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CAJANUS

Newsletter of

THE CARIBBEAN FOOD AND NUTRITION INSTITUTE

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EDITORIAL

This issue of 'Cajanus' covers quite a wide range. We have Dr. Yang's full and informative article on the use of the soybean, a philosophical article of wide interest and relevance by Mr. McDowell and a characteristically pithy piece on food quality by Dr. Sammy.

There are two items on food prices in the Caribbean and elsewhere. The implications of the findings may be of interest to retailers, governments and consumers.

The statement by Dr. Boerma on the world food situation emphasises that - contrary to the sometimes expressed view - we do not have yet the technical know-how to solve the world's nutritional problems. We are still at the mercy of wind, rain and drought. Man is still not intelligent enough to think globally, and the price of our bread is still influenced by harvest failures in Russia.

Along with this issue we are publishing the proceedings of a seminar on 'Food and Economic Planning' which was held last November in Trinidad. This is being distributed to our readers in the Caribbean. Readers in Third World countries can obtain the proceedings free. Elsewhere, the cost is US\$2.00. We have to make a small charge to defray the publication costs.

THE EDITOR

TOPICS AND COMMENTS

INSECTICIDE INTAKES - ACCEPTABLE DAILY INTAKES¹ AND RESIDUE TOLERANCES²
PROPOSED FOR CERTAIN INSECTICIDES BY FAO/WHO

Pesticide	Acceptable daily intake in milligramme per kilo- grammes of body weight	Residue tolerances on specific crops in parts per million by weight	
Aldrin and dieldrin	0.0001	Asparagus, broccoli, Brussels sprouts, cabbage, cauliflower, cucumber, eggplant, horseradish, onions, parsnips, peppers, pimentoes, radishes, radish tops	0.1
		Fruit (other than citrus)	0.1
		Citrus fruit	0.05
		Rice (rough)	0.02
		Potatoes	0.2
Chlordane	0.001	Potatoes, sweet potatoes, rutabagas, turnips, parsnips, sugar beet, radishes	0.3
		Asparagus, broccoli, Brussels sprouts, cabbage, celery, cauliflower, mustard greens, spinach, Swiss chard, lettuce	0.2
		Beans, peas, eggplant, tomatoes, collards (= coleworts)	0.02
		Wheat, rye, oats, rice (polished), maize, popcorn, sorghum	0.05
		Cantaloups, cucumbers, pumpkins, squash, watermelons	0.1

¹Acceptable daily intake is the amount which, during an entire lifetime, appears to be without appreciable risk on the basis of all known facts.

²Residue tolerance is the maximum concentration of pesticide permitted in or on food prior to consumption.

Source: FAO

INSECTICIDE INTAKES - ACCEPTABLE DAILY INTAKES AND RESIDUE TOLERANCES
PROPOSED FOR CERTAIN INSECTICIDES BY FAO/WHO (CONTD.)

Pesticide	Acceptable daily intake in milligramme per kilo- grammes of body weight	Residue tolerances on specific crops in parts per million by weight	
		Almonds, bananas, figs, filberts guavas, mangos, olives, passion- fruit, papayas, pecans, pomegra- nates, pineapples, strawberries, walnuts	0.1
		Citrus, pome and stone fruits	0.02
		Crude soybean and linseed oils	0.5
		Crude cottonseed oil	0.1
		Edible cottonseed oil	0.02
		Edible soybean oil	0.02
DDT	0.005	Apples, pears, peaches, apricots, small fruits (except strawberries) vegetables (except root vegetables) meat and poultry (on fat basis)	7
		Nuts (shelled), strawberries, root vegetables	1
		Cherries, plums, citrus, and tropi- cal fruit	3.5
Endrin	0.0002	Cottonseed, cottonseed oil (crude)	0.1
		Edible cottonseed and maize oil	0.02
		Apples, wheat, barley, sorghum, rice (husked and/or polished)	0.02
Heptachlor	0.0005	Pineapple (edible portions)	0.01

NUTRITION AND SCHOOLS¹

One of the approaches commonly employed to improve the nutritional status of the vulnerable segments of the population has been the provision of nutritional supplements - an approach which has been widely used in schools through school feeding programmes. This important educational potential should be kept in mind for introducing new foods and relevant nutritional practices. However, it has been observed that a standard recommendation on

¹From Tiglao, Teodora. *Planning for Health Education in Schools*. *Int. J. Health Educ.*, 15, (supplement to issue No. 3) 1972.

the nature and amount of dietary supplements cannot meet the nutritional problem in all situations. The dietary pattern and the nature of the deficit has to be considered. For example, in areas where the food intake is inadequate, both in protein and in calories, the use of protein-rich foods as a supplement may not bring about the desired improvements unless the calorie gap is also corrected.

No nation can afford to feed its schoolchildren with supplementary food on a continuing basis. The most logical way of solving the problem would be to make available enough food at prices within the reach of the general population through improved food production, marketing and distribution as well as educating the families to feed themselves well.

Teaching the essentials of nutrition deserves a high priority in school health education in accordance with local food habits and customs, available food supplies, cooking facilities and income level of the students. Nutrition education in schools, should desirably be closely integrated with community health, agricultural and other community development programmes.

HEALTH EDUCATION AND DEVELOPMENT¹

Prevention (of illness) consists largely of health education; this teaches people to behave differently from before. Some critics think it is not very effective, but that is when it is attempted as an isolated measure. In countries where it has been applied in the context of a general revolutionary change in people's lives (involving collective activity) and carried out systematically, on a large scale, it has been effective. Health education not only improves people's health, it contributes to their development; it demystifies their beliefs about the cause of disease. It shows them that disease can be eliminated from the community by their own efforts; it raises their consciousness of self-reliance.

VULNERABILITY OF YOUNG INFANTS TO FOOD ADDITIVES²

Very young infants are especially vulnerable to foreign chemicals because the mechanisms that provide protection against these substances are absent or not fully developed. Although the evidence for this derives mainly

¹From 'The Politics of Health in Tanzania' by Malcolm Segall (Professor of Child Health, Faculty of Medicine, University of Dar es Salaam) in *Development and Change*, 4, 39-50. Those readers who find the title of the article interesting will find the whole article well worth reading. The editor of 'Cajanus' can provide photocopies.

²From: Joint FAO/WHO Expert Committee on Food Additives (1972). Fifteenth report, Geneva (*Wld. Hlth. Org. techn. Rep. Ser.*, No. 488) p. 33.

from studies with drugs rather than with food additives. It is likely that such very young infants are less efficient than older children in metabolizing some food additives and may therefore accumulate them to excessive levels. If this occurs at a time when sensitivity to toxic effects is critical because of the delicately balanced growth and differentiation processes, there may be deleterious consequences that may not appear until much later in the child's development. Very young infants may also differ from older children in relation to physiological barriers protecting sensitive tissues, such as the blood-brain barrier or the protective barriers for retinal or lens tissue.

ACKNOWLEDGEMENT

In the last issue of 'Cajanus' we published a short piece (p. 269) entitled 'The Farmer, the Cow and the Housewife'. We regret that the origin was not given. It was by Israel Berkovitch and was in New Scientist, 29th June 1972, p. 724.

CAJANAQUOTE

"Sex is not everything... Food becomes in all primitive societies, and of course in all civilized societies, a centre of social groupings, a basis of systems of value and the nucleus of ritual acts and religious beliefs."

This heartening quotation is taken from The Sexual Life of Savages (1929) written by the great anthropologist Bronislaw Malinowski as a result of his field work in the Trobriand Islands.

SOYBEAN FOODS FOR THE CARIBBEAN

by

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SOYBEAN IN HUMAN NUTRITION

The aims of promoting soybean production and consumption are to introduce a new and inexpensive protein food and to add variety to the Caribbean diet. Countries with the potential for soybean production such as Guyana and, to a lesser degree, Jamaica, and Trinidad and Tobago, should give it priority in their agricultural planning, while others should include soybean as a part of their "beans and peas" import, if it is generally accepted. The purposes of this paper are to present the nutritional and economic aspects of soybean consumption and to introduce some soybean foods which may be accepted in the area.

If only protein is taken into consideration, soybean is the most economical source. Based on the current price in Kingston, the cost of utilizable protein is half of that of cornmeal, 20-50% of other beans and peas, 10-15% of meat, egg, fish, or milk. It is only 40% and 45% of the cost of skim milk powder and dried cod fish, which are under government price control. Details are illustrated in Table I (overleaf). The differences could be much bigger in Guyana where soybean is locally produced.

The merit of soybean consumption is not only in its high protein content; the more important may be in its value in complementing dietary protein. The staple foods in the Caribbean, namely wheat flour, rice, and corn, are all deficient in lysine, while soybean, similar to other legumes, is rich in

TABLE 1: Calorie and Protein Values and Cost of Utilizable Protein of Selected Food Items in Jamaica

Food and description	Cal- ories in 100g	Protein g/100g	Calories from protein	Protein cal. %	Protein score (A/E)	Utili- zable protein g	Retail price J\$/lb*	Cost of 20g utilizable protein J\$
CEREALS								
Cornmeal	364	7.9	27.33	7.51	55	4.35	.06	0.061
Rice, white	382	6.7	25.59	7.05	77	3.69	.13	.155
Wheat flour	364	10.9	44.15	12.13	52	6.00	.10	.074
BEANS & NUTS								
Cow pea (blackeye pea)	341	24.1	83.63	24.52	57	13.74	(.20)	.064
Lima bean	336	20.7	71.83	21.38	50	10.35	.32	.136
Pea, split	348	24.2	83.97	24.13	50	12.10	.18	.066
Pigeon pea	337	19.2	66.62	19.77	39	7.49	.25	.147
Red pea	337	22.0	76.34	22.65	47	10.34	.19**	.081
Soybean	335	38.0	131.86	39.36	62	23.56	(.15)	.028
Full-fat soya flour	357	39.0	135.33	37.91	62	24.18	(.18)	.033
MEATS								
Beef, med- ium fat	224	18.7	79.85	35.65	80	14.96	.83	.245
Pork, med- ium fat	216	15.5	66.19	30.64	81	12.56	.70	.246
Chicken, dressed	170	18.2	77.71	45.71	79	14.38	.60	.184
EGG								
Egg, fresh	162	12.9	55.08	33.79	100	12.90	.51	.174
FISH								
Fish, fresh	132	18.8	80.28	60.82	80	15.04	.96	.281
Codfish, dried	264	39.8	173.49	65.72	80	31.76	.51	.071
MILK								
Milk, fresh	65	3.5	14.95	23.00	69	2.42	.11	.200
Milk, powder full fat	506	26.0	111.02	21.94	69	17.94	.77	.189
Skim milk powder	360	36.0	153.72	42.70	69	24.84	.40	.064

*Retail price in per pound of edible portion. Information obtained on October 3, 1972, from Hi-Lo Supermarket, Liguanea Plaza, Kingston, Jamaica. Jamaica Dollar 1.00 = US Dollar 1.20.

**Value of imported red pea. Locally produced red pea sold at J\$0.30 per pound.

lysine. On the other hand, legumes are generally deficient in sulphur-containing amino acids yet the cereals are comparatively richer. The combination could greatly upgrade the quality of dietary protein. The use of soya flour for enrichment of wheat flour and bakery products at factory level is most nutritionally desirable and economical. Of course, in the final analysis of national diets in the Caribbean, the sulphur-containing amino acids may still be the limiting factor. It would require the increased consumption of foods rich in these amino acids such as eggs and fish.

The major obstacles in the direct consumption of soybean are the requirements of prolonged cooking, the existence of trypsin inhibitor, and the beany and sometimes bitter taste.

Cooking time could be reduced by using soybeans from a new crop and allowing sufficient time for soaking in water. The adding of a very small amount of baking soda (sodium bicarbonate) to the soaking water could also reduce both the cooking time and the bitter taste. Trypsin inhibitor can be inactivated by boiling for 20-30 minutes. The beany taste may be greatly reduced by cooking the whole seeds and discarding the cooking water. It is important that raw soybeans should not be cracked or ground. Otherwise, lipoxidase, one of the enzymes existing in soybean, coming in contact with air would immediately produce an objectionable beany taste. Of course, by discarding cooking water, some loss of water soluble vitamins will be inevitable. However, the loss of protein and iron is negligible.

SOME SOYBEAN FOODS FOR THE CARIBBEAN

Because soybean for direct human consumption is relatively new to the Caribbean, trials must be made in the development of soybean foods to fit local dietary practices. The recipes and formulations, though all tested on

one or more occasion, would require much refinement based on local acceptability. The foods as suggested below are arbitrarily divided into three categories, namely household preparation, processing at community level, and industrial production. The estimated cost of raw materials and a nutritional evaluation of the mixtures suggested for community and industrial production are detailed in Table 2 (overleaf).

HOUSEHOLD RECIPES

SOYA AND RICE WITH COCONUT MILK (4-6 adults)

INGREDIENTS

4 cups parboiled rice
 $\frac{1}{2}$ cup soybean
 $\frac{1}{2}$ cup coconut milk

METHOD:

Clean, wash and soak soybean overnight in two cups of water. Rinse soaked soybean and cook in three cups of water until bean is partially soft (about 40 minutes). Drain off cooking water and rinse cooked soybean. Cook rice and soybean together in six cups water until done. Add coconut milk and simmer a while until all absorbed in rice. Serve hot.

Remarks: The above recipe is similar to the Jamaican national dish of rice and red peas with coconut milk.

BAKED SOYBEAN IN TOMATO SAUCE

INGREDIENTS

4 cups soybean	3 tbsp. Tomato catsup
3 tbsp. cooking oil	1-2 tbsp. sugar (optional)
2 medium onion	A pinch of salt
1 cup chicken broth	

METHOD:

Clean and soak overnight two cups of soybean. Cook soybean for 30 minutes and drain. Fry chopped onion in oil until yellow. Add cooked soybean and chicken broth and bake at 375°F for one hour.* Add tomato catsup, sugar and salt. Bake another 15 minutes. Serve hot.

**Or simmer for one hour if oven is not available.*

TABLE 2: Nutrition Value and Raw Material Cost of Selected Protein Food Mixtures

FORMULATIONS											NUTRITION VALUE				
MIXTURE	Rice white	Rice flour	Wheat flour	Soy-bean	Soya flour	Skim milk powder	Edible oil	Sugar	Methionine	Raw material cost J\$/lb.	Cal. in 100g	Prot. g/100g	Prot. Cal.%	Chem. score A/E	Projected NDpCal%
Processing at Community Level															
Soya-wheat Instant Food A	-	-	60%	-	40%	-	-	-	-	.132	361	22.1	22.3	75.3	10.7
Soya-wheat Instant Food B	-	-	60%	-	35%	-	5%	-	-	.139	387	20.2	19.1	76.6	10.5
Soya-rice Instant Food	-	60%	-	-	40%	-	-	-	-	.150	352	19.6	19.7	66.5	9.1
Instant soup powder	-	-	28.6%	-	28.6%	-	14.3%	-	-	.347	408	25.6	24.8	79.5	11.8
Industrial Production															
Instant Soya-rice Baby Food A	40%	-	-	40%	-	5%	-	15%	-	0.149	355	19.7	19.9	65.5	9.1
Instant Soya-rice Baby Food B	40%	-	-	40%	-	5%	-	14.8%	0.2%	.152	356	19.9	20.1	87.5	12.0
Instant Soya-rice Baby Food C	40%	-	-	44.8%	-	-	-	15%	.2%	.139	354	19.9	19.9	85.2	11.6
Instant Soya-rice Baby Food D	59.8%	-	-	40%	-	-	-	-	.2%	.141	352	19.4	19.6	87.7	11.8

Remarks: 1. Raw materials cost is calculated according to retail price per pound of different commodities in Kingston as follows: Cornmeal, J\$0.06; rice, J\$0.13; wheat flour, J\$0.10; sugar, J\$0.11; edible oil, J\$0.31; and skim milk powder, J\$0.40.

2. Price of methionine is estimated at US\$5.00 per kg.

3. Soybean and full-fat soya flour are estimated at J\$0.15 and J\$0.18 per pound respectively.

4. Instant soup powder also includes 28.6% dried codfish.

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TROTTER STEWED WITH SOYBEAN
(a Chinese dish)

INGREDIENTS

1 lb. trotter	3 tbsp. cooking oil
½ lb. soybean	3 medium onion
3 tbsp. Soya sauce	A pinch of salt
2 tbsp. sugar	

METHOD:

Clean and soak soybean overnight. Clean trotter. Fry sliced onion in cooking oil until yellow. Add soybean and trotter and boil in water for one hour. Add soya sauce, sugar and salt, simmer another ten minutes. Serve hot.

SOYBEAN COOKED WITH CODFISH

INGREDIENTS

½ lb. dry codfish	¼ tsp. pepper powder
½ lb. soybean	1-2 tbsp. sugar (optional)
3 medium onion	Salt if so needed
3 tbsp. cooking oil	

METHOD:

Clean and soak soybean overnight. Drain and wash soaked bean. Clean and wash codfish. Cut codfish in one-inch squares. Brown chopped onion in cooking oil. Add codfish and soaked soybean. Boil for one hour until both are soft. Add the rest of ingredients and simmer for a while.

FRIED SOYBEAN

INGREDIENTS:

½ pound soybean	A pinch of salt
2 tbsp. edible oil	

METHOD:

Clean and soak soybean for two hours. Drain off water and wash. Cook soybean for twenty minutes. Add a little salt for seasoning. Drain off cooked water. Heat edible oil* and sauté cooked soybean until crispy. When cool, store in airtight container.

*Better taste could be developed if 2-3 cloves of pressed garlic are added when oil is hot.

SOYBEAN MILK (7 glasses)

INGREDIENTS

$\frac{1}{2}$ lb soybean	1 tsp. baking soda (if available)
2 tbsp. cocoa (or $\frac{1}{2}$ glass coconut milk)	3-4 tbsp. sugar

METHOD:

Clean and soak soybean overnight. Add half spoon baking soda in water. Change water and cook soybean for one hour. Add another half spoon baking soda in water before cooking. Drain out cooking water and rinse soybean (about $2\frac{1}{2}$ glasses of cooked soybean). Put cooked soybean, cocoa (or coconut milk) and sugar in waring blender and add $2\frac{1}{2}$ glasses of water. Beat in low speed for one minute and turn to high speed for five to ten minutes until emulsified. Add two more glasses of water and beat in low speed for a while. Serve hot or cold.

PROCESSING AT COMMUNITY LEVEL

Full Fat Soya Flour

Because people are becoming increasingly occupied, even in rural areas, some time-saving device to process soybean may be required. Experience learned from Korea and Tanzania show a Japanese make "CeCoCo" Flour Grind Mill, Type D, could generally serve the purpose. It was first recommended by the Northern Utilization Research and Development Division, Agricultural Research Service of the USDA. Such a machine can produce twenty pounds of full-fat soya flour with hand-operation, and double this production if run with a small electric motor. For economic use, the Grind Mill may be available to a village or community.

The Division published a pamphlet describing the steps in processing full-fat soya flour. However, in actual application, villagers seldom process more than five pounds of raw soybean each time, and they are not inclined to combine beans together to process in one

batch. The steps of processing soya flour are therefore modified as illustrated in Table 3 (overleaf). Full-fat soya flour, with a protein content of 39% and PER of 2.0 (Casein is 2.5) is the most important ingredient for many preparations.

The following recipes use full-fat soya flour as the main component and the products have protein content ranging from some 20% to 25%, and protein score from 67 to 80. The projected NDpCal% is from 9.1 to 11.8, indicating its superior quality even for feeding of young children and pregnant and nursing mothers. Details are illustrated in Table 2.

SOYA-WHEAT INSTANT FOOD A

INGREDIENTS

1 lb. full-fat soya flour

1½ lb. wheat flour

METHOD:

Mix the ingredients and toast on mild fire, turning frequently until ivory yellow. When cool, store in air-tight container for daily use.

PREPARATION:

Put 3-4 tablespoons powder and if sweetening preferred add two teaspoons sugar thoroughly mixed. Gradually pour in boiling water. Stir with a spoon. Adjust the amount of water to fit your taste. It should be in a thick porridge form.

SOYA-WHEAT INSTANT FOOD B

INGREDIENTS

1 lb. full-fat soya flour

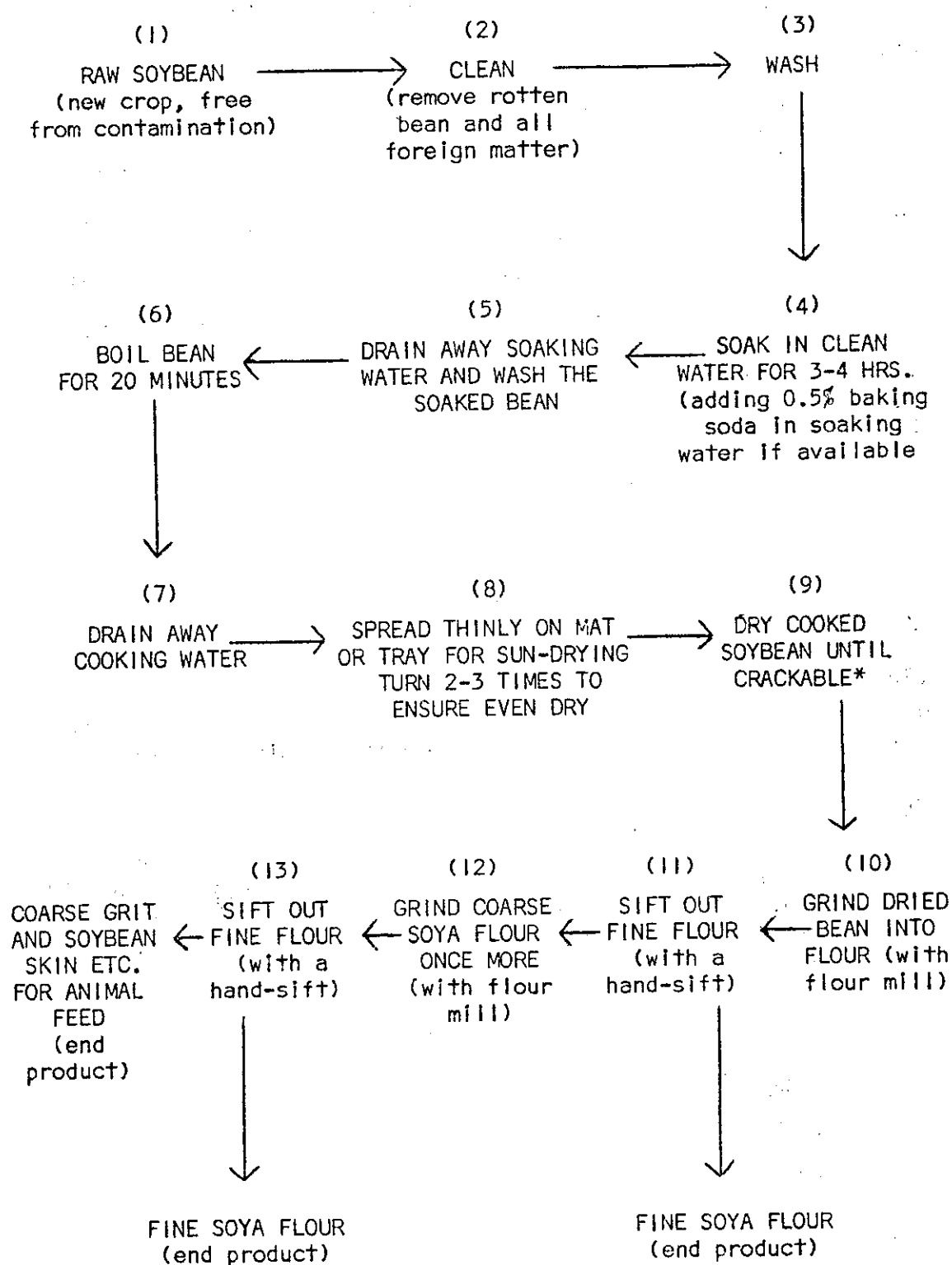
1½ lb. wheat flour

2 oz. edible oil

METHOD:

Mix the ingredients *thoroughly* and toast on mild fire, turning frequently until ivory yellow. When cool, store in air-tight container for daily use.

TABLE 3: Preparation of Full-Fat Soya Flour at Village Level



*If not crackable after a whole day of sun-drying, toast the semi-dried bean in hot pan over a low fire to ensure that the bean is fully dried.

PREPARATION:

Put 3-4 tablespoons powder and if sweetening preferred add two teaspoons sugar, thoroughly mixed. Gradually pour in boiling water. Stir with a spoon. Adjust the amount of water to fit your taste.

SOYA-RICE INSTANT FOOD**INGREDIENTS**

1 lb. full-fat soya flour

1½ lb. rice flour

METHOD:

Mix the ingredients *thoroughly* and toast on mild fire, turning frequently until ivory yellow. When cool, store in air-tight container for daily use.

PREPARATION:

Put 3-4 tablespoons powder and if sweetening preferred add two teaspoons sugar, thoroughly mixed. Gradually pour in boiling water. Stir with a spoon. Adjust the amount of water to fit your taste.

INSTANT SOUP POWDER**INGREDIENTS**

½ lb. full-fat soya flour

½ lb. dry codfish (salted)

½ lb. wheat flour

5 medium onion

3 oz. edible oil

1 tbsp. pepper powder (optional)

3 tbsp. sugar (optional)

METHOD:

Clean and wash codfish. Chop into small pieces and sun-dry. Pass through flour grind mill and sift, to obtain fine fish flour. Chop onion into very small chips and fry in oil until yellow and crispy. Add fish flour and fry a little while. Mix all other ingredients and toast on mild fire until ivory yellow. When cool, store in air-tight container for daily use.

PREPARATION:

Boil water with carrot cubes or greens if available and stir in soup powder. Add two tablespoons of powder to make each bowl of thick soup; or stir in vegetable soup and serve as thickening agent. One tablespoon of powder for each person; or mix with cornmeal or rice porridge to feed children from nine months up. For infant feeding, pepper powder should not be used.

INDUSTRIAL PRODUCTION

In the Caribbean countries the influence of mass media advertisement and North American and European tourists is so great that any packaged food product to be sold must be comparable in quality, convenience and appearance to those imported from industrially developed countries. As the target consumers for a single food item might be limited in number, food factories should produce a variety of products so that the indirect cost could be spread. For instance, a factory may produce infant food, breakfast cereal, soup powder and school snacks simultaneously. Even for infant food, different formulations may be considered so that the products could meet different demands.

