture, UWI to obtain the Bachelor of Science degree.

Girls will be eligible for both the Diploma and Associate in Science degrees. In either program they will do a course similar to the boys but will also do household sciences, food and nutrition. Over thirty girls have enrolled this term. Upon completion of their training, the girls will be uniquely qualified to fill strategic roles such as home extension economists, teachers, in private industry, and as ideal helpmates to progressive Jamaican farmers.

WE'LL NOT RETURN TO MONO-CULTURE

From the 'Guyana Graphic', 5 July 1968. Agriculture Minister Robert Jordan warned yesterday that Government would not encourage farmers to give up the cultivation of other crops and switch to cane farming because of the benefits of the credit system now available through the National Cane Farmers' Committee.

Addressing the inaugural meeting of the committee which is headed by his Permanent Secretary Frank Noel, the Minister said that he was aware that many farmers would be tempted to change over from planting foodstuff crops to planting sugar cane.

"But the Ministry of Agriculture cannot support this because we are pledged to diversification of crops and do not intend to return to mon-culture" he said.

Mr. Jordan declared that Government could not turn the "Nelson Eye" to farmers' taking lands out of food crops and putting them into cane farming.

However, he said cane farmers would benefit from the agricultural credit system which had been carefully worked out and entailed no risk.

Mr. Jordan said the problems which had to be faced in the sugar industry in the past were caused by poor communications rather than ill-will, and many cane farmers were still not quite clear as to why some types of cane fetched better prices than others and why one year the price was better than that of another year.

"The price of sugar will vary from year to year because a certain amount is taken by the United States and a certain amount is taken in the open market. However, much of the dissatisfaction could be avoided in the industry if the small cane farmer understood these factors" the minister explained.

Speaking about the question of protection for the small farmer, the minister suggested that they should ally themselves like the big sugar producers in order to protect themselves with the help of the committee.

The minister also said he hoped the necessary goodwill would exist on all sides and that cane farmers would be able to set up vigilante groups to protect their cane from sabotage.

Mr. Jordan emphasized that in spite of its "ups and downs" sugar could still make a valuable contribution to the Guyana's economy.

* * * * *

CAJANO-QUOTE

"The Caribbean is a happy hunting-ground for every energizer and life-saver in a package"

--- Mr. Sidney King at CFNI's recent conference in Guyana.

NUTRITION SEMINAR IN ST. VINCENT

By courtesy of Department of Education, St. Vincent, and the FAO Nutrition Adviser

A nutrition seminar was held on St. Vincent, August 6 - 10. It was organized by Mr. T. V. Keane, Director of Education, Miss Belle Allen, Home Economics Supervisor and Miss Isabel Foster, FAO Nutrition Adviser.

The seminar was planned for teachers and was attended by other interested persons. Over thirty persons attended throughout the week. Basic nutrition information was presented and related to local conditions. Dr. Antrobus outlined the background and status of nutrition problems on St. Vincent. Mr. Coombs discussed the importance of sanitation in relation to the home and school environment. The group prepared teaching aids which they displayed and evaluated on the final day.

At the end of the week the group expressed the desire to have a follow-up session. This the Department of Education expects to hold during the next school term.

PLUG FOR A FOOD INSTITUTE

From the 'Trinidad Guardian' 23 July 1968. The Trinidad and Tobago Congress has called for the establishment of an "Institute of Technology in Food Processing" attached to the University of the West Indies at St. Augustine. The call was made during the Tripartite Conference at Hilton Hotel, it was reported yesterday.

Congress claimed that a start towards the establishment of the institute could be made immediately and private companies should be asked to contribute to its upkeep in view of the fact that it would serve to study problems of local processing firms.

In a memorandum to the Conference called by Prime Minister Dr. Eric Williams to study the unemployment and retrenchment problems facing the country and to find solutions for these problems, Congress pointed out that such an institute would do research in the processing of all local foods, and would make the information available generally.

Government should encourage the production of processed fruits and vegetables, said Congress, to such an extent that sizeable surpluses would accumulate for export to the Carifta and other markets.

The Central Marketing Agency, it stated, must assist in market research, in grading, packaging, storing and advertising the locally produced products.

"Government must encourage their use by using them themselves and by insisting on their use in all Government institutions, and of course, using the mass communications media to give them an advantage over the foreign product."

"A bureau of standards must protect the consumer. In respect of locally produced foodstuffs,so long as quality is low, prices high and availability uncertain while imports of canned stuff is permitted and is cheap, so long production will be low".

Congress also called for properly organized Fisheries Department for collecting and disseminating information, undertaking research, and to develop a fishing fleet, an efficent marketing system, and the establishment of an Institute of Marine Biology.

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CORRECTION

The names of Miss N. Puga, FAO Expert, Guyana, and Miss M. Keyser, FAO Associate Expert, Guyana, were inadvertently omitted from our list of delegates to the conference held by CFNI in Trinidad in May 1968, on 'Recent Trends in Food and Nutrition in the Caribbean'.

COMING EVENTS

The 14th Scientific Meeting of the Standing Advisory Committee for Medical Research in the British Caribbean will be held in Trinidad, 18th - 21st April, 1969. There will be no special theme of the meeting and suitable papers on any medical or para-medical type will be considered for presentation. Papers should be of ten minutes duration and closing date for entry is 1st March 1969. All communications should be addressed to Dr. D. Picou, Secretary, S.A.C., Medical Research Council, Tropical Metabolism Research Unit, UWI, Mona, Kingston 7, Jamaica.

* * * *

A symposium on investigation and resources of the Caribbean Sea will be held November 18th - 28th at Willemstad, Curacao. The meeting is sponsored jointly by UNESCO, FAO and the World Meteorological Organization, and the host will be the government of the Netherlands Antilles. The symposium's purpose is to review knowledge and indentify new problems in the field of scientific investigations and research on marine resources in the Caribbean and adjacent regions. It will be divided into four main sections covering (1) physics and chemistry of the area and air-sea interaction, including hurrricanes, (2) marine geology, geophysics and mineral resources, (3) marine biology, and (4) fisheries resources.

* * * *

The Food and Agriculture Organization of the United Nations (FAO) will hold its Tenth Regional Latin American Conference in Kingston, 2 - 14 December, 1968.

The regional conferences are held every two years to discuss trends, policies and activities in the field of food and agriculture, including fisheries, forestry and nutrition. The Tenth Conference is being held in collaboration with the Economic Commission for Latin America.

Officials from headquarters in Rome as well as from the Latin American Regional Office in Santiago will be attending.

LEGUME PRODUCTION IN THE CARIBBEAN*

by

R. E. Pierre
Plant Pathologist
Faculty of Agriculture, UWI, Jamaica

Legumes, which are members of the plant family Leguminoseae, are one of the most important plant groups in agriculture. The importance of the legumes is perhaps superceded only by the Gramineae (cereals and grasses). Members of the legume family are used in agriculture for several purposes including forage, covercrops, green manures, grain and as green vegetables (edible pods). Some legumes are good sources of oil, e.g. peanut, soya bean. Others are excellent sources of vegetable proteins and are extensively used for human consumption and livestock feeds. I should point out that while legumes are rich in protein, this protein is sometimes deficient in some essential amino acids e.g. methionine. This quite obviously is an area in which nutritionists and plant breeders can get together, as it is not beyond the realms of possibility to produce new varieties in which such limitations are minimised.

Legumes possess an additional advantage in that, because of a symbiotic relationship with nodule bacteria (Rhizobium sp.), they are able to convert elemental nitrogen from the atmoshere into plant food and are thus widely used for maintaining and increasing soil fertility.

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*A paper presented to the CFNI Seminar on 'Protein Foods for the Caribbean', Georgetown, Guyana, 29th July - August 1st, 1968.

The importance of legumes in agriculture and nutrition, therefore, can hardly be overemphasized, particularly in developing countries of which there are several in the Caribbean area.

In this paper, I shall attempt to assess the demand for some of these legumes in the West Indies*, particularly pigeon pea (Cajanus cajan (L.) Millsp.), bean (Phaseolus vulgaris L.) and soyabean (Glycine max (L.) Merr.) and outline some of the problems associated with local production of these crops.

Some legumes grown and/or consumed in the West Indies

The more important legumes which are grown and/or consumed in the West Indies are listed in Table I. The important species produced in the West Indies are pigeon pea, cowpea, (including black eye and gub gub), lima bean, seim bean, mung bean, dry bean, snap bean and bodi bean. The last two are utilized mainly as vegetables (edible pods) whereas the others are grown mainly for dry seed. In terms of quantity utilized, pigeon pea, bean, garden pea cowpea and soyabean are the most important. Pigeon pea is widely grown and consumed in the West Indies. It is used in the green state, canned and as dry seed. Snap beans (edible pods) and dry beans are consumed throughout the West Indies. The dry beans are grown principally in Jamaica where they are known as red peas. Some cowpeas are also grown, but garden peas and soyabeans are virtually all imported, the former mostly as canned or frozen peas and the latter mainly in the form of oil, soyabean meal and various commercial preparations for human consumption. Attempts have been made to grow garden peas

*Refers in this case to Jamaica, Trinidad and Tobago, Barbados, Windward Islands and Leeward Islands.

in the hilly areas of Jamaica particularly in the cooler months and in some other islands, but the economic feasibility of its production has not been determined with sufficient accuracy. With regard to soyabean, however, it seems possible that a viable soyabean industry may develop in the West Indies in the very near future.

The demand for legumes in the West Indies

Estimates of the production and importation of legumes (excluding soyabean) in Trinidad and Jamaica for the years 1963 to 1966 are given in Table II. From these figures one can estimate the annual consumption of legumes in Trinidad and Jamaica as 15,000 tons (short). An additional 15% of that total may be considered a reasonable estimate of the production and importation into Barbados, the Windward Islands and the Leeward Islands, bringing the total to 17,250 tons.

Using the most recent figures (1966) one finds that pigeon peas and dry beans form 21% and 11% respectively of the total for Jamaica and Trinidad. All the pigeon peas were locally produced but of the 10,600 tons of dry beans utilized in these two islands, only 1,600 tons were produced locally.

If one were to aim solely at eliminating importation of dry beans into Trinidad and Jamaica, an increased area of 18,000 acres would be required, assuming (a) that average yields of 1,000 lbs/acre are obtained, and (b) that there is no increase in demand for this commodity. The second assumption is unlikely to be correct because with an increasing population an increased demand is expected. In fact, one group (1)

estimates a demand of just under 40,000 tons for the area (including Guyana) by 1970, of which some 29,500 tons are expected to be utilized in Trinidad and Jamaica. This means that an even greater acreage will be needed if we are to produce adequate quantities of these legumes locally.

With regard to soyabean, Trinidad imports well over 5,000 tons of soyabean meal annually, and importation of refined and unrefined soyabean oil into the region amounts to well over 450,000 gallons.

In addition, one must not overlook the fact that disease problems - lethal yellowing in Jamaica and red ring disease in the southern Caribbean - now confront the coconut industry of the region. Soyabean in fact could become an important supplementary source of vegetable oil.

The figures given here are not 100% accurate for the simple reason that it is rather difficult to obtain detailed information in these parts. For example, one frequently meets the classification "peas, beans and lentils" which includes everything from split peas to canned garden peas. Many of the figures therefore, have been estimated but in many cases the estimates may be regarded as conservative. Be that as it may, the figues do serve to give an idea of the magnitude of the demand for grain legumes in the West Indies - a demand which is by no means insignificant.

Nutritive value of some legumes grown in the West Indies

The nutritive value of some of the legumes which are produced in the West Indies is given in Table III. The figures are from the publication by Woot-Tsuen et al (7) and are selfexplanatory.

Problems associated with local production of legumes

It is common knowledge that agriculture in the West Indies traditionally has been orientated towards the production of crops for export e.g. sugarcane, cocoa, coconut, banana, citrus, etc. Most of our research efforts until recently have been directed towards the improvement of these export crops. It should not be surprising, therefore, to find that very little attention has been given to the production of food crops and the legumes are no exception. The production of these crops has been left largely to small farmers and backyard gardeners who possess neither the capital, the knowledge nor the skill that is required to produce these crops efficiently.

Fortunately, within recent times there has been an increased awareness of the need for producing highly nutritious foods locally. My own view is that there can be no true impact on food crop production in the West Indies unless some of these crops are elevated from their present status of 'backyard' and 'small farmers' crops to the more extensive system, which traditionally has been associated with crops like sugarcane, cocoa and banana.

The grain legume programme

The grain legume programme was initiated in 1967. The major objective of this programme is to increase the efficiency of production of grain legumes in the West Indies. This we hope to accomplish through a planned programme of intensified research aimed at producing maximum results in the shortest possible time. This programme is being

carried out by the University of the West Indies in association with several of the Ministries and Departments of Agriculture in the Caribbean and has been made possible largely through a grant from the Rockefeller Foundation. Scientists with various areas are participating. In this programme we are primarily concerned with three crops - dry beans (or red pea), pigeon pea and soyabean. The research work on bean began at the initiation of this programme but since 1956, research workers at the UWI have been directing their attention to the improvement of pigeon pea, and work on soyabean was started in 1965. It is noteworthy also that both pigeon pea and bean traditionally have been grown in the West Indies but except for a few sporadic trials, soyabean is virtually new to these parts.

I do not propose to attempt to justify the selection of these particular crops. Let it suffice to say that among the legumes three crops are in greatest demand presently.

Dry bean: Both imported (Red Kidney) and local dry bean types are grown in Jamaica. The local varieties yield approximately 600-700 lbs/acre whereas with the Red Kidney types, yields of 1,000 lbs/acre are obtained if imported, certified seeds are used as planting material.

The main problem, therefore, is that of low yields. Our approach to the improvement of dry bean production was firstly to identify aspects of the traditional system of culture which, with improvements, are likely to result in increased yeilds e.g., variety selection, seed purity, disease-free planting material, disease and pest control, fertilizer requirements, etc. We hope ultimately to improve the traditional system

of cultivation wherever possible, and to develop a system suited to large-scale, mechanized production.

Superficially, it appears that the yield potential of the local varieties is lower than that of the imported types, but this is not necessarily so. There are basically five local varieties (Cockstone, Miss Kelly, Portland Red, Round Red and Long Red), but over the years intercrossing and mixing between these and other types have resulted in a high degree of impurity. Our plant breeder has separated over 15 recognizable types from the original five varieties and many lines are still segregating. With such heterogenous material, it is simply impossible to determine yield potential with any accuracy.

Another major contributary factor to the low average yield is the high incidence of diseases. Several diseases have been observed on beans in Jamaica, many of which are seed-borne (2). One of the main areas in which we are directing our efforts, therefore, is to the production of disease-free planting material.

Pigeon pea: Several problems are associated with pigeon pea production. The main problems may be broadly listed as :-

(a) Uneconomic system of production, and

(b) Seasonal availability of fresh green peas.

Although several factors contribute to the overall uneconomic system of production, undoubtedly the most important of these is the high cost of harvesting. There have been many instances in which the value of the total harvest per man day, has been insufficient to

compensate for a day's work. This feature is attributable largely to the growth characteristics of the plant. The local lines are all tall (5-6 feet or more) and indeterminate in bearing habit, thus making it necessary to harvest several times per crop.

As a result of a breeding programme which started some 12 years ago at the UWI, St. Augustine, we now have five lines which are dwarf (3-4 feet), determinate bearing, pseudo-umbel in growth habit and which produce their pods in terminal clusters (5). The advantages of these new lines from the view point of ease of harvest, are tremendous. In addition, the yield potential of the new lines appears to be more than twice that of the older lines (4); but there are still problems. Indications are that the new lines are just as susceptible to rust, collar and stem canker and wilt as are the old lines, and a recent report indicates that one of these lines is more susceptible to pod borer damage than the traditional lines (6).

The seasonal availability of green pigeon peas, the stage in which it is preferred, is due principally to its photoperiodocity. Here again, the new lines are induced to flower in longer days. The net result is that green pigeon peas become available from these new lines as early as October, as compared with mid-December at the earliest when traditional lines are used.

Soyabean: The main problem with soyabean has been to determine whether or not the crop could be grown successfully in these parts. Of 100 varieties tested which were obtained from various parts of the world,

only seven of these showed promise in Trinidad. One variety F62,3977 from the USA was outstanding in that it consistently produced seed yields of over 2,000 lbs/acre.

In Jamaica, the situation is even more encouraging. Of 64 varieties originally screened, 49 yielded over 2,000 lbs/acre and 19 of these produced over 2,500 lbs/acre (3). Eight of these varieties have now been selected on the basis of yield and growth characteristics for further testing in Jamaica.

In conclusion, I would like to say that the technological problems which confront us are many, but they are not insurmountable. We look forward to being able in the next three years or so to say much more about legume production in these parts.

A much greater problem, in my view, is associated with the attitude of people towards these crops. It is said that legumes are uneconomic to grow. This may, in fact be so, but one finds that these crops have never been given a chance. How can one justifiably compare a crop grown under backyard and peasant-farming conditions with a plantation crop? I think it is time that these crops be given the chance they deserve.

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TABLE I, Some important legumes grown and/or consumed in the West Indies

Botanical Name	Common Name	Remarks
Arachis hypogea	groundnut, peanut	Small plant which buries its pods in the ground. Rich source of vegetable oil (up to 45%). Seeds roasted and eaten or used in confectionery. Grown to a limited extent in W.I.
Cajanus cajan	pigeon pea, gungo pea, congo pea, dhal	Short lived perennial which is often grown as an annual. Drought resistant with deep tap root. Prefers light soil with good drainage. Photoperiodic. Grown throughout the West Indies. Seeds eaten in the green or dry stage.
Cicer arietinum	chick pea, garbanzo bean, chana	Drought resistant. Straw contains oxalic acid. Not grown in the West Indies. Roasted seeds are eaten. Called chana in Trinidad.
Dolichos lab lab	bonavist bean, hyacinth bean, seim bean	Prolific climbing bean which produces flat broad pods. Very many varieties grown in the West Indies. Chiefly a backyard gardener's crop. Eaten as young pods or green and dry seed.
Glycine max	soyabean	Good source of oil and vegetable protein. Several varieties known. Different varieties suitable for various purposes, e.g. forage, oil and vegetable. Not grown to any appreciable extent in the West Indies.
Phaseolus aureus	green gram, mung	Small quantities grown in the West Indies. Used mainly as sprouted seeds particularly by Chinese.
Phaseolus lunatus	lima bean, butter bean	Bush and climbing types. Commonly grown in the West Indies, mainly in backyard gardens. Eaten as green and dry seed.