The FAO/WHO/UNICEF Protein Advisory Group has established a specification for "Protein-rich Mixture for Use As Weaning Foods", (Table 4 overleaf).

To have nutritionally balanced infant foods produced at the industrial level, enrichment could be a most economic approach. In fact, the costs of synthetic vitamins, minerals, and amino acids have fallen considerably in recent years. The following are some of the quoted prices:-

NUTRIENTS	UNIT	COST IN US\$
Thiamine chloride	kg	14.75
Riboflavin	"	32.00
Niacin	"	3.25
Vitamin A	1 million I.U.	.05
Calcium (CaCO ₃)	kg	.30
Iron (Ferric phosphate)	"	1.10
L-Lysine	"	2.20
DL-Methionine	"	5.00
DL-Tryptophan	"	24.00

TABLE 4: Guidelines for Composition
Expressed On A Dry Weight Basis

Component	Units per 100g
Protein	Not less than 20g*
Fat	As much as feasible, up to 10g
Crude fibre	Not more than 5g**
Moisture	Preferably 5-10g
Total ash	Not more than 5g
Acid-insoluble ash	Not more than 0.05g
Vitamin A	1,300 I.U. (equivalent to 400 mcg retinol)
Thiamine	0.3 mg
Riboflavin	0.4 mg
Niacin	5.0 mg
Folate	0.2 mg
Vitamin B ₁₂	2.0 mcg
Vitamin D	400 I.U.
Calcium	300 mg (as phosphate or carbonate)
Iron	10 mg (as food-grade compound of adequate iron availability)
Iodine	100 mcg (as iodate or iodine)

*This protein level assumes an NPU not less than 60 and a PER not less than 2.1. If these values are higher the level of protein may be reduced accordingly.

**Crude fibre higher than this may be acceptable although it would require clinical testing.

Reference: PAG Bulletin No. 12, 1971.

The cost of enrichment/fortification in the total cost of a product is almost negligible. It is roughly estimated that it would require only 0.4 US cents for vitamins and mineral enrichment and 0.4 US cents for methionine fortification in each pound of end product.

Among the convenience foods, instant food in powder form or in thin flake appears most economical in packaging, transporting and storage, as

well as in preparation. The Institute of Food Technology, Jamaica Industrial Development Corporation, Department of Food Technology, Faculty of Engineering and the University of the West Indies have made experimental production of some instant soya mixtures, with the formulations recommended by CFNI. Because there are reports on the incidence of hyper-sensitivity to wheat protein (coeliac disease) among young children in the Caribbean and because it is difficult to remove the germ and outer skin of corn, rice, which is abundantly produced in the area, was selected as the cereal component in the mixtures. In fact, rice protein is the best among common cereals. The cost of raw materials and estimated calorie and protein values of some mixtures are illustrated in Table 2. Their NDpCal% range from 9.1 to 12.0, indicating that there is sufficient room of dilution with sugar or starchy foods for feeding young children. The mixtures are all "instant" in nature. Just pour in boiling water and stir. Add more sugar if so preferred. Feed baby with spoon. "Water boiling" and "spoon feeding" are important in the feeding of young children within the Caribbean context.

The processing technique of the mixture is simple. It does not require elaborate equipment. Of course, quality end-products require quality raw materials. Soybean must be of good quality such as "Jupiter" soybean in Guyana and U.S., No. 1 grade or its equivalent if imported from outside the region. It must be of new crop and free from any mould, weevil, or other contamination. So must be the rice. Ordinary white rice is preferred to parboiled rice as the latter is not easy to emulsify. Anyway, vitamins and minerals will be added. The steps of processing are described overleaf.

Soaking and Cooking

- Soybean - (1) Clean bean, remove all rotten beans and foreign matter.
- (2) Wash the cleaned bean and soak in four parts of water for eight to ten hours. Add 0.5% Sodium bicarbonate in water for soaking. Drain the soaked bean and rinse.
- (3) Cook soybean for sixty minutes. Drain off cooking water and rinse cooked bean.
- Rice - (1) Briefly wash rice.
- (2) Soak rice in three parts of water for ten to twelve hours.

Emulsifying

Mix cooked soybean and soaked rice thoroughly and put in commercial blender. Add 1.5 part of water.

Beat at low speed for one minute and at high speed for ten minutes for each batch, until the slurry is fully emulsified.

Drying

Pass the slurry through a drum dryer. Adjust steam pressure so that rice starch could be fully dextrinized yet not significantly affecting protein quality. The product should be of thin flakes, *slightly* yellowish in colour.

Sweetening, enrichment and fortification

In view of the fact that vitamins and minerals as well as amino acid used for enrichment/fortification are only very small amounts, to make a "pre-mix" using sugar as carrier may be practical. Sugar used in the mixture should be pulverized (confectionery sugar). For small scale production, batch mixture is recommended. Flavour with chocolate or vanilla if so desired. In fact, the toasted rice flavour could sufficiently cover soybean odour.

Packing

Polyethylene bags with thermal sealing reinforced with outside paper cartons may be the most practical packaging for the instant soya-rice mixture. Four-ounce small package, eight-ounce medium package, one-pound large package, and ten-pound institution package may be considered. Of course, the size and design of the package should be market-tested. Much study on packaging should be done before launching large-scale production.

RECOMMENDATIONS

Agriculture

Research on genetic and variety selections and culture of legumes should be continued and strengthened. Periodic communication and exchange visit among research and extension workers should be encouraged in order to facilitate mutual enrichment of experiences.

In order to assess the economic viability of soybean to compete with other crops in the Caribbean, it should be produced on a commercial scale. The merit of crop rotation, for instance, soybean-corn-soybean, should be fully considered.

Production of soybean in kitchen gardens, including green soybeans for using as vegetables should be encouraged.

Home Economics and Nutrition Education

The increase of legume consumption should be encouraged through organized education programmes, including the training of personnel at different levels and actual demonstration to the mothers. Visual aid education materials should be adequately prepared and used in the training activities.

The time-saving grind mills may be made available to the areas where grain legumes are produced. Food processing stations at village level may be tried in the Caribbean. The assistance from external sources to provide simple flour mills may be considered.

Industrial Production

The instant cereal-legume mixture enriched/fortified may be produced in existing food factories, with the addition of a few necessary items such as wet-miller (commercial Waring blender) and drum-dryer.

The equipment should be used to produce a variety of foods so that the overhead cost of individual products could be reduced.

In the production of foods intended mainly for consumption by infants and young children, nutrition and sanitary standards should be strictly observed. Carefully planned acceptability and tolerance tests and marketing trials should be undertaken before large-scale production

References

1. Aykroyd, W.R., and Doughty, Joyce. "Legumes in Human Nutrition." *FAO Nutritional Studies No. 19*, FAO Rome, 1964.
2. "Technology of Production of Edible Flours and Protein Products from Soybean." *Agricultural Services Bulletin No. 11*, FAO Rome, 1971.
3. "Protein Requirement." *FAO Nutrition Meetings Report Series No. 37, WHO Technical Report Series No. 301*, Rome/Geneva, 1965.
4. "Amino Acids Content of Foods and Biological Data on Proteins." *Nutrition Division*, FAO Rome, 1968.
5. "Food Composition Table for Use in the English-speaking Caribbean." *CFNI, Jamaica/Trinidad*, 1972 (in press).
6. "PAG Bulletin No. 12, 1971." *FAO/WHO/UNICEF Protein Advisory Group*, UNICEF, New York, 1971.
7. "Improving the Nutrition Quality of Cereals - Report of Workshop on Breeding and Fortification, June 1971." *Agency for International Development, U.S. State Department*, Washington, 1971.

GOOD HUSBANDRY - THE ART OF THE FEASIBLE
A PRAGMATIC APPROACH TO AGRICULTURAL INNOVATION

by

James McDowell
Food Scientist, CFNI

"Very often the most solid gains can be most easily achieved through the introduction of simple principles and the practice of what may best be termed 'good husbandry.' This is something the 'backward' farmer readily understands. Yet the advantages of simple changes are often overlooked in governmental and intergovernmental circles, where faith is too often pinned to scientific and technological changes beyond the husbandman's capacity."

This quotation, taken from the FAO booklet 'Food Losses - The Tragedy, and Some Solutions', strikes an immediate and sympathetic response. Occasionally, one picks up a book and, suddenly, a phrase or paragraph seems to spring out of the page, and one finds oneself thinking "that says exactly what I think - and puts it so well, - why couldn't I have expressed it in that way." The above quotation evokes this feeling of rapport with its author, not only because of its basic wisdom, but also because it uses those rather old fashioned terms 'good husbandry' and 'husbandman'.

The Biblical term 'husbandman' always seems to me to be a much more comprehensive and more satisfying word than 'farmer'. It conjures up a picture of someone who is not just a grower of crops, but rather, of one who tends them with a special care, who protects and garners the fruits of his field so that they are in prime condition, and who is meticulous in avoiding waste, so that he makes the best possible use of every corner of his field and of every ear of grain which it yields. The good husbandman makes the best possible use of the resources available to him and, what is more, takes pride in doing so and gains status and esteem amongst his fellows for his skills and competence.

Nowadays, there is a lot of comment in this region about farming being in the doldrums and of an urgent need to revitalise agriculture and boost productivity. However, who ever heard of 'husbandry' being in the doldrums and in need of revitalisation...? What is productivity if it is not the business of making fullest possible use of resources, or, - as people used to say, - 'good husbandry?'

It seems that in discarding the old terms for the new we have lost more than the actual words, we have also lost their meaning in human terms. When we talk of the need for revitalising agriculture we are really talking of a need to go back to the old meaning and convert 'farming' into 'good husbandry' once again.

THE ART OF THE FEASIBLE

This brings us back to my first quotation, to the value of simple changes, and to what might, like politics, be described as 'the art of the possible' in agricultural innovation. However, since, in developing countries we are primarily concerned with practical results, we must approach the task of innovation with a certain degree of pragmatism - that is, the philosophy which makes practical results the only criterion of the value of any approach. It is necessary to think not only in terms of what is *possible* but also in terms of what is *feasible*, i.e. what is possible in existing circumstances. The 'art of the feasible' thus provides a very useful and pragmatic definition for the process of agricultural innovation.

The process of innovation involves communication of the idea and provision of motivation for its adoption, and in attempting to practice 'the art of the feasible' we need to make sure that both communication and motivation are feasible.

WHO, WHAT AND TO WHOM?

If we look at many current agricultural extension approaches, and if we ask the basic communications question - "*Who is saying what to whom?*" we usually find that a scientifically trained extension worker who possesses wide mental frames of reference is saying something fairly technical which *he* understands and believes to be logical, to a farmer with much less education and with narrower and differently oriented frames of reference. The farmer who, like all of us, is basically suspicious of that which he cannot fully understand needs to be convinced that the proposed change is desirable and needs to be motivated to adopt it. This is a potentially difficult communications situation, particularly since the time available for the dialogue is very limited. In the extension situation the practice of the art of the feasible demands that the message be simple and that it should deal in concepts which the farmer can easily understand. Consequently, the eventual introduction of more sophisticated changes must be brought about by paving the way through simple changes at first rather than attempting to introduce fairly technical (and, usually, culturally 'foreign') concepts straight away. I make no apology for stating the apparently obvious. The short history of attempted innovation in developing countries is already littered with well-meant but costly and ineffective examples of the over-ambitious approach.

The introduction of innovation must be seen as a dynamic process in which one innovation will lead on to others rather than being simply an end in itself.

If one searches for simple changes which will bring significant practical results, and which will also provide a springboard for further and, perhaps, more sophisticated developments, one does not have to look any further than the development of 'good husbandry' itself. If one looks for the most

feasible approach to good husbandry, it seems that the best starting point is in the post-harvest conservation of crops. The terms 'conservation' and 'good husbandry' are virtually synonymous. The Oxford Dictionary definition of conservation is 'the prevention of harm, decay or loss', and this is a basic element in the practice of good husbandry. 'Good husbandry', as we have seen earlier, is also a very good synonym for 'agricultural productivity' so it is possible to write a very simple, but very basic equation:

Conservation = Good Husbandry = Agricultural Productivity.

There is, of course, more to good husbandry than just crop conservation - there is the whole area of good agronomic practice. Why, therefore, should we select the conservation aspect for primary attention and not the important element of crop *production*? The answer lies in the definition which I have adopted for agricultural innovation - the art of the *feasible*.

It seems that it can be very difficult indeed to introduce significant improvements in production technique whereas, in contrast, the introduction of improved conservation *is* eminently *feasible*.

BARRIERS TO CHANGE

In attempting to change production methods we are faced with many formidable barriers - not the least of these is the natural and very understandable conservatism of the farmer, who is reluctant to exchange traditional methods for something for which he has no absolute guarantee of success. These existing methods, although imperfect, have at least produced crops of some sort in the past. Trying out a new production method is, for him, a gamble, and like Hamlet, he 'would rather bear those ills he has than fly to others that he knows not of'.

A second formidable barrier of an essentially practical nature, is that new approaches to crop production almost invariably involve additional inputs

of materials, equipment, or labour. In a situation where the farmer's returns are small and where his resources are very limited, he may not be able to afford to adopt the innovation even if he wanted to.

On the other hand, innovations in crop conservation deal with a crop *already produced by existing methods*. The farmer is not being asked to take a gamble on success or failure of a crop or on getting a good return for additional inputs. He is naturally anxious that the crop should be conserved, and, in helping him to do this more effectively, we are going along with his way of thinking.

Simple changes in conservation methods can be regarded as a further evolution of existing methods, rather than as an attempt to replace existing methods with 'new' methods. Improvement in methods of sun-drying and in methods of construction of granaries are the main elements in development of on-farm conservation. Such changes can be brought about by the farmer himself using locally available materials and at a very low cost indeed. Innovations of this nature, are thus well within the scope of 'the art of the feasible'.

BENEFITS OF GOOD HUSBANDRY

The benefits of good husbandry can be enormous in existing situations in many tropical countries. In most developing countries the amount of food lost through lack of adequate conservation practices can be of the order of twenty to twenty-five percent. There is no reason to suppose that levels of food losses in this region will be markedly different from this.

If, by improving conservation practice it becomes feasible to reduce those losses by only one-half, this would mean a ten percent boost in farm productivity. What other innovation is likely to result in an improvement of this magnitude? An increase of ten percent in availability of cereals, legumes and oilseeds would, in most countries, change a below-adequacy food

situation into a situation of surplus. The potential magnitude of a ten per-cent boost in productivity, even if its achievement requires a period of five years, must be seen against the background of existing agricultural growth rates in developing countries which, over the past decade, have averaged only 2.7 percent per annum.

However, there are many other benefits as well. Better conservation means that foods can be stored during the inter-harvest period, and this buffers the seasonal variation in food availability which gives rise to so many problems. It also gives the producer a much greater degree of control over marketing. He no longer has to sell all of his produce in the immediate post-harvest period when a glut may well reduce prices beyond the level of economic returns. He can thus hope for a better overall price and hence one of the major constraints on increased production is removed.

Better conservation practice also provides a motivation for increased production and the adoption of better production techniques. In the existing situation the farmer may well decide that there is little point in going for increased production when so much will, in any case, be lost, or will have to be sold at a very low price. If, however, it is possible for him to sell part of his crop on a better market, to have more to sell, and thus to get a better overall return, a powerful positive motivation exists for him to adopt improved production methods.

The ultimate benefit from better food conservation is to the consumer in terms of a greater total availability of food of better quality, available all the year round at stabilised prices. The potential benefits to the nation are very great in terms of better overall levels of nutrition, a self-generating domestic agricultural economy, and a very much reduced dependence on external sources with resultant economic benefits.

It is also important to bear in mind that the better conservation methods which are used for food crops are also appropriate for use with certain economic crops, particularly in the drying of coffee berries and beans and of fermented cocoa beans. The use of more efficient drying methods can bring about a very significant improvement in the quality and, therefore, the marketability of these crops.

HUMAN SIGNIFICANCE AND MATERIAL BENEFITS

The methods and techniques needed to bring about the necessary simple changes in conservation practice are available and are ready to be applied. It is, for example, possible to construct simple enclosed solar dryers, which can, if necessary be made almost entirely from local materials, bamboo, reeds and clay or from used packing case wood. These dryers will generate temperatures of 160°F to 180°F using only the heat of the sun. The temperatures attainable will not only allow the complete drying of grains or legumes in one day, but will also effectively disinfest the raw produce, thus producing a high quality product eminently suitable for storage.

It is also possible by simple changes in construction of traditional granaries to ensure that these will be insect-proof and rainproof thus allowing prolonged storage.

The innovations necessary to bring about changes of this nature are really evolutions of traditional practice and are well within the capacity of the husbandman.

This is where we came in!

The benefits of improving conservation techniques, that is, the reintroduction of the practice of good husbandry are not only of great material and economic significance. They are, perhaps, of even greater significance in

human terms if we can regain that attitude of mind where the 'farmer' becomes a 'husbandman' in the true sense of the word, and where the practice of 'good husbandry' becomes, once more, a dignified and ennobling task.

CAJANAQUOTE

"Freed from the terror of pandemics and of many epidemics, today we can see health as being at the root of life, and in the destiny that each human being moulds for himself; we understand it to be the infrastructure of happiness and a stimulus and component of development. We regard it as a goal for each person and as a means to achieve collective well-being. This enormous conceptual evolution - a reflection of scientific achievements and of the work of men, women, institutions, and Governments - gives due priority to our plans, whose ultimate aim is making health a right and a duty of all, not the privilege of some."

Dr. Abraham Horwitz
On PAHO's 70th Anniversary,
December 1972.

FOOD QUALITY ASSURANCE*

by

Dr. G. N. Sammy

Food is defined by the "Concise Oxford" dictionary as victuals, or nourishment, and victuals defined as food, while nourishment is defined as sustenance or food, and we have completed the circle.

Food in a narrower sense, may also be defined as the fuel and maintenance material for the human machine. Since the human machine is constantly at work then there must be a constant demand for food. In fact, food is one of the four basic needs of man and two-thirds of the world's population spend most of their working-life, directly or indirectly in the search for food.

Quality may be defined as the composite of those characteristics that differentiate individual units of a product and have significance in determining the degree of acceptability of that unit by the consumer

Quality is commonly thought of as degree of excellence. In the broader sense, it may be considered as a specification or set of specifications which are to be met within given tolerances or limits. Thus the level, or the excellence of the product, may be considered as the average, or mean level of quality required in the market place. It is not necessarily the highest quality that is attainable regardless of cost. The uniformity of the product may be described in terms of minimum limits, or more commonly a tolerance between the upper and lower control limits. Since there are upper and lower

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control limits, the manufacturer must therefore institute quality control for his products in order to meet the consumers' specifications within minimum cost to the consumer.

In the food field the quality attributes sought by the consumer would be: sensory, public health, and economic.

The Sensory attributes may readily be classified in accordance with the human senses by which they are perceived; the senses of sight, touch, taste and smell. These attributes are apparent, and gives the consumer a choice of accepting or rejecting, provided the consumer can exercise his senses in making the selection.

The Public Health attributes are mainly hidden, that is the consumer cannot evaluate them with his senses, and yet these are of real importance to his health and economic welfare.

Nutritive value, a hidden attribute is rarely considered by the average food consumer. We have just carried out a survey of the cost of ascorbic acid, vitamin C, which reveals the following:

	<i>Cost expressed in mgs for 1¢ TT</i>
Imported Black Currant Juice	
Brand A (very popular)	1.5 mg/1¢
Brand B	4.8 mg/1¢
Orange (fresh) at 4¢ each	21.0/1¢
Portugal (fresh) at 4¢ each	9.0/1¢
Grapefruit (fresh) at 4¢ each	45.0/1¢

Other hidden qualities may be harmful additives or harmless additives, with no nutritive value, high micorbial counts, due to unsanitary conditions and therefore a danger to health, toxic materials in the food, etc.

The economic attributes may include short-weight or volume, by deceptive containers, misleading labelling, lack of information on the labels, etc.

Thus, we see that food quality is a composite of three main attributes; Sensory, Public Health and Economic.

Quality assurance to the consumer is normally achieved in one of two ways or both; by free and open competition and/or by enforceable statutory regulations. However, public health quality by its very nature must be controlled by enforceable statutory regulations. Unfortunately, nutritive quality is not always considered by the enforcing agency as within the realm of public health.

In the economic sphere, there is some effort at price control of selected items, the effect of which we are unable to evaluate.

In a free enterprise society, food quality assurance is usually controlled by the consumer, through a wide selection and adequate supply. That is the consumer can exercise her criterion of quality, against cost in her selection, and thus create an atmosphere of competition. Manufacturers in such an atmosphere are forced to maintain or increase the quality of their products to meet consumers' specifications or go out of business. Thus market size and freedom of operation by manufacturers are most important. Any control imposed on the market will destroy the effect of free competition. Our own society is neither free enterprise or wholly control. It stands somewhere in the middle of being partially controlled and partially free.

Food manufacturers have a large degree of protection, by means of exemptions of one sort or another, e.g. duty-free equipment, raw materials, and tax-holidays. At the same time, they are protected by high tariffs and the negative list from imported products. Clearly, there is little or no competition, and the manufacturers can have a field day since there is little or

no statutory quality regulations. Our food regulations are mainly of the public health type. Thus, under the present system there is little or no room for open competition.

We may advocate statutory control, but in doing so we should carefully consider how far and at what cost this will achieve the desired effect. Let us look at the situation as it stands at present. We have a Food and Drug Division charged with the statutory control of food regulations. How far has this department been effective? Does it have full control over the situation or only partial control? Is the department fully staffed or is it understaffed? Is the department large enough to handle the job it is expected to carry out? Can we afford the additional cost to make this department fully effective? Can a statutory regulating body be fully effective? These are the questions we must answer before laying too much emphasis on statutory control. The problem of food quality is also being experienced in the USA where there is a very large Food and Drug Administration. In order to solve this problem they have recently embarked on a cooperative system jointly with manufacturers and consumers on a "quality assurance" programme.

Food quality in any country is the business of three groups, the manufacturers, the statutory regulating body and the consumer. It is necessary that we recognize that there is an inter-relationship among them. The manufacturer cannot exist without the consumer nor the consumer without the manufacturer, while the statutory body should act as the controlling factor. It must protect the consumer as well as provide advisory services to the manufacturer. If each group recognizes its responsibilities and endeavours to carry it out, then most of the problems existing today would be solved.

The first problem to solve is the establishment of standards or specifications for food commodities sold in large volumes. These standards or

specifications should be acceptable to both consumers and manufacturers. There should also be a standard of identity so that consumers may be sure of a particular product through a given name, e.g. Tomato Ketchup, - should be tomato paste with spices, - not starch flavoured with tomato paste, and coloured with artificial colouring. Once a specification is laid down, then it is the manufacturers' duty to see that the consumers are assured of the quality according to specification at the lowest possible cost. This will necessitate on his part the establishment of quality control in his factory. We can safely say that there are very few food factories in Trinidad that operate adequate quality control. In many cases, they are only tokenism.

The manufacturer is responsible for the quality of his product, from the time he receives his raw material to the time the consumer purchases, irrespective of how long it has left his factory. In other words the manufacturer must exercise some control in the retailing of his product. Thus if the manufacturer is to provide "quality assurance" to the consumer then he must:

1. Use approved raw and packaging materials that meet approved standards.
2. Use properly designed and constructed facilities.
3. Have effective and sanitary equipment.
4. Have well-defined operating procedures and controls.
5. Observe good manufacturing practices.
6. Have well-controlled distribution systems.

The points stated here do not apply to large factories alone, they can be applied to all manufacturing from the kitchen scale to the ultra modern factory. Problem arises when manufacturers fail to appreciate their responsibilities to the consumers, because of protection from competition and a lack of statutory enforcement.

The consumer has a responsibility to herself. In a way, the quality of food products sold in this country is a reflection of the awareness of her rights and responsibilities.

We have had with us for a number of years the Trinidad and Tobago Consumer's Association. From our observation, this Organization seems to have had little or no success in awakening the consuming public to its rights and responsibilities. This may have been due to a lethargic consuming public, or to an organization which had no rapport with the people it was supposed to represent or both a lethargic consuming public and an ineffective organization.

Deterioration of the situation as shown by the high cost and poor quality of locally produced foodstuffs gave rise to another organization; the Housewives' Association of Trinidad and Tobago. They came on the national scene like a "ball of fire"; have caught the imagination of a large number of the food consuming public, have done some useful work, and are continuing. It is to be hoped that they will continue to stir the consuming public with their activist approach, and not "fizzle" out as is generally expected from organizations of this type.

The consumer has three major rights in the consumption of foodstuffs: the right to safety; the right to quality and integrity; and the right to be informed.

In a way, the consumer's right to safety is ensured by statutory enforceable regulations. However, it is not enough to expect that the Food and Drug Division can do this job alone. It is the responsibility of each consumer to insist on proper sanitary and safety conditions in the manufacture, preparation and distribution of foodstuffs. Whenever and wherever we find violation of this 'right' we must take appropriate action.

The offering for sale of poor quality products is a reflection of our own standards. When we accept them without complaint we are merely saying, "the product meets our specifications". In many cases, we may not have a choice, if this is so, then we must be "loud and clear" in our complaint of the poor quality we have to accept because of a lack of choice.

The right to be informed is not fully appreciated by the manufacturers. We have labelling regulations, but these should be revised to make the manufacturer put, in bold prints of a readable size, things such as the composition of the product and weights and volumes, not in fine print in an obscure corner of the label, as is normally the case.

In the final analysis, the quality of the food products we get will depend on whether or not we are prepared to demand and at times loudly, a reasonably good quality of product for a fair price. If need be, we should be prepared to identify sub-standard products, if it is not sold as sub-standard, with the manufacturer concerned. We are convinced that manufacturers will yield to pressures, if it is kept up by the consumers.

The consuming public will always get the quality of products it deserves.

COMPARATIVE PRICES OF FOODS IN FOUR CARIBBEAN COUNTRIES

by

Isabel Foster, CFNI

These prices for four countries have been collected as follows:

Jamaica, November 1972; Trinidad and Tobago, December 1972; Barbados, December 1972; and Guyana, January 1973.

It is noticeable that Barbados is consistently higher on most items. In October there was a strike at the harbour in Barbados resulting in shortages of bread, flour and rice. We are not in a position to say whether prices rose at that time and have remained high.

This price information was prepared at the request of the Government of Guyana. For purposes of comparison all prices have been converted to Guyanese currency.

Foods listed for comparison are those commonly used, particularly by low income groups.

CFNI is grateful to those who cooperated in the collection of price data in individual countries.

Food	Purchase Unit	Guyana	Jamaica*	Barbados*	Trinidad* And Tobago
Bread	LB	.36	.48	.77	.37
Wheat flour	LB	.14	.24	.33	.14
Cornmeal	LB	.27	.14	.17	.28
Rice	LB	.18	.24	.39	.19
Oatmeal	LB	.70	.60	1.13	1.08
Macaroni	LB	.70	.48	.55	.56

* All prices converted to Guyanese dollars. See text for details.

Food	Purchase Unit	Guyana	Jamaica*	Barbados*	Trinidad* And Tobago
Red beans	LB	.70	.53	-	.98
Black eye peas	LB	.36	-	.97	-
Pigeon peas	LB	.60	.48	.44	-
Chick peas	LB	.55	-	-	-
Lentils	LB	.22	.72	.61	.98
Fresh milk	QT	.32	-	.55	-
Skim milk powder	LB	.57	1.68	1.10	.55
Whole milk powder	LB	1.48	1.73	-	1.29
Evaporated milk	14½ oz.	.40	.50	.47	.40
Condensed milk	14 oz.	.48	.36	.55	.43
Lactogen	LB	-	1.54	2.43	2.63
Olac	LB	-	2.52	2.75	-
Cheddar cheese		1.29	1.18	1.11	1.29
Fresh beef	LB	.98	1.32	1.65	1.75
Mince beef	LB	1.00	1.44	1.54	1.27
Goat	LB	-	1.08	-	1.39
Fresh pork	LB	1.25	1.44	1.43	1.43
Frankfurters	LB	1.00	.86	2.22	1.63
Chicken	LB	1.00	.96	1.27	1.02
Chicken backs & necks	LB	.55	.91	.44	-
Corned beef	LB	-	1.66	2.08	-
Fresh fish	LB	1.00	1.68	1.38	1.10
Salt fish	LB	.82	.94	1.15	1.12
Salt beef	LB	1.24	.96	1.32	1.01
Pig tail	LB	.43	.84	.88	.83
Pig feet	LB	.63	.60	.55	.58
Pig snout	LB	.40	.91	.55	.75

*All prices converted to Guyanese dollars. See text for details.

Food	Purchase Unit	Guyana	Jamaica*	Barbados*	Trinidad* And Tobago
Eggs	DOZ	1.20	1.44	1.72	1.47
Peanuts	LB	1.05	1.97	.88	-
Peanut butter		1.00	1.87	2.06	-
Irish potatoes	LB	.28	.24	.28	.23
Sweet potatoes	LB	.20	.24	.22	.30
Yam	LB	.20	.19	.22	.43
Green banana	LB	.20	.07	.33	.11
Ripe banana	LB	.25	.12	.44	-
Plantain	LB	.25	.22	.40	.33
Breadfruit	LB	.20	.19	.17	-
Dark green leaves	LB	.25	.24	.20	.33
Cabbage	LB	.36	.29	.79	.55
Carrots	LB	-	.72	.62	.98
Tomatoes	LB	.55	1.08	1.76	-
Onions	LB	.32	.36	.40	.17
Granulated sugar	LB	.10	.31	.44	.21
Golden sugar	LB	.08	.24	.19	.17
Dark brown sugar	LB	.07	.12	.17	-
Margarine	LB	.62	.62	.87	.77
Butter	LB	1.10	1.25	1.60	1.28
Cooking oil	QT	.74	1.46	1.14	.85
Milo	LB	1.56	1.70	2.20	2.15
Ovaltine	LB	1.52	1.56	2.20	2.15
Horlicks	LB	1.83	1.68	2.66	-

*All prices converted to Guyanese dollars.

THE PRICE OF GROCERIES IN THE
CARIBBEAN 1972-1973

by

Michael Gurney and Robert Cook
Caribbean Food and Nutrition Institute

In 1970 'Cajanus' published an article on the prices of a "Saturday grocery basket" as might be bought by our readers in the different countries*. The foodstuffs selected for the "basket" were not so much those of high cost-nutrient value as those foods that are convenient and popular. On page 37 of this issue we print a report by Isabel Foster on the comparative prices of low cost foods of good nutritional value.

Prices of the same items in the same quantities as were collected in September 1970 have been gathered again between November 1972 and January 1973. The items and quantities collected are set out in Table 1. We are grateful to the 'Cajanus' readers who collected prices and sent us the lists. The total costs of the grocery basket for the different countries are presented in Table 2.

Where the packaging in which any item was offered was different from what is on the list, the reader informed us of the weight or volume and we adjusted accordingly. Where we obtained two or more lists from the same area we took the average of each item. As was done in 1970 all prices were converted into USA dollar equivalents. As in 1970, we found considerable variation in prices within the same area. We took the rates around Christmas 1972 for this purpose.

*McKigney, J., and Cook, R. (1970). The prices of groceries in the Caribbean Area. *Cajanus*, 3, 315-319. The editor will send a copy to anyone who requests it.

TABLE 1: Grocery List

32 ounces fluid milk, pasteurized	1 lb. porridge oats
14½ ounces evaporated milk	12 ounces Kelloggs corn flakes
14 ounces sweetened condensed milk	½ lb. shortcake biscuits
1 lb. cheddar cheese	1 lb. dried beans
2 lbs. minced beef	1 lb. baked beans, tin
12 ounces corned beef, tin	1 dozen eggs, medium size (over 24 oz./doz.)
12 ounces luncheon meat, tin	32 ounces vegetable oil
4 ounces sardines, tinned in oil	1 lb. margarine, vitamin A enriched
3 lbs. (whole) chicken, broiler	1 lb. butter
2 lbs. pork chops	2 lbs. granulated sugar
1 lb. pork sausages	¼ gallon ice cream, vanilla
½ lb. bacon, middle quality	16 ounces orange juice, tinned
3 lbs. enriched white flour - general purpose	1 lb. tinned peaches
1 lb. rice, parboiled or enriched	4 ounces Liptons tea
2 lbs. loaf, white sliced bread	1 lb. ground coffee

[US\$1.00 is assumed as equivalent to the following (as rates around Christmas 1972): Jamaica, \$0.86; Guyana, \$2.19; Eastern Caribbean, \$2.00; Australia, \$0.83; Bahamas, \$0.98; England, £0.43; and the Philippines, P7.10].

Considerable differences between countries were found in the overall cost of the grocery basket. Also price changes since September 1970 vary very much between countries; they are however all upward in direction. The implications of the findings were discussed in the previous 'Cajanus' report. Suffice it to state here that such differences in price merit thought as to

TABLE 2: Total Price of the List of Foods on Page 41 in Various Caribbean Countries, November 1972 to Early January 1973, in Local Currency and US\$ Equivalent. With a Comparison of September 1970 Price of the Same Items.

Ascending order	Country and location	No. of Lists averaged	Price in local \$	Price in US \$ equiv.	% of the median Caribbean figure	% of the 1970 figure (in local currency)
1	Guyana*	1	31.66	14.45	82	124
2	Jamaica-Maypen	1	12.89	14.99	85	-
3	Jamaica-Westmoreland	1	13.52	15.72	89	106
4	Jamaica-average	4	13.85	16.10	91	110
5	Tobago	1	32.81	16.40	93	112 (T'dad)
6	St. Lucia	1	34.30	16.81	95	113
7	Jamaica-Kingston	2	14.50	16.86	96	117
8	Barbados	3	36.01	17.65	100	130
9	Antigua-rural supermarket	1	37.65	18.46	105	-
10	St. Vincent	2	38.63	18.94	107	116
11	Antigua-average	4	42.10	20.64	117	116
12	Nevis**	1	42.15	20.66	117	-
13	Antigua-urban supermarket	1	42.81	20.99	119	-
14	Grenada	2	45.78	22.44	127	144
15	Bahamas	1	24.29	24.79	140	123
	England	2	£6.40	14.88	84	121
	Philippines-Manila***	1	P106.66	15.02	85	-
	Australia-NSW	1	13.22	15.93	90	-
	USA-Washington	1	18.01	18.01	102	116

*Corned beef, luncheon meat, sardines and tinned peaches are banned imports in Guyana, they are not available. These items comprise 14.5% of the food basket cost in the other Caribbean countries surveyed. The overall Guyana figure has been adjusted by this amount.

**Fluid milk, pasteurized is reported as not available in St. Kitts. The average Antiquan price is used for this item.

***Kelloggs cornflakes are reported as not available in Manila. The overall average price is used for this item (US 36¢).

TABLE 3: Comparative Prices of Certain Manufactured Baby Foods

	Guyana	Tobago	Grenada	St. Vincent	Barbados	St. Lucia	Antigua	Nevis	Jamaica	Bahamas	USA	UK	Philippines	Australia
3½ oz. strained meats	0.36	0.43	0.33	0.47	0.32	-	0.43	-	0.27	0.37	0.27	0.10	0.49	-
4½ oz. strained fruits and desserts	0.27	0.23	0.24	0.18	0.24	-	0.21	-	0.25	0.17	0.12	0.12	0.27	0.14
4½ oz. strained vegetables	-	0.24	0.27	0.19	0.25	0.21	0.22	-	0.25	0.17	0.12	0.10	0.27	0.14
7½ oz. strained vegetables with meat	0.64	-	0.29	0.49	0.28	-	-	-	0.32	0.17	0.18	0.21	0.27	0.18
8 oz. Gerber cereal	-	0.32	0.33	0.43	0.29	0.38	0.32	0.55	0.34	0.33	0.21	-	0.37	0.13
8 oz. Gerber cereal with bananas or strawberries	0.67	0.67	-	0.59	0.58	0.62	0.84	-	0.27	-	0.39	-	0.37	0.13
32 oz. Enfamil ready-to-use formula	0.57	-	-	-	1.58	-	2.14	-	1.23	2.03	0.43	-	-	-
32 oz. Similac ready-to-use formula	0.72	-	2.12	-	3.87	-	2.44	-	1.78	-	0.42	-	-	-

NOTE: For countries with more than one price list the average has been taken.
All prices are in US dollar equivalents. (See text for rates of exchange).

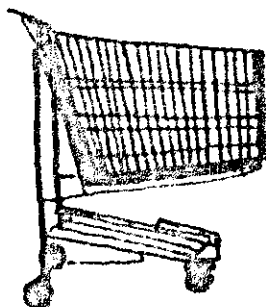
why they should occur between neighbouring countries.

We also collected the prices of some prepared "baby foods" not because we think 'Cajanus' readers use them very much, but because they are used widely and price comparisons would be interesting. The results, expressed in USA dollar equivalents are shown in Table 3. It is clear that prices of such items in the Caribbean are greatly above those in the USA.

ACKNOWLEDGEMENT

This study results entirely from the pooling of information contributed by the people listed below. Our thanks are due to them:

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THE WORLD FOOD SITUATION*

by

A. H. Boerma
Director General, FAO

"Over the last two years there has been a series of unusually bad harvests in many countries of the world due to severe weather conditions such as drought. The most sensational result of this has of course been the massive and quite unprecedented purchases of grain by the Soviet Union. But a number of poor countries, far less able to afford to import food, have also been seriously affected. They range from the Far East to West Africa to Latin America.

As a result of all this, the world's reserve wheat stocks are being depleted to a lower level than has been the case for a large number of years. The rice situation has also become very precarious. Recently, there have been articles in the press mentioning the threat of famine in some parts of the world.

Let me deal with this question of famine first. In my view, based on a number of careful assessments by our experts over recent months, there is not - I repeat not - a likelihood of immediate widespread famine at this time - that is to say, not for the next few months.

But, if there is not an immediate threat of widespread famine, there are already food shortages in several countries in the regions I have mentioned.

*The text of a statement to the press on 1 February 1973.

It is difficult to estimate the full extent of the human suffering that may be involved, for the sudden spread of hunger and malnutrition does not easily lend itself to rapid calculation. But there is undoubtedly cause for serious concern. I would advise governments whose countries are likely to need supplies or assistance from outside to make their arrangements in good time.

But this is only one aspect of the situation. The need to meet the abrupt increase in import demands for cereals from various countries has also led to punishing and potentially dangerous consequences. Wheat prices on the world market have risen since the middle of last year by 70 to 80 percent. This imposes yet another heavy burden on the already frail financial reserves of many developing countries which are being forced to buy cereals abroad because of poor harvests at home. Perhaps the most serious consequence for the long run has been the depletion of the world's reserves of grain. We estimate that, by about the middle of this year, wheat exporters' stocks will be down to below 30 million tons - the lowest level since 1952. And, in the interval of these two decades, the world's population has grown by about 50 percent.

So much for the present. But what is going to happen in the next crop season beginning as from the middle of this year? By then, stocks will be so low that they will offer no security should there be a new succession of serious crop failures in 1973. Thus the chances of there being enough supplies of food grains in the crucial months from this summer until the middle of next year are going to depend almost entirely on the size of the 1973 harvests.

There are some hopeful signs. The governments of several key countries have already adopted measures to increase production. The United States, for example, has lifted some of its controls on grains and rice acreage in order to encourage farmers to grow larger crops as from the spring of this year. In Canada, the Minister of Agriculture has called on farmers there to grow all

the wheat they can this spring. India, too, has embarked on an intensive campaign to boost its spring harvests; and, finally, I am glad to say that the Soviet Union is planning to try and make up for last year's crop losses by increasing its investment in agriculture by ten percent.

I strongly endorse such measures which show a clear sense of responsibility not just in national but also often in world-wide human terms. I think it is fair to say that most things that governments could have done to prepare against a crisis later on this year have in fact now been done.

But there remains one vast incalculable - nature itself. One thing that has been harshly, even humiliatingly, made clear in the last two years is that, despite all our technological progress, despite all the buoyant hopes invested not long ago in the so-called Green Revolution, harvests are still far too often at the mercy of the weather. In this respect at least, man has so far failed to master his natural environment.

At present, early weather reports from several important areas of the world - including, again, the Soviet Union - are far from reassuring. If the weather conditions in vital grain-producing areas turn out again to be bad, then the world could well face an overall shortage of grain supplies later this year or in the first half of 1974. The situation is not helped by the fact that there is at present a shortage of fertilizers which has led to higher prices for them and which could accentuate the difficulties of several developing countries.

All this leads me to the central question I wish to raise today. There is, as I have said, little likelihood of immediate widespread famine. The possibility that I have envisaged of a world shortage of cereals later this year or next may not materialize. *But, in the name of reason, can this world of the 1970's, with all its scientific prowess and its slowly growing sense*

of common purpose, go on enduring a situation in which the chances of enough decent food for millions of human beings may simply depend on the whims of one year's weather? Is this a tolerable human condition? Emphatically, not.

So - what to do? Broadly speaking, the problem has to be tackled in two ways. Firstly, as I have had occasion to say many times, it is absolutely vital to give much more serious and concentrated attention to the longer-term problem of food production in developing countries. You probably know that their agricultural production has been lagging ominously in the last two years. And our latest assessment of the longer-term prospects makes depressing reading. It is inescapably clear that many developing countries must give much higher priority to their agriculture and that most developed countries must give much higher priority to helping them.

But this does not of course solve the more pressing problem of how the world, with its mounting population, can protect itself against short-term changes in climatic conditions which threaten its food supplies. Recently I wrote to the Governments of Canada, the United States and to the Commission of the European Common Market expressing my concern at the present situation and drawing attention to the need to make provision for extra food requirements in some developing countries as a result of this situation. I know that several of the governments concerned are fully alert to the gravity of the problem, as is shown by the measures taken to increase production in Canada and the United States.

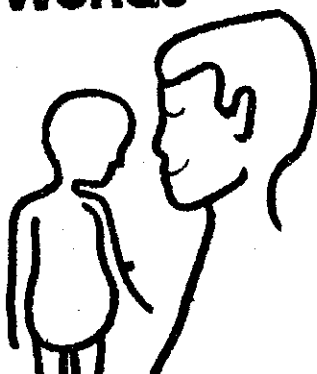
But even such measures will not provide the world with enough basic security against crop fluctuations. In the past, we have depended too much on surplus stocks available in North America, because that is where nearly all of them were. This cannot continue. Times have changed. Other countries can and should now play their part too as guardians against famine in the world.

I believe we have reached the point where there must be some sort of convention among producing countries under which they would undertake to hold certain minimum levels of food stocks to meet emergencies. There have, I know, been proposals in the past for international food reserves which were not accepted by governments. But their basic flaw was precisely that they were aimed at just a very few governments, whereas it is my idea that all countries which are in a position to do so - including developing countries - should participate in concerted policies for actively building up food reserves.

"I believe, both morally and practically, that nothing less will do if the world is finally to free itself from these repeated alarms about its food supplies which by now should already be a story of the past."

CAJANAQUOTE¹

**Man lives
on one
Earth..But
In Two
Worlds**



¹Freedom From Hunger Campaign - Ideas and Action Bull., 88 (1973).

NUTRITION NEWS AND OPINION FROM THE CARIBBEAN

HOME GARDENS GET A BOOST

In 1972 a home garden competition was held by the agricultural extension services of Trinidad and Tobago. There were 700 entrants in four categories: urban (where available land area is small and plants may have to be grown in troughs and pots), suburban (where fruit trees may be incorporated in the gardens), rural (where small livestock may be reared), and a combination category of trough and bed culture.

A sum of TT\$30,000 was spent on this campaign. In 1973 the same amount will be available. The emphasis will be on demonstration plots in agricultural demonstration stations, specified households, school yards, etc. It is hoped that these demonstration plots will be useful both to householders directly, as examples, and to agricultural extension officers who work in the home garden campaign, in their teaching.

YOU CAN STARVE WHILE OVER-EATING
News From Guyana - Guyana Consumers Association¹

In Guyana we are turning our attention to food and diet. The Food and Nutrition Survey that was carried out in 1971, has brought out some ugly facts about our own state of nutrition.

About one-third of our children under the age of five years, are considered to be suffering from malnutrition and generally there is an inadequate consumption of foods that supply protein and calories.

You may wish to dismiss this as not applying to you and your household. You may use it as evidence of the high cost of living. But let me add that there were cases of diet deficiency even where the household income was above \$997 per month; and if this does not hit you hard enough there was proof that some children in low-income groups were well nourished.

Is malnutrition something due to bad eating habits, bad storage of foods, bad cooking methods, or simply wrong priorities?

One of the startling facts about nutrition is that evidence exists to suggest that severe malnutrition before the age of two years may retard brain growth; and the damage can never be repaired.

¹Extracted from an article in the Sunday Graphic, 4 February 1973, by Eileen Cox.

YOU CAN STARVE WHILE OVER-EATING (Contd.)

In the light of the report from the Food and Nutrition Survey, some consumers may now feel inclined to have second thoughts on the slogan "Death to Rapists". We may all wish to ask a few more questions about the background of our delinquents. Could it possibly be that some of them suffered severe malnutrition in their childhood?

While you are marshalling your thoughts, let me pass on another piece of information on the question of nutrition. In 1967-68, while the American economy was booming, the country "discovered" mass malnutrition in its midst.

Such a state of affairs adds to the difficulty of knowing whether a child is well nourished or just simply "over fed" with the wrong foods.

The word "nutrition" is so much in the air now, after the Second Workshop of the National Food and Nutrition Survey, which held sessions at the University of Guyana, at the Ministry of Health and at the Public Service Ministry in Kingston, that it may be well for consumers to look more closely at their eating habits.

'Putting up' Juice

To begin with, do you have a "kinna"? Most of us object strongly to eating "skin fish". Some, on religious grounds, will not touch pork or beef. Vegetarians, also, turn their noses up at the mention of these products.

But, if your "kinna" is the innocent pumpkin of fairy tale fame, you may be losing out, for the pumpkin makes a tasty dish when cooked in a variety of ways.

There are a hundred and one little things that we may learn about the use of foods. Are you, for instance, one of those busy mothers (or fathers) who squeeze orange juice in the evening to store overnight in the refrigerator and thus cut down on your chores in the morning? Then you are losing some of the vitamin content of the fruit.

Fruits should be eaten soon after they are cut. Vegetables also lose some of their value when stored. Therefore, one good reason for eating local is that you are eating fresh vegetables and fruits.

Also, did you know that the humble "tick leaf" or callaloo, contains more protein than the lordly cabbage? That dried beans are richer than young immature beans? and that the mighty plantain, now selling at thirty cents per pound, is hardly worth a second glance?

By this time, you may have decided that you know all about nutrition and this article is not for you. But, hold it for a minute! If a member of your family is overweight, you do have a nutrition problem. The Food and Nutrition Survey did find that there is a problem of obesity among women. Two-thirds of the urban women and about half the rural women are obese as shown by their fat folds and their weight.

YOU CAN STARVE WHILE OVER-EATING (Contd.)

Side by side with this, a large minority of school-age rural children remain underweight and many rural men are underweight and lean although most are muscular.

WHO APPOINTMENTS

Dr. G. E. Cumper, formerly Professor of Economics at UWI, Mona, has joined WHO as an economist to work in the South-East Asia Regional Office.

Dr. Cumper will study health economics and the health aspects of economic development as a member of a WHO team of public health advisers associated with national planning bodies and such agencies as the United Nations Development Programme (UNDP) and the Economic Commission for Asia and the Far East (ECAFE). The importance of such work was emphasized by the Indian delegation at the recently held twenty-fifth session of the WHO Regional Committee for South-East Asia.

Dr. S. P. W. Street, of Jamaica, has been appointed as the first WHO Representative to Bangladesh, which was admitted to membership of the Organization in May. Stationed in Dacca, Dr. Street will represent the WHO Regional Director for South-East Asia in contacts with the Government of Bangladesh and with representatives of other United Nations agencies engaged in relief and other operations in that country.

Dr. Street was born in 1920 and obtained his degree in medicine at University College, London, in 1944. He became a Fellow of the Royal College of Surgeons in 1952 and of the International College of Surgeons in 1954. After specializing in surgery at the Kingston Public Hospital, Jamaica, for several years, he held the post of senior medical officer in the same hospital from 1964 to 1968. He has served as Chairman of the Board of the West Indies School of Public Health and as associate lecturer at the University of the West Indies. More recently, as Chief Medical Officer of the Ministry of Health of Jamaica, he was responsible for the administration of the country's public health and curative services. Since joining the staff of WHO in 1971, he has served the Organization as a public health administrator in Nepal.

Dr. Street was a member of the WHO Executive Board from 1969 to 1971 and has represented his country at meetings of the United Nations Commission on Narcotic Drugs.

SECOND TECHNICAL WORKSHOP ON NUTRITION IN GUYANA

From January 22 to 26 a very busy and well-attended workshop was held on the University of Guyana campus to discuss the findings of the National Food and Nutrition Survey. The participants comprised technical people from within and without Government and from CFNI and PAHO.

The main purposes of the workshop were, firstly, to review the draft of the survey report and make suggestions and, secondly, to draw up practical and useful recommendations for submission to Cabinet and for action. Already the survey findings have influenced activities, particularly in health and agriculture.

Discussions were also held on a relevant food and nutrition policy for Guyana and the mechanisms through which such a policy could be carried out.

At the end of the week a seminar on the use of legumes, especially soybeans, was held. Some of the dishes produced were much appreciated at a party held on the last evening.

CAJANAQUOTE

Man is not just a stomach. We believe that, above all, he hungers for dignity.

Jacobo Arbenz

(An antidote to the 'Cajanaquote' by Balfour on page 289 of our last issue, Vol. V, No. 4).

NEWSPAPER CLIPPINGS

FAMILY OF FIVE FITS FOOD BUDGET¹*From The Trinidad Guardian, November 28, 1972*

Small families are better fed nutrition-wise. This not surprising conclusion was revealed in a National Household Food Consumption Survey in Trinidad and Tobago, 1970. The survey was conducted by the Caribbean Food and Nutrition Institute, Trinidad Centre, University of the West Indies, St. Augustine.

It took in a sampling of 1,050 households and dealt with income, household sizes and racial differences. It was found that households of up to five members could meet their requirements of calories and all other nutrients.

The report states that results revealed "that there was the existence of considerable proportions of undernutrition in the households of mostly six members and over in the rural as well as in the urban areas."

Households were labelled under five ethnic groups: African origin; East Indian origin; Foreigners; and nationals of mixed or undetermined origin.

It was found that foreigners had the highest incomes, ate more and better than the other groups.

Household Income and Expenditure

The East Indians, in the rural and weighted (12 food groups) average, had the lowest household and per caput income. Highest per household and per caput income was of the foreigners, followed by the Chinese, mixed group and Negroes.

"In the urban residences, the East Indians had a little higher income than the Negroes. The expenditure on food was to some extent proportional to the income.

"The East Indians according to their low income and highest family sizes spent the lowest amount per caput per day."

Foreigners spent the highest, \$1.58; followed by the Chinese, \$1.23; mixed group, \$1.14; Negroes, \$1.03; and East Indians, 91 cents.

Dealing with food consumption patterns, "the Chinese need the highest amount of milk both in urban and rural residences and its consumption by the East Indians was lowest."

¹Main headline on page 1 of the Trinidad Guardian, November 28, 1972.

FAMILY OF FIVE FITS FOOD BUDGET (Contd.)

In urban homes, East Indians topped the consumption of cereals and Negroes ate the most root crops and sugar. Mixed groups had the highest intake of vegetables, fruits and meats.

The report notes that foreigners had a much better diet and much higher consumption of all the food groups.

The report is the main conference paper at the current seminar on nutrition which opened yesterday at the University of the West Indies.

GOVERNMENT MOVES TO FIGHT MALNUTRITION

From The Express, November 28, 1972

Government has taken steps to set up a national food and nutrition policy. The move has been made in an attempt to combat malnutrition among children and diseases such as diabetes and anaemia.

Dr. Cuthbert Joseph, Minister of State in the Prime Minister's Office described this as the main reason for the four-day Seminar on Food and Economic Development in Trinidad and Tobago, which opened at the University of the West Indies, St. Augustine, yesterday.

Dr. Joseph, in delivering the keynote address at the opening ceremony in the Caribbean Food and Nutrition Institute (CFNI) JWI, expressed the hope that the seminar will provide guidelines for "the equitable distribution of food."