TABLE 1. (cont'd)

Bontanical Name	Common Names	Remarks
Phaseolus mungo	woolly pyrol, black gram, urdi	Used mainly as dry seed. Small quantities grown in parts of the West Indies.
Phaseolus vulgaris	Salad bean, snap bean, string bean, french bean, dry bean, red pea	Grown through out the West Indies. Many commercial varieties including bush and climbing types. Young green pods are eaten as are the dry seed. Dry beans are grown mostly in Jamaica.
Pisum sativum *Pisum sativum* var. *macrocarpum*	green pea, garden pea, sugar pea	Rarely grown in the West Indies. Small quantities produced in cool season. Whole pods or seeds eaten.
Vigna sinensis	cow pea, black eye pea, southern pea, gub-gub	Small quantities grown throughout the West Indies. Used mostly as dry seed.
Vigna sesquipedalis	yard long bean, bodi bean	Number of types known including bush and runner. Length of pods varies tremendously. Grown in many parts of the West Indies, especially in the wet season. Young pods eaten.

TABLE II. Estimates of production and importation of grain legumes in Trinidad and Jamaica

(all figures in short tons)

Year	Pigeon pea		Dry Bean				Others (a)				Total
			LOCAL		IMPORTED		LOCAL		IMPORTED		
	T/DAD	JAM.	T/DAD	JAM.	T/DAD	JAM.	T/DAD	JAM.	T/DAD	JAM.	
1963	805	800	-	650	5,943	2,324	-	-	2,393	997	13,912
1964	962	1,200	-	653	5,444	3,217	-	250	3,185	1,379	16,290
1965	2,004	1,000	-	781	4,320	2,321	-	280	137	995	11,838
1966	1,301	1,800	-	1,600	7,627	1,360	-	500	376	146	14,710

(a) Others include garden pea, lentil, split pea, cowpea, lima bean, bonavist bean etc.

TABLE III. Food value of some legumes grown in the Caribbean (per 100 gm)

			Water	Energy	Protein	Fat	Total Carbohydrate	Fibre	Ash	Calcium	Phosphorus	Iron	Vitamin A.	Thiamine	Riboflavin	Niacin	Ascorbic Acid
			%	Cal	gm	gm	gm	gm	gm	mg	mg	mg	IV	mg	mg	mg	mg
1.	Cajanus cajan	pigeon pea	(B) 70.3	114	7.0	0.6	20.8	3.3	1.3	32	122	1.5	70	0.37	0.18	2.3	43
2.	Dolichos lab-lab	hyacinth bean	(A) 11.8	338	22.2	1.5	61	6.8	3.5	88	395	3.5	-	0.62	0.2	2.3	-
			89	35	2.8	0.3	7.1	1.8	0.8	62	58	1.0	1260	0.1	0.14	0.9	21
3.	Glycine max	soya bean	(B) 67.0	119	12.5	6.5	12.5	1.5	1.5	79	265	3.3	700	0.37	0.15	1.4	30
			(C) 7.5	331	34.9	18.1	34.8	5.0	4.7	227	586	8.0	110	1.07	0.31	2.3	Trace
4.	Phaseolus lunatus		(B) 66.5	128	7.5	0.8	23.5	1.5	1.7	63	158	2.3	280	0.21	0.11	1.4	32
5.	Phaseolus vulgaris	dry beans (Red Kidney)	(C) 12.2	336	23.1	1.7	59.4	3.5	3.6	163	437	6.9	-	0.57	0.22	2.5	2
6.	Phaseolus vulgaris	snap bean	(A) 88.9	35	2.4	0.2	7.7	1.4	0.8	65	44	1.1	630	0.08	0.11	0.5	19
7.	Pisum sativum	garden pea	(B) 74.3	98	6.7	0.4	17.7	2.2	0.9	22	122	1.9	680	0.34	0.16	2.7	26
8.	Pisum sativum var.macrocarpum	sugar pea	(A) 83.3	53	3.4	0.2	12	1.2	1.1	62	90	0.7	680	0.28	0.12	-	21

TABLE III. Food value of some legumes grown in the Caribbean (per 100 gm) (cont'd)

		Water	Energy	Protein	Fat	Total Carbohydrate	Fibre	Ash	Calcium	Phosphorus	Iron	Vitamin A.	Thiamine	Riboflavin	Niacin	Ascorbic Acid
		%	Cal	gm	gm	gm	gm	gm	mg	mg	mg	IV	mg	mg	mg	mg
9. *Vigna sinensis*	cowpea	(C) 10.6	342	22.9	1.4	61.6	4.2	3.5	77	451	6.5	30	0.92	0.16	2.2	2
10. *Vigna sp.*	cowpea	(A) 86.2	44	3.4	0.3	9.2	1.8	0.9	53	65	1.1	1670	0.16	0.1	1.1	34

A - Young pods

B - Green seed

C - Dry seed

GENERAL NUTRITION NEWS AND OPINION

A SALUTE TO LA LECHE LEAGUE INTERNATIONAL

From The Journal of Pediatrics, July 1968, Vol.73, page 161.

This summer, July 17, 18, and 19, over 1,000 women and some 400 babies are expected to attend a convention in Denver, Colorado. Its purpose? The promotion of breast-feeding! The women, of course, are members of La Leche League International, and the 400 babies, presumably, will present dramatic testimonial of successful maternal nursing.

Probably most pediatricians have at least heard of LLLI and know in general that it is an organization of women, experienced in the techniques of breast-feeding, who are interested in encouraging other mothers to nurse their babies. But many may not be familiar with its origin, objectives, and rather phenomenal growth in the few years it has been in operation. Even the name needs some explaining.

La Leche (lay-chay) is taken from a Spanish title of the Mother of Christ: "Nuestra Senora de La Leche y Buen Parto" - "Our Lady of Happy Delivery and Plentiful Milk". La Leche literally means "the milk" and the principal concern of LLLI is good mothering through the promotion of breast-feeding the world over.

The League came into being in 1956 when two young mothers attended a picnic in Franklin Park, Illinois. They brought their nursing babies with them, and as they chatted with other women, some of whom

were young brides and some of whom were mothers who had been unsuccessful in nursing, they unconcernedly and happily nursed their infants. Many questions and answers went back and forth and the idea took root that this mother-to-mother and mother-to-prospective-mother exchange might be expanded and developed into something worthwhile.

A group was formed and from this small beginning 12 years ago there are now chapters in many states of this nation, including Hawaii and Alaska, and in six foreign countries. Headquarters was established in Franklin Park, Illinois. A Medical Advisory Board was set up which is consulted for editorial approval of materials, breast-feeding research, and medical problems. A number of nationally known pediatricians serve on the Board.

La Leche stresses the importance of meetings in which mothers interested in nursing can share other mothers' experiences, and be provided with pertinent reading material. The most important publication of the League is a 166 page illustrated book entitled "The womanly art of breast-feeding." Techniques essential for successful nursing are thoroughly set forth in this small volume. In addition, the League publishes a bi-monthly newsletter relating the experiences of nursing mothers and babies.

What has been said is but a brief and sketchy account of this unique organization. That its program is meeting a need is clearly demonstrated by its rapid growth and by the recognition it has achieved in the short time it has been in existence.

Perhaps the medical and nursing professions should feel some embarrassment that under their guidance breast-feeding has been permitted to decline to the low incidence of 25 per cent, when it has been repeatedly demonstrated that the majority of women can nurse their babies if they wish. The reason seems clear. Formula feeding has become so simple, safe, and uniformly successful that breast-feeding no longer seems worth the bother. This is in sharp contrast to the situation at the beginning of the century when the mortality rate among bottle-fed infants was high. Then every effort was made to secure human milk for babies. Wet nursing was almost a profession. Most nurses in the obstetrical nursery were taught the technique of manual expression of milk from the breast. Breast-milk banks were in operation in most of the larger cities of the nation. But as the problems of contaminated milk, vitamin deficiencies, curd tensions, composition of formulas, and protein and calorie requirements became solved, all of this changed. Now wet nursing has disappeared, there are probably few nurses in the country who know how to milk the human breast, and breast-milk banks have long since gone out of existence.

The techniques of formula feeding have received major attention, while the techniques of breast-feeding have faded into the background. Now a dedicated women's organization has taken on the task of attempting to restore what is called by some, "the lost art of breast-feeding." Certainly their efforts deserve the commendation of the medical and nursing professions.

The JOURNAL OF PEDIATRICS takes pleasure in wishing LLLI a most successful convention and for continuing success in its goal of "good mothering through breast-feeding the world over".

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NEW US FOOD PLAN STRESSES VOLUNTARY POPULATION PROGRAMS

From USIS Bulletin, 2 August 1968. WASHINGTON -- The United States made good its pledge to help nations who help themselves when President Johnson signed a two-year extension of the Food for Freedom Act this week.

With the program extension, the Federal government is authorized to continue food shipments to developing nations at a rate allowing spending of more than 6,200 million dollars over the two-year period.

One of the most important provisions of the bill is an amendment which earmarks not less than five percent of foreign currencies received in return for food aid shipments for family planning programs. The host government would have to request such use of the funds and the programs would have to be voluntary.

Another amendment to the bill will specifically authosizes use of foreign currencies for rodent, weed, insect and other plant and animal pest control. This authority existed only in general terms before.

FOOT-AND-MOUTH DISEASE ERADICATION CAMPAIGN

The Inter-American Development Bank (IDB) and the Pan-American Health Organization recently joined to start a campaign aimed at the eradication of foot-and-mouth disease in South America. IDB is lending almost 50 million dollars to the programme, which is to take between ten and twenty years.

READER'S LETTER

From Dr. W. J. Branday, Medical Officer of Health, Parish of St. Mary, Jamaica.

Dear Sir,

I believe that there are two ways in which the diets of Jamaicans may be improved, which have not been fully examined; these are (a) the use of the Black River swamps, and (b) the breeding of fresh water fish in rivers, and the establishment of shell fish farms in shallow coastal waters and inland ponds.

The area of the Black River swamps is considerable, and are not used; the introduction of water buffallo should be considered, as this would add to the fertility of the swamp and encourage the growing of rice; meat and rice, both most valuable foods, would be produced. Alligators breed in the swamps, but it should be possible to control these and permit the water buffalo to breed well. Rice is one of the best foods; indeed about one thousand million people, one-third of the population of the world, live on a diet of little more than rice alone.

It may be difficult to establish fish in fresh water ponds and rivers, but success should be possible, and the result would be an excellent addition to the diets of considerable numbers of persons. Once established, the fish should be regarded as wild animals and

public property, to be caught and eaten by any who wish to do so. In the issue of "Cajanus" (No.2) for April, page 48, there is a description of the growing of lobsters, oysters, clams and shrimps in bays and estuaries, and the building of tidal ponds in mangrove swamps; it is stated that shellfish farms can be started without large cash investment and with unskilled labour. There are large areas of such waters in many parts of the island, and the possibility of using some of them for this purpose should be studied at once.

It has always been known that diets of Jamaicans do not provide enough energy and are deficient in some of the constituents of foods which are needed for good health and normal development and growth. In the ways suggested, considerable improvement could be effected, at reasonable cost, by the use of facilities which exist but are neglected. These changes should be considered by those persons who have the knowledge, and should be called to the attention of those who can give the necessary directions.

Yours etc.
W. J. Branday

WHAT THE PUBLIC HEALTH INSPECTOR COULD DO TO PREVENT MALNUTRITION*

The work of Public Health Inspectors already indirectly contributes to the prevention of malnutrition in several ways. Firstly, wherever their endeavours to improve environmental sanitation and water supply are successful, these successes must result in a decrease in the incidence of roundworm, hookworm, gastro-enteritis and dysentery. Roundworm and gastro-enteritis are, in the Caribbean and elsewhere, very common precipitators of severe malnutrition and in general have a marked detrimental effect on the nutrition of pre-school children. Similarly, hookworm and dysentery promote anaemia and undernutrition at all ages. In another way also, the Public Health Inspector makes a direct contribution to better nutrition, in efforts to ensure the clean preparation and handling of food, and in a few cases exercises some control over food quality, e.g. in enforcing standards which prevent dilution of milk.

Further than this, can, and should, the Public Health Inspector make a more direct impact on the prevention of malnutrition? We believe that he both can and should do so. He ought to do so for two reasons:

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* This artilce does not represent a definitive statement of CFNI's views on Infant Feeding. Such a statement awaits more comprehensive consultation with colleagues in the Caribbean than has been possible hitherto.

(a) The modern concept of the Public Health Inspector, as opposed to the old Sanitary Inspector, is that he has a general concern where possible and appropriate, with all major public health problems, rather than concentrating on the performance of a relatively restricted range of functions usually related to enforcement of legislation. This is far from saying that these traditional special functions of the Public Health Inspector are not important, but when the Inspector can in the course of his duties perform other functions related to enlightening and educating the public in health matters, he should do so. Indeed many if not most Public Health Inspectors wish to bury once and for all the old image of being a sort of sanitary law enforcement officer whose visits are most unwelcome, and would prefer to be seen as offering guidance and assistance to the family and community in health problems.

(b) There is a shortage of trained personnel in the health services of the Caribbean countries, including a shortage of Public Health Inspectors themselves. In many countries Public Health Nurses, for example, are not numerous enough to carry out the enormous amount of home visiting which is necessary. On the other hand many Public Health Inspectors spend as much as three-quarters of their duty hours in

visiting homes, especially homes of people whose socio-economic circumstances are poor and from which almost all cases of malnutrition arise. It is only sensible that, in circumstances of shortage of personnel on the one hand and opportunity on the other, the very rigid division of functions should be avoided, and that the Public Health Inspector should, where he sees it is plainly needed, offer some words of advice concerning child care and nutrition, or where necessary offer to facilitate admission to hospital.

What knowledge does the Public Health Inspector require in order to be able to exercise such functions?

He should be able to recognize malnutrition of such a severity that admission to hospital is indicated. This means that he ought to recognize the features of kwashiorkor and severe marasmus. He should also recognize the difference between the normally nourished child and these children, more numerous by far than severe cases, who are suffering from mild-moderate protein calorie malnutrition. These mild-moderately malnourished children are the ones who are highly vulnerable in the sense that they will suffer from infectious diseases more frequently and with greater severity, and are susceptible through this and the continuation of inadequate feeding to the onset of severe malnutrition.

How does one recognize the varying degrees of malnutrition?

The Public Health Inspector ought to be given opportunity to see various degrees of protein-calorie malnutrition in hospitals and

in clinics, together with numerous films, slides and photographs of such children, until familiarity with the features of the conditions enables him to recognize malnutrition and roughly assess its degree when he comes across it in the course of his work. However, many Public Health Inspectors who take a general interest in public health already have some knowledge of malnutrition, and what may help here is to give an account of the signs of various degrees and kinds of protein-calorie malnutrition, so as to enable the Inspector to classify the severity of the case with more confidence. We will only mention here those signs which are visible on simple inspection of the child and do not require a regular clinical examination and measurement.

There are two main forms of severe malnutrition, kwashiorkor and severe marasmus. These forms, however, are not mutually exclusive and it is quite common to find children with features of both.

Signs of Kwashiorkor

1. Essential signs, always present -

   (a) oedema, pitting on pressure, usually confined to the feet and lower legs but sometimes also affecting the arms and even face,

   (b) wasted muscles, with some subcutaneous fat remaining however, so that this fat and the oedema may even lead to a deceptive appearance of fatness to the untutored eye.

2. Signs usually present, rarely absent -

   (a) intense misery, no smiles, no interest in people or playthings;

   (b) changes in the hair, which is lighter in colour than normal; maybe reddish, sparse, more straight than usual, easily pluckable;

   (c) light colour of skin.

3. Signs sometimes present -

   (a) skin condition such as "flaky-paint","crazy pavement" rash, ulcers and cracks, especially cracks around the ears;

   (b) anaemia, judged by very pale conjunctivae and nail beds;

   (c) signs of associated vitamin deficiencies, such as cracks at the angles of the mouth, smooth red tongue.

Diagnosis is made not from the presence of any one of the signs, but from oedema plus some of the other signs.

Signs of severe Marasmus

1. Sign always present -

   (a) Gross wasting both of muscles and subcutaneous leading to the child looking as if he were all skin and bone. The skin is in loose folds, especially around the groin, buttocks and axillae;

   (b) because his own muscle and fat has been consumed by the child to keep alive, but some bone already formed remains,

this leads to his having limbs and hands and feet which seem to be all out of proportion, far too long as well as just thin.

2. Signs sometimes present -

(a) the same hair changes as in kwashiorkor, usually not so pronounced;

(b) associated vitamin deficiency signs;

(c) misery.

Both marasmic and kwashiorkor children have a rather "jowelly" appearance, as the muscles of the cheeks with which a child sucks are the last to disappear, and so seem especially prominent.

The "marasmic-kwashiorkor" child usually looks like a case of marasmus in all respects except for the fact that he has oedema.

Both marasmic and kwashiorkor children are suffering not only from growth-failure but usually are retarded in their "milestones", i.e. are not sitting-up by six months old, not standing by ten months and not walking by fourteen months.

Signs of mild-moderate Malnutrition

These children usually show some of the signs above in a modified degree, One of the most easily noticed is the hair signs, and also a generalised thinness of the limbs, often with the ribs visible and perhaps some loose folds of skin at axillae or at least flattening of the buttocks, without looking like the dreadful "skin and bones" or "Belsen victim" or "Oxfam picture" which denotes severe marasmus. It is really a matter of degree.

The milk-moderate case is one which appears as intermediate between the normal healthy podginess of the young child and the severe signs of malnutrition.

What then can the Public Health Inspector do?

In the case of severe malnutrition (kwashiorkor or severe marasmus) he should not hesitate to advise the mother to take the child to hospital. There are hospital facilities for such children in every Caribbean country, and as the child may be unlikely to get better without close medical supervision, admission to hospital is the only logical action. The effort of the Public Health Inspector in these severe cases is therefore confined to persuading the mother to take the child to hospital.

It is in the case of mild-moderate malnutrition where the Public Health Inspector can exert a most beneficial effect in prevention. Such cases are ten to twenty times more numerous than severe cases, and commonly include 10 to 20 per cent of the children aged six months to two or three years. He can make a real effort in improving the nutritional state of these children in two ways.

1. Point out to the mother (or guardian) the importance of taking the child regularly to the nearest Child Welfare Clinic, stressing the advantages she could receive for the child in the way of checking on the child's progress, possible assistance with powdered milk, and immunization to protect the child from some dangerous diseases.

2. Advise the mother, or whoever is caring for the child, on certain general and particular points about the feeding of the child.

What advice should the Public Health Inspector give the mother? Let us consider first the main factors leading to inadequate feeding of the infant and young child, and the advice will follow from this.

<u>What are the main factors leading to improper and inadequate feeding of the infant and young child?</u>

1. Early weaning from the breast is one of the commonest factors responsible for malnutrition in young children. This is resorted to for one or more of the following reasons:

(a) Mother does not realize the value of breast milk for the young child. Superimposed on this is the relentless onslaught of advertisers extolling the value of expensive proprietary infant milks. In addition there may be the mother's lack of confidence in her ability to successfully breast feed her child.

(b) The need for mothers to seek employment outside the home, which means often the child has to be left in the care of an older sibling or neighbour where interest and knowledge of child care may be minimal, often results in improper and inadequate feeding of the child. Poor food hygiene or environmental sanitation, introducing the element of infection, leads to gastro-enteritis which is one of the

chief precipators of malnutrition. Bottle feeding, and insufficient care as to proper cleansing and sterilisation of bottle, further increases the chances of infection. Poverty and inability to get sufficient quantities of the relatively expensive proprietary infant feeds used results in overdilute feeds and inadequate feeding.

2. Lack of knowledge as to (a) the nutritional needs of young child, (b) nutritional value of available foods and proper child feeding results in late supplementary feeding, poor choice of supplementary foods and inappropriate meal pattern.

The largest proportion of the most nutritious part of any meal, particularly the scarce protein items, is generally given to the adult male member of the household, and pre-school children get the least. Most often the child is transferred to the family diet of a single meal each day supplemented with a series of drinks of herb tea of negligible nutritional value. This pattern does not allow the child's requirements for the day to be met, and undernutrition and/or malnutrition results.

The incorrect knowledge and ill-founded attitudes of the community about feeding of children, and other practices adversely affecting nutrition of children, are also responsible for malnutrition. For example, it is believed that "a little tinned food" is good for the child, with the result that expensive tinned proprietary foods are purchased in preference to the polythene-packed packets of skimmed

milk powder which is inexpensive. Potatoes and chocho are considered most desirable foods in infant feeding, whereas peas and beans, protein rich foods, are considered unsuitable for young children. Sauce of meat and fish is given to young children rather than the food itself, thus withholding nutritious items that might be accessible to the child.

3. Other detrimental practices stem from erroneous ideas. For example, egg white, which parents see given in hospitals to children with acute gastro-enteritis, is taken as the cure-all for illness of any kind, and many children admitted to hospital are found to have a dietary history of having been fed egg-white for a week or ten days prior to admission. There is also the widely prevalent practice of giving mainly herb teas for varying periods of five to nine days, followed by purgatives, as a prerequisite for weaning the child from the breast.

What are the main points in the advice to be given concerning feeding the young child?

1. The excellence of breast milk as an ideal food for infants and young children should be pointed out andevery effort made to encourage mothers to breast feed their children as long as possible. From the age of four months, however, there will be need to supplement breast milk which will still remain an excellent food, but will at this age be inadequate as the only source of nourishment.

2. In cases where circumstances necessitate bottle feeding the child, ensure that the mother receives instructions as to adequate and appropriate feeding (appropriate quantity of milk powder and desirable dilution) of child. Simplified instructions on this subject are indicated in Tables I and II. Emphasize the desirability of using cup and spoon to feed thechild rather than the bottle as it is much easier to keep the former clean. Much more effort and resources are needed to keep bottle and nipple clean.

TABLE I: SIMPLIFIED USE OF COW'S MILK AND ITS PREPARATIONS IN THE FEEDING OF BABIES UP TO THREE MONTHS OF AGE

Fresh Cow's Milk	Full Cream Powdered	Evaporated Milk
Dilution ... 2 parts boiled milk + 1 part boiled water	1 level teaspoon milk powder + 1 fluid ounce boiled water	1 part evaporated milk + 3 parts boiled water
Add sugar ... 1 level teaspoon household sugar per feeding		
Calculate Daily Volume -	2½ fluid ounces per lb. body weight per day	
Calculate Volume per feed -	One-fifth of daily total at each of five feedings at 4-hourly intervals	

TABLE II: SIMPLIFIED USE OF COW'S MILK AND ITS PREPARATIONS IN THE FEEDING OF INFANTS OVER THREE MONTHS OF AGE

Fresh Cow's Milk	Full Cream Powdered Milk	Evaporated Milk
Dilution.... Undiluted boiled milk	1 rounded teaspoon milk + 1 fluid ounce boiled water	1 part evaporated milk + 2 parts boiled water
Add Sugar ... 1 level teaspoonful household sugar per feeding		
Calculate Daily Volume -		
Calculate Volume per feeding - One-fifth of daily total at each five feedings at 4-hourly intervals		

From "Child Nutrition in Developing Countries" by D. B. Jelliffe, US Government Printing Office, Washington D.C., 1968.

Until three months of age, the cheapest full cream milk available on the market may be used, and after three months dried skim milk powder provides best value for money. If skimmed milk powder used is not fortified with Vitamin A, a supplement of either cooked and mashed yellow vegetable or fruit such as pumpkin, carrot, papaya, or mango or cooked and mashed dark green leafy vegetables, such as callaloo, or pusley, should be given.

3. Supplementary feeding should be started from four months onwards. As the child has greatest need for protein, small amounts of well-cooked mashed peas or beans may be given along with small quantities of boned mashed fish or scraped meat, and eggs. In addition to this well-cooked and mashed yellow or dark green leafy vegetables should be given.

4. The need for observing elementary rules of hygiene in food preparation, and the desirability of keeping the home and surroundings clean, should be emphasized.

5. An attempt should be made to explain to the mother that the child's needs, particularly for the valuable protein items, are greater than all others and special effort should be made to cater to this need.

6. Mother should be advised on better spacing of meals than is often the case; e.g. a practical pattern to aim at, would be a breakfast of porridge with some skimmed milk powder, a midday meal which includes vegetable proteins and a little animal protein, and some dark green leafy vegetable, and an evening meal of the same order.

7. Traditional weaning practices, such as herb teas followed by purgatives, should be discouraged.

8. In view of the great need for protein, and the inadequate financial resources of many families, it is necessary to find and use the most economic source of protein. Skimmed milk powder provides the best source of protein for money expended. Every effort should be made to encourage the use of this commodity in as many possible ways. e.g. some milk powder could be mixed into porridge or mashed into any of the other foods that are fed to the child.

Failure of Lactation

Although many reasons are given for failure of lactation, very often the real underlying reason is anxiety and lack of confidence on the part of the mother in her ability to successfully breast feed the child, and this worry leads to failure of the let-down reflex.

This anxiety is to some extent generated and/or reinforced by advertisement and the opinions of neighbours and relatives, constantly advocating alternatives to breast-feeding. This creates doubt in the mother's mind.

Once the let-down reflex is not operating properly because of this anxiety, and when the breast is not emptied properly on account of the supplementary bottle feed being given, this itself leads to such troubles as cracked nipples, engorgement and breast abscess, setting up a vicious circle which ends in the abandonment of breast feeding.

What can one do to help a woman worried about her ability to breast feed?

a) Try to reassure her, encourage her, tell her that worrying about it makes things worse.

b) Advise her to eat well, drink well and avoid getting over-tired.

c) Advise her to "drink milk to make milk".

This may be as much a psychological as a nutritional help to lactation, but is worth trying nevertheless.

Written by Staff of the Caribbean Food and Nutrition Institute, August 1968, for the Sixth Course for Senior Public Health Inspectors, 1968, held in Kingston Jamaica.

YOUR QUESTIONS ANSWERED*

Q. Since the land area of the Caribbean is limited, it appears that any significant increase in food production will be at the expense of agricultural exports. If this is the case, will there be anything gained?

A. The food production situation is certainly much less serious than this question implies! Significant increases in production of both food and export crops can be achieved on present acreage if available knowledge could be applied. Thus, although land now in export crops would need to be diverted to food crops for the Caribbean countries to be self-sufficient for the present population, more intensive production on the remaining areas would permit present levels of agricultural exports.

* * * *

Q. How can we break the vicious circle of little money - little in the way of nutritious food - low productivity - little money, which plagues all efforts to improve the lot of the poor?

A. This certainly is a question which would take a long time to answer fully even if one could do so. One can only make some general suggestions concerning each link in the chain.

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*These questions were among those raised at an "Any Questions" session at CFNI's conference in Trinidad in May and not answered then for lack of time.

(a) Little money - little nutritious food. Two things would help here. Firstly, education of the consumer in how to obtain the maximum nutritional value for the lowest cost. When we think of the money spent in prestigious brands of imported food in preference to the cheaper better-value local product (e.g. cornmeal, rice) or on tonic foods, we see how much this is needed. Secondly, home gardens could produce much more in the way of nutritious food, especially legumes, than they do at present.

(b) Little nutritious food - low productivity. The provision of nourishing mid-day meal by all large employers would almost certainly raise productivity. The Mordecai Commission emphasized low nutritional status as one of the main reasons for the low productivity of the Jamaican sugar industry, but to a large extent the answer lies in the hands of the estate owners themselves. Field kitchens serve armies well, and there is no reason why they should not be a <u>profitable</u> investment for employers. Construction workers and industrial workers are other categories who would benefit from this. An industrial health service aimed at least at preventing productivity-lowering diseases (e.g. hookworm) should accompany industrial and agricultural canteen programmes.

(c) Low productivity - little wages. This is a problem for the economist, trade unionist, politicians and employers.

A layman in these matters can only say that it would seem very desriable that increases in wages should accompany and be directly related to increases in productivity, and the worker should see this mechanism in action. The means might be piece-work, productivity bonuses, profit-sharing or partial worker ownership. However, these are problems for others than nutritionists.

* * * *

Q. The raising of goats for milk and meat on the scale of at least one goat per family has been advocated. Goat raising is usually associated with soil erosion. Would it, therefore, really be advantageous to this area?

A. Certainly the milk and meat produced by goats could make a significant contribution to the diet of families with small plot of land. Nevertheless, unless confined, goats will rapidly denude land where forage is limited, and soil erosion results. For this reason, goats should not be promoted unless one is assured that they will be properly cared for and controlled. The introduction of goats through 4-H clubs might be an appropriate means of obtaining the desired nutritional benefits without endangering the natural resources of the area.

* * * *

Q. What would be the main features of an effective Child Welfare Service?

A. There are two aspects of effectiveness in a child welfare service. The first is that the rate of attendance and re-attendance should be high, so that the majority of children are brought at the required regular intervals. The second is that when the child is brought, then what happens in the clinic should be related to his needs, as the mother understands them as well as from the point of view of the public health service.

Features which would help to attain these ends include -

1. Accessibility, so that the majority of mothers can reach the clinics or clinic sites without too much expense or inconvenience.

2. Shorter waiting period, by having the mothers come in groups at intervals throughout the session, and not all together at the beginning. Where there is no clerical staff for sorting out records, then the mother can keep the records of her children and bring them to clinic each time.

3. The use for each child of a weight-for-age chart covering the first three years of a child's life is essential. Only by using such a chart can early malnutrition be detected in time for preventive measures. It also serves to sort out the 'at risk' child, who should be given more time and attention, from others, thus improving efficiency and cutting down waiting time.

Nurses however must be specifically trained to weigh children and plot the chart properly.

4. The use of the weight chart and the consequent knowledge of the child's progress in relation to past growth performance enables the individual nurse-to-mother guidance to be related to the individual child's needs at the time. There should be ample time for such instruction. Advice should include referral to Family Planning Services where appropriate.

5. There should be facilities at the clinic for the treatment by the nurse of most common minor ailments of childhood and the means for immediate referral to medical aid of more serious illnesses. One way of achieving this is to have a physician attend regularly some part of the session, not necessarily for more than 15 - 60 minutes, but enough to enable the more sick child to be dealt with on the spot.

6. The full range of immunizations should be offered at each clinic.

7. Supplementary foods, such as DSM, should be distributed to the 'at-risk' child and the children with mild-moderate PCM rather than as a general dole. They should be pre-packed, if necessary by clinic staff, in polythene packets to save clinic time.

8. Finally, the nurse should hold short sessions of group health-education; and

9. Staffing ought to be such that there is some time for home visiting, particularly to encourage attendance of the mother of the 'at-risk' child who does not come to clinic regularly.

NEWS OF CFNI ACTIVITIES

The June issue of the Journal of Tropical Pediatrics is a special 'Caribbean Food and Nutrition Institute issue'. It is devoted completely to work done at the Institute since its inception last year, both by CFNI staff and by a visiting research worker. The latter, Mrs. A. Fonaroff, is one of several research workers from the USA or Puerto Rico who have made CFNI their headquarters while conducting investigations here. Her paper "Differential Concepts of Protein-Calorie Malnutrition in Jamaica: An Exploratory Study of Information and Beliefs" is published in this issue as a Monograph, fourth in a series put out by the Journal of Tropical Pediatrics over the last few years. The journal may be of interest to our medical readers, and information concerning subscriptions can be obtained from the Editor of Cajanus.

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Liaison has been established between CFNI and UN Special Fund/Ministry of Agriculture Groundwater Research and Survey Project in Jamaica. The project involves a feasibility study of the economics of a proposed irrigation scheme for two agricultural areas of the country where small holdings predominate. Assistance

of CFNI has been obtained in determining the nutritional implications of the current and alternative cropping systems. Data obtained from the detailed agricultural and sociological survey of the families involved should provide considerable new information about attitudes to foods and to changes in farming practices in rural Jamaica.

From July 29 to August 1 inclusive, CFNI held a conference at the Technical Institute, Georgetown, Guyana in 'Protein Foods for the Caribbean'. The conference was opened by the Guyana Minister of Agriculture and the Minister of Health also spoke at the opening ceremony. Mrs. Burnham, wife of the Prime Minister, attended the closing session. CFNI is very grateful to members and officials of the Guyana Government for their support and assistance in holding this seminar and also to their colleagues in PAHO, FAO and UNDP in the area for their help.

The proceedings of this conference will be published eventually in book form. In the next issue of Cajanus the conclusions of the conference will be published, when they have been approved by members of the sub-committee of delegates elected for that purpose.

A list of the titles and authors of papers presented is appended here as follows:

Session I - Background: Food and Nutrition in the Caribbean

Nature and Scope of Nutrition Problems - Dr. F. Ramsey, Paediatric Specialist, Ministry of Health, Barbados.

Socio-economic Factors Affecting Agricultural Production - Mr. Nityanand, Economist, Ministry of Agriculture, Guyana.

Session II - The Importance of Establishing Government Food and Nutrition Policy

Health in Nutrition Policy - Dr. J. G. Chopra, Nutrition Section, PAHO, Washington.

Nutrition in Food Policy and Planning - Dr. J. McKigney, CFNI.

Incorporating Nutrition Policy in Agricultural Palnning - Mr. M. El Moghazi, Planning Advisor, Ministry of Agriculture, Jamaica.

Marketing - Means of Stimulating Increased Protein Production - Mr. T. Skinner, General Manager, Central Marketing Production Agency, Trinidad.

Session III & IV - Availability of Protein Resources for Adequate Nutrition

Protein Supplies for the Caribbean, Present and Projected: Animal Protein - Prof. P. Mahedevan, Dean, Faculty of Agriculture, UWI.

Fish Resources - Mr. J. Dibbs, Caribbean Fisheries Development Project, Barbados.

Programme to Increase Protein Production in Trinidad - Dr. O. Gonzalez, Chief Technical Officer, Ministry of Agriculture, Trinidad.

Staple Crop Production -
Mr. P. Haynes, Department of Crop Science,
Faculty of Agriculture, UWI, Trinidad.

Rice -
Dr. M. Pawar, FAO Advisor on Rice Genetics, Guyana.

Legumes -
Dr. R. E. Pierre, Grain Legume Programme,
Faculty of Agriculture, UWI, Jamaica.

Home Production of a Protein Infant Food -
Dr. D. B. Jelliffe, CFNI.

Seeking Additional Markets for Traditional Foods: Jamaica -
Mr. D. Evans, Industrial Development Corporation, Jamaica.

Guyana -
Mr. S. King, Guyana Marketing Corporation.

Diversification of Agriculture:

Barbados. Mr. E.G.B. Gooding, Barbados Sugar Producers Assn.

Guyana. Mr. J. Dummett, Guyana Development Corporation

Jamaica. Mr. W. Knowles, Caymanas Estates, Jamaica.

Session V - Protein Foods, Past Experiences and World Developments

Oil seed Proteins -
Dr. Max Milner, Food Conservation Division,
UNICEF.

Amino Acid Supplementation of Foods -
Dr. D. Rosenfield, International Agricultural Development Service, USDA.

Fish Protein Concentrate and other Recent Developments -
Papers by - Dr. L. Brinkman, Research Biochemist, PAHO
Mr. J. Dibbs, Caribbean Fisheries Development Project, USAID
Mr. G. Parman, Office of Food from the Sea, USAID.
Mr. B. Weinberg, Department of Industry, Canada.

Sessions VI & VII - Development, Formulation and Testing of Protein Mixtures

Past Experience -
the late Dr. Z. Kertesz, former Secretary, FAO/WHO/UNICEF Protein Advisory Group.

Current Concepts of Testing -
Dr. K. King, Asst. Vice- President, Williams-Waterman Program.

Cultural Adaptations and Acceptability -
Dr. S. Reddy, CFNI.

Testing High Protein Mixtures for Nutritional Adequacy -
Dr. R. Bressani, INCAP, Guatemala.

Use of Protein Mixtures in Community Nutrition Programmes -
Dr. K. King, Williams-Waterman Program.

Essential Role of Marketing -
Dr. R. Shaw, INCAP, Guatemala.

Potential for Food Technology Development in the Caribbean -
Dr. J. Sammy, Department of Chemical Engineering, UWI, Trinidad.

Socio-anthropological Considerations in Marketing -
Dr. P. Singer, UN Social Development Commission, New York.

Developments in Guyana -
Dr. C. C. Nicholson, Ministry of Health, Guyana.

Developments in Jamaica -
Miss Helen Fox, Scientific Research Council, Jamaica.

Diets Based on High Lysine Corn -
Dr. A. Pradilla, Department of Pediatrics, Universidad del Valle, Colombia.