Dr. N.T.A. Byam, secretary of the National Nutrition Council of Trinidad and Tobago, explained that areas to be covered included the forecasting of foreseeable changes in world food patterns.

Representatives from organisations dealing with agriculture, industry, engineering, and research, among others, are attending the seminar which was formally opened by Dr. Y. H. Yang, CFNI, Jamaica.

ADOPT RATIONAL NUTRITION POLICY. SAYS MINISTER

From The Trinidad Guardian, November 28, 1972

Dr. Cuthbert Joseph, Minister of State in the Office of the Prime Minister, yesterday called for the adoption of a rational food and nutrition policy, the use of proper food habits and the eradication of malnutrition.

ADOPT RATIONAL NUTRITION POLICY, SAYS MINISTER (Contd.)

He said, "while we in Trinidad and Tobago have been fortunate in escaping major disasters such as famine, hunger and malnutrition have always been among the chief problems of developing countries."

Dr. Joseph noted that because of the baneful effects of malnutrition on the well being and productivity of children and adults, there is urgent need for steps to be taken to encourage the use of proper food habits.

Dr. Joseph gave the keynote address at the opening session of a four-day seminar on "Food and Economic Development in Trinidad and Tobago."

The seminar, a venture by the National Nutrition Council and the Caribbean Food and Nutrition Institute, is being held at the Caribbean Food and Nutrition Institute, UWI Campus, St. Augustine.

Dr. Joseph deputised for the Minister of Health, Senator Francis Prevatt, who was unavoidably absent.

He said that the rate of population increase has already given cause for alarm and has resulted in the Family Planning Programme.

Pause To Think

"What we have needed to know as well," he continued, "is the extent of food availability, its adequacy at various social and economic levels of the population and our precise degree of self-reliance in food production."

He added that this data on food is "compiled to a large extent in the food balance sheets prepared by CFNI for Trinidad and Tobago and in the report of the Food Consumption Survey carried out under the direction of the Institute."

"Most of us tend to be over complacent about food," Dr. Joseph continued, "not paying enough attention to production. We tend to restrict our area of concern to increases in the prices of commodities."

"Few of us pause to think sufficiently about the fact that world shortages exist and that it has become a matter of major national importance that we make every possible effort to increase our production of food."

Dr. Joseph thanked the Institute for the invaluable work it had done so far on the country's behalf; and he hoped that the seminar would provide guidelines "to assist us in greater self-sufficiency in, and more equitable distribution of food in keeping with our development efforts in other directions."

ADOPT RATIONAL NUTRITION POLICY, SAYS MINISTER (Contd.)

Four Points

Dr. Y. H. Yang, Deputy Director of C.F.N.I. (Jamaica) in the contribution, explained that a four-day seminar may be "too short to formulate an all-comprehensive National Food and Nutrition Policy."

He however expressed the hope that with the co-operation of all, the seminar could define the problems and recommend practical policy and action programmes.

This, Dr. Yang said, would solve the problems and leave the detailed planning and implementation to the individual ministries and agencies through the coordination of the National Nutrition Council.

He added, "the nutritional status of people affects growth and development, learning capacity and working efficiency which in turn affects the economic development of a country.

"Modern knowledge in health protection, agricultural production, food technology, social and economic planning, education and communication is available to us. The promotion of optimum nutrition is within our ability."

Dr. Yang suggested that after two or three years, "we could meet here again to evaluate the progress, re-define the problems, and re-orient policy and programmes."

Dr. N. T. A. Byam, Secretary of the National Nutrition Council of Trinidad and Tobago, outlined briefly four considerations in the framing of a Food and Nutrition Policy:

1. The need to protect nutritionally vulnerable groups;
2. The need to seek ways and means of meeting food and nutrition needs of a constantly growing population and to provide, as far as possible, for the effects of foreseeable changes in the World Food situation;
3. The need to re-assess our requirements continuously, and to monitor our population in order to identify new or emerging vulnerable groups in the light of socio-economic or cultural change, and also to evaluate the importance in the community of nutrition-related diseases, e.g. diabetes and atheroma;
4. The integration of policies in this field with our total scheme of economic, industrial and social development.

LET'S EAT LIKE CARONI

From The Trinidad Guardian, (Editorial) November 29, 1972.

The current seminar on Food and Economic Development is intended to provide the opportunity to discuss on the expert plane the results of the national household food consumption survey carried out by the Caribbean Food and Nutrition Institute in 1970.

Out of it is expected to emerge recommendations on which a national food and nutrition policy can be based.

Habits of eating, like so many others, die hard and concern about nutritional values takes second place to tastes which have become second nature as a result of long usage. Yet knowing how important proper nutrition is to good health and consequently to productivity and to development, it is essential that we should strive to turn things around.

While we accept the word of the Food and Agriculture Organisation expert who said some time ago that our people are the best fed in the whole Caribbean, we must be concerned that this high standard is marred by the existence of malnutrition among thirty percent of the infant population, no matter that it is said to be not very severe in most cases.

The better standard, according to the expert, was due to our better spending capacity and better eating habits. In fact, however, if this is true, generally speaking the wide variation throughout the country in the intakes of essential nutrients and the deficiencies found indicate a dire need for positive action. For in spite of all that is said, it was found that there existed considerable under-nutrition and malnutrition among the population surveyed.

The results of the survey suggest the need to change the eating habits of a large part of the population and it seems that we all need to study and adopt the eating habits of Caroni. For while it was found that in Trinidad the daily cost of food was highest in Caroni yet the money was well spent, the nutritional quality of the food appeared well balanced and better than diets in the eight other areas.

The cost of food in the whole country was found to be highest in Tobago. Yet the nutritional characteristics of diets were not better than those of Caroni.

While it would seem that an education programme will have to concentrate on pre-school and school children, much could be done to encourage among adults the use of available foods.

FOOD IMPORTS UP 29 PERCENT IN FOUR YEARS DESPITE PROCESSING PLANTS
From The Trinidad Guardian, November 29, 1972.

Food imports in Trinidad and Tobago rose by 29.5 percent between 1968 and 1971. In 1968 this country imported \$87.6m worth of foodstuffs and in 1971 the figure rose to \$113.9m.

Meat and meat products rose from \$10m in 1968 to \$14.5m in 1971. Fruits and vegetables moved from \$10.1m in 1968 to \$15.8m in 1971; and wheat and wheat-flour jumped from \$10.5m to \$16m.

These figures were presented yesterday by Dr. G. M. Sammy to the Seminar on Food and Economic Development in Trinidad and Tobago at the UWI, St. Augustine. Dr. Sammy's talk was titled, 'An Approach to Food Processing Development in Trinidad and Tobago.'

To illustrate the point about importations, Dr. Sammy produced figures to show that the food processing plants imported the bulk of their raw material. Wheat for the flour mill is 100 percent imported. A total of 80 to 90 percent of meat for ham, bacon and sausages is imported. The score for fruits and vegetables (not including citrus) is 80 percent.

Importations for snack foods, milk and milk products is from 60 to 80 percent. For ice cream it is between 80 and 90 percent "and we import 100 percent of our spices and condiments."

Dr. Sammy said: "A study of the raw material imported shows that the food processing industries receive only a very small quantity of their raw material from local sources.

"This problem is clearly stated in 'CARIFTA and the New Caribbean' in these words: The domestic agricultural sector (producing food and livestock products for the local and regional markets) is in a very underdeveloped state, and this results in very high and growing levels of imports of food from the outside world."

Little Hope

Dr. Sammy, who has for some years been a pioneer in food processing in this country, is with the Department of Chemical Engineering at the UWI, St. Augustine.

He sees little hope for the immediate reduction of imports of raw material for processing factories. He said yesterday: "The processing sector was established on incentives such as duty free imports of equipment and raw material, tax holidays and a protected market - negative list. Such a system guarantees the processor a substantial profit margin.

"It was expected by Government that the processors would have endeavoured to build up a raw material supply locally. However, that has not materialised. It would be unreasonable to expect the processors to change from a system that guarantees a profit to one that would be uncertain. Thus the import of raw material continues."

FOOD IMPORTS UP 29 PERCENT IN FOUR YEARS DESPITE PROCESSING PLANTS (Contd.)

Dr. Sammy went on to show that in respect of three local products, the farmers have the potential to supply all that the factories need. The products are pigeon peas, pork and guava.

He pointed out that in respect of pigeon peas, there was over-production in 1968 resulting in heavy losses to the farmers even though they had been asked to grow the crop at a guaranteed price.

As a result, there was a significant drop in production last year "and we are now importing dried pigeon peas from Africa."

Exactly the same thing happened with pork, Dr. Sammy said. "There was over-production, the farmers lost money and now they are reluctant to return to pork production. We are now importing 90 percent of the pork we process."

In the case of guava, Dr. Sammy explained that a farmer who planted 10 acres of guavas was unable to sell more than 75 percent of his crop. Two processors said they took as much as they had capacity for. A third said he was not interested in cultivated guavas. His needs were satisfied with wild guavas. But Dr. Sammy explained that the guavas could have been preserved in sulphur dioxide and kept for use in the off season.

"The failure in each of the three cases quoted," said Dr. Sammy, "was due to faulty or inadequate planning. Nevertheless, it clearly establishes that we can produce sufficient quantities of raw materials for processing."

70-MILLION DOLLAR DOMESTIC FOOD CROPS PLAN From The Daily Gleaner, January 5, 1973

A two-part programme of production, intended to increase domestic food crop production by an additional \$70 million yearly while simultaneously utilizing a basic 50,000 acres of unused land, was announced by the Prime Minister, the Honourable Michael Manley, at the Ramson Hall in Kingston yesterday.

Chief guest speaker at the half-yearly meeting of the Jamaica Agricultural Society, Mr. Manley made the announcement as he reiterated Government's intention to bring the island up to self-sufficiency in foodstuffs, and to re-vitalize agriculture.

One part of the programme will see Government-run farms in operation in different parts of the island, on which willing farmers and workers in the surrounding districts will be recruited to work.

The second part will see Government allotting parcels of land, also in different parts of the island, to willing and able small farmers on the land-lease basis, on condition that these farmers utilize their allotments to the fullest in food production.

70-MILLION DOLLAR DOMESTIC FOOD CROPS PLAN (Contd.)

Mr. Manley told a frequently cheering and packed Ramson Hall that farmers who worked on the Government-operated farms and proved themselves after a time to be efficient, would be allotted these lands on a cooperative basis and left to run and operate that way.

Organization

In the cases of the lands on lease, farmers would be similarly organized into cooperative groupings and encouraged to operate on that basis.

The Prime Minister also told his hearers that private holders of unused lands were being encouraged to make these unused lands available to Government on a land-lease basis, and that Government would lease those lands to willing and able small farmers who joined in the food production programme.

He said that the two-part programme would officially start on January 25 on the 500-acre parcel of land at Hounslow in St. Elizabeth, and that he himself, would be going down to that occasion to start the project.

University students and sixth formers from Secondary schools would also be invited to attend, "because I want them all to see and understand that every bit of work that a man has to do for his living has every bit of dignity in it."

In the course of his address, Mr. Manley invited land holders present who had idle acres in their possession to volunteer right at the meeting to lease those lands to Government for the purpose he had set out; and tumultuous scenes followed the frequent applause that punctuated his address and the standing ovation given him as he concluded.

Deep Feeling

The JAS President, Mr. P. A. Broderick, in a voice that plainly carried overtones of deep feeling, called upon such idle-land holders attending the meeting to "come up to the penitent form and make your offerings now."

He declared that "what we want in this country is an agricultural revival, and this could well be it" and then invited the audience to stand and sing, "Now thank we all our God..." before the holders of idle land came up to the platform to make their offers.

Everyone acceded to Mr. Broderick's request for singing and this was followed by eight idle-land holders who, together, offered 585½ acres for lease to Government under the terms set out.

The Prime Minister emphasized the point that Government thought the massive plan for food production could become fully operative in two to three years.

Mr. Manley told his audience, in the part of his address dealing with the food production programme: "The Government has identified a total of

70-MILLION DOLLAR DOMESTIC FOOD CROPS PLAN (Contd.)

50,000 acres capable of tremendous development over the next two to three years and I would like to emphasize that the speed at which we have to bring that land into production is going to be determined by the people whom we put to work on it.

"Remember that what we are aiming at is \$70 million a year of food imported into this country.

Two Phases

"We are going to work this thing in two clear phases. The first phase is - beginning on January 25, we will actually begin the ground-breaking and basic work on the first 500-acre lot at Hounslow in St. Elizabeth.

"I, myself, am going there that day, because I want to show Jamaica how small farmers have to fight to survive, and to let this country know that no man is too big for the work that has to be done. I am going to invite some university students and some sixth formers to go down, because I want them to see and to understand that every bit of work that a man has to do for his living has every bit of dignity in it; and as soon as other lots are available, announcement will be made.

"We see the whole exercise in two distinct parts. Firstly, there are areas in which the Government is going to run the farm for a start, in collaboration with local people who are willing to work and pool together. There may be some farmers who will want to work, and some people in the villages who will want to get the opportunity to work as Government gets the farm going in the right crops.

"We propose to have markets and other facilities available. In due course, when we have got an area established and being well run, making money and successfully operating, what the Government proposes to do is to take the people who are working the farm and set them up into a corporation and then Government can slide out gracefully and leave them to run it.

"The second part is this: In some of the land that we have identified, we may find that some of it is right beside existing small holdings. Where we find a settlement of small holdings of farmers who are genuinely farming and really producing, but what is beating them is that their holding can be made bigger, what we want to do is, in certain areas, invite some of the small farmers to take up larger holdings which we will release to them on a cooperative basis and on a clear understanding that when we find some of this land adjacent to small holdings and a man takes up a lease, there will be no question of his being able to sell it.

"The understanding is that if the man will work with us, then he will have the land on lease so that he can have a better holding to work for better production, and eventually have more things to sell.

"So this will be the system of assisting farmers to enlarge their holdings in order to produce more and become more efficient. What we want is to

70-MILLION DOLLAR DOMESTIC FOOD CROPS PLAN (Contd.)

create land reform in Jamaica in order to get all the unused land into production.

"In order to do this, we cannot have people taking lands and holding them for speculative purposes. Land speculation grows no food. All that it does is to get profit for people who have done nothing. We cannot afford it when there are people who want to work by the sweat of their brows with their hands to improve their lot and that of their children.

"Now, over and above the 50,000 acres that we have identified for developing over the next two to three years, we know that there are quite substantial parcels of land that can now be made available to Government for leasing to small farmers in order to create greater land room.

"There is many a farm that might be say, 200 acres in size and for reasons of lack of capital, the owner may be able to develop and use say, only about 150 acres. All over Jamaica, there are parcels of land of 30 acres or 50 acres that are not in use because the particular owner may not be able to handle it efficiently.

"The Government cannot do everything. We are making a massive effort with the 50,000 acres; and this is a time when everybody must come together and do what he can for his country.

"I am announcing through your conference, Mr. President, an appeal from the Government made by me in all solemnity, to all farmers in Jamaica who have parcels of land that they cannot now use, to offer these lands on a lease basis to the Government, so that we can, in turn, re-lease them to the people, and increase the cultivated land room in Jamaica.

"We believe that there is a spirit of cooperation in Jamaica today that will lead to an answer to this appeal.

"We believe that there are people in Jamaica who believe that there has got to be a change. The society has got to be transformed. There are those who believe that people have got to be given an opportunity to produce for themselves and for Jamaica."

PRIME MINISTER TO HEAD PROPOSED NATIONAL FOOD, NUTRITION COMMISSION
From The Daily Gleaner, March 29, 1973

Proposals for the setting up of a National Food and Nutrition Commission to advise on all areas of nutrition have been outlined by the Minister of Health and Environmental Control, Honourable Dr. Kenneth McNeill, a JIS release said yesterday.

PRIME MINISTER TO HEAD PROPOSED NATIONAL FOOD, NUTRITION COMMISSION (Contd.)

Speaking at the annual conference of dietitians at the New Nurses Hostel at 50 Half-Way-Tree Road, yesterday, the Minister said that the proposed Commission would be headed by the Prime Minister, Honourable Michael Manley, and would include representatives of the Ministries of Health, Agriculture, Mining and Natural Resources, Industry and Tourism and Commerce and Consumer Protection.

Specialized agencies such as the Caribbean Food and Nutrition Institute, the Tropical Metabolism Unit of the University of the West Indies, individuals from the commercial and industrial sectors and people involved in food production would also assist on the Commission.

Dr. McNeill said that the role of dietitians was very important in the society, as it was their task to examine the nutritive components of the food eaten by the population of Jamaica.

On the subject of agriculture, the Minister said that Jamaica should produce more food relevant to the health needs of the society. When this was done, he said, the people would have to be educated to accept these foods and this would entail changing the eating habits of the nation. A step in this direction would be for the hotels to serve more Jamaican foods.

Falsification

The Minister said that the Government intended to ban products that were too expensive for their nutritional value, and advertising agents would have to see that products were not marked to falsify their values.

Condensed milk, he said, was a very poor source of nutrition, whereas powdered milk was very nutritious, but many people attached a stigma to the use of this milk.

Many mothers preferred to feed their babies on milk preparations rather than on the breast and the dietitians had to help in bringing about a "Back to the Breast Movement" so that more children could be fed on breast milk during the pre-school age because most cases of malnutrition occurred in this age group.

CFNI NEWS

GUYANA AND BARBADOS

A team from CFNI visited Guyana in January to participate in the second Technical Workshop there (see page 53). The team then went on to Barbados to have discussions with Government officials. Dr. Frank Ramsey and Miss Patricia Peña showed the team around the new Nutrition Centre and Dr. Ramsey chaired a meeting of the National Nutrition Committee which the CFNI team attended. The progress in implementing the recommendations of the 1969 National Food and Nutrition Survey (PAHO Sc. Pub. No. 237, 1972) was discussed.

A seminar on Nutrition and National Development is to be held in Barbados in May under the auspices of the Government and CFNI.

COMMUNITY HEALTH AIDES

A new - to the Caribbean - cadre of worker, the Community Health Aide, has been developed in Jamaica. Community Health Aides are given a short training before being sent to their home areas to work under the supervision of a public health nurse.

CFNI was involved in the initial workshop for those people who were to teach basic nutrition to the Community Health Aides and also in an evaluation of the work of the Aides in the field. The basic points in nutrition that the Community Health Aides should know and put across will be published in the next issue of 'Cajanus'.

NUTRITION SEMINAR HELD AT SEAFORD TOWN¹

A seminar on the subject *Basic Nutrition For School and Community* was held on February 8th and 9th at the Seaford Town Community Centre, under the auspices of the Lambs River Nutrition Education Action Committee (NEAC).

The seminar was part of NEAC's plans for further development in nutrition education in the district within the framework of the Freedom From Hunger Campaign project which started eighteen months ago.

The seminar had among its principal speakers Miss Thelma Stewart, Senior Education Officer (Home Economics) Ministry of Education, who spoke on

¹From the *Gleaner*, Jamaica, February 21, 1973.

"Ways of Teaching Nutrition"; Miss Helen Fox, Technical Officer (Nutrition), Ministry of Health, who gave a lecture-demonstration on "Local Diets for Infants and Young Children"; and Mrs. Noelin Vacianna, Public Health Nurse, Westmoreland, who presented "The Story of Malnutrition in Westmoreland." Other speakers on nutrition topics were staff members of the Caribbean Food and Nutrition Institute.

Altogether forty-five persons, made up of sixteen teachers from schools in the district, seven home visiting volunteers and ten other interested citizens, as well as a number of health personnel from the parish, attended the seminar.

Miss Ruby Thorpe, Principal of St. Leonard's School and Chairman of NEAC opened the seminar and the principals of the district's other schools, Mrs. Gardner, Virgo and Ramsay, chaired the remaining sessions.

One of the highlights of the seminar was the final series of short presentations made by the members of local committees and the volunteer group concerning their role in the Nutrition Education Project and describing recent progress in nutrition within the district.

Reactions from participants indicate that not only were they better informed about nutrition and the nutritional problems of their district, but greatly stimulated to accelerate their activity in the field of nutrition education.

Miss Althea Ulett, Project Field Assistant, moved the vote of thanks to end the seminar.

NUTRITION AND WORKING EFFICIENCY

On New Year's Eve the study of "Nutrition and Working Efficiency" being carried out jointly by CFNI and Cornell University (USA) moved into a new phase, for it was on New Year's Eve that harvesting of the 1972/73 sugar crop began at one of the two estates on which the study is being carried out. The study, conceived more than a year before, will continue throughout the current harvesting operations.

The project aims to study some of the relationships between nutritional status and productivity. More than two hundred cane cutters will be weighed throughout the crop and their productivity measured. Relevant social and economic data are also being collected. Food intakes will also be measured on a sample of the men. It is anticipated that the final analysis of the results will be finished by New Year's Eve of 1973. Now there's a very definite New Year's (Eve) resolution!

LETTER TO THE EDITOR

From Ms. Monica A. Jones, Director, Information and Education, The Family Planning Association of Trinidad and Tobago.

Dear Sir:

I read with great interest the October/December issue of 'Cajanus', but beg to disagree with your writer of 'Shirt Signs' who states.....
'The clenched fist appears on T-Shirts but not as yet the Lippes Loop.'

I enclose herewith a sample of one of the T-Shirts the Trinidad and Tobago Family Planning Association produced for the 1972 Carnival Season. The ensuing controversy brought much attention to the programme and we had requests for them from many countries around the world.

Sincerely

Monica A. Jones

13 February 1973

EDITOR'S NOTE:

Here is a picture of your editor's new shirt (front and back). It fits him snugly and is much admired by his friends and colleagues. He apologises for his omission and awaits new developments from the 1973 Carnival.



NUTRITION MADE SIMPLE

WHAT DO FOODS DO?¹

Put as simply as possible, our food must fulfil three distinct functions. It supplies:

- (i) materials needed for building the body and repairing it,
- (ii) the energy the body needs,
- (iii) certain other substances needed for proper functioning of the body.

First Function: To Supply Building Materials

These materials are essential:

- *during childhood and adolescence*, for growth. The growing child is forming new cells; it needs material to build bones, to develop muscles, and to enlarge the organs of its body. (During pregnancy and lactation women also need extra building materials in their food to provide for the growth of the baby).
- *at all ages*, for the maintenance of tissues, through constant renewal of the materials of which cells are made.

Our bodies are made up of thirty-three different chemical elements. These include oxygen, carbon, hydrogen, nitrogen, potassium, sodium, iron, phosphorus, sulphur, chlorine, and many others. Some are present in very small amounts; for instance, iodine. The elements are combined in the body to form complex chemical substances.

However, it must not be thought that these substances, once they have been formed in the body, remain there without any further change. Far from it: the materials which make up the cells are *continually renewed*. This renewal, which is made possible by the regular destruction and reconstruction of the materials, produces an effective protection against "wear and tear".

Second Function: To Supply Energy

We need energy in order to live and to work, and this is supplied by "burning up" food in our bodies.

Lavoisier, in the 18th Century, showed that it was the *combustion* (another word for "burning up") of food that made life possible for animals and man.

¹From 'Our Foods - A Handbook for Educationists' by H. & M. Dupin. Les Éditions Sociales Françaises - Paris (1965).

The sort of combustion that takes place in our bodies is of course very different from the burning up of a piece of wood or charcoal. However, the amount of energy produced by food is measured by means of the same unit, namely the *Calorie*, that is used in physics for the measurement of heat. The amount of heat (or energy) that the body can obtain from one gramme of a particular food is known as the "caloric value" of that food.

People doing heavy work use up a great deal of energy - the labourer loading sacks on to a lorry, the peasant cultivating his field, and the canoe-man paddling against a strong current.

But the body still uses up energy, even when at rest. For example, even while a person sleeps, some of his organs must go on working; he is breathing and therefore his respiratory muscles are at work; the heart is pumping blood through the whole body; the digestive organs carry on with their task, and the kidney never stops working.

If instead of looking at a bodily organ as a whole, we look at the cells of which it is made, we find that complex chemical reactions are going on in every cell. Some of these reactions release energy but others, more numerous, use it up. This energy, which is essential to the life of our cells, is produced by the "combustion" of food.

Third Function: To Ensure the Proper Functioning of the Body

The most important point about a number of foods is that they supply certain substances which are essential for the proper functioning of the body. This fact is difficult to describe simply, so we will use an analogy. Steel is very much stronger than iron; it will support heavier weights, is much harder to bend, and resists heat better. Steel consists of iron to which very small quantities of certain other metals have been added. These represents only one or two percent of the weight of the steel, but they give it its special quality of strength.

It is the same with our bodies; they need small quantities of certain substances which should be supplied by our food. These are essential for resistance to infection, and the efficiency of many bodily functions.

CAJANAQUOTE

"You can't teach nutrition to people on an empty stomach"

Dr. A. J. D'Souza

CANDI NEWS

Members will I am sure join us in expressing our deep gratitude to the Director and staff of CFNI for so kindly devoting an entire issue of 'Cajanus' to the Proceedings of the Inaugural Meeting of CANDI (Vol. V, No. 3, pp. 144-263).

Since the inauguration of our Association, much activity of interest to members has been taking place. Of greatest importance is the Food Service Supervisor's Course, which took place in Barbados. There is no doubt that this course will be a resounding success. This, due to the dedication and tremendous effort of our first elected President and course coordinator, Miss M. Zephirin in planning and organising this much needed programme.

The following members of CANDI have been privileged to participate in this course which was opened on August 14 by the Minister of Health and Welfare, Barbados: Mrs. W. Davis, Jamaica, Chairman of the Education Committee; Mrs. J. Inniss; Miss L. Horne, Trinidad; Miss P. Peña, Chairman of the Nutrition Committee. Mrs. R. Jackman, Barbados, has been very active in the course.

I was privileged to pay a two-day visit to the course as an observer and I must say that the effect of such training on the future of dietary services in the region cannot be overstated.

It is with regret that we announce that for the remainder of this term of office the duties of President of the Association have to be handed over. But we are happy to note that these duties will be performed by our Vice-President, Mrs. E. Phipps of Bermuda. We wish Eugenie every success in the performance of these duties.

An impromptu meeting was held in Barbados on the afternoon of November 4, where plans were initiated for our second annual meeting scheduled to be held in Barbados in June 1973, subject to the approval of the Barbados Government. A conference committee headed by Mrs. R. Jackman was formed. The success of this meeting will depend on the support of ALL members. We hope you are planning to be in Barbados in June. Some members are already considering fund raising activities to assist with air fares and hotel accommodation.