Developments in Trinidad -
Dr. L. Brinkman, Research Biochemist, PAHO.

Session VIII - Governmental Action and Food Aid

UNICEF - Dr. Max Milner, UNICEF, New York

AID - Dr. M. Forman, Office of War on Hunger, AID, Washington.

World Food Program -
Mr. A. de Alth, WFP, Trinidad.

Governmental Interaction with Food Aid -
Mr. M. Knight, Central Planning Unit, Jamaica.

R I C E

by

M. S. Pawar
FAO Rice Geneticist, Guyana*

Rice is the staple food of half the world's population. It is, therefore, necessary to ensure that the food that enters the rice bowl has in it adequate nutrition. This is all the more necessary because most rice eaters are too poor to afford any appreciable quantities of supplementary "protective" foods such as milk and milk products, meat, fish, eggs, pulses, vegetables and fruit. In fact, even their calorie intakes are often below nutritional requirements, as is their intake of protein, which is mainly derived from the staple rice itself. There is also insufficiency of the B group of vitamins, vitamin A, calcium and ascorbic acid. Lack of vitamin A, often associated with protein deficiency, leads to a great deal of preventable blindness in children and the incidence of anemia in women of child-bearing age, continues to be high.

In its natural state, the nutritive value of rice is good, comparing very favourably with that of other major cereals used as staple foods (Table I). Husked rice (i.e. rice freed only of its hulls) has about the same content of calories and vitamins and slighly less minerals compared to whole wheat. The protein content is less. But it is heartening to know, as a result of studies at the International Rice Research Institute, Philippines, that there are over 2,000 varieties

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*Paper presented at the CFNI Seminar on "Protein Foods For The Caribbean", held in Georgetown, Guyana, July 29 - August 1, 1968.

belonging to the world collection whose protein content is OVER ten percent and there are nearly a hundred of them, whose protein content varies from fourteen to eighteen percent (wet basis). The studies are still incomplete and so one need not be surprised if still higher values are reported. Apart from quantitative considerations, it may be stated that rice protein has the highest nutritive value of cereal grains. Moreover, high-protein factors containing about fifteen percent protein can be produced by controlled milling methods. They are very suitable for feeding infants and young children and surveys of rice mills are currently being carried out in certain countries to determine the possibilities of manufacturing this product on a large scale.

But generally speaking, a great deal of the nutrients contained in rice are lost first at the time of milling and later in washing and cooking. The milling processes including polishing remove the bran and germ thereby losing a portion of the best protein and most of the fat, minerals and vitamins.

These losses could be avoided by several ways. One way would be undermilling the rice, as people will not go back to the primitive and laborious hand pounding methods. Undermilling is being practised in Ceylon and parts of India and Africa. Undermilling not only prevents loss of valuable nutrients but increases the amount of whole rice. It may, however, be mentioned that undermilled rice is not so easy to store and tends to be easily attacked by store insects.

Better than undermilling is parboiling, as the rice so treated is not only more nutritious but the milling recovery is very much higher. Parboiled rice stores much longer and better than white rice. However, people accustomed to white rice do not generally relish parboiled rice, more especially if the parboiling is done in a defective way leading to offensive odours in the final product. Fortunately the Caribbean market is not only used to, but demands parboiled rice and almost all the rice that enters the Caribbean market from Guyana is parboiled. But the serious defect in the present product is its offensive odour caused by excessive and sometimes careless steeping, use of unhygienic water and inadequate drying facilities. It is, therefore, necessary to overcome these defects and produce superior parboiled rice that is not only free from odour but has a pleasing light sheen on the grain.

One other means of increasing the nutritive value of rice would be the artificial enrichment of milled raw rice with thiamine and other nutrients (niacin, iron and riboflavin). This has become a valuable weapon against beri-beri and has been applied on a large scale in Haiti, Puerto Rice and the Philippines. Wherever practical difficulties of organizing, financing and enforcing rice enrichment regulations are encountered, it is recommended that the mixing be done at home by the housewife. In Japan, such a procedure has been largely successful.

As stated earlier, loss of nutrients further takes place during washing and cooking. Washing, especially when repeatedly done, removes most of the remaining vitamins and minerals. This can be

avoided if the rice that comes to the market is clean and free from impurities such as dirt, grit and other foreign matter. Lastly the method of cooking determines whether nutrients are conserved or lost. If excess water is added and drained out after the rice is cooked further losses occur. This can be avoided by proper education and demonstration. For getting free fluffy rice it is not at all necessary to use excess water.

Other things being equal, mixed cereal diets are to be preferred generally to those based on single cereal. Fortunately the food pattern in the Caribbean is of a mixed character, wherein parboiled rice and white flour and also ground provisions figure. If the white flour could be replaced with flour of medium extraction or whole wheat flour, the diet would stand to gain.

So far, various methods of either preventing loss of nutrients or enriching white polished rice have been considered. The problem may be approached from yet another angle. This is to improve the dietary pattern so that it contains less rice and more of other foods particularly the "protective" foods. Such shifts are unquestionably taking place in many countries. This is the most satisfactory one in the long run, but it takes time, whereas some rapidly effective measures are often needed. A good example is Japan. Table 2 shows the changes that have taken place in the food intake of that country during the fifteen years ending 1963. It is clear from the figures given therein that Japanese consumption of cereals and starchy

roots and tubers has decreased, while there has been a dramatic increase in the intake of beans, foods of animal origin and also fruits and vegetables. This is partly due to the high incomes, but it is also worth noting that food and agricultural planning in Japan has been oriented to nutritional needs, since it is important that the production and consumption of good sources of the nutrients in which rice diets are deficient should be encouraged. Is it possible to do this in the Caribbean? Definitely yes.

Finally, the production and yield of rice must be increased, since an increase in supplies of rice itself is often the most feasible method of expanding availabilities of calories in the short run. In the Caribbean context this would imply that Guyana which is the main source of supply of rice should increase her production by increasing productivity. A review of the area, production and productivity (Table 3) shows that during the last fifteen years the area and production have more or less doubled but the yield per acre has gone down from 2,072 lbs to 1,932 lbs/acre. By itself this downward trend is undesirable but when considered in the context of a steadily rising population the future is menacing. Projections have shown that if the population growth continues at the present rate in the whole of the Caribbean, then by the end of this century the total rice now produced in the Caribbean will be grossly inadequate. It may barely be sufficient for Guyana's needs. Fortunately, there has been a breakthrough in rice research in Guyana during the last two years and it is on record that a progressive Guyanese farmer,

utilising these research findings, has been able to produce the incredible yield of 70 bags/acre, in three consecutive seasons spanning over just ten months. He has already planted his fourth-crop-of-the-year and expects to produce almost 100 bags/acre/year when the fourth crop is harvested. In contrast, the present national average is just 13 bags/acre/year.

The impact that will be made on production by this recent breakthrough in the production technology will be two fold. As and when the bulk of the rice farmers adopt the new technology, production will increase several fold and new markets may then have to be found. If this is not preferred, then the total AREA under rice can be REDUCED and production maintained at the present level and the area so vacated devoted to such essential items as grain legumes, (e.g. soybeans and other beans) and pastures. Guyana is notoriously short of pastures and the present livestock is more of an amphibious kind, part of them living in water and other times on land. As and when this switch over in the cropping pattern takes place, it should be possible to produce more of vegetable and animal protein, fruits and vegetables and thus ensure a balanced nutrition. As stated earlier rice scientists have discovered rice varieties having protein up to 18 percent. When this germplasm is fully incorporated in the varieties of tomorrow, what we would have is not only an increase in the quantity of rice but also in its quality, especially its protein. What is needed is a solid support for a full-fledged rice research and extension programme covering rice production, processing and storage.

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Rice - Grain of Life ..... FAO 1966

Annual Report, The International Rice Research Institute, Los Banos, Laguna, Philippines, ... 1967

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Table 1 - Nutritional Composition of Cereals, Starchy Roots and Plantains (Retail Weight) in 100 grams.

	Calories	Protein	Fat	Calcium (Ca)	Iron (Fe)	Vit.A	Thiamine (Vit.B_1)	Riboflavin	Niacin
	No. per 100 gr.	(....%	....%)	(....mg.....)		I.U.	(..... mg.....)		
WHEAT, HARD									
Whole meal or flour	332	13.8	2.0	37	4.1	(0)	0.45	0.13	5.4
Flour, medium extraction	350	13.4	1.4	24	2.4	(0)	0.34	0.08	2.0
Flour, white, low extraction	364	12.7	1.1	16	1.0	(0)	0.13	0.06	1.2
WHEAT, SOFT									
Whole meal or flour	333	10.5	1.9	35	(3.9)	(0)	0.38	0.08	4.3
Flour, medium extraction	349	9.8	1.3	24	2.4	(0)	0.30	0.06	1.3
Flour, white, low extraction	365	8.6	1.1	16	1.0	(0)	0.13	0.03	0.8
RICE									
Husked or brown	357	7.5	1.8	15	1.4	(0)	0.33	0.05	4.6
Home-pounded, undermilled	359	7.1	1.1	14	1.0	(0)	0.16	0.04	2.5
Parboiled	359	7.1	1.1	14	1.0	(0)	0.22	0.04	3.8
Milled, white	360	6.7	0.7	10	0.9	(0)	0.08	0.03	1.6
BARLEY									
Pearled, light or dark	346	9	1.4	20	0.7	(0)	0.15	0.08	2.5
MAIZE (Corn)									
Grain, or whole meal	356	9.5	4.3	7	2.3	450	0.45	0.11	2.0
SORGHUM (Sorghum vulgare)	343	10.1	3.3	39	4.2	200	0.41	0.15	4.0
MILLET									
Raji (Eleusine coracana)	332	6.5	1.7	350	4.0	(100)	0.35	0.05	1.5
Bajra (Pennisetum glaucum)	348	11.7	4.7	28	(4.0)	(200)	0.33	0.15	2.1

Table 2 - Changes in Food intake in Japan

	1949	1955	1960	1963
	Grams per caput per day			
Cereals	473	480	452	428
Rice	333	347	358	350
Wheat	66	68	65	65
Others	74	65	29	13
Starchy Roots and Tubers	170	81	64	53
Sugars	5	16	12	14
Beans	50	67	71	69
Animal foods	68	115	147	178
Fish	56	77	77	77
Meat and poultry	5	12	18	28
Eggs	3	12	19	28
Milk and milk products	4	14	33	45
Fruit and vegetables	222	235	242	262
Processed vegetables	50	56	51	52
Seaweeds	3.4	4.3	4.7	4.6

Table 3 - Area, Production and yield of paddy in selected producing countries by regions 1950 - 54 & 1960 - 64 averages.

Country	Area		Production		Yield	
	1950-54 Average	1960-64 Average	1950-54 Average	1960-64 Average	1950-54 Average	1960-64 Average
	1,000 hectares		1,000 metric tons		kilograms/hectares	
Far East	69986	80456	100363	140225	1430	1750
Latin America	2972	4830	4950	8322	1670	1720
Guyana	53	100	136	239	2072	1932

BOOK REVIEW

NO NEED FOR HUNGER - by Jonathan Garst, Random House Inc., New York (1963).

The theme of the book is summed up in two quotations:

1. "The present world population can be well fed, and feeding people well is one way to slow down population growth.... hunger is one of those conditions which results in unrestricted child bearing - improvident births ...."

2. "Hungry soil, hungry crops, hungry people; feed the soil, feed the crops, feed the people. That is the way to start prosperity".

It is difficult to say for whom this book is intended: it is certainly not an academic study, though where necessary it quotes figures (accurately) with telling effect: it is not a "popular" book because the subject matter is an unpopular one with most of us, who ostrich-like refuse to recognize the condition of more than half the world. Presumably the readers will be mainly American and other officials concerned with aid programmes to underdeveloped countries, some government employees and, let it be hoped, members of governments in some of the richer countries. It deserves a much wider audience, for there is a lot to disturb, but also (so unusual in works dealing with hunger) there is glorious hope.

Dr. Garst develops his lines of thought with extreme simplicity and clarity. The well known figures of the population explosion are quoted. In Europe and Japan the population is doubling itself in 100 years, in Latin America in 25 years. The USA is cited as a special case where the country is still expanding within its own borders, allowing a rate of growth of the population higher than that of Europe, but much lower than Latin America. In the latter, Uruguay and Argentina are the only countries with good food supplies and these have the lowest expansion rates. Dr. Garst suggests that hunger leads to high birth rates, rather than vice versa, (and he is not alone in this thesis, cp. Josúe de Castro's "The Geography of Hunger"); he strongly maintains that where food is plentiful man's hopes and aspirations for a better life are a motivating factor for restricting population growth. The approach "You cannot do anything for these people: they breed like flies", is utterly wrong: if you can find some way to feed them well they will develop an outlook on life that will diminish "improvident births".

The total amount of hunger in the world is growing year by year. Need this be? Dr. Garst is sure that food can be increased more rapidly than the population, for a long time yet, if we only applied the knowledge we have, and this is true for the notoriously difficult tropics. Dr. Garst does not fall into the trap, as so often happens to "advisers" from temperate lands, of

imagining that because magnificent jungles thrive in the tropics, so will cereals and vegetables.

To put the matter in perspective, it is pointed out that to bring many underdeveloped countries to the level of North American consumption, the use of gasoline per head would have to be increased several hundred times; that of paper 300- to 400-fold. In food, however, 1,500 calories a day is a starvation diet, 3,000 is overfeeding: an increase of less than 2-fold is all that is contemplated.

With this in mind Dr. Garst recalls the tremendous increases in agricultural production in the past half century: the development of hybrid corn at Coon Rapids by his brother Roswell Garst and Henry Wallace; the development of knowledge about the use of fertiliser (with due credit to the classic British work at Rothamsted), along with the bald statement that on poor soils one ton of nitrogen is worth 7 acres of land; and the British pioneering work on herbicides and their developments today. The food raising capacity of the USA has more than doubled between 1930 and 1960, from 26 bushels of corn per acre to 54, and from 131 eggs per hen per year to an average of 209. The new knowledge and techniques, suitably modified, can be applied all over the world to small peasant holdings: the fundamentals do not need farms of a thousand acres.

"Feed the soil" - especially with nitrogen. A recent FAO publication (*) showed an extraordinarily close correlation on the figures from 40 countries between the use of fertiliser and the

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(*) Crop Production Levels and Fertiliser Use: FAO, Rome 1962.

average level of grain production per hectare: the range was from zero fertiliser and 800 kg. grain/ha to about 400 kg/ha of fertiliser and 3,500 kg. grain. Dr. Garst does not quote these but shows from his own experience how true is the general trend. Of course fertiliser is not the only factor - climate, the pattern of rainy and dry seasons, water supply, drainage, salinity; these and others are recognized and discussed. But it is the author's experience (and the reviewer's) that the neglect of plant food is a major and over-riding reason for low yields and hunger in the tropics today.

By several ingenious and highly practical schemes, Dr. Garst sees some hope - a great hope - of beating the population explosion. He quotes -

> "The time is out of joint; O cursed spite,
> That ever I was born to set it right".

This is not in keeping with the tune of the book. Certainly the time is out of joint, but nowhere do we feel that Dr. Garst is cursing his fate; rather he tackles the problems with gusto and vigour and we, his readers, and the world, should thank the "cursed spite" that he was born to set it right.

E. G. B. GOODING
Barbados Sugar Producers Association
Bridgetown.

COMPETITION FOR PROVERBS RELATED TO NUTRITION

All cultures have age-old sayings, proverbs and the like. Some are "wise saws" based on long standing experience, some less so, and some foolish.

Proverbs often relate to food, and, if nutritionally sound, can be used as a theme for health education.

For example, "Empty sack don't stand up", could be used to encourage better eating habits.

A prize of £5. 0. 0d. ($24. EC) will be given for the best West Indian proverb concerning food which could be used for nutrition education.

Entries must reach the Editor by January 10, 1969, Several proverbs can be submitted by an entrant. In each case, they should state what nutrition education point they could be used to illustrate. Results will be announced in Cajanus No. 7 (February, 1969).

EDITOR'S ANNOUNCEMENT

With this issue readers on our mailing list will be receiving a short questionnaire concerning this newsletter, together with an addressed envelope. Cajanus, in our view, is not merely a means whereby the Institute addresses its readers, but should be a vehicle which through reader participation enables all interested in nutrition in the Caribbean to communicate with each other.

We shall be most grateful if our readers would spare us ten minutes or so to complete the questionnaire, as we are anxious to re-model 'Cajanus' in accordance with our readers' advice.

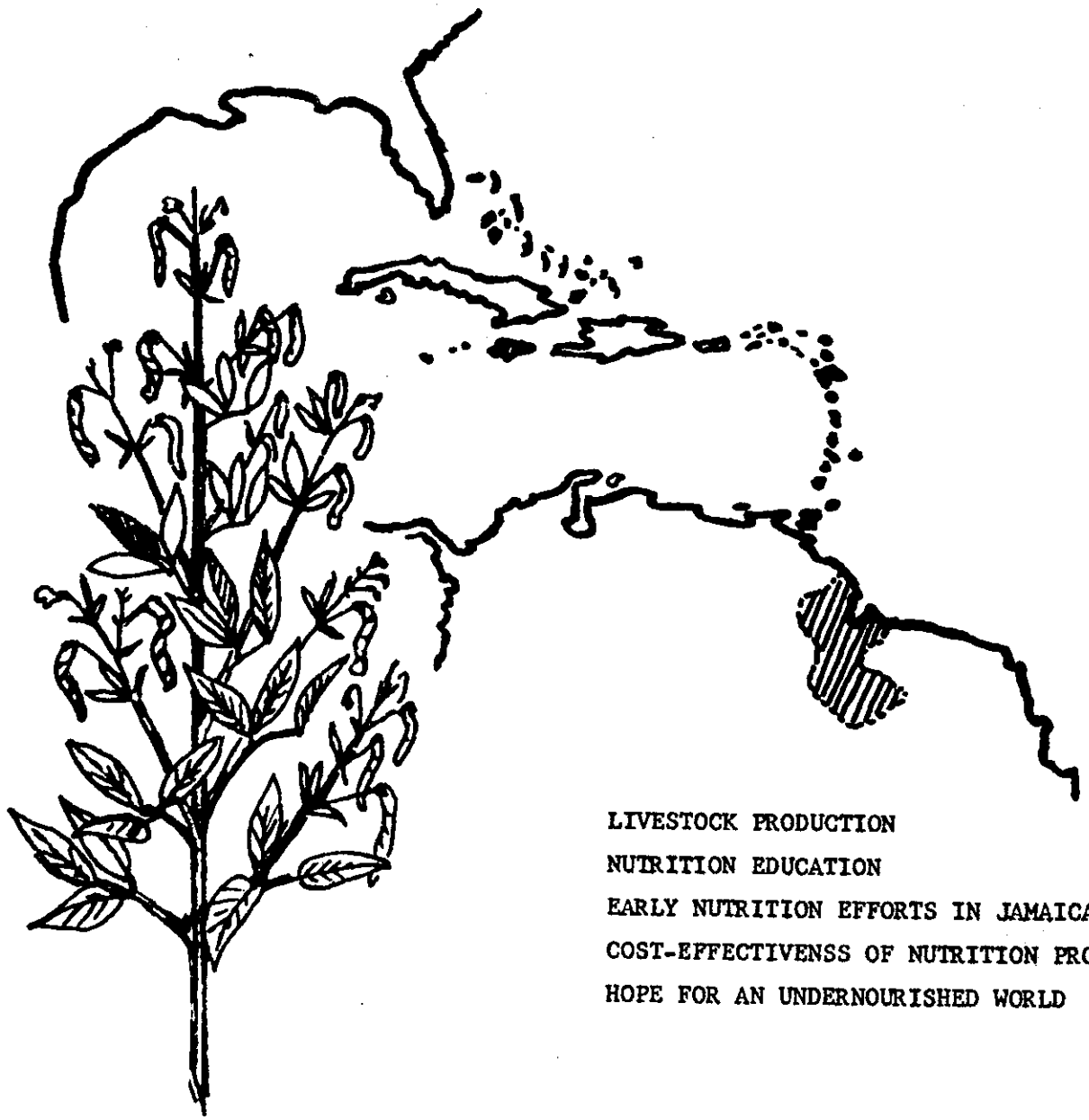
We shall publish in Cajanus No. 7, February 1969, an account of the answers we receive.

No. 6 December 1968

CAJANUS

NEWSLETTER OF

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE



LIVESTOCK PRODUCTION

NUTRITION EDUCATION

EARLY NUTRITION EFFORTS IN JAMAICA

COST-EFFECTIVENSS OF NUTRITION PROGRAMS

HOPE FOR AN UNDERNOURISHED WORLD

C A J A N U S

Newsletter of

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE

Trinidad Centre:
UWI Campus
St. Augustine
Trinidad.

Jamaica Centre:
P.O. Box 140
Mona, Kingston 7
Jamaica.

The editorial office is at the Jamaica Centre of CFNI.

CONTENTS

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ANIMAL PROTEIN SUPPLIES FOR THE CARIBBEAN *

by

P. Mahadevan
Dean of Agriculture, University of the West Indies.

The war against want calls for a strategy that would significantly and speedily augment the current food resources in both the plant and the animal kingdoms. A question that might well be asked, however, is whether the development of food resources in the animal kingdom is really important. Is it not perhaps meeting a privileged and limited demand? Should not top priority be given to food crops, particularly in territories with 3 per cent rates of population increase? Do not cows come far behind corn in such a programme? But, the fact is that people like meat, milk, fish and eggs. The growing demand for livestock products is increasing world prices in the face of a relative inelasticity in their supply. There is need to double animal production in the short term by 1975, while in the long term the target is even more daunting, because by the year 2000, world supplies of animal products would need to be raised to six times the present volume. It is obviously important therefore to examine the prospects for the growth of animal protein production in the future.

Insofar as the Caribbean region is concerned, two facts can no longer be ignored, namely:

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* A paper presented at the Seminar on "Protein Foods for the Caribbean" held in Georgetown, Guyana from July 29 - August 1, 1968.

1) A vast sum of money is being spent on meat and dairy product importations from areas with which the Caribbean countries have little reciprocal trade.

2) The unit territories of the region are being priced out of their markets for the traditional export crops like sugar, cocoa, cotton, citrus and coffee.

The present organisation of animal production in the Caribbean:

Until recently, livestock production in the Caribbean has for the most part been a peasant undertaking . The only exceptions were (a) cattle ranching in Guyana, (b) the trend towards larger units in broiler production and egg production in Jamaica, Trinidad and Tobago and Barbados, and (c) intensive beef production in parts of Jamaica. The livestock population of the West Indies is fairly large relative to both human population and land area. The proportion contributed to the gross domestic product by livestock is around 2 per cent in Jamaica, Trinidad and Tobago, Barbados, the Leewards and Windwards, and about 3½ per cent in Guyana.

Possible future reorganisation:

A close examination of the economic resources of the West Indies shows that land is likely to be the main limiting factor in any possible future reorganisation of animal production. All the constituent territories have a high population density except for Guyana and Dominica. But, in these two territories, although more land might be brought into use, the terrain imposes a severe limitation on the possible pattern of

land utilization. In these circumstances, the only courses open are (a) a more intensive utilization of the land currently devoted to extensive forms of livestock production, and (b) the release from other crops of more land for livestock production.

The supply and demand position:

(a) Beef:

All territories except Guyana are net importers of beef, and indeed, the only territory for which complete self sufficiency in beef might be predicted is Guyana. Table I sets out the beef supply and demand position in 1958 as well as the projections to 1965, 1970 and 1975 made by the USDA Economic Research Service. The projections should, however, be viewed with caution. The need to do this is borne out by comparing the 1965 projections for Trinidad and Tobago with the true figures for beef consumption in that territory in 1965 which are set out in Table 2. It will be seen that the projections are way out by some five million pounds. It will also be noted from Table 2 that (a) there was no definite upward trend in the importation of beef over the years 1962 to 1966; (b) there was a marked increase in local production between 1965 and 1966; and (c) the overall consumption of beef showed no significant trend.

What are the possible reasons for this lack of increase in overall consumption? It would seem that import substitution has been a major factor in influencing the pattern of consumption. The period leading to 1965 was characterised by a substantial boom in the poultry

industry of Trinidad and Tobago. In 1961, local production of broiler meat was 2.7 million pounds as against a net import figure of 6 million pounds; but, in 1965, the figure for local production rocketted up to 23 million pounds and far exceeded the USDA projection for 1965 of 14 million pounds. That beef consumption during this period remained relatively stagnant is thus understandable in the context of broiler meat being supplied in vastly increasing quantities at competitive prices.

Another case of import substitution that may affect the accuracy of projections of demand for beef involves the pig or pork industry. At the present time, a number of Caribbean territories are near self-sufficient in pork production, and substitution may take place if the price ratio is in favour of pork. Current prices for both pork and beef are about the same.

(b) Pork, goat meat and mutton of sheep and lamb:

Let us now consider these other meats -- pork, goat meat and mutton of sheep and lamb in their own right. The supply and demand position may be summarised as follows: Mutton of sheep and lamb is mainly imported; pork is mainly locally produced; while, goat is wholly locally produced. The USDA researchers considered these meats separately and found that a deficiency arose between supply of goat and projected demand. It is unlikely that goat would be imported, but imported mutton might well be substituted. Imports of pork are not expected to increase as local supply will increase with demand. There is, however, unlikely to be very much change in the sheep population.

(c) Poultry meat and eggs:

In regard to poultry meat and eggs, as indicated earlier, the poultry industry has been the fastest growing agricultural industry in the Region. The factors that have contributed to this are: (a) the direct transfer of technology from more developed countries; (b) the industrialisation of production, processing and marketing of poultry and poultry products; and (c) the provision of increased credit facilities to farmers through supplies of feedingstuffs, day-old chicks and veterinary therapeutics. The economics of the organisation of the poultry industry is such as to make it both feasible and profitable in the smallest of the territories of the West Indies. Parallel with the growth of the poultry industry has been a decline in the number of small poultry producers and the emergence of more large-scale enterprises.

(d) Fresh milk:

Let us now turn our attention to fresh milk. Fresh milk cannot be imported, and hence the deficiencies which projections may show between demand and supply cannot be filled in this manner. The alternatives might therefore be some price increase or substitution of other milk foods or increased local production of milk. The ambitious dairy development plans of the larger Caribbean territories is indicative of the desire on the part of the respective governments to come to grips with the problems of increasing the local production of milk. Some ten thousand head of Holstein and grade Holstein cattle have been imported into the Commonwealth Caribbean territories within a period of

five years. But, even so, the consumption of milk and dairy products in the area has grown at a much faster rate than the local production of milk. Thus, in 1964, the islands of the Commonwealth Caribbean imported 36 million dollars worth of milk and dairy products.

Total volume of imports:

It is appropriate at this stage to consider the total volume of imports of meats of various kinds, meat preparations, dairy products and animal feedingstuffs into the Commonwealth Caribbean, including Guyana. Meats of cattle, sheep, pigs and poultry that were imported amounted to approximately 31.4 million pounds by weight in 1963. Meat preparations including bacon, ham, pickled pork, salted or smoked beef and sausages accounted for a further 31.3 million pounds. Dairy products (principally butter, cheese, condensed milk, evaporated milk, powdered milk) as well as milk-based infant and tonic foods totalled 78.3 million pounds. Finally, imported animal feedingstuffs amounted to some 149 million pounds.

The future:

The sixty-four thousand dollar question that remains to be answered is, what are the opportunities for effective substitution for this large import bill on livestock, livestock products and animal feedingstuffs? There is little doubt that the scope for import substitution in the Region is overwhelmingly predominant in the livestock sector. I am also equally confident that this sector offers the largest scope

for the development of an integration activity within the agricultural economy of the West Indies. But, if success is to be achieved rapidly, deficiencies in the existing approach to livestock development should be overcome. These include:

(a) an absence of sufficient scientific and technically competent personnel to help increase production efficiency through such means as (i) producing more from the same amounts and kinds of feed now used; (ii) making use of feeds now wasted (e.g. crop residues and by-products); (iii) producing livestock feed on land not now productive; and (iv) introducing the new tropical legume technology developed elsewhere, to increase grassland yields and quality.

(b) Inadequate operational research, training and demonstration facilities, to permit the training of people in a problem-solving research and educational environment.

(c) Insufficient attention to identifying the principal factors limiting the growth of the livestock industry and establishing priorities in livestock production and distribution problems requiring solution.

Deficiencies in the numbers of scientific and technically competent personnel in animal production are being remedied rather slowly by the undergraduate and postgraduate training programmes in the various fields of genetics, nutrition, physiology and management, provided at the University of the West Indies Faculty of Agriculture in Trinidad. These would however have to be strengthened substantially if current and

anticipated future needs are to be effectively met.

Conclusions:

Let me conclude by reference to Malthus. About 170 years ago, Malthus published his well-known theory of long-run stagnation which held that the large masses of people would exist near or below the subsistence level of the food supply. Malthus' theory was based on the premise of static technology in agriculture and continuous population pressure. Some fifty years later, Mill (1897) observed that the feature that most characterized civilised nations was the perpetual and unlimited growth of man's power over nature. Today it appears that Malthus was essentially correct with regard to a large part of the world; yet Mill's view is much more appropriate in others. Neither theory is however basically inevitable; the major differences that have built up through the years between the developed and underdeveloped countries have been man made.

In both developed and underdeveloped countries, protein is likely to continue to be a great shortage. It is without doubt a basic need in the diet of all peoples; short supplies of it are an important reason for keeping half the world hungry. Although 70 per cent of

the world's supply of human dietary protein comes from vegetable sources and only 30 per cent from animal souces, in several countries animals are and will continue to be the main source of protein. In the United States, for instance, 70 per cent of the protein supply comes from animal sources, whereas in India the corresponding figure is only 12 per cent (FAO, 1964). Some exciting new developments are however, taking place in the production of protein by synthetic means far more effectively than can be done by the animal itself. It is claimed that a major source of synthesised protein in the future might well be petroleum, and already a protein has been produced from partially refined oil having a nutritive value almost equivalent to that of meat.

Be that as it may, the demise of the animal as an important protein source for humans is unlikely in the foreseeable future. Supplies of protein cannot yet be boosted fast enough to keep pace with present consumption and demand, and the fast-rising population means that supplies are falling further and further behind. The future lies in extending the methods of industrial farming and automation of production to all classes of livestock which would repay intensive rearing, in the increased use of venterinary drugs, therapeutics and antibiotics to augment production and disease control and in the search for efficiency in the use of land, labour and capital.

TABLE I

Beef Supply and demand in 1958 and projections to 1965, 1970 and 1975

Territory	Local Production	Exports	Imports	Household Demand
1958	(1,000 lb)	(1,000 lb.)	(1,000 lb.)	(1,000 lb.)
Trinidad & Tobago	3,083	-	5,934	9,017
Jamaica	21,952	-	3,652	25,604
Windward & Leeward) Islands & Barbados)	3,500	-	2,441	5,941
Guyana	7,226	-	106	7,332
Total	35,761	-	12,133	47,894
1965				
Trinidad & Tobago	5,411	-	9,489	14,900
Jamaica	32,500	-	3,460	35,960
Windward & Leeward) Islands & Barbados)	4,000	-	3,723	7,723
Guyana	9,500	-	38	9,538
Total	51,411	-	16,710	68,121
1970				
Trinidad & Tobago	7,000	-	11,349	18,349
Jamaica	39,000	-	5,594	44,594
Windward & Leeward) Islands & Barbados)	5,200	-	4,043	9,243
Guyana	11,200	155	-	11,045
Total	62,400	155	20,986	83,231
1975				
Trinidad & Tobago	7,600	-	14,206	21,806
Jamaica	46,000	-	6,338	52,338
Windward & Leeward) Islands & Barbados)	6,400	-	4,374	10,774
Guyana	12,900	130	-	12,770
Total	72,900	130	24,918	97,668

TABLE II

Consumption of beef in Trinidad & Tobago 1962-66

Year	Imports		Local Production		Total
	Quantity (lb.)	Value $ C.I.F.	Quantity (lb.)	Value $ C.I.F.	Quantity (lb.)
1962	5,969,009	3,310,815	2,963,600	2,963,600	8,932,609
1963	6,192,552	3,539,653	2,895,300	2,895,300	9,087,852
1964	7,600,090	4,689,870	2,825,000	2,825,000	10,452,090
1965	8,376,740	4,279,094	2,932,100	2,932,100	9,308,840
1966	6,218,739	4,632,670	3,718,700	3,718,700	9,937,439

GENERAL NUTRITION NEWS AND OPINION

HOPE FOR AN UNDERNOURISHED WORLD

Leading Article - The Lancet - London 19 October 1968

Hope is the keynote of this year's annual review by the Food and Agriculture Organisation of the United Nations - a sharp contrast to the forebodings of disasters presented in previous reports. In most parts of the world the population has been increasing at a rate of about 2.5% annually. During the decade 1955-65 the growth of agriculture was little greater, and in most developing countries where malnutrition is widespread the food-supply was barely keeping pace with the population. In 1965 and 1966 there were poor harvests in many parts of the world, notably India and Pakistan; disastrous famines would have followed but for relief from the large stocks of wheat in the USA. These stocks amounted to 38.4 million tons in 1961, but were reduced to 11.6 million in 1967. Not only were the harvest conditions in general good in 1967, but for the first time a significant proportion of crops were raised from improved seeds of high-yielding strains of cereals. These strains have been developed at the International Maize and Wheat Improvement Center in Mexico and at the International Rice Research Center in the Philippines, which are each supported largely by the Rockefeller and Ford Foundations. Dwarf varieties of wheat, Sonora 64 and Lerma Rojo 64, commonly yield 4 tons

per hectare and sometimes 5-8 tons, in conditions where the usual yield with standard varieties is 1.2-3 tons. Similar increases in yields are obtained by the use of I.R.8 strain of rice. In 1966-67 some 500,000 hectares in Pakistan and 800,000 hectares in India were sown with Sonora 64 and Lerma Rojo 64 wheat. Turkey acquired 22,400 tons of seed; and other countries including Afghanistan, Iran, Iraq, Kenya, Lebanon, Libya, Morocco, Rhodesia, South Africa and Tunisia, are beginning to use these strains. The new rice has been widely used in the Philippines and in India. Thus, in the great Tanjore rice-growing district in South India, the rice harvest was increased by 450,000 tons as a result of the use of improved seeds. There are also new high-yielding strains of maize, sorghum, and potatoes, which promise to be particularly valuable in Latin America.

Some idea of the gaps which can be filled by improved methods of agriculture is conveyed by average national yields of cereals, given in quintals per hectare by FAO for the period 1963-67. Yields for wheat include Iraq 4.6, South Africa 7.0, Pakistan 8.1, India 8.3, Kenya 11.4, Australia 12.0, USA 17.4, United Arab Republic 26.8, UK 40.5, Netherlands 44.4; and for rice, Puerto Rico 6.8, India and Pakistan 15.3, Thailand 16.3, Hong Kong 18.3, Ceylon 19.3, Malaysia 25.8, USA 47.6, Italy 48.9, and Japan 51.8. The gaps between top and bottom of these leagues can certainly be closed to a large extent by the use of the new seeds, provided that improved methods of farming are introduced. If the new seeds are to produce their best yields,

the land must be kept in good order, weeds controlled, and the crop kept free of disease; hence the use of fertilisers, herbicides, pesticides, and fungicides must be greatly increased. Whereas in Western Europe commercial fertilisers were used on arable land at an average annual rate of 134 kg. per hectare in 1966-67, the corresponding figure for developing countries is 9 kg. per hectare. Losses of the crop on storage may be large, up to 25% in some circumstances, because of contamination by fungi and insects or consumption by rodents. This waste can be greatly reduced by the construction of suitable granaries and by the use of chemicals.

In 1967 the FAO estimate of the increase in agricultural production in the developing countries was 6% - well above the estimate for the growth of population. Here lies the ground for the hope that widespread malnutrition can be prevented. Achievement can come only through the enthusiastic co-operation of peasant farmers, who are extremely conservative and reluctant to spend money, which usually has to be borrowed, on new methods of crop husbandry. Hence the immense importance of agricultural education. The Rockefeller Foundation report that Philippine farmers, using I.R.8 rice and with an investment of $200 per hectare on labour and chemicals, can get net profits of $250 per hectare at harvest four months later. It is comparatively easy to demonstrate that money invested in a crop can bring in a handsome dividend in a single season, but the farmer is unlikely to make the investment until he has first seen the results with

his own eyes. Hence the enormous importance of agriculutral development programme and training colleges, so that new attitudes and desires can be created and the skills in the use of new resources can be taught. In rural communities, an agricultural education programme can be organised as part of a general education programme, which includes teaching in health education, mother-craft, nutrition and home economics. The applied nutrition programmes, which are organised by FAO are a small start in this direction.