CANDI has been invited to send a representative to participate in discussions on the establishment of Professional Training in Home Economics at UWI.

Miss Pat Peña, the Chairman of our Nutrition Committee has been working on a regional project on diet in diabetes. She would particularly like to express her appreciation to Mrs. Sadle Campbell of the Scientific Research Council in Jamaica, Dr. N. Byam and Miss E. Warner of Trinidad for their advice and assistance in getting this underway. Pat has recently been appointed to a post of Nutrition Officer in the Ministry of Health, Barbados. She will be working in close collaboration with Dr. Frank Ramsey in the National Nutrition Centre.

The editor of Medi-News Caribbean has extended an invitation to CANDI to become one of the organizations contributing articles to the above publication. We would welcome articles from CANDI members for publication both in 'Cajanus' and the Medi-News Caribbean. Regional Representatives and CANDI members please note that we await items of interest for publication in our newsletter.

Editor/Co-Editor

CAJANAQUOTES:

The old man stood by the market stall and gazed wistfully at the array of fruits all priced beyond his means.

He had hoped to buy a banana or two but they were being sold at five for fifty cents and the vendor was unwilling to sell less than five.

"Times real hard" he muttered.

"Is hard, yes" the vendor replied as she threw some rotten bananas into the drain.

As told by Ms. Eileen Cox

"Calories do count, but let's choose our calories by the company they keep."

Isabel Foster

EDITORIAL

We must first apologise for the late release of the last issue of 'Cajanus'. It would have been sent off on time if it were not for frequent prolonged power cuts in Kingston. These slowed down the typing, printing, collating and binding. We hope, however, that you enjoyed 'Cajanus' when it came.

This issue contains three contrasting articles. The first by Robert Cook and V. H. Yang (page 77) is a "position paper" on national food and nutrition policy. Nutritional considerations underlie so many aspects of the political, economic, social and administrative life of countries that it is clear they should be given due emphasis in decision making. We all eat, and sometimes it appears that we all think we know everything about nutrition. Some method of deployment of the available expertise in food and nutrition, so that the best decisions are made and carried out, is needed in all countries and regions and for the world as a whole.

The piece by Peter and Alison Heywood (page 95) about their first experiences with their baby Jacqueline could be considered a fable of our times, except that it is true in every detail as well as in its moral implications.

Lastly we present, garnished with pictures, a look at key nutrition concepts for community health aides. Community health aides are new members of the health team in Jamaica. After an initial training of eight weeks they work in their own communities as multi-purpose health workers under the supervision of public health nurses. Their impact is currently being evaluated with help from CFNI.

THE EDITOR

TOPICS AND COMMENTS

MINERAL EXCESSES IN ARTIFICIAL FEEDING

Two interesting articles on milk powders used for infant feeding appeared recently in the British Medical Journal. The first, on the mineral content of such products comes from the Department of Paediatrics at the University College Hospital in London, England¹. All the brands tested contain, when made up according to the manufacturers' recommendations, much higher concentrations of sodium, potassium, calcium, and phosphorus than does human milk. These minerals are important in the diet in small quantities; if a baby receives more than he needs he excretes the excess through his kidneys in the urine. However a small baby's kidneys cannot secrete very concentrated urine; so, if he has excess minerals to excrete, extra water has to go out in the urine as well. All except one brand tested contained more protein than breast milk. The excess nitrogen has to be excreted through the kidneys in the same way.

In situations where the baby is already sweating due to a warm climate or to a fever or if he is losing water in diarrhoea, this extra water loss in the urine due to artificial feeding may lead to dehydration. Alternatively the minerals, especially potassium, may be retained in the body with harmful effects.

The authors show that if a baby is given over-concentrated milk feeds or a small amount of feed, he may well lose water in this way. This does not occur with breast feeding, as breast milk contains less of these minerals than do the artificial milks tested. Even if the baby is sweating he does not usually need extra water over and above that present in the breast milk, and he will not become dehydrated and thus thirsty.

However an artificially fed baby who is sweating is likely to get thirsty from dehydration and, rightly, be given extra fluids. These may be sweetened and thus contain extra calories over and above the baby's needs. The authors point out that this may be a "rather subtle but important factor in the development of infantile obesity."

The second paper, coming from staff at the Newcastle General Hospital, Newcastle-upon-Tyne in England² shows that nurses, midwives and mothers often make up feeds incorrectly. Both papers prove that the scoops provided with baby milks often do not provide accurately controlled amounts of milk. The main error in England seems to be that feeds are often given too strong; and this, as just described, could be harmful to babies.

¹Shaw, J.C.L., Jones, Ann and Gunthor, Mavis. Mineral content of brands of milk for infant feeding. *Br. Med. J.* 7th April 1973, 12-15.

²Wilkinson, P.W., Noble, T.C., Gray, G., and Spence, O. Inaccuracies in measurement of dried milk powders. *Br. Med. J.* 7th April 1973, 15-17.

MINERAL EXCESSES IN ARTIFICIAL FEEDING (Contd.)

The authors of these papers suggest that containers often do not convey adequate information on the mineral contents of powdered artificial baby milks and also that scoops should be standardised or, better still that the milks be made up in small, accurately weighed packets. These problems, of course, are of no concern to breast fed babies. Their milk is neither "stretched" nor over-concentrated, their kidneys are protected from overwork and their bodies from consequent dehydration.

J. M. Gurney

CLINICAL INDICES OF NUTRITIONAL STATUS*

Physical examination for nutritional status is almost useless because of the non-specificity and subjective nature of most of the signs. In the special case where a specific nutritional disease is known to be present in a population, a rapid clinical survey to detect a particular sign associated with the disease may give a rough indication of its prevalence. Age must be taken into account, since clinical signs caused by specific nutrient lacks may differ in different age groups.

Some typical examples are:

- (1) presence of oedema in pre-school children as an indicator of protein-calorie malnutrition of the kwashiorkor type;
- (2) absence of knee or ankle reflexes as an indicator of beriberi;
- (3) palpation and classification of the size of the thyroid gland as an indicator of endemic goitre;
- (4) inspection of the skin of the arms and neck for the dermatosis of pellagra.

Unless there is good evidence that the disease already exists to a significant extent in the population, however, such methods of ascertainment are likely to be inefficient and uninformative.

*From: World Health Organization (1972) *Health hazards of the human environment*, Geneva, pp. 291-292.

A KETOTIC DIET¹

The book "Dr. Atkins' Diet Revolution" is a best seller in the USA because it tells fat people what they want to hear - that they can lose weight while eating unlimited amounts of meat, cheese, shell fish and rich sauces. In these terms, the pitch to the paunch is evidently irresistible because the book has sold a million copies in six months.

From a nutritional point of view, the proposed diet is more revolting than revolutionary. It differs from the usual low-carbohydrate (60g) diet because it is initially carbohydrate-free. Carbohydrate levels are gradually increased weekly to 20-40g. Ketonuria is maintained. Dr. Atkins feels that "ketosis is a state devoutly to be desired."

Dr. Atkins proposes the diet as a life-long proposition. He recommends it not only for a weight loss but also claims that his diet is the medical treatment of choice for most people with high cholesterol levels, adult-onset diabetes, migraine, heart and arterial disease, and for fatigue and emotional disturbances. Dr. Atkins states that the book represents his experiences with ten thousand patients. Unfortunately, he has not published the work in clinical journals so medical scientists have not had an opportunity to examine his findings.

The author does not have much regard for nutritionists - "I realize what a fortunate thing it was that my training had been in cardiology and not in metabolism. If I had been trained in nutrition and metabolism, I'd be parroting the same classical misconceptions that so many of my colleagues still hang on to." Later he asks, "why hasn't medicine explored the role of carbohydrates?" and implies that it is because carbohydrate foodstuff manufacturers have subsidised nutrition departments.

The American Medical Association, American Academy of Nutrition and other medical groups have already discussed the potential health hazards of the diet, particularly for those persons predisposed to heart, kidney, or gout conditions. Certainly the long-term recommendation of a diet which contains sixty percent of its calories from fat is not compatible with current knowledge of diet and heart disease for those at risk. This reviewer questions the propriety of diet recommendations which lead to abnormal levels of certain metabolites, such as serum uric acid, when there are other diet plans available which do not. (The author's bizarre and erroneous interpretations of intermediary metabolism is mute testimony to the need for nutrition training in medical schools.)

¹We are subject to foreign fads and fancies, and some home grown ones too. The particular example reviewed here is available in some of our pharmacies, and some 'Cajanus' readers are likely to be asked their opinion on "eat fat and lose weight reducing diets" and the like. If any reader would like a more detailed criticism, please write and we will send one.

A KETOTIC DIET (Contd.)

This reviewer is particularly concerned that the author does not give reasonable notification of health risks to his readers so that they may exercise good judgement regarding the use of the diet. Because it appears in book form, and because the author is a graduate of a highly regarded medical school, many readers will take it for granted that the material in the book reflects current nutritional knowledge. This is certainly not the case.

The book is not recommended to anyone.

Robert B. Bradfield

(Reprinted from "The science of nutrition"
from the University of California's agricultural extension programme).

(This book review is being published in the July issue of the *American Journal of Clinical Nutrition* and also in the Spring issue of the *Journal of Nutrition Education*).

CAJANAQUOTE

"Whatsoever was the father of a disease, an ill diet was the mother."

George Herbert
(1593 - 1633)

NATIONAL FOOD AND NUTRITION POLICY
IN THE COMMONWEALTH CARIBBEAN

by

Robert Cook and Yueh-Heng Yang
Director and Deputy Director
Caribbean Food and Nutrition Institute

INTRODUCTION

Concern of governments with *food supply* is as old as the history of mankind. Many historical examples come easily to mind, from the establishment by the Greek city-states of colonies on the coast of South Russia where grain grew abundantly, to the Roman annexation of Egypt, whose main purpose was to secure the "bread", which with the "circuses" would keep the city population peaceful, to the political struggle in England between 1815 and 1846 over the Corn law and its repeal, a prolonged battle between the landowners and the industrialists over cheap food for the factory workers.

Concern of governments with *nutrition* as such is naturally more recent, as the science itself is relatively young. Government actions did not really begin on a large scale until the 1920's and 30's. At that time and until after the Second World War, emphasis was mainly on vitamins, since particular vitamin deficiency diseases such as rickets in industrial Northern Europe, pellagra in the United States, and beri-beri in the Far East, were major health problems.⁽¹⁾ The importance of protein in the diet was not recognized until after the great pioneering work in the 1930's of a Jamaican, Dr. Cicely D. Williams, who first described kwashiorkor when working as a District Medical Officer in Northern Ghana.⁽²⁾ The latest development in recognition of needs has been that of the importance of caloric supply, in effect of total balanced adequate diet, and the term protein problem, or protein gap is now seen to be partly inappropriate.^(3,4)

The activities of government (and voluntary agencies and foundations too, which often led the way) have also evolved in the period since 1945. At first, and this still applies to some extent, the programmes were what one might call unilateral or one-direction programmes. As examples one may consider the vitaminization programmes, such as the fortification of food, or the distribution of cod liver oil, or the programmes based on the activities of one specialty or ministry, such as the so-called "well-baby clinics" or infant welfare clinics. Many of these programmes were successful, very successful indeed. The great vitamin deficiency diseases beri-beri, rickets and pellagra, were virtually conquered, and the mortality of infants was greatly reduced. Indeed, the child health clinic, improved from a scientific and functional point of view, still has a major role to play now and in the future.

Nevertheless, after a peak of expansion in the 1950's, given much impetus by UNICEF assistance, a general feeling arose that the infant welfare clinic was not enough. Attention needed to be given to other methods of improving nutrition, such as the promotion of more food production in home gardens and better preparation at home, and in particular to the enormous and important target audience which the schools provide. Thus arose a partnership of Health, Agriculture and Education called the *Applied Nutrition Programme*, aiming especially at improving nutritional knowledge and action on the part of the people themselves. These Applied Nutrition Programmes were devised and began to be implemented in many countries, among them several Caribbean countries, during the late 1960's. They have had, to be candid, some drawbacks and failures. For one thing, because they were never very comprehensively financed but mainly had to draw their resources from the general budgets of the ministries involved, they have, in many instances, not yet expanded from the original pilot areas to the nation-wide coverage originally intended. Another feature is that the

need for collaboration makes a considerable call on the patience and understanding of officials in different ministries, and sometimes differences arise and are exacerbated. Nevertheless, most Applied Nutrition Programs have quite a few successes to their credit also, and not least among these is a significant sharpening of public and political awareness of the meaning and importance of nutrition, and the provision of at least a testing-ground for inter-ministerial cooperation.

RECENT DEVELOPMENTS

Meanwhile however, there are changes taking place in the general and food economy of the nations. Political independence leads to a clearer realisation of the nations' needs, and increasing, sometimes bitter, experience of economic dependency on others. It is clear that the primary products of developing countries often have to struggle to maintain their place in the world market; that tourism is vulnerable to all kinds of fluctuations; that it is difficult for small local industrial manufacturers to compete with large-scale corporations. Worst of all perhaps, it becomes very apparent that the food supply of many developing countries - and this applies very much to the Caribbean - is to an excessive extent dependent on relatively remote events, often unpredictable and never controllable by the developing countries. Recent examples of such events include the corn blight in USA in 1971, the dispute over the territorial waters of Peru and Ecuador, large wheat sales by one super-power to another, a rain-spoiled soya harvest, and a deal over butter between powers in Europe, all of which events have contributed to raising the price to the Caribbean consumer of flour, bread, beef, poultry, pork, and milk in all its forms. Added to this are the effects of devaluation on countries who import much of their food, increasing in local currency terms the price of imports and diminishing in the local currency the price per unit obtained for

exports. One is no mere prophet of doom when one states that there seems to be a danger of a continuing and increasing relative food shortage here among the Caribbean peoples. In a country in which average expenditure on food amounts to under twenty percent of income, a rise to twenty-five percent is not really a major disaster. However, the National Food and Nutrition Surveys of Barbados and Guyana^(5,6) show that in these countries half the population is compelled already to spend between sixty and ninety percent of their income on food. The close correlation between low family income and the presence of malnutrition in these families shows how vulnerable are their children to any significant rise in the prices of basic foods which is not accompanied by a rise in family income.

Governments are not, however, asleep or unaware of these things. For some years now they have done their best to control the price of basic foods, not always successfully and not always in the most sophisticated way, but they have been exercising a fairly tight degree of control over the foods which matter most to the people. Lately other direct manifestations of government concern have appeared. Guyana, which because of its land resources is the least dependent of the four sovereign states in the English-speaking Caribbean, has adopted a policy aiming at self-sufficiency in food supply by 1976. Jamaica is undertaking now a series of actions whereby the Government itself imports certain basic foods and sells them at cost price or even below that by means of subsidy. What determines what are basic foods? Not merely their popularity and certainly not the proportion of foreign exchange they take up, but really their basic nutritional value as inexpensive major sources of calories and protein in the diets of the mass of the people.

Thus when we speak of a national food and nutrition policy we are not dealing with some abstraction of marginal importance being promoted by external

advisors; rather, we are dealing with something which always had importance but which is rapidly approaching the most critical level not merely of importance but of simple necessity, and is becoming one of the most essential and urgent subjects calling for increased effort on the part of governments and people.

However, the whole matter is really complex. It is, in spite of past concern and past experience, still to some extent an uncharted sea. Even the most sophisticated country, with its computer technology, with everything in its favour from data banks to think tanks, allows itself to be taken by surprise by shortages of wheat and soya which stem in part from its own policies and actions in the immediate and not-so-immediate past. Everyone is good at hindsight, at detecting critical price increases when they have already happened. Not so good are we at foreseeing and preventing them.

DEFINITIONS OF NATIONAL FOOD AND NUTRITION POLICY

We have seen, then, that there have certainly been actions to safeguard and extend food supply in relation to nutritional needs. These have usually been ad hoc responses to threats of crisis, and sometimes they have been based on a rough-and-ready set of guiding principles. With a national food and nutrition policy government attempts to define more clearly these principles, to set targets, to establish programmes to reach these targets, as well as to protect the country as far as possible against unexpected blows.

An early definition of national food and nutrition policy stated simply that such a policy *"concerns the complex of measures which promote changes in food consumption that lead to adequate levels of nutrition."*⁽⁷⁾ The FAO Manual by Johnston and Greaves from which this quotation comes remains a most important exposition of the subject.

A later publication⁽⁸⁾ says that *"the food and nutrition policy should be defined as the formulation of a series of measures designed to ensure an*

optimum nutritional state for the entire population, through adequate supply of foods and appropriate changes in the patterns of consumption."

Another definition⁽⁹⁾ states that a national food and nutrition policy is a "a complex of educational, economic, technical and legislative measures designed to reconcile, at a level judged feasible by the planner, projected food demand, forecast food supply and nutritional requirements.

Most recently a paper by Rueda Williamson⁽¹⁰⁾ defined a food and nutrition policy as "a coherent set of principles, objectives, priorities and decisions adopted by the Government and applied by its institutions as an integral part of the national development plan in order to provide to all the population, within a specified time, the food and other social cultural and economic conditions essential to satisfactory nutrition and dietary well-being."

These definitions are at no point in conflict. The second, third and fourth are simply a series of refinements, clarifications and elaborations of the first definition. It can be seen from these definitions that the programmes to implement food and nutrition policies will combine nutrition-related activities in Health, Education, Community Development and Consumer Protection with programmes in Agriculture, Trade, Economic Development and the food industry; that there is room and indeed necessity for both long-term and short-term measures, with both short-term objectives such as protection of young children and pregnant women from the more severe consequences of low food-purchasing power, and with long-term objectives such as the virtual elimination of clinically-detectable malnutrition and greater national self-sufficiency in food supply.

The justification for such a policy is not merely humanitarian, not merely economic and not merely political in the best sense of the word. It is all of these. It is a policy of social, economic and human development. Over-

reliance on food imports is perilous. Malnutrition is both a cause of avoidable public expenditure and, through its effect on mental and behavioral development in children and on working efficiency in adults, an economic drag on a community as well as a crucial social problem. Better nutrition of the people will accelerate economic development, will promote social stability, and is a fruitful investment in the most important of all natural resources, people. It is not just a social welfare expense, but has a lasting value to the future of the nation.

STEPS IN FORMULATION OF FOOD AND NUTRITION POLICY

In some countries, but not in the Caribbean of today, one quite difficult step is the creation of awareness of nutrition as a national problem and priority among the economic planners and decision-makers. However, throughout the Commonwealth Caribbean that awareness already exists, and the dialogue between nutritionist and planner and politician has already begun, and steps are being taken in several countries toward the formulation of national food and nutrition policies.

The first step is collection of *baseline data* on the actual food and nutrition situation, the diagnosis of the problem. The necessary baseline data include, as well as population and agricultural censuses, five kinds of information:

1. Food Balance Sheets - with the assistance of CFNI these have been prepared for recent years for many of the countries.
2. Household Food Consumption Survey - such surveys have been undertaken in Barbados, Trinidad and Tobago and Guyana between 1969 and 1971.
3. Assessment of the Nutritional Status of the People - recent data are available from surveys in Barbados, Jamaica, Guyana and St. Vincent.

4. Household budget survey - particularly in respect of food expenditure and nutrient costs. Such information is available for Barbados and Guyana at least.
5. An appraisal of food habits, food customs and preferences, and knowledge, attitudes and practice about nutrition. A number of such studies have recently been undertaken in most of the countries of the area.

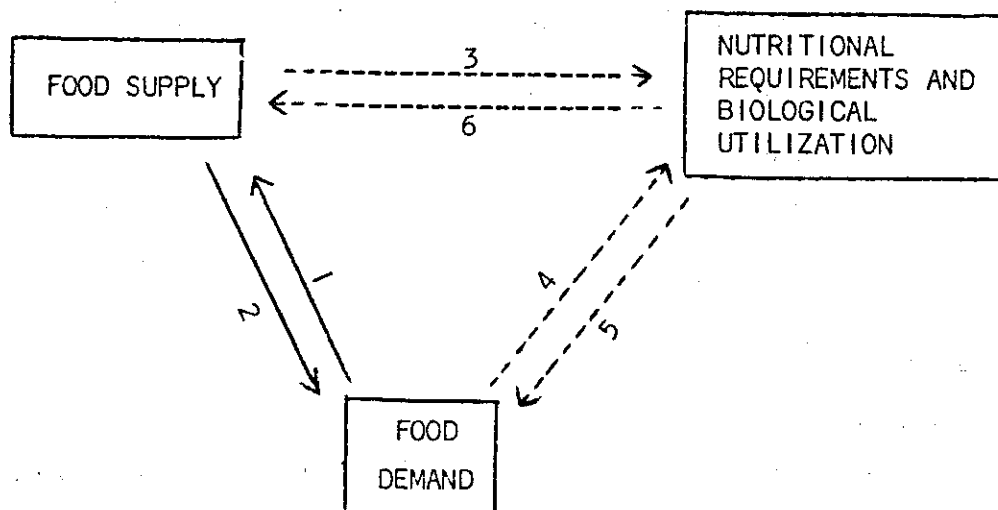
Thus since 1968 a substantial amount of necessary data has become available. These data are not perfect or complete but if action were to wait on perfect completion of baseline data, it would never take place at all.

We may safely say that at least in the independent countries the availability of data is sufficient to justify the initiation of policy.

CONTENT OF NATIONAL FOOD AND NUTRITION POLICY

One may pursue this subject by elaborating on the definition of a policy as a complex of educational, economic, technical and legislative measures designed to reconcile food demand and food supply with nutritional requirements. Some would use, instead of nutritional requirements, the term "biological utilization of food", which is acceptable so long as it is not thought to signify only the process of digestion and absorption but is taken to include both nutritional requirements and factors influencing requirements.

We may note at the outset some of the relationships between the three factors demand, supply and requirement:



The connections between supply and demand are clear, with demand strongly influencing supply (1) and supply to a variable extent satisfying demand (2). The consumption which results from the interaction of supply and demand is the only way in which nutritional requirements can be met (3 and 4), and while food supply and demand do not directly influence requirements it should be noted that there are other factors which can interfere with optimum biological utilization and do affect requirements and which thus influence the extent to which the availability and consumption of food, resulting from the interaction of supply and demand, can satisfy nutritional requirements. Such factors include, for example, higher protein and calorie requirements in illness, the prevalence and degree of intestinal parasitism. The influence of nutritional requirements on demand (5) is weak in developing countries, being limited for the most part to those among whom education influences food selection and purchasing. Herein lies the role of nutrition education and consumer education. Influence of nutritional requirements on actual supply (6) is surely uncommon, being found only where nutrition education stimulates home garden or subsistence food production; or where there is strong government intervention such

as in wartime or in other very centrally-directed economies.

In the midst of this triangular relationship stands the national food and nutrition policy, and we may now consider some of the more important measures, programmes and projects whereby the policy can influence the interactions between the three main factors. The account we give will by no means be comprehensive, and the technical reader can no doubt easily expand it.

Measures Pertaining to Food Supply

Food Production:

- expanding usable land, e.g. settlement, agrarian reform, irrigation, drainage;
- making better use of land, e.g. improved agriculture, fertilizers, mechanisation, improved varieties of seed or livestock, in particular in relation to basic staple foods;
- incentives to increased production, e.g. guaranteed prices.

Marketing:

- transportation, especially 'feeder' roads in rural areas;
- storage, e.g. silos, cold storage;
- grading of produce;
- organization and simplification of marketing, e.g. marketing corporations, cooperatives and popular low-price stores.

Food Conservation and Processing:

- rat- and insect-proof storage and packaging;
- veterinary services and vaccinations;
- improved canning and drying of produce.

Food Quality Control:

- standards regarding food hygiene and additives, and nutritional quality;
- fortification and enrichment.

Measures Pertaining to Food Demand

In the final resort per capita family income, which itself turns partly on employment opportunity, education and family size, is the major factor. Particularly in developing countries where so much of income has to be spent on food, all measures improving per capita income of a large number of families will affect food demand.

In particular it should be remembered in the nutrition context that supplementary feeding programmes of all kinds are forms of income-redistribution (indirect forms, one hopes!) if they are paid for from taxation but benefit those in most need. So indeed are other services, including public health services and public education. Particular measures affecting demand directly are:

Food Price Manipulation or Control:

- tariffs reduced on basic foodstuffs, and increased on luxury or low-nutritional-value foods;
- tariffs varied to protect and stimulate local production;
- subsidies for essential foods at times of world scarcity;
- price control measures, regulating the mark-up between ship or farm-gate and the retail outlet.

Nutrition Education and Consumer Education:

- consumer guidance through the mass media;
- nutrition education in schools;
- regulation and control of advertising, prohibition of misleading promotion on "tonic" foods, powdered milks for infants, etc.
- Government support to Consumer Associations.

Measures Pertaining to Nutrient Requirements and Biological Utilization of Food

These concern mainly the control of parasitic and infectious diseases causing loss of nutrients. In the most vulnerable group of all, that of the pre-school child, this loss of nutrients is probably highly significant. Programmes which could diminish this waste include:

- programmes to strengthen maternal and child health services;
- immunization against measles, pertussis and tuberculosis;
- environmental sanitation, improved water supply;
- food hygiene;
- promotion of breast feeding.

(A change from breast feeding to artificial feeding, it should be noted, involves the complete wastage of the one food which is entirely specific for our species, and which is adequate as total food supply for a child for six months and as a supplementary food for six to twelve months).

Education and Training

Although it has not been specifically mentioned, the successful implementation of many of the above measures turn on adequate training programmes which will make available the necessary personnel in agriculture and its specialties, in food science and technology in certain health fields, in aspects of education, in management and administration, and in nutrition itself.

SOME NECESSARY CHARACTERISTICS OF NATIONAL FOOD AND NUTRITION POLICY

A policy needs to have several vital features:

1. The policy will never even exist, let alone be implemented, unless it is *acceptable to the economic planners* as part of the general economic

development plans; and even more important *acceptable to the political authorities* who by right of the constitution govern the country and who alone decide policy.

2. The items of policy, whether in health, or education or agriculture or trade or whatever, should be *specific*, that is to say, should have specific objectives, with numerical targets if possible, and definite time-schedules within which they are intended to be achieved.

3. The policy must be *pragmatic*. It must be based on the actual resources available, and the actual programmes and projects already existing.

4. The policy must be *dynamic*. Circumstances will change, some objectives will be achieved, new knowledge will become available, experience will tell which are the best ways of meeting certain objectives, new channels of investment in nutrition will become technically possible.

The policy-making and coordinating and implementing machinery must be flexible enough to respond to these changes.

And some clarification is appropriate here also as to *implementation*. Of this, one thing especially must be borne in mind. Whatever the inter-ministerial coordinating machinery, each item of policy, each project and programme within the policy, should be the responsibility of that Ministry, (Education, Agriculture, Health, Trade, etc.) to which the particular type of activity normally belongs. To depart from this is likely to cause confusion and risk frustration.

INTER-MINISTERIAL MACHINERY FOR FORMULATION AND IMPLEMENTATION OF FOOD AND NUTRITION POLICY

It is clear that the food and nutrition policy overlaps the policies of a number of ministries and that these ministries will be the instruments of implementation of the food and nutrition policy. It follows, therefore, that some form of coordinating machinery is quite essential.

There are three levels involved:

1. The political decision-making level.
2. The technical planning level, formulating policy and planning programmes for submission to the first level.
3. The technical support level making detailed study and preparing the details of programme plans in special sectors.

Let us examine what would in the Caribbean context be desirable and feasible characteristics of organization at these three levels.

1. The Political, Decision-making Level

In the larger Caribbean countries there exists a Cabinet Committee called the Economic Development Committee or Economic Planning Committee or some similar title. A food and nutrition sub-committee of this Committee would have the characteristics desirable for this level, in that it would be headed by the highest authority, the Prime Minister or his deputy or nominee, and would give to Economic Planning the necessary influence which would enable the food and nutrition policy to be coordinated completely with the National Development Plan. A further advantage is that its attendance is at minister or deputy minister level, and this itself means that the highest authority in each sector is represented. At the same time, since the power of financing development belongs to the cabinet meeting under a different guise, this diminishes the likelihood of inadequate financing impeding the implementation of

the policy, as it impeded the Applied Nutrition Programmes.

This group at the highest level, however, could be organized in a slightly different way if desired, e.g. as a National Nutrition Council, provided that the advantages of prime ministerial leadership and ministerial level representation were retained.

Such a group, being principally the source of authority and decision, not of technical discussion, need not meet very frequently. At an early stage perhaps monthly or quarterly meetings might be needed until the policy was formulated and adopted, but for the most part probably quarterly or half-yearly meetings would suffice.

2. The Technical Planning Level

Probably in Caribbean circumstances what is termed a Technical Advisory Committee would be most appropriate. At this there would be represented the governments' chief technicians in the sectors involved (sometimes this is synonymous with the Chief Technical Officers of the ministries, but in specialized fields this is not necessarily so).

With these government personnel, representatives from private food industry or agro-industry or from voluntary agencies or special advisors from international agencies might be co-opted if there is particular reason to do so, but usually such additional support might be more appropriate at the technical support level.

The Technical Advisory Committee's functions would be to formulate the policy itself, with the economists playing their proper role, for submission to the political level; to plan the programmes for implementation of the policy; and to evaluate the effectiveness of the policy and the programmes. However, an essentially inter-ministerial or inter-sectoral committee such as this could not allow itself to become bogged

down in long discussion of details of interest to only a minority of the committee. It would certainly need the support of the Technical Support Level.

3. Technical Support Level

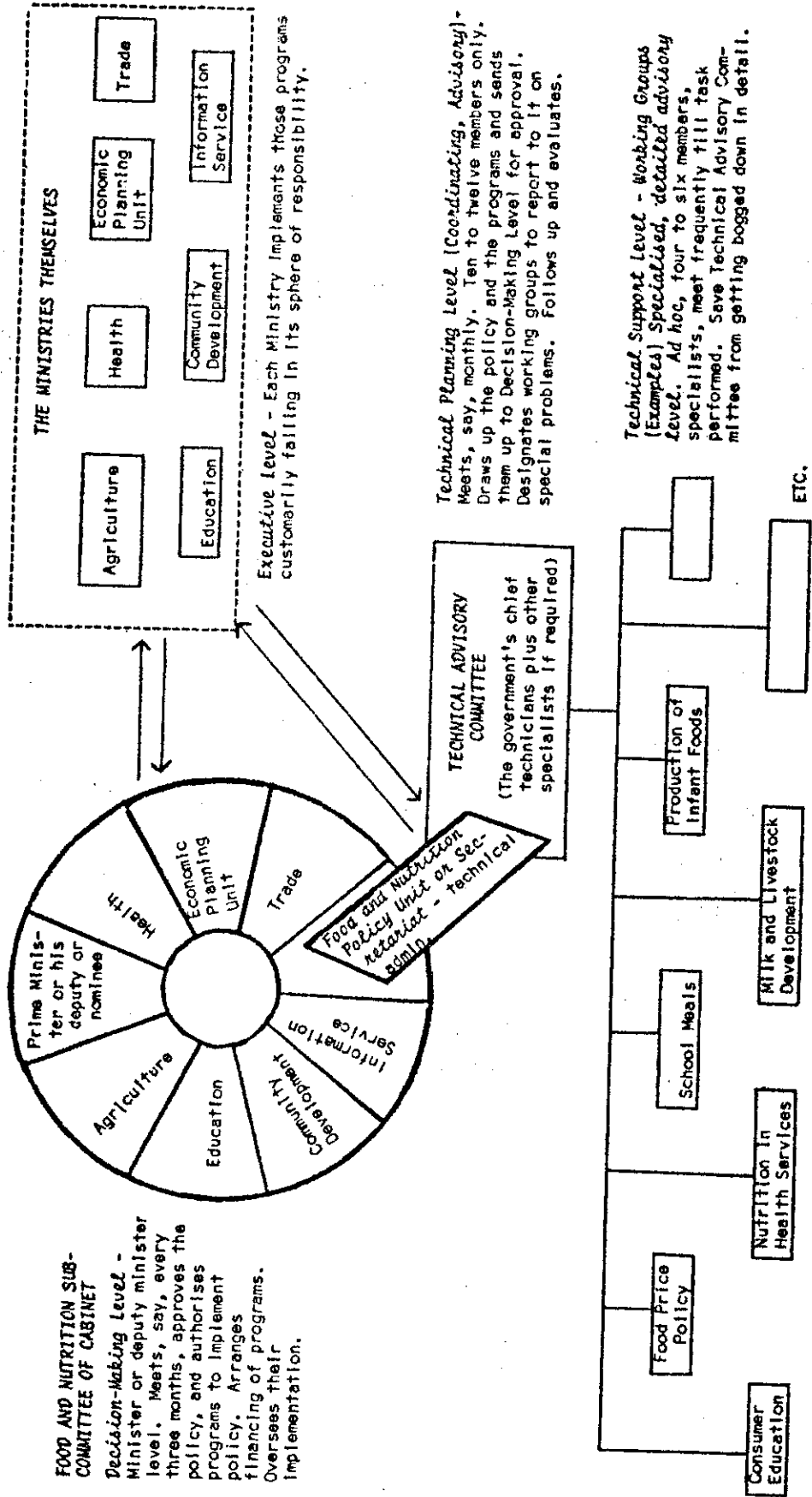
These would be ad hoc working groups of a small number of experts, as few as four or five, called into existence for quite specific purposes to prepare reports and plan in detail programmes in such special areas as livestock development, school meals, nutrition in health services, food price policy, etc. etc. (see the section on Contents of Policy above for the special policy or subject areas which might feature in formulation and implementation of programmes).

Such working groups would naturally meet frequently until the task assigned to them were completed.

Secretariat or Food and Nutrition Policy Unit

Finally, it is clear that some kind of secretariat is required in order to have maximum coordination on a day-to-day basis between the levels described, and to assist cooperation between the ministries involved, and to help maintain momentum in the whole process of formulation, implementation, evaluation, and re-formulation. At the very simplest level a secretariat must prepare for the meetings of the different levels, and so must have an experienced administrator in charge. For the smaller countries this may be the most suitable form of secretariat. However, in the larger countries of the Caribbean the "secretariat" could in fact be a small interdisciplinary technical group, a Food and Nutrition Policy Unit working in connection with the sectoral planning units in the various ministries. The diagram on page 93 of this paper attempts to express in visual form the kind of coordinating machinery envisaged.

INTER-MINISTERIAL MACHINERY FOR A NATIONAL FOOD AND NUTRITION POLICY



References

1. Aykroyd, W.R. (1970) *Conquest of Deficiency Diseases*, FFHC Basic Study No. 24, WHO, Geneva.
2. Williams, Cicely D., (1933) *A Nutritional Disease of Children Associated with a Maize Diet*, Arch. Dis. Childh., 8, 434.
3. Protein Advisory Group of the United Nations System (1973) PAG Statement (No. 20) on the "Protein Problem", PAG Bulletin, Vol. 3, No. 1, p.4, Spring 1973.
4. Payne, P.R. (1973) *Nutrition: A Priority in African Development*, Letter to the Editor, Lancet 1, 932.
5. *The National Food and Nutrition Survey of Barbados*, Scientific Publication No. 237, Pan American Health Organization, Washington, 1972.
6. *The National Food and Nutrition Survey of Guyana*, (In press).
7. Johnston, B.F., and Greaves, J.P. (1969) *Manual on Food and Nutrition Policy*, FAO Nutrition Studies No. 22, FAO Rome.
8. *Elements of a Food and Nutrition Policy in Latin America*, Scientific Publication No. 194, Pan American Health Organization, Washington, 1970.
9. FAO (1972) *Formulation of Food and Nutrition Policies*, Nutrition Newsletter Vol. 10, No. 2, p.1.
10. Rueda Williamson, R. (1973) *Mechanisms to Formulate and Coordinate National Food and Nutrition Policies and Programs*, PAHO Document RICAZ 6/15 a paper presented to the VIth Inter-American Meeting on Foot-and-Mouth Disease and Zoonoses Control, Medellin, Colombia, 9-12 April 1973.

CAJANAQUOTE

"If we establish goals for such things as food, housing, clothing, health, education, and employment, we begin to get the answers to how the economy should be run, and we begin to get the answers of what form economic policy should take."

Norman Girvan

"PLEASE BREAST FEED YOUR BABY"
AND KEEP THE BOTTLE FOR YOURSELF

by

Peter Heywood and Alison Heywood

We had decided to breast feed our baby. It was all very simple really. We had read and listened to all manner of people declare the advantages of breast feeding. It was the obvious thing to do. Neither of us had actually grown up in a household where breast feeding was extolled, not to mention practised; but wasn't it the oldest form of infant feeding known to man? And one of us has a Master's degree in Nutrition.

At least this was how things looked when Alison was just over six months pregnant and it became necessary for us to change obstetricians. What follows is our account of the last two months of pregnancy and the first six months of our life with Jacqueline, who was born in a private hospital in Kingston, Jamaica. It is an attempt to describe some of the difficulties encountered in breast feeding. Many of the comments are made with the benefit of hindsight - an undeniable advantage. But we could not have made them without such benefit and it is not our intention to blame this person or that person, profession 'X' or profession 'Y'. Some of the blame must lie with us. We did not ask the right questions. We hope that we will ask them next time and that, perhaps, our experience will help others to ask the right questions too.

Our account is divided into two sections - ante-natal and post-natal. In each section the potential sources of advice are listed and a general evaluation of the help given is made. We stress that this evaluation relates only to breast feeding and does not relate to other aspects of the care received.

Following the two sections we present some general points which should be helpful in devising programmes to assist similar people.

1. *Sources of advice during Ante-natal period*

A. Obstetrician (private)

- always appeared in a terrible hurry;
- did not ask how it was intended to feed the baby;
- gave no advice about breast care and preparation;

2. *Sources of advice during Post-natal period*

A. Hospital (private)

- baby was kept in nursery and not in the private hospital room;
- the nurses were reluctant to wake Alison for the 2.00 a.m. feed;
- formula was given at the 2.00 a.m. feed instead of waking Alison. This stopped after Alison insisted that she wanted to feed Jacqueline at all meals;
- formula was routinely given after each feed until it was requested that this practice cease;
- no advice was given about nipple care until soreness developed;
- although Alison was advised to express milk when uncomfortable, no help or advice was offered;
- although no advice to stop breast feeding was given, it can be seen from the above that an air of positive encouragement was definitely lacking;
- although milk nurses did not visit Alison in hospital, free samples from one firm were present in the room on admission.

B. Milk Nurse - Two days after leaving hospital a milk nurse visited Alison at home.¹ The advice given was as follows:

- a general statement that "breast is best";
- vitamin drops containing 10 vitamins should be started at three to four weeks;
- diluted orange juice should be started at four to five weeks;
- iron supplementation should be started at six weeks;
- cereal should be given twice daily from six to eight weeks of age;
- infant milk formulas can be used from birth;
- a special high protein milk powder is available and baby will grow better if more protein is given.

The general point to be made here is that although breast is said to be best all additional advice implies the exact opposite. If breast *is* best, then why does one need to give vitamin drops, orange juice, iron supplementation, cereal and a special high protein formula - all before the child is two months old?

C. Pediatrician 'A'

- on our first visit it was assumed that Jacqueline was being fed on formula;
- introduction of cereal was recommended at one month of age;
- introduction of vegetables was recommended at six weeks of age;
- introduction of fruit was recommended at seven weeks of age;
- no real support for breast feeding was given.

As a result the first visit was also the last.

¹The Milk Nurse obtains names and addresses of mothers and infants from hospital records. At no time was permission sought from either of us by the hospital authorities to release such information. This would appear to be one area in which hospitals could improve on their behaviour, at least from an ethical viewpoint.

D. Pediatrician 'B'

- very helpful support for breast feeding;
- did not advocate the early introduction of solids;
- did not advocate vitamin or mineral supplements at an early age;
- on the one occasion that Jacqueline vomited, did advise cessation of all feeding, except for glucose water.

E. Health Clinic

- helpful support for breast feeding.

Discussion

This was the first pregnancy for both of us. As a result, if breast feeding was to be a success, good advice and support was needed. As indicated much of the advice received was contrary to evidence regarding the adequacy of breast milk for children up to at least four months, and in many cases, up to six months of age. In other cases support was either lacking or discouraging. And this is from the professionals who have the immediate responsibility for child health in many countries. This illustrates the enormous task still ahead of the advocates of breast feeding in convincing health professionals who will, it is hoped, convince their patients. In the two cases where positive advice and support was given, it was of great value.

Breast feeding in the Caribbean may be decreasing - it is certainly not increasing. If the number of people in the lower socio-economic groups who breast feed is to increase, we feel that an increase among the middle classes may be necessary first. If this is so, then private hospitals and doctors, to which the middle class go, must become positive, instead of neutral or negative, forces in support of breast feeding.

At a more personal level, we feel that the single most important concept for the mother to understand is the suckling reflex and the regulation

of milk production. This involves an appreciation of stimulation by suckling, of the need to empty the breast and, if an increase in production is necessary, the need to feed more often so that within forty-eight hours the extra milk will be regularly produced. The important point here is recognition of the fact that an increase in production takes a little time - it is not instantaneous, but it is amazingly prompt.

The need to relax during feeding should be emphasized. It is here that tiredness may lead to stress and thereby, to a block in the suckling reflex. Alison found that a bottle of beer started ten to fifteen minutes before a feed was very helpful on such occasions. Hence our title, "Please breast feed your baby" - and keep the bottle for yourself.

In the end two sources of information about breast feeding stand out. The first was a friend who had successfully breast fed her child. The other source was books, in particular "Please Breast-feed Your Baby" by Alice Gerard¹ and the La Leche League publication, "The Womanly Art of Breastfeeding"². Both these books discuss the basic physiology of breast feeding as well as giving much practical advice.

And what of Jacqueline? She was fully breast fed until four months of age, at which time small amounts of cereal were given twice daily. Now six months old, she feeds from the breast four times daily, has cereal in the morning, pureed foods from the family pot at mid-day and in the evening, has boiled

¹Published by Signet Books, New York.

²Further information is available from:-

La Leche League International,
Franklin Park,
Illinois, 60131
U.S.A.

cow's milk at the three "meals" and takes orange juice between "meals". On the whole, she makes too much noise, especially around 5.30 in the morning as she starts a new day chatting to her two particular friends - a teddy bear and a tortoise. Or is it a hare and a?

CAJANAQUOTE

*In Jamaica the bottle is becoming the baby's mother.
The baby is put into the crib and the bottle cotched against
the pillow.*

Helen Fox

KEY CONCEPTS IN NUTRITION FOR COMMUNITY HEALTH AIDES

compiled by

Albertine Hoskins	-	Supervisor of this Aide Programme
Cynthia Reid	}	Teachers of Aide
Louise Pitters		
Janet Johnson		
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Family multimixes



1. The four important food groups are:

- A. (i) cereals
(ii) roots and starchy fruits
- B. peas and beans
- C. dark green leafy or yellow vegetables
- D. foods from animals.

2. Mixes of these groups are good

e.g. 2 mix - cereal + peas together are good (eg. rice and peas)

3 mix - cereal + peas + C or D are better

4 mix - cereal + peas + C + D are best

3. Quantities to mix

Four parts of A

Two parts of B

1 part of C and/or D

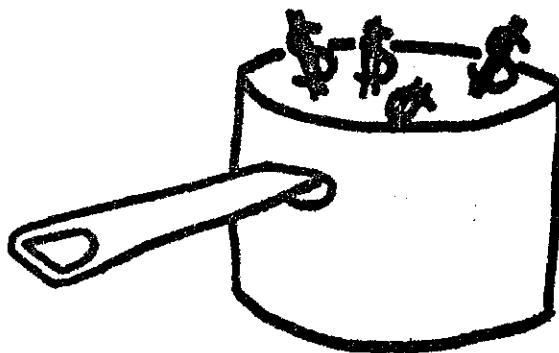
Note: More details are given in the appendix

TEACHING AIDS

1. Good pictures of all the food groups above.
2. Magnet board and small magnets.
3. Demonstration of actual recipes.

TEACHING TIME - Two lessons

Budgeting for food



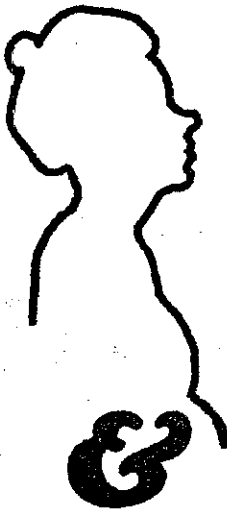
1. *Basic principle* - We should learn to spend money wisely.
2. *Containers* - It is not worth paying for a fancy container.
3. *Bone* - Lean cuts are better value than bony cuts.
4. *Flavour* - Flavour does not necessarily mean goodness.
 - e.g. 1. Chicken noodle soup does not contain much chicken.
 2. Beef soup is only nourishing if the meat is eaten as well as the liquid.
5. *Water* - Dried foods are usually good value.
 - e.g. 1. Beans
 2. Saltfish
 3. Skim milk powder

Buy the product dry and soak it yourself.
6. *Home food production*
 - e.g. pumpkin, peas and beans, calaloo and okra.

TEACHING AIDS - Foods, containers and price.

e.g. cornmeal and cornflakes

TEACHING TIME - One lesson.



Diet in pregnancy & lactation



1. *Greater needs* - When pregnant and especially when breastfeeding a woman needs more food. The only exception is extreme obesity.
2. *Iron* - This makes blood strong.
 - A. Good sources of iron are:
 - (a) dark brown, wet or head sugar and molasses. These are better than white sugar;
 - (b) peas and beans;
 - (c) dark green leafy vegetables;
 - (d) liver, kidney and heart.
 - B. Iron is better absorbed if:
 - (a) taken at a main meal;
 - (b) taken with an acid fruit drink.
 - C. Iron tablets from the clinic should be taken daily as well.
N.B. See 'B' above.
3. *Food groups* - Each meal should include foods from at least two groups.
(See family multimix lesson)

TEACHING TIME - One lesson.

Infant care



BREAST FEEDING

1. *Breast milk* - is better for human babies than cow's milk because:
 - (a) It is made for baby humans who are different from baby cows;
 - (b) It protects against many diseases, e.g. diarrhoea, polio and measles.
 - (c) It is more convenient than other methods:
 - (i) ready to serve
 - (ii) right temperature
 - (iii) clean - no need to boil water.
 - (d) It is cheaper. The mother needs to eat more but this is not as expensive as artificial feeding of baby;
 - (e) It promotes love. Does not let a pillow and a bottle become the baby's mother;
 - (f) It encourages the womb to return to its normal size quickly.
2. *Method*
 - (a) establish a regular routine to suit both baby and mother;
 - (b) encourage baby to suckle as soon as it is born. (The watery milk in the first few days is good for the baby even though the quantity is limited);
 - (c) different babies have different frequencies of feed - fit the feeding to suit both parties;
 - (d) the milk flows better when the mother is relaxed and happy;
 - (e) having a drink before feeding helps;
 - (f) wear convenient clothes and a supporting brassiere.
3. *Let-down reflex* - Every woman produces milk in her breast after delivery. The 'let-down' of this milk can be spoilt by tension and worry.
4. *Breast and bottle* - Introducing a bottle makes breast-feeding less successful.
5. *Hygiene* - The mother's nipples and hands should be washed just before feeding.
6. *Problems* - If there is any problem get help from the midwife or staff nurse or public health nurse quickly.

TEACHING TIME - Two lessons.

Young child feeding



1. Breast milk *alone* is best for four months.
2. Introduce other foods by cup and spoon (not bottle) at about four months. Start with small amounts.
First: Porridge (thick *not* thin) and fruit juice (from *any* fruit).
3. Continue breast-feeding during this period.
4. Introduce foods from the family pot at six months. (See lessons on multimixes and appendix 1). They can be mashed through a sieve at first, and later crushed together with a fork.
5. Continue breast-feeding during this period.
6. By one year of age baby should be on all family foods - remember the multimix principle.

TEACHING AIDS - Demonstration:
[Spoon, sieve, fork and bowl (enough for student participation in sieving and mashing)].

TEACHING TIME - One lesson.

Weighing



BABIES

Setting up scale:

- (a) use a firm, safe base on which to rest the scale;
- (b) the scale balance at '0'.

Weighing:

- (a) baby minimally dressed - no shoes;
- (b) towel weight must be subtracted;
- (c) baby must not be held;
- (d) baby must be watched *all the time* (particularly with basket scale)
- (e) have mother where baby can see her;
- (f) always be gentle;
- (g) support baby's head.

Recording weight:

- (a) accuracy is very important;
- (b) write weight down immediately alongside the name of baby.

MOTHERS

Setting up scale - as for babies

Weighing

- (a) no shoe and no bag, etc.
- (b) all of feet on scale;
- (c) free standing and looking straight.

Recording weight:

- (a) stoop and look straight on dial if a dial is used (not from the side);
- (b) otherwise - as for babies.

TEACHING AIDS

1. Scales - both baby model and adult model.
2. Babies - of varied weights.
3. Towels
4. Paper and pencil for recording.

TEACHING TIME - One lesson.

Selection of children who are at risk



1. Second and third degree malnutrition (II and III on weight for age chart).
2. Falling off of weight gain (i.e. deviation into II).
Clinical signs - swelling of both ankles (pits with pressure).
3. *Kwashiorkor* - silky pale hair (corn silk)
misery and apathy
peeling skin (weight may not be low)
4. *Marasmus* - skin and bones appearance
big seeming head
eyes seem extra big
loose wrinkled skin on upper arm, buttocks and thighs
(weight is always very low)

- TEACHING AIDS**
- 1. Charts
 - (a) enlarged for wall (plus pins and strings)
 - (b) clinic cards (prenatal and child welfare, one for each student)
 - 2. Photos of kwashiorkor and marasmus.
 - 3. Real children if possible with kwashiorkor and marasmus.

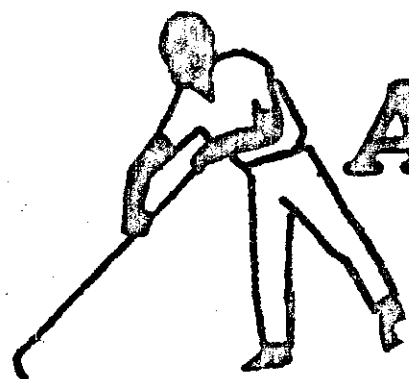
- TEACHING TIME**
- Two lessons.

Nutrition of old people



1. Old people are not as active as the young - they may need less 'food'.
2. They must not waste away - they must have a *mixed* diet (see *multimix* lesson and the appendix).
3. They may lack teeth and therefore need food in soft form.
4. Keep up their interest with a variety of foods.
5. Fruits should be eaten every day.
6. Old people should be encouraged to remain active and to help in family work as far as possible.
7. It is best for *all* the family to eat together as far as possible.

TEACHING TIME - One lesson.



Adults' and schoolchildren's diets

1. The multimix principle applies.
2. Breakfast is important for children before going to school.
3. School lunch is important - soft drinks are a bad substitute.
4. In adolescence children need big meals to grow well.



TEACHING TIME - One lesson.

APPENDIX

MULTIMIXES FROM THE FAMILY POT

"Most communities have by age long experiment come to use foods in mixtures, so that their nutrients complement one another."

D. B. Jelliffe

We are, therefore, aware of the importance of a mixed diet for healthy minds and bodies. The family pot (the meal cooked for the family) usually contains a mixture of foods, but they are not always selected from different food groups. Multimixes show us how to improve the family pot and how to select from it suitable meals for baby, expectant and nursing mothers.

Here, then, is a simple, cheap way to make sure that dinner is a nourishing meal for the whole family. Choose one food from *each* of two or more of the following groups:-

- (a) *Staple Foods*: (i) Cereal grains - rice, cornmeal, bulgur and oats.
(ii) Roots and Fruits - yam, Irish potato, sweet potato, cassava, green banana or breadfruit.
- (b) *Legumes*: Red peas, gungo peas, black-eye peas, cow peas and broad beans.
- (c) *Dark green leafy or yellow vegetables*: Callalu, pumpkin, carrot, pear, bush cabbage, kale, pakchow and spinach.
- (d) *Animal Foods*: Eggs, milk, meat, fish, cheese and poultry.

Peas soup with pigs tail and flour dumplings is a favourite family recipe containing foods from group (a), (b) and (d). The addition of pumpkin to the peas soup improves the flavour and enables us to have group (c) included and therefore a more nourishing meal.