It is very important that prices of food crops should be kept high enough to provide a financial incentive to farmers. An FAO table shows that this is not usually achieved, even in rich countries. Thus, in the UK where in 1955-65 food production increased by 44% (a rate of growth attained by few other of our major industries), prices received by farmers, when corrected for cost-of-living index, are down by 13%. Farmers in Australia, Ireland, and New Zealand are also getting less for their products than fomerly.

In all countries of the world, rich and poor alike, agriculture must be treated as an industry in which skills and initiatives should be rewarded with wages and incomes comparable to those obtainable in other industries. Without such incentives, food production is unlikely to keep up with the growth of population.

No doubt can now remain that increased agricultural production could meet the needs of a much greater population than exists in the world today. But the new hope in agriculture must not divert

attention from the problem of population. In the president's report of the Rockefeller Foundation Problems of Population come before Toward the Conquest of Hunger, but we need not argue about precedence. The well being of mankind in the 21st century depends on our ability in the remaining years of the 20th to teach people in all parts of the world how to grow enough food for a population which will be limited by the forethought of educated parents.

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MENHADEN FISH PLAY SIGNIFICANT ROLE IN THE US ECONOMY

US Information Service, 17 October 1968

The menhaden fish is never found on a US restaurant menu and American sportsmen are not interested in catching it. But in Louisiana and some other coastal states in America the menhaden are caught by the truckload and represent one of American's most widely used and important products from the sea.

A cousin to the herring, they are rather derisively referred to by fishermen as mossbunkers, pogies or fat-backs. Characterized by a flat, silvery body and a large head, they roam in large schools in the coastal waters of the Atlantic and the Gulf of Mexico and are taken in a six to eight month season from late spring to early fall. They subsist largely on diatoms, minute drifting plants, and in turn are

heavily preyed on by larger fish. The menhaden grows to 12 to 16 inches.

Despite their lowly status, they make a welcome target for specialized commercial fishermen who harvest more than a million tons annually, about 40 per cent of America's total catch of all fish each year.

Nearly all Americans make use of the menhaden in one form or another. It supplies nearly 75 per cent of the fish meal and 80 per cent of fish oils and solubles used in the United States. Menhaden meal is widely used as poultry and hog feed.

The American woman's lipstick contains menhaden oil; it is also used in the manufacture of paints, resins, putties, lubricants, soaps and some pharmaceuticals. It helps temper saw blades and makes varnish dry faster, inks write better and linoleum wear longer.

US scientists are excited about the prospects of using the inexpensive and readily available meal to help solve world food shortages through its introduction as a high protein additive to grain flour.

One of the most successful fisheries in the Louisiana Menhaden Company which has a fleet of boats and a companion fleet of trucks operating out of Cameron, Louisiana.

The ships, usually about 150 feet long, head out into the warm Gulf of Mexico waters early so that the first light of day finds them ready to spring into instant action when a school of menhaden is sighted by spotter planes. The sound of the whistle sends the crew scurrying toward the two 36-foot seine boats swinging in the stern davits or being towed behind the mother ship.

The purse boats, each carrying half of the 200 fathom seine net, separate just before reaching the school and proceed in an opposing half circle plying out the net to surround the fish. Once the circle is completed, a lead weight goes over the side to close the purse and the fish are trapped. Mechanical retrieving rigs take up the net, using the cork floats as its top as the mother ship moves in. Part of the net is attached to the ship's side and a power winch and fishermen pull in the net to form a neat triangle between the small boats and the ship.

Soon thousands of the fish, weighing up to a pound each, are confined in a small section of the net and a large hose is dropped into their midst to pump them into the hold. Other species -- sharks, catfish, tarpon and an occasional bluefish -- are pulled out of the hold and dumped over the side.

A typical set, as the spreading of the net is called, may yield anywhere from 15,000 fish for a poor set to 100,000 or more for a good one. Gulf fishermen still are talking about one set which brought in 1,200,000 fish. The crew that made this set netted some 40 million menhaden in one season.

A refrigeration system preserves the fish until the ships return to port where the menhaden are unloaded by suction pumps onto automatic scales for weighing.

They are then carried to a continuous cooker where processing starts with live steam. Huge presses squeeze out the valuable oil

and water while the solid portion of the fish is fed into large rotary driers to remove the remainder of the moisture. The dried material is then ground into fish meal and carried by conveyors to huge loading sheds.

The Louisiana Menhaden Company operates two tractor trailer combinations, each carrying a payload of 18 tons, to transfer the meal to curing warehouses. Operating around the clock, these two trucks remain in constant use throughout the season. Specially devised hoisting systems raise the giant trailer beds high in the air so the meal streams down into hoppers to be carried to warehouses. Rotors turn the meal so that proper curing can take place.

A third flat-bed truck carries a large rubber tank to transport the soluble material from the docks to huge tanks at the curing plant. Some of the oil not carried by river barges is delivered to manufacturers by tank trucks.

Thus while this fish seldom reaches the dinner table, it finds its way into virtually every household in the nation.

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WORLD BANK

From The Daily Gleaner, Wednesday, October 23, 1968. Editorial

Our columnist "Thomas Wright" has made a pertinent observation regarding the recent policy statement of Mr. Robert McNamara, President of the World Bank, to the effect that the Bank would give more consideration to loans for agricultural development in the developing countries. He points out that Mr. McNamara did not say how the developing countries are going to solve the problem of declining prices for their agricultural output.

A good example of this is sugar. While developed nations and international institutions, such as the World Bank, are promising more aid to the developing countries, everything possible is being done to place obstacles in the path of a new international sugar agreement which would guarantee minimum prices for sugar. The United States refused to participate in the Conference which is currently in session. The European Common Market countries have refused to accept an export quota of 300,000 tons. Instead, they want a quota which is much in excess of demand. If their request were met, it would have to be at the expense of other countries, principally the developing.

The whole situation just does not make sense. The "have" countries make repeated statements that they want to help the "have nots"; yet when the time comes for action instead of words, they show no mercy.

In the case of the World Bank, we are sure that Mr. McNamara and his advisers are fully aware of the consequences of over-financing agricultural production for export. After all, price trends clearly show that prices for primary products are not rising as rapidly as prices of manufactured goods which the developing nations must buy from the developed countries. A major factor is the inability of the developing countries to control output. When export prices are high over-production usually follows. The keeping of buffer stocks to control fluctuations is costly, and most countries do not have the financial resources.

However, there is a tremendous scope for financing production of food crops for local consumption. Taking Jamaica as an example; last year some £24.3 million of food was imported. This represents about one-fifth of total imports. Much of this could have been supplied locally. Perhaps more than half. What has been lacking in Jamaica, and in other developing countries, is long-term capital at low interest rates. Investment in agriculture takes a long time to pay off; much more so than in industry. Neither the private nor the public sector can provide sufficient capital for this type of development.

The World Bank will now supply the long-term capital, but at commercial rates of interest. This is not good enough, and we hope that the proposal for lowering interest rates made by Jamaica's Minister of Finance and Planning, Mr. Seaga at the recent annual meeting of the Bank held in Washington is given serious consideration.

CONCLUSIONS OF THE CFNI SEMINAR

on

PROTEIN FOODS FOR THE CARIBBEAN

Georgetown, Guyana, July 29 - August 1, 1968.

I. The major impact of serious, overt malnutrition in the Caribbean still falls on young children in the form of marasmus (often with diarrhoeal disease), kwashiorkor and less advanced forms of PCM. The pattern seen is related to a variety of social, cultural, educational and economic problems, including poverty, family instability and inappropriate, deleterious food habits especially concerning infant feeding.

II. Basic to the food and nutrition situation in the Caribbean is the rapidly rising population, and an agricultural pattern historically linked to the production of a limited range of cash crops and with inadequate emphasis on the production of nutritious foods for local consumption, including protein foods.

III. By inclusion of nutritional considerations in overall national planning, as well as in health, agriculture, education and community development, conflict between the measured nutritional needs and the economic aspirations of the governments and peoples of the Caribbean could and should be avoided, and the fulfilment of each made to promote the fulfilment of the other. This could be facilitated by including the nutritional disciplines in economic planning units.

IV. A review or present and projected levels of production of traditional sources of protein in the area revealed a large potential for increase in per caput production. However, this potential is limited by the rapidly rising population and anticipated continued use of much of the best land for sugar production (though in connection with the latter increased yields per acre would lead to fulfilment of the sugar quota using less land and freeing more for protein-rich food crops). How much of the available land should be used for animal protein production e.g. cattle development, and how much for protein food crops, e.g. cereals, pulses and oilseeds, is a difficult question, balancing the lower conversion efficiency of animal protein with the existing and increasing public demand.

V. The prospects of availability of new sources or protein, from oilseed, fish protein concentrate, high-lysine corn and from rice with a higher total protein content, were reviewed. Arguments for and against amino-acid fortification of cereals were also considered. Though it may be some years before these new sources make an impact on the protein supplies of the area, yet benefits may be expected from these directions, and thus the possibility of utilising such sources should be kept continually under active consideration and investigation.

VI. Specifically in regard to the production of a much-needed local high-protein mixture for young children, two special factors affect favourably the prospects of successful production and marketing

in the area. These are:

(a) the already widespread use, even in the lower socio-economic groups, of expensive proprietary foods, which are often quite inappropriate and which need to be replaced by an inexpensive, statusful and acceptable product, which gives better nutritional value for money;

(b) the recent coming into existence of the Caribbean Free Trade Area.

VII. The conference was aware of how many and complex are the steps which lie between the wish and the achievement in regard to such high-protein foods for young children. Recognition was given to the work already undertaken in developing and testing mixtures in Guyana, Haiti, Jamaica and Trinidad. Such work should be encouraged and intensified. Use should be made of experience gained outside the area, available through such bodies as the FAO/WHO/UNICEF Protein Advisory Group. There is urgent need for studies to determine local potential availability and cost of ingredients, manufacturing capability and marketing possibilities.

VIII. All nutrition-related programmes should be planned on the basis of measured local needs and be assessed at intervals in regard to measured nutritional benefit resulting from the quantity of resources expended in the programme. This applies as much to a high-protein food for young children as to any other programme, and is one of several

reasons why any high-protein food manufactured in the Caribbean should be commerically viable and self-sustaining, after initial government assistance.

IX. In looking towards possibilities of increased availability of protein foods, there are two factors which need to be stressed:

(a) the major public health nutrition problem is related to caloric as well as to protein deficiency, and that an increase in calories must also parallel augmented protein production;

(b) much better use could be made of protein supplies which <u>are</u> already available, by means of:

i) better choice of foods promoted through consumer education with a view to obtaining greater nutrition value for money;

ii) better distribution of food in quality and quantity to vulnerable groups within the family, promoted by nutrition and health education;

iii) active pursuit of public health measures and animal and crop protection which avoid wastage of resources due to disease and parasitism in the human, the animal and the crop;

iv) improved marketing and utilization of the single cheapest supply of animal protein available at present,

namely imported dried skim milk, which is now a poorly packaged food of low status in the eyes of many consumers;

v) strenuous efforts by health and education authorities to defend the most adapted supply of animal protein to the infant, human breast milk, against the relentless encroachment of expensive proprietary powdered milks through advertising and the lack of orientation of health personnel.

PRESENT-DAY CONCEPTS OF EDUCATION IN NUTRITION *

by

Jean Ritchie

Quite extensive problems of poor food habits and malnutrition exert a markedly detrimental effect on the health, welfare and economy of the Caribbean peoples. There are two main approaches to overcoming the problems:-

(1) enlightened food and nutrition policies within the economic policies of the several countries; and

(2) a widespread programme of education in nutrition.

Actually, the second of these in a way takes in the first, because one may well view education in nutrition as beginning with the Prime Minister of a country and going right down to the youngest member of the population. We cannot assume that the policy makers in any country have a complete knowledge of the nutritional needs of their population. Some do, many do not.

Our education task then very often begins with the political representative of the people rather than with the woman in her home, although she of course is the person who in the end has to put into action what the policy makers are trying to bring about. Beginning,

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* A paper (taken from a tape recording) which was presented at the CFNI Conference for Senior Administrators on 'Food Nutrition and Health in the Caribbean', Mona, Jamaica, February 1967.

therefore, with this rather broad concept of education and nutrition in mind, I would like to outline some of what seem to be the essential points which we should think about when we are contemplating trying to influence people's behaviour through education.

The first of these is that information and education do not mean the same thing. Many education and nutrition programmes in the old days were a question of printing posters, printing leaflets, telling people what they should do and stopping at that. It was all done with the best intentions, but sometimes it was completely ineffective. For example, in the Philippines some years ago we ran a test on what was happening to certain leaflets about nutrition which were being printed at some expense with bilateral assistance and were available at Community Centres for people to take copies as they wished. We questioned all the people in the community as to whether they ever went to the community centre; secondly, did they know there were leaflets there; thirdly, did they ever read any leaflets; and fourthly, whether they had ever done anything which the leaflets had told them: and in fact the answer, apart from going to the Centre, the answer to the other three questions was absolutely nil.

We have to go further than just telling people what they should do. We must go to the next stage, which is to make them want to change. Educationists talk about motivation, and we must show people how these changes will actually benefit them. Nobody changes their usual habits simply because somebody tells them to do so. One only

changes because one feels that one is going to get some benefit out of it; and moreover the benefit must be greater than any disadvantage involved in the change. For example, if an agricultural extension worker is trying to change a farming practice, the farmer may well reply that perhaps the extension worker is right, but if he is not and a failure occurs, it is his (the farmer's) family that will go hungry. So the farmer will play safe and do as he has always done. So the element of risk must be considered there. Then there may be the opinion of the neighbours. Someone might like to change but fears that the neighbours may disapprove - think that he is making himself different to everybody else, was breaking a pattern. Social obligation may be another factor. There are many.

To site another example, in New Guinea nutritionists were trying to persuade people to use as food for the family the pigs which they had been keeping for a long time and to which they had fed a great deal of food scraps over the years, but which they did not slaughter and eat. It seemed such a waste of a good source of meat. However, the cultural anthropologist working with the nutritionists discovered that the people felt that they should keep these pigs because when some aged relative died, which might be any time, they always had to have a large pig on hand so that it could be slaughtered for the funeral feast. Otherwise they would be utterly shamed.

We must try to recognize the factors which militate against change in the particular local circumstances at the time, and in order to do this we must understand the people's values, and base our teaching on a proper knowledge of what the people's values are.

However, it is comforting to realize that habits are not static, but are always changing, and if we can identify the direction in which they are changing then perhaps we can do something to divert the direction of change to something we prefer. Now we know in the Caribbean that habits are changing towards using more of these rather expensive baby foods. Cannot we find what are the motives that are making people change towards these baby foods, and try to take measures to see that something better is provided or cheaper, so long as it would have prestige and would attract them? It is probably impossible to stop the change, but possible to divert the direction a little to something beneficial or at least neutral rather than something positively detrimental.

Next we all look at food and at health and at nutrition through a "cultural screen", which is our heritage and our background experience. People involved in nutrition education must make a positive effort to see how other people see the thing, because nobody has a vacuum in their minds about food and nutrition or about health. Everyone has some preconceived ideas and it is important to know what these are.

The next point that I would like to make is that advice on education and nutrition must be practical. There is no sense telling

people to do things they cannot do unless we, at the same time, try to discover what the obstacles are and how to overcome them, so that in fact people can do it.

I would like to give another example about the rubber tappers in Thailand and Malaya. These men were paid for piece work and women went out to work as well as men. The children were left with some neighbour and had little to eat during the day. The woman came hurrying home as fast as she could from the rubber plantation for she knew her children were hungry. By the time the man had gone to pick up his day's pay, and returned having bought the protein food for the main meal, the woman had already made a starchy porridge and given it to the children because they were hungry and could not wait. Thus the main reason why these children were getting scarcely any protein in their diet was a question of the time at which people were paid and the fact that they had to buy their daily supply of fish and meat on their way home. Something fairly simple could be done about this, because it was not a prejudice and merely an administrative change was required.

Then another point we have to remember is that people only really apply what you teach them to themselves if you teach them in a context that they are familar with or that they can understand.

Then again every service must back up each other, one and all teaching the same thing. Chaos results if everyone teaches something different.

To cite another example, I was in Indonesia where in the villages I was visiting the agricultural department was encouraging the development of fish ponds for greater protein supply, and in the same village the health department was trying to get the ponds filled in, so that they could control the mosquitoes and also put a stop to the use of human excreta as fertiliser for feeding the fish. These poor people, apparently, did not know where to turn as they were told a different thing everyday. I have seen a similar thing in Nigeria, where the home economists trained in Britain have been saying that women must stop breast-feeding their babies at 9 months because it is dangerous for the baby and the mother. Yet the doctors and nutritionists are telling them to keep on breast-feeding for 2 years or longer, because it is the most inexpensive, the most hygienic, the most satisfactory form of protein food. The poor mothers are being bombarded with contradictory advice.

There is another reason why we have got to back each other up on this, and that is that attempts to induce change are more effective the more you pile one on top of the other different methods of persuasion. This has been shown by a study in the United States, and it has also been shown in Japan in quite a different culture. It may not be so in every culture, but it seems probable. One method of approach might be good, two is better, three is better still, and by the time one gets at people in about eight different ways there is a very high probability of their being influenced by the education.

It is important when one is using these different methods to find out who are the people in a community who influence the others. It seems that it is not the very first people to make the required change who are most influential, for they are often the unstable type who will try anything once. It is those who are not first but nevertheless quite early to change, the "early adopters", who are the real leaders, usually intelligent and quick to spot the advantages. Then come the "late adopters", and finally there is always a very conservative residue. One must find out who are the early adopters and concentrate ones efforts on them. If you can get that number two element you may be using your money a great deal better than if you are spending it on trying to reach the late majority. The others will come along once the influential people adopt a new practice.

Finally, two more points. One is that it is worthwhile to work out what response one is getting from different methods, to see how much in terms of cost accounting one is achieving for money invested, let us say, in posters or in home visits or in demonstrations or extension techniques. Just as in any business one wants to get the best value for the money and the resources one has, and it might well be worthwhile spending money on sociological study and experimental study on the effectiveness for cost of one's efforts before one really gets going on a very large national or island-wide programme.

Lastly, we all know that if we are actually personally involved in the preparation of something, be it a party, or a training course we usually feel really obliged to put everything we can into it to make it a success. The same applies to planning which concerns several ministries. If a health ministry does it and then asks the agriculture ministry to come in, the chances are that the agriculture ministry will be too busy doing something else. However, if everyone is in on the planning stage, then they become associated with it, and feel this is something of their own. This applies not only to ministries but to human beings everywhere, including the people in a village or suburban community. If the people in the community are involved from the start then they will feel that this is their programme and if they can help to plan it they will also have to go through with it.

YOUR QUESTIONS ANSWERED

Q. How can figures on the cost of different foods as sources of protein (e.g. in the article on Hidden Cost of Protein in Cajanus No.2) be put into practice by the housewife who knows nothing about protein quality?

A. One cannot expect the West Indian housewife to prepare meals on the basis of the amino-acid content of each protein source. However, while purchasing the lower cost food items, she can easily practice (and usually does) the most basic concept of good nutrition - a varied diet tends to be balanced. In this regard, she can be encouraged to include the four basic protein sources in each meal - staple foods, legumes, animal protein and dark leafy green vegetables.

Q. Are there any specific problems common to Applied Nutrition Programmes against which safe guards may be taken? What are they, and how can they best be avoided by others in the initial stages of their own programmes?

A. Two recent publications have been produced which deal with the problems which have been encountered in Applied Nutrition Programmes and suggest ways in which to avoid them. The first is the report of the Joint FAO/WHO Technical Meeting on Methods of Planning and Evaluation in Applied Nutrition Programmes, published in 1966 by WHO as Technical Report Series No. 340 and by FAO as Nutrition Meetings

Report Series No. 39. The second is the report of the Latin American Seminar on the Planning and Evaluation of Applied Nutrition Programs, held in Popoyan, Colombia, published by PAHO in 1967 as Scientific Publication no. 160. The former can be obtained through the area FAO office in Trinidad, and either or both through any PAHO office or through CFNI. They are recommended to all who are engaged in Applied Nutrition Programmes.

The problems described and suggestions made in th se reports cannot be detailed adequately in a brief note such as this. Suffice it to say that these reports do deal with difficulties of co-ordination between the various ministries, shortage of well-trained staff, both national and international, lack of experience among international staff in this kind of programme (since it is a relatively new kind), budgetary difficulties, and the lack of speedy and easily demonstrable results, which is inevitable in such a slow process as changing people's food habits.

Q. We hear all the time of population explosion and insufficient food supplies, but with improved food technology, can we not be more optimistic? Is it not a question of better distribution of food? Could you say something of possible future unconventional sources of food; e.g. from the sea bed and from bacteria?

A. In spite of considerable expansion in cultivated land area and fairly widespread adaptation of important "break-throughs" (genetically improved plants and animals, fertilizers, herbicides, insecticides, antibiotics, etc.) during the past 25 years, population has outpaced food supply. Improved food technology and better distribution of food can help, but both imply increased per capita purchasing power - something that is difficult with rapid population growth. Production of protein from petroleum currently seems to be the most advanced of the "unconventional" sources. By 1970 possibly 10,00 tons will be used annually in livestock feeds.

Q. Is it possible for CFNI to carry out a height and weight study in the Caribbean, so that a norm for the area may be established?

A. CFNI does not have plans at present for a study with this specific aim. However, much informantion about the heights and weights, particularly of children, in the area has already been gathered and published by other authorities. The island-wide survey in Jamaica by Miss Helen Fox, the work in many islands and Guyana by Dr. M. Ashcroft, and the ICNND surveys in Trinidad, St. Lucia and St. Kitts are among examples which came to mind. CFNI will no doubt add to this general pool of information by means of surveys, in conjunction with governments, already undertaken, (e.g. in St. Vincent) or planned (e.g. in Barbados).

These surveys are however surveys of samples of the age group-populations as they are, so to speak, not as they ought to be. Presumably in order to establish a norm, if norm means a standard of growth which could be achieved if the people were adequately nourished, we would have to exclude that part of the population in which malnutrition of varying degrees is found. In developing countries this is sometimes done by examining 'elite' groups. CFNI does not know of any plans at present to conduct such a survey. The close similarity between the heights and weights of Eurpean and North American children and children from African elite groups leads many authorities to feel that they can for the time being rely on standards derived from UK or USA.

However the problem in the Caribbean is more complicated than this, for, as Ashcroft has shown, there are differences between the heights and weights of the various racial groups, particularly between children of Chinese or East Indian origin on the one hand and of African or European origin on the other. How much these are differences caused by genetic or by environmental factors (i.e. cultural feeding patterns) is debatable, and depending on this is the question of whether a norm for the area can be established, or whether we require a norm for each main racial group.

SOME EARLY EFFORTS TO IMPROVE NUTRITION IN JAMAICA

by

Dr. W. J. Branday
Medical Officer of Health, Parish of St. Mary, Jamaica.

To a large extent the state of nutrition of a people determines their health, and the vigour of their mental as well as physical activities. It is widely recognized that if correct kinds and quantities of various nutrients are not consumed, it is possible to suffer from ill health, even though the appetite is satisfied and hunger is not felt. The kinds and quantities of foods required for good health have been known for a good many years now, but even recently new knowledge has been gained, and some of the beliefs of the last twenty-five years have been changed.

This article makes a few brief observations on some of the earlier efforts to bring about improvements in the nutrition of Jamaicans. While some of the specific plans and projects did not meet with success, yet there have been great changes and the people are undoubtedly better nourished than they were a quarter of a century ago.

In the early nineteen-forties it had already been recongized for some years that the diet of the people of Jamaica was not nutritionally satisfactory, being insufficient in quantity and not containing an adequate amount of protein and of certain vitamins and minerals. Reports to the effect that deficiencies existed were made at intervals, but it was not until about thirty years ago that a serious endeavour was made,

by the Nutrition Committee of Jamaica in 1937, to indentify just what the deficiencies were and to suggest what should be done to reduce or eliminate them. Among the findings of this committee were that the average consumption of beef "reached the amazing low figure of one pound per month" per person and in any case a third of the total beef consumption of the island was in Kingston where a ninth of the population lived. The daily consumption of fresh milk in the Kingston area was only two and a half ounces per person.

The report "Nutrition in the Colonial Empire" published in 1939 was an investigation into the nutrition of many territories in a similar economic position to that of Jamaica, and the defects in the diets of peoples were found to be very similar also. It was found that the inhabitants of all these territories did not get enough to eat, and again specifically deficiencies of protein, Vitamin B and iron were particularly apparent. This report attracted much attention and it was decided that an attack on the problem must be begun at once. Though progress was at first slow, partly due to the fact that no funds were allocated for this purpose, this situation was remedied after the war, and much improvement has been made since.

One early effort to improve nutrition in Jamaica was the establishment of a factory at Frome to manufacture food yeast. This was established about 1943, and the cost was borne by the Colonial Office. Food yeast is a dry powder with little taste, and it was planned to add it to a food consumed by everyone, to enrich that food and particularly

to provide additional quantities of B complex vitamins (thiamine, riboflavin, nicotinic acid). It was at first estimated that the cost would be "approximately sixpence per pound". The food selected to be enriched was flour, and it was proposed to send the food yeast to Canada to be added to the flour. It was not a successful effort. Among the reasons were that at the time Jamaicans did not consume a great deal of flour compared with, say, the Trinidadians who consumed three times more per person or the Barbadians who consumed four times more. Furthermore, the poor whose diets were most deficient were the very ones of those who consumed the least flour, and thus the addition of food yeast to flour should not have been expected to have much effect on their nutritional state. Finally, food yeast was not an attractive food in itself even as an additive, and at a retail price of four shillings a pound almost no one would buy it, and eventually the factory was closed.

Among all the considerations of governmental bodies mentioned above, it was very soon realised that Jamaica did not, as it still does not, produce nearly enough food to feed its inhabitants, and large quantities were being imported which were relatively expensive. It was seen quite clearly that improvement in the diet must be effected by growing more food in the island, and the Agricultural Policy Committee requested advice of a Nutritional Committee of the British Medical Association, Jamaica Branch. The report of this committee "Nutrition in Jamaica" was published in 1945. It recommended measures to bring about improve-

ment and proposed a dietary (page 31) "as a practically attainable aim to meet the nutritional and economic needs of Jamaica. It is one which is particularly designed to fit into the farming requirements of the country, and we submit it for consideration as a basis for agricultural policy".

In the opinion of the members of this committee the amount of cultivable land in Jamaica was not sufficient (a) to grow all the vegetable food which the inhabitants needed, and (b) to provide food for the number of animals required to supply the necessary amount of meat, milk etc., and (c) to allow continued cultivation of such export crops as sugar and bananas. However, whatever the conclusions reached by this committee in 1945, with the technical means then available, it is not possible today to say the same, i.e. that the land is simply insufficient in extent for these three purposes. The quantity of food which can be grown on an acre of land has been increased and must increase further, by the use of fertilisers and of new higher-yielding varieties, such as the corn being grown at Caymanas at present. Also methods of producing more animal protein at a lesser expense in land use are possible, e.g., fish farming, or the use of land not hitherto regarded as cultivable, e.g., growing rice in swamps.

The recommendation in "Nutrition in Jamaica", that wheat be imported as grain and milled in the island, is one of those which have been put into practice, and in general though there were some failures there has been a good deal of improvement in the last 25 years, though

much remains yet to be done before the diets of the majority of Jamaicans can be regarded as satisfactory and the full expected physical and mental improvement which is potentially possible can be realised.

EDITOR'S NOTE

This article of Dr. Branday is very interesting, for it reminds us that efforts to improve nutrition were being undertaken a quarter of a century or more ago. Particularly because of inevitable changes of staff, these efforts and the lessons which can be drawn from their success or failure tend to be forgotten. Another example which springs to mind is the Food for Family Fitness Campaign in Jamaica. We would be particularly interested to hear from our readers, in the form of letters or brief articles, an account of this and other endeavours not in Jamaica only but also elsewhere in the Caribbean which were made between 1930 and 1955 to improve nutrition.

NUTRITION NEWS AND OPINION FROM THE CARIBBEAN

CARIBBEAN FARMING

The first issue of this quarterly (see Cajanus No.4 page 71 for full details) is with the printers and will be ready by the end of November. The subscription rate is $4.00 (W.I.) or 16 shillings and 8 pence a year for the four issues. Intending subscribers should write to the Editor, Caribbean Farming, Faculty of Agriculture Building, UWI, Mona, Jamaica. (Telephone 76661 Extension 472).

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PUMA IS COMING YOUR WAY SOON

From 'Guyana Graphic', 13 July 1968

A new non-carbonated beverage derived from soya beans is soon to be put on the market by D'Aguiar Bros (DIH) Limited. The drink, called 'Puma', is rich in protein but will be marketed as a soft drink.

The bottling franchise was awarded to DIH by the Monsanto Company of St. Louis, Missouri, USA, after market research and testing in the past few months had demonstrated that people in Guyana were enthusiastic about the product, recognised its nutritious and refreshing qualities and would like repeat purchases.

This market research, the Monsanto Company said, was completed prior to the conclusion of the franchise agreement with DIH.

The new drink is similar to a drink called Vitasoy developed and marketed in Hong Kong by Mr. K. S. Lo, Managing-Director of the Hong Kong Soya Bean Company Limited. The only difference is that Monsanto food technologists have structured it in flavour and appearance to meet preferences of people in various parts of the world.

Mr. Peter D'Aguiar says that Puma will be valuable as it will help to satisfy the nutritional needs of the people of Guyana.

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CMA TO SHIP EGGS, AND POULTRY TO CARIFTA COUNTRY

From 'Trinidad Guardian' 7 September 1968

The Central Marketing Agency (CMA) in Trinidad and Tobago will ship eggs, poultry and pork to the Caribbean Free Trade Association (CARIFTA) countries.

Chairman of the CMA, Ulric Lee, making this announcement to the Trinidad Poultry Association last Wednesday, said that CMA will be the sole exporter for the region.

Mr. Lee said that the CMA and the poultry association would have to get together to work out the arrangements to fulfil the Carifta countries requirements.

STANDARDS

He called for the setting up of standards in the industry and the introduction of some form of inspection to maintain and keep the standards in force.

Mr. Lee added: "The CMA proposed to market frozen birds, but if we undertake this a lot of changes will have to take place in the industry as a whole".

The CMA Chairman said that the control of production of broilers and eggs must be left to the farmers.

He said: "We have asked in a document to the Government to see in what way the Agricultural Development Bank can assist the farmers by making loans available to them."

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"WE NEED MORE SUGAR PER ACRE"

From Advocate - News, Barbados, 3 September 1968

Barbados Prime Minister Mr. Errol Barrow sees the need for increased sugar production in Barbados to enable the nation to produce an optimum of 175,000 tons of sugar a year, on less land than is now under sugar.

Mr. Barrow said yesterday: "Great sums of money have been spent in research in agriculture and in an effort to produce high yields of sugar cane but on one side of the picture there is a shrinking labour force in agriculture and a constant clamour for the mechanisation

for harvesting and other activities in the production of sugar cane and ultimately in sugar, molasses and rum," he said.

Mr. Barrow continued: "If we are to go into dairy farming and if we are to go into imports substitution because of the high cost, particularly since devaluation, of imported fodder, it will be necessary for us to make 10 blades of grass grow where one grew before."

"We have got to make the amount of land left over to the production of sugar produce as much as the total area now in production," he added.

"We have to increase our efforts in research; we have to increase our research in fertilisers and so on to produce at least as much as 175,000 tons of sugar, which I consider as the maximum production for Barbados," the Prime Minister added.

Giving a breakdown, Mr. Barrow said that Barbados' quota on the Commonwealth Sugar Agreement was close on 140,000 tons; the domestic consumption was 12,000 tons; and there was an obligation under the Commonwealth Sugar Agreement to supply 164,000 tons on the overall agreement quota.

"We also take advantage of the United States price for a minimum of 8,000 to 10,000 tons with the Canadian concession which has recently been made whereby the industry in this island profited to the tune nearly $300,000," the Prime Minister added.

Mr. Barrow was at the time addressing the Dairy Herd Management seminar, at Queen's Park, before declaring the seminar open.

"Every acre of land we use for planting Pangola Grass or some type of crop or fodder which is useful for the dairy industry must be at the expense of the sugar industry," he said.

"What we have got to do is to transfer our attention from the production of grass which is known as sugar cane to the grass which will produce fodder for the animals which will be useful in the dairy industry."

The Prime Minister told the farmers that he was appalled just 48 hours before addressing them when he had to buy dairy feed over the counter at 16c. lb.

He said that dairy feed comprised proteins and corn which grew out of the land and there was not a single element of the feed which was imported that could not be produced successfully in Barbados or in other parts of the West Indies.

He referred to CARIFTA and said that there was no commodity which could more freely cross the points of entry of the free trade area than dairy products and feed such as corn.

"We have in Guyana and other parts of the West Indies lands which are not producing anything which can be usefully consumed in the area and we should look on the production of dairy feed as a West Indian problem and not as a Barbadian one.

He said the Government was worried that most of the imported feed came from hard currency areas.

"If the feed came from the sterling areas we would not be so concerned because we earn enough from our sugar and by-products within the sterling area that we do not have too much of a balance of payments problem," he said.

He added: "We are concerned that the more we become self-sufficient in milk, the higher indebted we become in the importation of feed."

Mr. Barrow pointed out that Barbados consumed five million gallons of milk a year of which three and a half million gallons were imported in evaporated, condensed or milk powder. Barbados produced the remainder - one and a half million gallons.

He urged farmers to double their production.

He also said that the average production in Barbados was 12 lb. of milk a day. "This is not good by any average. The lowest should be 20 lb. a day," he said.

THE COST-EFFECTIVENESS OF CHILD NUTRITION PROGRAMMES *

Calculation of cost-efficiency is essential to the industrialist or the modern farmer when he is confronted with choices regarding future production and policies, and transferred to the nutrition field such calculations could be invaluable in determining priorities and selecting methods, i.e. types of programme. However, this paper is not a presentation of hard facts and figures about the subject, and cannot say that such and such a type of nutrition programme is less costly and more effective than another. The reason is that the very kind of information on which such calculations would be based is largely lacking. The paper is instead a discussion of principles, a definition of the elements of cost-effectiveness studies, and contains or refers to a few facts and figures only, as examples of the types of data required.

A Descriptive Definition of Child Nutrition Programmes

The first step in definition is to clarify what we mean by child nutrition programmes. Firstly, almost all nutrition programmes are child nutrition programmes, for even those aimed at the general population have important implications for the nutrition of children, the most vulnerable and severely affected group. Secondly, in programmes we will include not only special programmes but also regular services.

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* A paper presented at the CFNI Conference on "Recent Trends in Food and Nutrition in the Caribbean", St. Augustine, Trinidad, May, 1968.

These programmes and services fall into two groups: those aiming at treating malnutrition and related diseases; and those aimed at prevention of malnutrition and amelioration of current unsatisfactory nutritional levels.

The first, treatment, is largely carried out by means of hospitalisation of severely malnourished children. There is also out-patient and clinic and private-doctor treatment of lesser degrees of malnutrition and especially of other conditions, such as gastro-enteritis, made more common and severe by the ubiquity of moderate protein-calorie malnutrition.

Of preventive programmes there are many kinds, of which we may list eleven examples:

1. The type of nutritional supervisory service carried out in Child Welfare Clinics, with some home visiting by nurses, which involves also education of the mother in child care and child feeding, and often the distribution of supplements such as dried skim milk to those in need. The follow-up of patients discharged from hospital after an admission for malnutrition would also count as a nutritional supervisory service.

2. The wider distribution of protein supplement, e.g. dried skim milk. Usually this is more a ration for all in certain categories who care to claim it, rather than related to the need of the individual or family. Usually also supervision is limited to seeing that the ration is correctly distributed, and

not often concerned with checking on consequent nutritional progress. This kind of programme, usually sponsored by UNICEF, with its channels of distribution at schools, ante-natal clinics and child welfare clinics, has been a very common kind in this and most other areas.

3. With the main outlets through schools, and sometimes also involving community development or 4-H clubs, we have what are technically known as Applied Nutrition Programmes. These involve mainly a new emphasis on nutrition and agricultural education in the selected schools, together with an increase in nutrition activities of the health and community development and agriculture departments. In essence, though details of the programmes vary, they are intended to be co-operative efforts by agriculture, health, education and community development ministries.