The best meals are those in which each of the groups, (a), (b), (c), and (d) are represented. If only *two* groups are represented they should be groups (a,i) and (b) *or* (a) and (d) *or* (b) and (d) *or* (b) and (c) *or* (c) and (d), *never* (a) and (c) as this mixture will not provide enough of the growth foods.

Multimixes are given to the baby when he is six months old and should be mixed in the following proportions:

Foods from group (a) 4 taplespoons

" " " (b) 2 tablespoons

" " " (c) 1 tablespoon

" " " (d) 1 tablespoon

and given in increasing amounts starting with two tablespoons of mixture at six months and increasing to six tablespoons at nine months. Between nine and twelve months add two to four extra tablespoons of foods from group (a).

NUTRITION NEWS AND OPINION FROM THE CARIBBEAN

EXPERIMENTS ON GROWING OF SOYBEAN BY UWI¹

Soybean is the protein ingredient of most of the livestock feeds in use in Jamaica today. It is also one of the greatest sources of high quality protein known to man.

Imports of soybean and soybean products into Jamaica currently run to about \$3 million a year. Recently there have been comments on whether or not soybean will grow in the island.

Experiments in the cultivation of soybean in Jamaica have been taking place for a number of years but the crop is still not produced on a commercial scale. Up until about 1965 no really serious attempt was made to grow soybeans as a crop nor to solve the problems which restricted its widespread cultivation.

The most serious hindrance to the success of earlier attempts to grow soybean seems to have been its photoperiod sensitivity as the varieties which were being grown were not sufficiently day insensitive. This relates to the plant's reaction to light. When planted at the time of year with long days the plant tends to grow very tall with many leaves but low yields. When planted during the period with fewer hours of daylight the plant grows very short, flowers early with an accompanying low yield.

Another problem of fair magnitude appears to have been a high rate of insect damage caused partly by a lack of proper spraying schedules.

These problems were not however insurmountable. Experiments at the University of the West Indies have produced at least three varieties of soybean which will grow all year round and give a reasonably good yield under proper conditions of soil, moisture and management.

Some years ago the Ministry of Agriculture obtained from the Faculty of Agriculture of the University of the West Indies in Trinidad, a number of varieties and strains of soybean which were part of a world collection being maintained by the Faculty. The Ministry carried out an intensive selection programme with these varieties. Between 1965-1967 the number of promising varieties and strains had been reduced from approximately 60 to about 12.

In 1967 the research again shifted to the UWI when the research group of the Faculty of Agriculture was created at Mona. An eleven acre plot was grown successfully at Vernamfield with the cooperation of the Agricultural Development Corporation. However, bad weather at the time of harvesting and a lack of proper harvesting equipment affected the yields from this trial.

Early in 1969 Dr. Charles Panton of the Department of Botany at the University of the West Indies began research on the soybean to produce genetic variants which were more adaptable to local conditions. Starting with ten

¹UWINR-23-73, Mona, Public Relations Office, UWI, Mona, March 27, 1973.

EXPERIMENTS ON GROWING OF SOYBEAN BY UWI (Contd.)

varieties the research has now been narrowed to four. Hybrids have been obtained by crossing these four varieties and the resulting strains have shown improvements in yield and early maturity.

The programme has now moved from the stage of basic research to that of developmental activity. Last September approximately three acres of soybean were planted at Lawrence Field in the Caymanas - Bernard Lodge Estates area - to produce seed for more extensive plantings.

Seed obtained from this trial plot were planted in a ten-acre field at Hounslow in St. Elizabeth five weeks ago with the cooperation of the Ministry of Agriculture which is also seeing to the care and maintenance of the field.

The main purpose of the Hounslow trial is to answer questions relating to cost and returns on a reasonably large-scale operation. On small plots of approximately one-quarter acre at the UWI, Mona, yields of better than a ton per acre have been obtained. While this high yield may not be possible on a larger scale Dr. Panton expects yields ranging from 1800/2000 lbs. per acre, dry grain, which would make the crop economically viable.

NUTRITION AND MALNUTRITION

Pan American Health Organization. Scientific Publication No. 237. The national food and nutrition survey of Barbados, undertaken by the Government of Barbados with ... Caribbean Food and Nutrition Institute ... and Food and Agriculture Organization. pp. vii + 139, 1972. PAHO, 525 Twenty-third Street, N.W., Washington, D.C. 20037, U.S.A. (\$2.50).

This book consists of fifteen chapters which describe the main characteristics of the small island of Barbados (166 square miles), with a climate that is "superb", and the methods and results of a food and nutrition survey of the whole territory. The survey was conducted by a team of 102 people, including 30 students in the Caribbean Food and Nutrition Institute. For the students this was an in-service form of training.

Much attention was given to the selection of samples which was primarily by systematic random sampling of households; the sample represented somewhat more than one percent of the total households in Barbados which numbered 60,000. Anthropometry and clinical examinations were made on 1829 people, an examination of household characteristics, income and expenditure on 651 families, home food production on 630, infant and pre-school child feeding practices on 320, and an enquiry into the diet in pregnancy and lactation on 323 families. Family food consumption, dental examinations and other observations were made on smaller sub-samples.

Very few clinical signs of malnutrition were observed and those present consisted of dryness of the skin, thyroid enlargement (1%), scars at the angles of the mouth and others of doubtful significance. By accepting certain criteria of normality there were an appreciable number of the children who were too small and hence, according to the authors, malnourished. No cases of kwashiorkor were seen, but six percent of the infants under one year of age

NUTRITION AND MALNUTRITION (Contd.)

who were examined were marasmic. No evidence of protein deficiency was found in the children aged 0 to 47 months as indicated by the concentration of transferrin in serum. Among adults many of the women were obese and some of the men also.

Just over forty-five percent of a sample of thirty-one pre-school children in one district were thought to be anaemic, although most of them had a haemoglobin level higher than 10 g/100 ml. Only thirteen out of a sample of 107 had haemoglobin levels less than 9 g/100 ml. About nine percent of school children were considered to be anaemic, and almost twenty percent of women. From the results of determinations of serum iron, saturation of serum iron-binding capacity and serum and red cell folate concentrations, the conclusion was reached that among young children iron deficiency and folate deficiency were of about equal occurrence; in women iron deficiency was the main cause of anaemia. There was no evidence that intestinal parasitism was a serious problem.

Dental caries was found to be highly prevalent and less than one percent of children between the ages of ten and fifteen years had a normal dental state. Permanent teeth were as much affected by caries as were deciduous teeth. Periodontal disease was common.

Apart from inadequate refuse disposal, conditions of living were fairly good, although facilities for storing food were poor or non-existent. The majority of families had either a television, radio or rediffusion radio service, and sixty percent read either a newspaper or a magazine. There was over eleven percent unemployment among the men, and somewhat less than half the household women were employed outside the home. A high proportion of household income was used to buy food.

There was much variation in the pattern of breast-feeding of infants; some were fed every three hours, others every four hours, some three times a day and some on demand. Almost twenty-four percent of babies were bottle-fed from the time of birth. Information about the time for which a standard can of powdered milk was used indicated appreciable variation in the dilution of the mixture which was given to different babies. A variety of extra foods and supplements were commonly used in infant feeding, including bush tea, fruit juices and cod liver oil. About one-third of the youngest children were living only with a mother, and over thirteen percent were living with neither parent.

Nearly forty percent of women were found to eat chalk during pregnancy, most of them for the reason that they liked it. About two-thirds of the pregnant women were taking iron supplements. During lactation, milk, fruit juices, fish and some other foods were especially eaten in the belief that they increased the production of milk.

The enquiry revealed many common beliefs about the use of particular foods and of diseases in childhood. Marasmus was a condition not widely known by the women who were interviewed.

Over one-quarter of householders had no garden; about ten percent had an area for cultivation between 1000 and 2000 square yards. The families

NUTRITION AND MALNUTRITION (Contd.)

who were interviewed were not strongly motivated to home or commercial production of foods. Laying-hens were reared, but otherwise animal production was not pursued to any extent.

The food balance sheet for the whole of Barbados was examined, and full details for 1966 are given. The mean availability of food *per caput* amounted to 2334 Kcal/day and 64.6 g protein/day. Consumption of food by tourists is showing an upward trend with time and, in 1969 represented the food requirements of 1.75% of the resident population.

An analysis was made of the relative costs of different foods in Barbados as sources of protein and calories, and the results are presented in a table.

The results of the dietary enquiries indicated that some families ate too much and some too little, although there was a possibility that some of the food intake was unrecorded, for example, snacks, sugarcane and fruits consumed outside the home. The majority of families did not seem to consume enough calcium, iron and thiamine.

A special enquiry into the diet of young children showed that there was undue delay in weaning from milk onto a full diet.

The results of the various parts of the survey were analysed statistically. Among other significant associations that were thus revealed were those between the weight for age of children, family income, expenditure on food and expenditure on milk.

The final chapter consists of recommendations based on the results of the enquiry. These include home visiting as an essential part of the nutritional supervision of children; the availability in child health centres of suitable preparations of iron, strict limitation of bottle-feeding in hospitals, enrichment of margarine with vitamin A and many others.

G. R. Wadsworth
[in Tropical Diseases Bulletin, 70, 69-71
(1973)].

A RAPID SURVEY TO ASSESS THE NUTRITION OF JAMAICAN INFANTS AND YOUNG CHILDREN IN 1970¹

An attempt by the Caribbean Food and Nutrition Institute to assess the nutritional state of Jamaican children under the age of four years is described. Results from 490 children in seven rural and three urban areas, which were chosen from those areas sampled in an earlier (1964) survey (Fox *et al.*, Information: Bull. Sci. Res. Council, Jamaica, 1968, Vol. 8, 33) were based

¹Gurney, J.M., Fox, H., and Neill, J. Trans. R. Soc. Trop. Med. Hyg., 1972, vol. 66, No. 4, 653-62.

A RAPID SURVEY TO ASSESS THE NUTRITION OF JAMAICAN INFANTS AND YOUNG CHILDREN IN 1970 (Contd.)

on anthropometric data; these included height, weight, head, chest and arm circumferences, triceps fatfold thickness and total number of erupted teeth. With the use of the Harvard Standard weights for age, one-sixth of the babies under three months were underweight, indicating a considerable degree of poor maternal nutrition. About a quarter of the children aged 9-24 months and one-fifth of those in their third and fourth years were found to be below eighty percent of standard weight. These findings are attributed to a widespread tendency to supplement breast-feeding inadequately, and at an early stage, with bottle feeding, and a failure to wean satisfactorily.

The overall pattern of anthropometric results suggested a continuing dietary deficiency, mainly of total calories. In all measurements the children in urban areas were closer to the Harvard Standard than those in rural areas but the proportion of total expenditure used for food was highest in the poorer rural areas. In one remote village, where the lowest percentage of underweight children was recorded, a subsequent study of food habits indicated that complete breast-feeding was continued for longer and that pulses were eaten more often, and at an earlier age, than in other areas.

Jean Robertson
[in Tropical Diseases Bulletin, 70, 170
(1973)]

SEMINAR ON NUTRITION AND NATIONAL DEVELOPMENT HELD IN BARBADOS

A UNICEF-Assisted CFNI/Government of Barbados Seminar on "Nutrition and National Development" took place from May 14th to 18th, 1973 in Bridgetown Barbados. Coordinating the proceedings very expertly was Dr. Frank Ramsey, Director of the National Nutrition Centre.

The papers given were well prepared and covered a wide range of activities and roles of Health, Agriculture, Education, Marketing Corporation, Community Development, Trade, Economic Development, private industry and voluntary groups. In Barbados, Health and Education have for some time been fully committed to nutrition programmes and the strong contributions of Agriculture, Trade and Economic Planning were particularly welcome.

The complete proceedings will be published within the next few months together with the recommendations to Government of the three working groups. Recommendation No. 1, drafted by the meeting of senior staff of the Ministries involved which took place on the afternoon of May 18th after the Seminar was completed, advised that a National Food and Nutrition Policy for Barbados be formulated and implemented, and that the appropriate inter-ministerial machinery be established for this purpose.

NEWSPAPER CLIPPINGS

PLAN TO FEED THE NATION

From Guyana Graphic, February 23, 1973

THE CONCEPT OF FEEDING OURSELVES

This means that the nation must produce as much of its food requirements as is possible to enable the nation to be properly fed and at a cost reasonable to both consumer and producer.

In the concept of feeding ourselves, the Government is also concentrating on the quality of the human diet, so that people can have a properly balanced diet and hence maintain good health and strength and the ability to ward off many diseases associated with poor nutrition.

To feed ourselves properly, it is not necessary to produce foods which look like the present imported item or taste like the items we now import. We must stop thinking in terms of substitution and to assume that the only way to proper nutrition is to have a food consumption pattern as we now have. It is necessary, therefore, to feed ourselves with the foods that can be grown in Guyana. Thus, we have to think in terms of feeding ourselves with the foods that can be grown in Guyana, rather than slavishly trying to imitate the imported item.

WHAT FOODS DO WE NEED

The basic food ingredients that are needed are: proteins; fats; carbohydrates; vitamins; and minerals.

These can be obtained from the foods we grow in Guyana - namely: eggs, meats, fish, milk, rice, green vegetables, peas and beans, fruits, etc.

AREAS OF CONCENTRATION OF EFFORTS

The question is often asked - are we producing all the food items needed in sufficient quantity? One has to admit that there is room for augmenting supplies, thus the Government of Guyana has identified ten production projects for concentration of efforts. These projects are:

The vegetable project; food crops project; the edible oil project; the dairy development project; the fruit project; the sheep and goat development project; the stockfeed project; the fishmeal project; the pork project; the peas, beans and peanut project.

Each project will have a programme leader who will be responsible for the coordination of the execution of the project.

PLAN TO FEED THE NATION (Contd.)

CHANCES OF SUCCESS

The chances of success are very great and for many reasons:

- There is great political support for a major thrust in agriculture; in many countries, agriculture does not get the support it needs;
- There is more diversified agricultural technology in the country than there has been before;
- Farmers are showing response to the call for increased production;
- The restriction on imports has served to stimulate local production;
- The resources of the whole country are being tapped. One is not relying on the coastal strip to produce everything. The country is being divided into fourteen zones and the crops and livestock ideally suited for these zones will be promoted;
- Farmers in all parts of the country are being mobilised. Farmers not only on the coast will be involved but those in the river and interior districts.

The increase in agricultural output will help to accelerate industrial development. Indeed agricultural and industrial development need to go on simultaneously. Industry will provide more employment and a larger market. Agriculture, on the other hand, will supply the raw materials on which industry will be based. In the first instance, these industries will be village-based and manufacture items such as shovels, spades, driers, wheel barrows, trailers, etc.

Through feeding ourselves, Guyanese agriculture will become modernised and more productive.

USING LOCAL FOODS TO FEED THE NATION From Guyana Graphic, February 23, 1973

Since the recent import restriction, the tremendous swing towards local foods has gathered great momentum in our country. From experiments we have realised that we can make most of our own foods which include oils, sauces, juices, nuts, packaged dried fruits, processed fish, salted fish, and a variety of other products which we once imported.

And since Guyanese of all walks of life have realised the tremendous benefits that could be derived from the drive to feed themselves, they venture into the developmental process of our natural resources.

USING LOCAL FOODS TO FEED THE NATION (Contd.)

The Guyana Government has been embarking on programmes designed to transform Guyana from a purely agricultural economy to an agro-industrial state. Just over a year after the establishment of one fruit processing factory at the Industrial Site at Ruimveld, another one is due to be opened shortly at Charity on the Pomeroon. Thousands of dollars worth of equipment have already been set up and the plant at Pomeroon will concentrate strictly on utilising our citrus fruits in the production of juices and canned products.

This factory is designed to extract juices from limes, pines and oranges, which will be bottled and sold, and will correct the situation that now exists in periods when, for example, the lime crop is off and ridiculously high prices have to be paid for fresh limes.

The plant has adequate storage facilities for the fresh juices, so that when the fruits are out of season, the juices can still be obtained. A section of this plant has a steam operated distillery for the extraction of lime oil, for which there is constant demand both in Guyana and overseas.

Most of our citrus fruits in Guyana, have been used to produce peel and is attractive and of good flavour. And of course, many housewives can tell you that they replace spice and clove which we now import.

Fruits have also been used to make a wide variety of jams, jellies, fruit-cakes, fruit-cheese, chutneys and pickles, in addition to syrups, squashes, cordials, wines and even champagne. What is even more interesting is to know that the fruit skins serve just as good a purpose as the fruit itself.

Our coconuts too are being used and domestic production of various coconut products have revealed a tremendous increase between 1963 and 1970. In 1963, the production of copra-meal was 3,447,395 pounds, and in 1970, it increased by some 1,038,037 pounds. Increases in edible oil and raw oil were 101,010 and 15,552 gallons respectively.

Within just one year, that is, 1969-1970 some important agricultural crops like citrus, cocoa, and peanuts increased tremendously. Citrus increased by some 159,600 pounds, in 1969; and the increase of peanuts was 10,200 pounds, from 63,800 in 1969 to 75,000 in 1970.

With respect to fish, about seventy to eighty percent of it is being exported, after the local demand is met. This percentage includes shrimp too.

Important industries like the Fisheries Division of the Ministry of Agriculture, Guyana Industrial Holdings, Guyana Marine Foods Ltd., and many other in-shore and off-shore Fisheries in the city and in the rural areas have been working hard in an effort to make the nation a self-sufficient one.

As was recently disclosed by the Fisheries Division, some 260 talapia fish farms have already been established as part of the massive country-wide campaign to push the production of fish at cooperative and community levels.

USING LOCAL FOODS TO FEED THE NATION (Contd.)

TWENTY FISH FARMS

At the moment there are twenty fish farms at Matthews Ridge. On the West Coast, Demerara - ninety, on the Corentyne Coast - twenty, and on the Essequibo Islands and Coast - sixty. Other areas where fish farms are established also include New River, East Bank, Demerara, Kamarang, Tumatumari and Mazaruni.

During 1970 some 16.8 million pounds of fresh fish its equivalent mainly in the form of salt-fish, was imported, costing approximately \$3.0 million. Guyanese should then reflect on the dollars prevented from going out of the country through producing its own food.

One of the major fishing industries in Georgetown which so far has been doing an excellent job is the Processing Division of the Guyana Industrial Holdings. Their shrimp operation has been growing immensely over the past five years. Because of their fully equipped industry, they have been able to produce over 3,000 pounds of shrimp every hour. From this production ninety per cent is being exported.

The production of fish which includes salted-fish and smoked-fish, is a minor, yet successful operation. On an average scale, it produces 10,000 to 12,000 pounds of processed fish per month. The smoked and salted operations include various types of scaled and unscaled fishes of which the minority is unscaled, since the major section of the consumers demand that their processed fish be scaled fish.

So the nation has set itself the noble task of feeding Guyanese, but it is the people who must first be re-oriented in their tastes and come to the realisation that our local products are just as good as that which we import.

PROVIDING AN ADEQUATE DIET FOR PUPILS

From The Daily Gleaner, Jamaica, April 28, 1973

The Prime Minister has said at the opening of a Nutritional Production Centre on Marcus Garvey Drive that the time has come when priority attention should be given on a national scale to the provision of adequate diet for the country's people. Concern about the country's nutritional standards has been expressed with increasing intensity over at least three decades. This is the first time, however, that comment has come from the level of Prime Minister. The inference is, and the Prime Minister's continuing speech removed any doubt to the contrary, that the Government is not only alive to the nutritional aspects of Jamaica's dietary problem, but has plans for immediate implementation affecting school children of the four to fifteen group. Future plans include the processing and manufacture of cereal products for weaning babies and infants.

PROVIDING AN ADEQUATE DIET FOR PUPILS (Contd.)

The pioneering zeal among individual school-masters backed by the enterprising efforts of parent-teachers in the late thirties and early forties gave way to the establishment of a Government school feeding programme which took the form of a cash subvention rather than the provision of actual meals, the exception being Corporate Area schools that arranged for a central kitchen. Supplements to this programme largely through United States Aid and the World's Council of Churches included dried milk, beans, rice and flour.

In some communities local supporters on an individual basis or through active Parent-Teacher groups, provided bananas, breadfruit, firewood and other forms of assistance. The emphasis was more on supplying one meal per day with some lip service to nutritional needs, but with a greater accent on bulk. As one programme executive puts it "The child, on rising from a meal, should feel satisfied."

Consideration should be given as to how far the voluntary effort will continue against the background of a Government operating scheme. If communal effort is discouraged this could be a blow to the politics of participation.

Obviously, a Prime Minister could not necessarily have the details of the scheme or regard a factual presentation as demanded by the occasion on which he spoke. Some further clarification appears necessary, however. It is stated, for example, that U.S./AID will provide the input of milk production for the first year. From what source is milk provided for future programmes? As regards the weaning foods programme, which is not a programme for immediate implementation, cannot production of local substitutes be scheduled to avoid the importation of components from the United States? As regards local producers of weaning food has the Government had dialogue with them before entering into competition with them? In order to have them participate could their equipment be used to manufacture weaning foods on a Government or ARA Services Formula? Will Government or ARA competition put them out of business, resulting in redundant machinery, loss of capital, and displaced establishment?

Seven schools are to participate in the first deliveries. How have the priorities been determined? Are these areas of greatest nutritional deficiency? Are these the schools with the least satisfying feeding programmes? Would a good lunch programme aid the compulsory education drive at Tarrant's School or Jones Town? The Minister of Education in his speech did refer to compulsory education. Are these the schools of best known teacher cooperation? Since the programme embraces the age span of four to fifteen, where, if at all, will Basic Schools participate?

ADVANTAGE

Is the project a straightforward commercial venture or are the executives employed by the Government? Is there any proposal to mobilize the goodwill and services of the many social workers in the country to whom the Prime Minister paid glowing tribute, and many of whom worked voluntarily on previous school-feeding projects?

PROVIDING AN ADEQUATE DIET FOR PUPILS (Contd.)

There is one advantage of a fresh packed lunch scheme that comes immediately to mind. Teachers could be relieved of such chores as arranging menus, purchases, supervision of cooking and the time consuming task of reconstituting milk without adequate equipment. In this respect teachers could find more time to devote to professional teaching. Against this in schools where school lunch preparation was incorporated with the Home Economics programme there will be need for modification as the concentration may now be serving lunch rather than the preparation of meals.

The magnitude of the task can be envisaged by reference to the 1970 Census figures which would, admittedly, be conservative for 1973. Statistics available for children five to fourteen years, reveal that in the Corporate Area alone 137,681 such children existed in 1970. The programme's immediate objectives as stated by the Prime Minister provides for 107,000 children in the age group four through fifteen with one-third of their daily nutritional requirements. Against the background of the need the Prime Minister rightly warned this was only the beginning. A release by ARA Services, Inc. the Philadelphia Company that has developed the programme, states that by 1975 the number of children receiving the lunches will reach 202,000. Unless the programme is expanded to include schools adjacent to the Corporate Area, the Project could remain a Corporate Area Project, for by 1975 the four to fifteen group in the Corporate Area alone could be well over 200,000. The company's release does refer to infant, primary and junior secondary schools in the Corporate Area. It must not be overlooked that several pupils attending other secondary schools could do well with a nutritional supplement in their diet.

So a side thought, where adults may become slightly envious or nostalgic is to learn that one ingredient of the "patty" is pickapeppa sauce, which has been absent from our supermarket shelves for close upon nine months, following a strike and shut down. The lunch programme has been under development for more than two years, but it could be uncharitable to suggest any hoarding of pickapeppa for "patty" manufacture.

The ARA Services release has Prime Minister Manley as saying this will be the first full scale lunch programme among underdeveloped countries in the Western Hemisphere. In context of previous school feeding programmes in Jamaica, this may be an overstatement; for previous programmes, if not entirely nutritionally "power packed" covered schools throughout the length and breadth of Jamaica, catering to a larger school population, and had milk and beans among its constituents and at one stage food yeast manufactured locally, and whose re-introduction to fortify the milk could be considered in reducing the need for imported ingredients. At some school tuck shops and caterers do supply milk and patties in addition to sweets and biscuits, and in assessing the labour content of the Project their displacement must be measured against the jobs and vocational training for 160 Jamaicans when the programme reaches full stride.

It has been said that half a loaf is better than none, and one-third of each day's nutritional needs could be accepted in similar philosophical vein and in facing the stark realities of the dietary situation. Any programme that sets appropriate standards can only encourage a greater reaching

PROVIDING AN ADEQUATE DIET FOR PUPILS (Contd.)

for high quality in other school feeding efforts. The Jamaican parent, accustomed to make sacrifices for his children is not likely to downgrade the present family menu, because his child gets a good school lunch, unless his progeny becomes too "power packed." Everyone will wish the programme well and since it is likely to operate in a controlled area, it should be possible to measure its nutritional impact on the school population to which it caters.

CAJANAQUOTE

It is clear that nutritional problems in many countries are made worse due to a mal-distribution or an uneven distribution of foods, health and social services and incomes. This mal-distribution may be between areas of a country, between communities, or families, or in the case of food, within the family itself. Examples include the relatively high doctor/population ratio in urban versus rural areas; and the high consumption of foods of animal origin by the middle and upper classes and their low consumption by low income families with detriment to the health of both groups.

PAHO 4th Technical Advisory
Committee on Nutrition, 1972.

CFNI NEWS

NUTRITION EDUCATION COMMITTEE - FOLLOW-UP TO TECHNICAL GROUP MEETING

One of the most important decisions taken at the Technical Group Meeting on Nutrition Education held in St. Lucia in July 1972 was the appointment of a Committee to follow-up the recommendations made at that meeting.

This Committee, consisting of nine representatives from the Commonwealth Caribbean countries, met in Trinidad on April 26 and 27. They provided up-to-date information on progress made in nutrition education in individual territories since the St. Lucia meeting. It was clear that, in several territories, positive attempts were being made to have nutrition education firmly established within the framework of teacher training and schools curricula, as well as by use of television, radio and newspaper.

The Committee regarded the setting up of resource centres for nutrition education material in each territory as a readily attainable goal. This should lead to the collection of nutrition literature, teaching aids, etc. for use within each territory.

At the same time, the need for properly oriented teaching guides and lesson manuals on nutrition was again stressed. Other matters receiving the special attention of the Committee were:

- (i) the importance of the role of CFNI in various aspects of nutrition education, especially in maintaining liaison between territories;
- (ii) University degree courses in nutrition;
- (iii) extension of technical assistance and exchange programme into the field of nutrition education.