4. Another type of programme which is sometimes carried out consists of a marked intensification of nutrition education aimed mainly at the general public (e.g. Foods for Family Fitness Campaign, Jamaica, 1948). The channels of communication of these campaigns are both the normal activities of the ministries involved and an increased use of radio, television and the press.

5. Another kind of nutritional programme, one which does not involve any appeal to the public to take any action, is the enrichment of foods. This centres on whatever is appropriate in the particular country for the particular problem, and may involve such things as the addition of Vitamin A to cooking oils, or the iodisation of salt. In the Caribbean, with its considerable consumption of mainly imported cereals, it involves or could involve particularly the addition of supplements to wheat flour, corn flour, or rice. These supplements are usually iron plus the B group of vitamins; but could also be lysine and other essential amino-acids. Iron supplementation of flour is meant to help to deal with the major public health problem of iron-deficiency anaemia, but there is doubt about its effectiveness. Amino-acid fortification of flours, it is claimed, could raise their protein quality to the same as that of milk protein.

6. The development and marketing of special high protein foods (e.g. Incaparina) or beverages (e.g. Vita-Soy) is another example of the 'food technology' approach, but in this instance depends like most programmes on public response. Cost in this case would include any subsidization whether from governments, international or voluntary agencies or the firm developing the product.

7. A type of programme which is not a direct nutritional operation but must be considered in this context, in view of the

relationships between nutrition and infection, is the campaigns against communicable diseases and parasitic intestinal infestations which play an important part in gradually or suddenly precipitating severe malnutrition or anaemia. These campaigns would include efforts to reduce the incidence of diseases by immunization (measles, whooping cough, tuberculosis) malaria eradication, and specific campaigns against roundworm or hookworm, and also, especially in this area, efforts to improve supply of pure water and install better sewage disposal methods, which must reduce the incidence of gastro-enteritis. It may seem at first sight far-fetched to include such things as environmental sanitation or immunization as child nutrition programmes, but as they may significantly reduce the amount of severe malnutrition in young children, we must include them if we want honest cost/efficiency comparisons.

8. Another kind of nutrition programme is that expressed through the enactment and enforcement of certain legislation; for example, laws governing the quality of food, food hygiene and fair retail practices, or possible laws to prohibit certain commercial advertising detrimental to nutrition and health.

9. Next we must include as nutrition programmes a whole series of programmes aimed at making more food available. These include agricultural programmes stimulating by subsidized distribution of seeds or fertilisers and by improved marketing and

extension advice, increased production of certain foods; they include also enactment and enforcement of price controls; and also direct food subsidies for imported or home-grown food; and finally, possible differential import duties based on nutritional value, e.g. letting dried skim milk be imported duty-free, while increasing the tax on expensive patent foods of low nutritional value.

10. The provision of mid-day meals to school children or to industrial or agricultural workers is another type of nutrition programme. The beneficial effects, physical and mental to school children may seem obvious, but ought to be measured. The effect on productivity of meals for adult workers may not only assist the country's economic progress, and actually bring the employer a greater financial return than the amount he spends in providing the meals, but also may affect child nutrition if the adult worker then requires a lesser share of the limited amount of good food available to the family.

11. Lastly we must include as nutrition programmes all programmes which provide to the public motivation for, advice about and means of contraception. We include this because it is fairly certain that better spacing of children would result in better health and nutrition of both mother and child, and that for most countries reduction in the rate of natural

increase in the population would probably contribute to a higher standard of living and greater availability of food.

So much, then, for a definition of what we mean by nutrition programmes.

The Kind of Data Required in Cost-Effectiveness Studies, with some examples

Next we must review the kind of data required in investigation of cost-effectiveness and as we go through the list we will add some illustrative examples.

Essentially such studies will consist of (a) determining the cost to the community caused by the presence and present extent of the disease, in this case malnutrition, and related diseases; (b) balancing against this the cost of preventive programmes in relation to the amount of malnutrition which they are found to prevent; and (c) also comparing the cost-effectiveness of one kind of preventive programme with another. Only if we do this can we arrive at a rational choice among the methods available for combatting the problem.

The cost to the community in the Caribbean area of the present extent of malnutrition, under-nutrition and related disease has been dealt with in general in an article published elsewhere, and the main headings of cost and loss to the community from the present extent of nutritional problems are listed there.*

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* Cook, R. (1968). The Financial Cost of Malnutrition in the Commonwealth Caribbean. Journal of Tropical Paediatrics, 14, 60. Reprints available from Editor, Cajanus.

To attach a cash value to these losses would in the main require a special research effort; not necessarily prolonged or expensive, but a special effort nevertheless. As a rough guide however to the kind of amounts involved one is able to attach an approximate figure to two elements among the main headings:-

(a) The costs of treatment of the children admitted to hospital in the Commonwealth Caribbean area for malnutrition with or without gastro-enteritis comes to something in the region of two million E.C. $ per annum. This refers to hospitalisation alone, and does not take into account any out-patient or private doctor treatment before or after, and does not include any costs to parents in time or money.

(b) The cost of child life wastage in relation to children whose certified cause of death is malnutrition or gastro-enteritis in Jamaica and Trinidad comes to about E.C. $300,000 for these two islands, and if extended pro rata to the whole area, just over half a million dollars. This is a rather conservative estimate, based on minimal allowances for food, clothing, child-birth or funeral expenses for each individual, and also rather conservative on the grounds or numbers, for an investigation in Jamaica* has shown malnutrition is a much

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* McKenzie, H.I. et al (1967). Child Mortality in Jamaica. Milbank Memorial fund Quarterly, 45, 303.

commoner contributing factor in death in early childhood than a reading of death certificates would make one believe.

These estimates, amounting together to between two and three million dollars E.C. per annum on these two headings of child life wastage and hospitalisation are only rough estimates, and of course only deal with two items out of many. They are merely an approximate guide, and the matter certainly deserves further investigation.

Let us turn to the cost-effectiveness data on preventive programmes. Let us remind you that what we really need is (a) data on cost, (b) data on effectivenss related to the cost, and (c) comparison on this basis between preventive programmes themselves and between cost of prevention and losses due to absence of prevention.

There has in fact been remarkably little investigation into these aspects. Firstly, many nutrition programmes have no accompanying study of what they achieved in terms of measured benefit to the population served. Secondly, in very few scientific papers on programmes which are evaluated in these terms of measured benefit is the cost, total or per person served, mentioned.

To run briefly through our list of child nutrition programmes to see if such data could be obtained, let us look first at evaluation of effectiveness for all of them. This ought not to be very difficult, as it rests partly on before and after comparisons of certain vital and health statistics which are already collected or could be

collected, and partly on similar comparisons of direct measurements of nutritional status among samples of the population served, procedures which are not expensive relative to the total cost of the programme. Whilst indicators for evaluation should be chosen which are appropriate for the particular programme, some indicators should be included which are capable of use in all nutrition programmes, to facilitate comparison of one programme with another. This should not be too difficult to arrange, since most general or child nutrition programmes have certain common objectives.

To go through our list of preventive programmes in search of data, we can see that the costing of the nutritional supervisory services, (Child Welfare Clinics etc.) presents no insuperable difficulties. From other countries we have a few examples of this kind of costing in relation to achievement, though not between different kinds of programme in an ecologically similar area. For example Morley's well-known child welfare clinic at Imesi in Nigeria cost U.S $15 per year per child served, and reduced infant mortality over 5 years from over 290 per thousand live births to 70.

With regard to wide scale distribution of supplements such as Dried Skim Milk, the commercial value of the product is known (about 36 E.C cents per pound) and an examination of government accounts ought to reveal the cost of distribution, which some say is about equal per pound to the cost of the Dried Skim Milk itself. If this is so, it would be interesting to compare the cost-effectivenss of the traditional type of distribution with the cost of government subsidy of

commercially imported and distributed Dried Skim Milk.

As regards cost-efficiency in what are technically known as Applied Nutrition Programmes, this is certainly mentioned in the 1966 WHO/FAO report on the evaluation of such programmes, but only in one line, as a research need, and in the 1967 report of the Latin American Seminar on the Planning and Evaluation of these programmes there is no information either on internal cost-efficiency ratios or on comparison between these and curative services or other types of preventive service.

The author does not know of any data on the cost-effectiveness of campaigns of intensified nutrition education of the general public, nor of the enactment and enforcement of nutrition-directed legislation. Cost of food enrichment and fortification is available however. We know that enrichment of wheat flour with iron and the B Vitamins costs about 5.4 E.C. cents per 100 lbs. of flour, sufficing one person for one year, and similarly lysine fortification of flour would cost about 40 cents E.C. per person per year. However, what we lack here is not costing but knowledge of comparative effectiveness.

The evaluation of cost-effectiveness of campaigns of control of communicable diseases and parasitism does present a problem, not of determining their total cost, nor of determining their effectiveness in regard to the particular diseases or in regard to nutrition, but it is impossible to know how much of their cost to allocate to their effect on nutrition and how much to their action in regard to

the specific diseases controlled. Also if very successfully applied to a major cause of mortality such campaigns may have a "population-explosive" effect and may some years later thus intensify as well as alleviate nutritional problems. In turn, however, increased survival of children may perhaps stimulate acceptance of family planning.

The cost of agricultural programmes should present no difficulty in this highly cost-conscious sector of the economy, but food consumption surveys and nutritional assessment must accompany them before we can arrive at conclusions as to their nutritional value. Likewise it is possible to devise a plan for evaluation of programmes to provide meals for school children or adult workers including evaluation of nutritional effects on the families of recipients.

Finally, Family-Planning porgrammes ought to be fairly simple to evaluate both in terms of cost and of nutritional benefit to those families who use the service and possibly to the community in general.

It will be seen from this brief resumé that while little hard fact is available at present the evaluation in these terms of this type of service and programme presents no really insuperable difficulties. It is only slightly more complicated than the calculation of industrial or agricultural cost-efficiency ratios, and while one would not wish to over-simplify matters, the complexity is not so great in many other forms of medical, economic or sociological research.

The main obstacles to this type of research are twofold. Firstly, it requires care and determination to isolate types of programme in order to make a comparative evaluation. One would suggest that the best way to do this would be to conduct different kinds of programmes simultaneously in areas which are geographically distinct but socio-economically similar. The second main obstacle in the way of such studies is that many government personnel, who would in fact be extremely interested in the results of cost-effectiveness studies, have not yet realised what financial benefits these could bring, and therefore are not yet insistent in demanding of academic institutions and international agencies that these should assist them in this type of study.

To outline the need for these studies, and to point to the possibility that considerable financial savings and major improvements in nutrition may result, has been the main objective of this paper.

READER'S LETTER

From Mr. A.C. Hodges, Regional Planner, Town Planning Department, Kingston

Dear Sir,

As dietary fats are thought to have an influence on the development of vascular and cardiac conditions such as atheroma and myocardial infarction, and people in middle age or with a tendency to these conditions are advised to take a higher proportion of polyunsaturated fats in their diet, could you publish the relative values in terms of saturated and polyunsaturated fatty acids of locally available fats and oils, such as coconut oil, avocado pear, etc?

Yours etc.
A. C. Hodges.

6 November 1968.

Many conflicting reports on this topic have been published in the last few years, and the possible relationship between diets modified in fat and cholesterol content and the incidence of coronary heart disease remains unproven.

The approximate fatty acid composition of some fats and oils consumed in the Caribbean area is as follows:

Table. Fatty acid composition (percentage of total fatty acids) of some fats and oils consumed in Caribbean area.

Fat/Oil	Percentage of total fatty acids *			
	Saturated	Total unsaturated	Mono-unsaturated	Poly-unsaturated
Coconut oil	89	9	8	1
Palm oil	49	51	42	9
Peanut oil	19	80	54	24
Soy oil	14	80	29	51
Oleo oil	32	66	66	0
Butter	62	38	34	4
Avocado	25	75	62.5	12.5
Pork Lard	38	56	46	10

* As some fats contain fatty acids other than saturated and unsaturated, columns 1 and 2 do not always add up to 100.

CFNI NEWS

Dr. P. N. Sen Gupta has now joined the staff of CFNI and commenced his duties as Food Policy and Planning Officer. He is also officer-in-charge of the Trinidad Centre of CFNI, UWI Campus, St. Augustine. Dr. Sen Gupta spent some time with CFNI staff in Jamaica early in November, will be visiting Barbados later in November and Jamaica again in early December.

Mrs. Armstrong began work in October as Assistant Administrative Officer at the Trinidad Centre, and the centre is thus rapidly in the process of becoming fully operational. The arrival of the Nutrition Educator is expected in the near future.

CFNI will be co-ordinating a Caribbean-wide investigation into Infant Feeding Practices in 1969, and a small working party will be held in Jamaica in December towards this end. The ultimate objective will be to draw up guidelines on teaching on infant feeding which are based on consultation with collegues throughout the area, founded on knowledge from this and previous investigations, and particularly take into account local circumstances of food availability, economic situation, home facilities, culture patterns, etc.

Dr. Miguel Guzman, Head of the Department of Statistics at the Institute of Nutrition of Central America and Panama (INCAP), has just

completed a 10-day assignment as a PAHO/WHO short-term consultant advising CFNI on the drawing up of a computer programme for nutrition surveys. Colleagues of the Medical Research Council (TMRU and ERU) and from the Nutrition Unit of the Scientific Research Council were consulted concerning the various items and parts of the programme. More consultations will be held later this month with authorities in Barbados and in December with those participating in the working-party. It is hoped that not only will this computer programme be used in a joint government of Barbados-CFNI nutrition survey commencing April next, for training CFNI's diploma students and for the Caribbean-wide investigation into infant feeding practices mentioned above, but also will be available to any Institute in the Caribbean to use in nutrition surveys. The programme will have a certain flexibility and be capable of modification for particular purposes.

CFNI is in process of selection of candidates for its Diploma in Community Nutrition Course which begins in January next. Candidates will be assisted by PAHO Fellowships and will spend three months in Jamaica, next will visit for seven weeks other islands in the Caribbean, principally Barbados, and then spend six weeks at the Trinidad Centre of CFNI. They will then return to their home countries for a final three-month project, making a nine-month course in all.

Anyone concerned with the nutrition problems of developing countries will profit from reading this book which delineates problems encountered, clarifies them, underscores their complexity, and illuminates a method of objective appraisal.

* * * *

CAJANOQUOTE

"In Britain at least 30,000 deaths a year and probably many more are attributable to smoking, and by the end of the century more British men will have died from this cause than in the two world wars. Using published figures for the sale of cigarettes and of oral contraceptives in Britain in 1967, it is possible to calculate that the risk associated with the use of oral contraceptives is probably equivalent to smoking a third of a cigarette, one a day, for three weeks out of four (although it is not known if the risks of smoking are proportional to the number smoked or if there is a threshold effect). It is one of the paradoxes of modern medicine that it is often difficult for a doctor to persuade a woman to take oral contraceptives because she has fears of the risks attached to them , while at the same time it is virtually impossible to stop her or her husband smoking. From the point of view of the health of society it would be more justifiable to have oral contraceptives in slot machines and restrict the sale of cigarettes to a medical prescription".

I.P.P.F. Medical News Vol. 2, No. 4 October 1968.

BOOK REVIEW

Campaigns against Hunger by E. C. Stakman, Richard Bradfield, Paul C. Mangelsdorf. (The Belknap Press of Harvard University Press, Cambridge, Massachusetts), 1967.

The achievement of the Rockefeller Foundation through its various programs for increasing food production with special emphasis on the importance of coordination and continuity of effort, particularly in Mexico, and later, with application to many countries throughout the world, has been admirably recorded in Campaigns against Hunger.

The program introduced new strains of improved corn seed by selecting superior varieties from the native corn and using them to create more productive yields, developed a "stem rust" resistant wheat hybrid variety that inaugurated a "wheat revolution", and placed high priority on bean improvement both through breeding and through control of diseases and insect pests.

A feature to be particularly commended in achieving improvement and selection is that disease resistance and yields were not the only criteria used. There was comparable attention given to protein quantity and quality, and even to cooking time of bean. The latter was an important consideration particularly in view of high altitudes and prolonged cooking time due to low temperature and the scarcity and

relatively high cost of fuel. While all of the above aspects have contributed to substantial progress in bean production, it is recognised that yields can be raised still further if the information now available is utilised more widely, primarily a problem of extension and demonstration.

The dramatic improvement in Mexico's food supplies between '43 and '63 involved corn, wheat and beans. Considerable attention was also given to potatoes, soyabeans and sorghums, with varieties resistant to diseases prevalent in Mexico, and adapted to Mexican climate. These represented potential sources of food that can be exploited should the need arise. These crops are expected to become increasingly important as population pressure becomes more acute and Mexican agriculture becomes less traditional, less provincial and more functional.

Better control of living enemies of crop plants was one of the 'Big Three' that helped win the Mexican agriculture revolution: better varieties; better soil management; and better protection against destructive diseases, voracious insects and noxious weeds.

The development of a competent corps of Mexican agricultural scientists and scholars was the most valuable permanent contribution of the revolution in agriculture. Participation in research was the

principal device for selecting and helping to educate potentially productive national scientists. And research also paved the way for the more effective organisation and coordination of investigational, educational and extension agencies.

The Mexican Agricultural Program has had evolutionary extensions to Colombia, Ecuador and Chile. A point which merits special mention is that these national programs were linked to an organic international system, which made them mutually stimulating and helpful, and their cooperative efforts produced far greater values than if they had operated as unrelated entities.

The authors draw attention to compartmentalisation which is one of the seven or more curses in less developed countries. The separation between research, education and extension is so sharp and wide in many countries that the gaps are seldom bridged. Effective cooperation cannot really be compelled, nor can it be exercised at pleasure. The ideal solution would be to convince everyone that the cause of fighting hunger and ignorance is so worthy that it is dishonourable to hinder the cause through departmental isolationism. Unless this can be done, the highest efficiency cannot be attained in getting results, nor in getting them to the farmer.

EDITOR'S ANNOUNCEMENTS

We thank those readers who have completed our evaluation questionnaire, which was included in the last issue of CAJANUS. We appeal to all our other readers who have not yet done so to help us in this way to develop the newsletter in the direction they would wish. An account of the answers we receive will be published in the next issue.

We remind readers of our competition for proverbs related to nutrition, see page 89 of the CAJANUS No. 5 (October) for details. Prize £5 ($24. E.C.)