A Standing Committee of five persons was selected, viz:

Miss Thelma Stewart, Senior Education Officer (Home Economics) Ministry of Education, Jamaica.

Mrs. Gwendolyn Tonge, Home Economics Supervisor, Ministry of Education, Health and Culture, Antigua.

Miss Eunice Warner, Nutrition Supervisor, Ministry of Education, Trinidad and Tobago.

Mr. Johannes Leonce, Acting Principal, Teachers College, St. Lucia.

Miss Mildred Johnson, Education Officer (Home Economics) Ministry of Education, Guyana.

Alternate members:

Miss Norraine Davis, Nutrition Officer, Ministry of Education, Barbados.

Miss Dorothy Bowen, Education Officer, Ministry of Education and Culture, Bahamas.

This Committee will continue the work of reviewing progress in nutrition education, and promoting the implementation and extension of plans and programmes in this field. A special priority will be the setting up of a regional, inter-disciplinary body to establish guidelines for the teaching of nutrition in teachers' colleges and schools. It is planned that the Standing Committee will meet before the end of 1973.

COMMUNITY HEALTH AIDES - PROGRESSIVE EVALUATION BEGINS

In the latter part of 1972 the Government of Jamaica launched a programme designed to provide the health team with a new member at the local level: these are Community Health Aides (CHA's). CFNI was involved in the training of the first CHA's, and is currently involved in an evaluation of the effectiveness of the programme in the parish of St. James.

The evaluation is designed to assess the goals set out by the Ministry of Health regarding:

- (1) nutritional status of young children;
- (2) the food consumption patterns of mother and child; and
- (3) the fertility of young mothers.

At present the evaluation has identified some training deficiencies and re-training or "in-service" training will be planned accordingly.

Baseline data have been gathered in test and control areas, periodic re-surveys are planned to measure the impact the CHA's are making on the population and nutrition of the community.

Whenever necessary the evaluation is designed to promote feed-back suggestions for the improvement of the programme to trainees, administrators and supervisors.

NUTRITION MADE SIMPLE

VITAMIN A DEFICIENCY DISEASE - Robert Cook, D.M.

After protein-calorie malnutrition of early childhood, with which it is often associated, perhaps the most disastrous nutritional deficiency is that of vitamin A, for the effect when it is severe is to cause blindness. It is however, in its severe degree, confined to certain areas of the world, (unlike PCM which is universal to all developing countries, and was universal in industrialized countries in an earlier stage of their social and economic development less than one hundred years ago). Nevertheless, confined to certain areas though it is, vitamin A deficiency could still well be the principal cause of blindness in the world, certainly in man-years of blindness, even counting trachoma and glaucoma.

The Various Forms of Vitamin A

Effectively speaking, vitamin A is found in the diet of man in two forms:

- (1) preformed, vitamin A itself, from foods of animal origin, and
- (2) as precursors of vitamin A, called carotenes, from which vitamin A is formed, found in foods of plant origin.

Preformed vitamin A, i.e. vitamin A itself, is soluble in fats but not in water, stable to heat at ordinary cooking temperature but not at high temperature or prolonged cooking. It is destroyed by exposure to sunlight. It occurs in several forms as retinol, (an alcohol) as an aldehyde, (retinene) and as an acid, (retinoic acid) but this is of no practical importance, nor is the fact that there are two chemically distinct forms, vitamin A₁ and A₂, since A₂ is found only in the livers of freshwater fish. For practical purposes we will refer to *vitamin A* or *retinol*.

Carotenes are responsible for the colour of red and yellow vegetables, and include alpha, beta and gamma forms. The beta form is the most important. It is the most widely found, in association with chlorophyll, the green pigment of plants, and each molecule of beta-carotene yields two molecules of vitamin A, whereas the others yield only one.

Measurement

Vitamin A can be expressed as *international units (i.u.)*, or in weight, but the former is still more common. One unit is defined as the vitamin A activity of .300 micrograms of vitamin A or .600 mcg of beta-carotene. Note that in practical life not all carotene is converted in the human body, in fact only about one-third, and this has to be taken into account when assessing the adequacy of vitamin A intake.

VITAMIN A DEFICIENCY DISEASE (Contd.)

TABLE: Sources of Vitamin A and Carotene

Source	Description	Range (i.u./100g edible portion)
<i>1. Fatty fish and their oils</i>		
Halibut-liver oil	-	2,000,000-36,000,000
Cod-liver oil	-	40,000-400,000
Cod-liver oil	B.P. (1953) standard	60,000
Cod-liver oil	British Welfare Foods (1958) standard	90,000
Shark-liver oil	-	45,000-600,000
Herring	Fresh	90
Salmon	Tinned	80-250
Sardine	Tinned	136-290
Tunny	Tinned	70-200
<i>2. Dairy produce</i>		
Butter	-	2,400-4,000
Margarine	Vitaminised	3,000
Eggs	Fresh, whole	1,000-1,140
Milk	Fresh, whole	70-230
Cheese	Whole, fatty type	1,200-1,740
<i>3. Meats</i>		
Liver	Sheep and ox	4,000-45,000
Beef	-	0-50
Mutton	-	0-50
<i>4. Fruit and vegetables*</i>		
Red palm oil	-	40,000-100,000
Carrots	-	6,000-15,000
Leafy vegetables**	-	80-12,000
Tomatoes	-	1,100-3,000
Apricots	Fresh	690-2,790
Bananas	-	100-300
Sweet potatoes	Colourless	500
Sweet potatoes	Red and yellow varieties	3,800-7,700
Orange juice	-	190-250
<i>5. Negligible sources</i>		
Lard and vegetable oils	-	Trace only
Bacon and pork	-	Trace only
White fish	-	Trace only
Cereals (except maize)	-	Trace only
Sugar, jams and syrups	-	Trace only
Potatoes	-	Trace only

*Fruits and vegetables contain only the precursor carotene.

**Fully grown dark green leaves as commonly used in the tropics are in general a better source of vitamin A than hearts of lettuce, cabbage, etc.

Sources of Vitamin A in the Diet (Contd)

I reproduce for you a short table of the vitamin A content in various foods. Apart from the fish liver oils, and red palm oil, each over 40,000 i.u. of vitamin A per 100 g edible portion, the principal sources of vitamin A or carotene (over 1000 i.u. per 100 grams) are, for vitamin A itself, liver, butter, margarine fortified with vitamin A, eggs and cheese; and for carotene the main sources are carrots, pumpkin, red and yellow sweet potatoes, and dark green leafy vegetables (note *dark* green, not lettuce or cabbage).

Requirements

Assuming about one-third of the intake to be in the form of vitamin A, and two-thirds as carotene, 5000 i.u. is a satisfactory intake for an adult, and about 3000 i.u. for an infant and 8000 i.u. for a lactating woman.

Effects of Deficiency

In fact the full physiological explanation of the effects of vitamin A deficiency is not clearly known, and it is better that we confine ourselves to a description. In the main, we can divide vitamin A deficiency manifestations into three:

1. As vitamin A is required for the formation of rhodopsin or visual purple, which is needed in order to be able to see in dim light, the deficiency therefore results in '*night blindness*', which can of course be dangerous in certain occupations or at certain times, but is not of major public health importance.
2. *Keratinization of the epithelium.* In epithelial cells throughout the body there is a progressive shrinking and hardening and degeneration of the cells. This has two main effects: Firstly, in the skin it produces roughness and dryness and keratin blocks the sebaceous glands, producing what look and feel like hard and permanent goose-pimples, a condition called *hyperkeratosis*, which appears first on the upper forearm and thighs then on the trunk. This is found only with fairly severe hypovitaminosis A, and is mainly important not for its own sake but as a clinical sign of vitamin A deficiency. Secondly, its effect on the muco-epithelial cells in the nasal passage, sinuses, middle ear, lungs and urinary tract render them all more liable to infection.
3. The real public health problem however stems from the effect of these same epithelial changes on the surface tissues of the eyes: the conjunctivae and especially on the cornea, a condition called collectively xerophthalmia.

The first mild symptoms are photophobia, itching and sometimes inflammation of the inner surface of the eyelids. As dryness of the conjunctivae and cornea increases a sign called *Bitot's spot* can be seen, usually in children. This is a small foamy-looking plaque, usually on the lateral aspect of the cornea, and is due to heaping

VITAMIN A DEFICIENCY DISEASE (Contd.)

up of epithelial cells and defective function of the tear glands due to keratinization. Next, the whole of the cornea demonstrates this *xerosis*, dull, lustreless, relatively dry with a rough or striated surface. This progresses to a point where the cornea becomes oedematous and inflamed and very susceptible to infection. Finally with the combined effect of xerosis and infection the cornea becomes cloudy and then soft, and *keratomalacia* (liquefaction of the cornea) is the end result, with permanent partial or complete blindness in one or both eyes, as the final result.

Four facts should be remembered:

- (1) these very severe forms of xerophthalmia occur after *prolonged* vitamin A deficiency;
- (2) they occur mainly in children under five years, or even under three years;
- (3) they are always associated with severe PCM;
- (4) children with keratomalacia have a low probability of survival in countries where it commonly occurs, both because of the severe PCM accompanying it, and because the disabled of any kind whether blind or crippled or mentally retarded, are at a great disadvantage for survival in circumstances of real poverty.

*Geographical Distribution of Xerophthalmia and Keratomalacia**

The following are countries where xerophthalmia and keratomalacia occur in significantly high numbers:

South and East Asia: Indonesia, Philippines, Viet-Nam, Bangladesh, and South India are the most affected, and to a much lesser extent, Malaysia, Singapore and Hong Kong. In these latter countries the disease is disappearing.

Middle East and North Africa: Jordan is certainly severely affected and probably also Syria, Iraq, Yemen, and Libya, and to a lesser extent most of the other countries.

Rest of Africa: Here the problem is very localised, principally in areas of semi-desert where green and yellow vegetables are in short supply, e.g. Somalia, parts of Kenya and Tanzania, Northern Nigeria and Botswana.

*References - Oomen, McLaren and Escapini, (1964). *A Global Survey of Xerophthalmia*. *Trop. geog. Med.* 16, 271.

Hypovitaminosis A in the Americas, PAHO Scientific Publication No. 198, 1970.

VITAMIN A DEFICIENCY DISEASE (Contd.)

The Americas: Here, in brief, the prevalence of the severe forms seems to be very much in proportion to the general poverty of the area. Thus the lesions are found particularly in North-east Brazil, in the Yucatan area of Mexico, in Guatemala, El Salvador and other such Central American countries and (most revealing) in Haiti. It is strange that in the English-speaking West Indies low serum levels of vitamin A are reported, yet xerophthalmia is a very rare occurrence indeed. This reflects something about serum vitamin A as a guide to prevalence of the severe manifestations of hypovitaminosis A.

Prevention and Treatment

1. Nutrition education.
2. Fortification of commonly consumed cheap foods: e.g. skim milk, (done by UNICEF) sugar (INCAP) vegetable fat (Jordan).
3. Introducing the cultivation of the palm tree which supplies red palm oil (this is spreading in South-east Asia).
4. "Vaccination" style prophylaxis among vulnerable children as an immediate short-term measure. At first intra-muscular injections were recommended, but while they afford some protection for six months or so, they are poorly taken up by the liver. Oral administration of 200,000 i.u. every six months until three years is the currently favoured method (see WHO Chronicle, Jan. 1973).
5. Adequate treatment. All children with PCM in vulnerable areas should receive large doses of vitamin A intra-muscularly then oral prophylaxis, as well as treatment for PCM. Otherwise eye-lesions may appear during the stage of recovery from PCM, as was first noticed in Jordan by Shirajian, (quoted in Oomen, McLaren and Escapini).

FEEDING IN THE FIRST FEW MONTHS* - Michael Gurney

About a quarter of the pre-school age children in Jamaica do not get enough of the right kinds of food to eat.

The result of this is that growth, both physical and mental, of these children is slowed down. When they go to school they may not profit fully by what the school has to offer them. Some of these children die. There are about seven times as many deaths in this country of children in their second year of life as there should be, and very many of these deaths have malnutrition as the main or contributing cause.

*Published in 'The Gleaner' (Jamaica) on 1st May 1973 under the title "Breast or bottle-feeding is important."

FEEDING IN THE FIRST FEW MONTHS (Contd.)

Some of our young children are obese. This can lead to problems in later life such as a greater risk of diabetes, heart disease and joint troubles. Besides, as adolescents they may worry about their fatness and may have to cope with ridicule from their companions.

Both these types of malnutrition - under-nutrition, and obesity - occur in all classes of society. Children with not enough to eat are more commonly found among the poor but occur in the middle classes as well. Childhood obesity, though commoner in the middle classes, is also found in poor families.

While there are many causes of the malnutrition we find in Jamaica, there is one pattern of behaviour which is a very important trigger for both under-nutrition and over-nutrition. This is the inappropriate use of artificial baby milks.

The Fat Baby

Let's take the fat baby first. A certain amount of chubbiness is good in babies - too much is harmful. When a baby suckles at a mother's breast it is a very vigorous activity involving the cheek muscles and the tongue, and the baby enjoys this and feels the warmth of his mother's body. Within the first few days of life a breastfed baby establishes a kind of link with his mother ensuring that he gets exactly the amount of feed he needs at the right intervals. Technically speaking, we say that a conditioned reflex under endocrine control is established. This incorporates a sensitive feedback mechanism that relates the child's nutritional needs and the capacity of his stomach to maternal milk production and availability¹.

As the baby grows, his requirements for mother's milk increase. His stomach gets bigger so that he can take more milk at a time. This means that he suckles at less frequent intervals than when he was very small but he takes in more milk at each feed.

The mother's production of milk automatically increases as the baby's requirements increase. This is directly because of the link established between the mother and baby by breastfeeding. It is only when a baby is about six months old that he cannot get all the food he needs from his mother's milk and so needs some other feeds as well.

The bottle-fed baby is in a different situation. The bottle is held above his head so that the milk flow is aided by gravity and he does not have to suck as hard as the breastfed baby. The nipple on the bottle is different from the mother's breast and the mechanism of suckling is also different. The self-regulatory mechanism that exists between mother and suckling infant does not exist. If he is 'force fed' the baby's stomach distends. This happens to some artificially fed babies; a mother is often anxious to ensure

¹ For more detailed information on this mechanism see "How breastfeeding really works" by Dr. and Mrs. Jelliffe, in 'Cajanus' Vol. 4, page 1 (1971).

FEEDING IN THE FIRST FEW MONTHS (Contd.)

that her baby gets as much milk as he *can*, rather than as much as he *needs*. Over-feeding of bottle-fed babies is a main cause of infantile obesity.

The Under-fed Baby

Let us now think about the baby who becomes undernourished because of feeding with artificial baby milks. A one pound tin of different brands of these baby milks costs more than a dollar in Jamaica. I wonder how many readers know how long a one pound tin of artificial baby milk should last if the baby, of say two months, is getting enough. The answer is about four days. That is, a baby needs almost two tins a week. Many of our mothers just cannot afford to spend over two dollars a week on baby foods on top of all their other household expenses. It is because of this that we often find that the milks have been "stretched", or over-diluted, so that one tin will last one or even two full weeks. This is a major cause of malnutrition.

Many mothers do not have a supply of good clean water in the yard, let alone in the house itself. Many do not have convenient facilities for boiling water; and most do not have a refrigerator for storing milk. It is no wonder that we find that bottle-fed babies are much more likely to get diarrhoea than are breastfed babies. It only takes two or three attacks of diarrhoea to precipitate a baby into a state of marasmus and severe malnutrition!

Avoiding Trouble

Clearly not every mother wants to breastfeed her baby. A few cannot breastfeed for more than a few weeks; they may have to go out to work for instance. These babies are at risk of developing either form of malnutrition - marasmus or obesity.

Breastfeeding is usually successful; however it can go wrong. A breastfeeding mother needs support and knowledgeable advice from her family, friends and the nurse, aide or doctor. There is no doubt that breastfed babies are more likely to grow along the normal path than are bottle-fed babies, who may well stray into either of the two extremes of obesity or under-nutrition.

As breastfeeding in the early months of life protects many babies from becoming malnourished or obese it is obvious that encouragement should be given to enable mothers to breastfeed their babies. Positive help is required, so any nurse, for example, who persuades a mother to give her young baby artificial baby milks when she could very well breastfeed may be permanently damaging that child. If she is doing this for money the nurse is betraying her trust as a skilled member of the health team. To give free introductory samples of artificial baby milks to mothers who cannot afford to continue the habit is like "pushing drugs". Once a baby is accustomed to feeding from a bottle it is difficult to start the breast again; the baby has to re-learn the technique and the mother's milk may be no longer flowing freely.

FEEDING IN THE FIRST FEW MONTHS (Contd.)

The Healthy Baby

All babies are lovable and fortunately most of our babies are healthy, at least for the first few months of their lives. These earliest months are when the baby's personality and ability to love start to develop. His brain and body are both growing very fast and he needs the best food he can get. We can, even when we are not rich, give him the best - breast milk. It is available to almost all mothers; it is perfectly adequate for at least the first four months, and it costs very little.

CANDI NEWS

By now all members of CANDI should have received notices of the Second Annual Meeting which is scheduled to be held in Barbados on the 28th and 29th of June 1973. For further information on the Meeting, please write to CANDI c/o CFNI, Trinidad Centre.

Hope to see you all in Barbados as we have an interesting programme to cover. Some of the topics to be discussed are:

Renal diseases - medical and nutritional aspects
Obesity and fad diets.

The mid-year Board of Directors' meeting, which was scheduled to be held in Trinidad in January, had to be postponed. It will now be held in Barbados in June, immediately before the Second Annual Meeting. Board members please note as you will be expected to arrive in Barbados at least one day earlier than other members.

Committee chairmen are reminded of their reports which are to be presented at the Annual General Meeting.

You will be pleased to know that CANDI was represented by Mrs. D. Shillingford of Dominica at the recently concluded Fifth Commonwealth Caribbean Health Ministers' Conference held in that island.

We have received several letters from the Chairman of the International Committee of Dietetic Associations expressing interest in CANDI and requesting information regarding dietetics in the Caribbean. As you know, the Sixth International Congress of Dietetics is scheduled to be held in Hanover, Germany from 17th to 22nd May 1973. We do hope that some of our members can attend. Unfortunately we are unable to send an official delegate due to lack of funds. CANDI has been invited to be a member of the International Dietetic Associations.

FROM: Maxine Hosking, Department of Dietetics, Royal Prince Alfred Hospital, Missenden Road, Camperdown, N.S.W., 2050, Australia, TO: Miss L. Clifton, President Elect and Editor of CANDI.

Dear Miss Clifton:

I am the Senior Therapeutic Dietitian at this hospital and this year I am the President of the Dietetic Association of New South Wales. Because a former member of our department, Peter Heywood is doing the field work for his Ph.D. in Jamaica and is associated with CFNI we now receive and enjoy a copy of 'Cajanus'.

Two things in the July-September 1972 issue prompted me to write to you. The first is that I noted the formation of the Caribbean Association of Nutritionists and Dietitians. I can appreciate the amount of work that must have gone into making this a reality. The Dietetic Association of N.S.W. sends its congratulations and wishes your Association a great future. In Australia there are five state Dietetic Associations and all are quite independent and autonomous. In 1972 we took the first steps toward establishing a national Association. This will take time and a lot of thought but we hope that in 1977 when the 7th International Congress of Dietetics is held here in Sydney that we shall have our National Association going. Perhaps we shall have the pleasure of welcoming members of CANDI to Sydney at that time.

The second reason for writing to you as an office-bearer in CANDI is that I would like to amend a statement made in the paper on diabetic diets given by Patricia Peña. She said that Australia uses a 10 gram CHO portion with relatively free use of protein and fat. Unfortunately because of State divisions and differences in training, etc. it is not possible to say what "Australians" do about their diabetic diets. What she said is true in the State of Victoria. In New South Wales we believe strongly in strict control of the calories with about forty percent of the calories coming from CHO. Also we use a 15 gram CHO portion. I am closely involved with a diabetic education programme being developed in this hospital and Professor Turtle and the staff in our Diabetic Clinic support the use of a more vigorous approach to dietetic control in diabetes than is taken in other parts of Australia.

These differences in therapeutic policy between the States will make our progress towards a national Association somewhat slow.

We look forward to reading of your Association's activities in future copies of 'Cajanus'.

Yours sincerely

Maxine Hosking

EDITORIAL

This issue of 'Cajanus' is more of a pepper-pot than usual. You can dip in your spoon and may come up with quite a variety. Both the "Topics and Comments" section at the front and "Nutrition News and Opinion from the Caribbean" contain a mixture of ingredients, and "Cajanaquotes" provide the spices. However, this editorial will simply draw your attention to the major "staple" articles.

We publish a very timely piece by Manuelita Zephirin on food faddism (page 145). Some of the newspapers in the area are very prone in their food supplements to "pad with a fad" - often an inappropriate exposition of the views of the new North American primitives. Also we present some basic information on human milk compiled by the Jelliffes and Michael Gurney (page 156). It is rather a long article so we have divided it into two; the second part (including the references) will be published in our next issue. We have a clear description by Dr. C. Gopalan and Mr. N. Naidu from the National Institute of Nutrition in India on how malnutrition affect family size and population growth and how family size affects health (page 164).

The article by Tom Henderson of the University of the West Indies on how we can get our ideas across to others is particularly appropriate to this issue, for we are asking you to fill in the enclosed questionnaire. It won't take long and will help us to improve 'Cajanus'. Also it will keep you on the mailing list. Please help us by filling it in and sending it off quickly.

Thanks.

THE EDITOR

TOPICS AND COMMENTS

FAMINE THREAT GROWS

Experts forecast a serious world food shortage for 1975. In fact, famine risks hitting several regions of the world sooner because of disastrous weather over recent years.

Figures issued by the United Nations Food and Agriculture Organisation (FAO) indicate that the stocks of wheat held by exporter countries will be reduced next year to less than thirty million tons, the lowest level since 1952. Since that date the world population has increased about fifty percent. That is why Addeke Boerma, the FAO Director General, has called on countries which have insufficient agricultural production of their own to import foodstuffs while there is still time. The fall in world cereal stocks follows the poor harvest in the Soviet Union in 1972 and a poor rice harvest in the Far East. The increase in demand has led to an enormous rise in prices.

According to Mr. Boerma, world wheat prices have increased seventy to eighty percent since the middle of last year. That throws an additional burden on the already weak financial resources of many developing countries who are forced to buy cereals abroad because of bad harvests at home.

The world's leading cereal producers - United States, Soviet Union, Canada and India - have encouraged farmers to sow as much as they can this year. Mr. Boerma considers that these measures demonstrate a sharp sense of responsibility not only in national terms but also in human terms at world level.

But one unknown factor which can have incalculable importance remains: nature itself. An implacable and even humiliating factor has emerged over the last two years. That whatever sorts out technological progress, whatever the hopes we place in what not so long ago was called the "green revolution", harvests too often lie at the mercy of the weather. In this field at least man has failed in his attempts to dominate his environment.

Because of the exceptionally low level of stocks, says the FAO, world wheat needs in 1973-74 will have to be met almost totally by future harvests. The result of these harvests is therefore of vital importance. For the moment first indications are not encouraging, except in India. The Indian Ministry of Agriculture has just announced that a record harvest is in sight.

"If weather conditions again turn bad in regions vital for cereal production", says Mr. Boerma, "the world may have to face a generalised shortage of cereals during this year or during the first half of 1974."

"The situation is all the more difficult as there is also a lack of fertilisers which has increased their price and could heighten the difficulties of several developing countries."

To avoid abandoning the feeding of millions of human beings to the whims of the weather, Mr. Boerma suggests more attention should be paid to the long-term problems of food production in developing countries.

And above all, the FAO Director-General appeals to all producer countries to build up sufficient food stocks to meet any emergencies.

But the bad weather has not had worrying effects merely on cereal growing. Millions of head of cattle are dying in West Africa, in the Southern Saharian region which stretches 4,500 kilometres (2,500 miles) from Mauritania to Chad, running through Senegal, Upper Volta, Mali and Niger. The drought has continued for the last four years.

Long- and short-term mercy operations have been drawn up jointly by representatives of the FAO and UNDP (United Nations Development Programme) and WFP (World Food Programme).

An operational mercy unit has been sent on the spot. Its first task is to save all the cattle that can still be saved. For this constitutes the principal source of food for a large proportion of the population. The herds will have to be built up again.

To avoid a return of such catastrophes, another specialised team has also been sent out. This will draw up a regional development plan.

THANKS FOR THE MAMMARY
By Lindsay Mackie

A working party of paediatricians appointed by the Department of Health and Social Security of Britain meets soon to start work on the problem of how best to feed a baby.

There has been a minor spate of articles and discussions on the subject of infant nutrition recently, and it is gradually edging up from its former under-researched and unfashionable position on the scale of medical interest.

The vast majority of the 900,000 or so babies born in Britain each year start life on a basic diet of dried milk. And the majority of these babies do perfectly well on it and pursue an uninterrupted bouncing babyhood.

But a paper published recently in the British Medical Journal says that overfeeding of dried milk can cause brain damage in babies, from an excess of sodium which puts a strain upon the kidneys and lessens a baby's resistance to infection.

¹From 'The Guardian' 3rd July 1973 page 15.

Another paper in the British Medical Journal in April found that many mothers, midwives and nurses made up over-concentrated feeds, through inaccurate measurement, and another paper in the same issue found one baby food which contained a concentration of sodium to a level twice that of cow's milk.

This baby food has now been altered by the manufacturers, but the authors suggested that mineral contents should be printed on the packet (not required at the moment) and the authors of the paper on inaccurate measuring of powder suggested that scoops should be standardised and dried milk powders should be marketed in small, accurately weighed packets.

There are a lot of obstacles in the path of a perfect feeding programme for babies. Breast is best, most paediatricians suggest, but there is the problem of getting mothers to do it.

The leading paediatrician said last night: "If you look at the success of the anti-smoking campaign it doesn't give you much confidence in the profession's ability to educate the public at large."

Dr. Mavis Gunther, a leading authority on infant feeding, says: "Mothers are given such conflicting advice on feeding from all sorts of sources, and they are not shown how to breast-feed. It can be difficult and sometimes there isn't time made available in hospitals."

Some paediatricians advocate ready made liquid foods, which eliminate the possibility of over-concentration. The problem here is cost. A spokesman for Unigate said last night that his firm has been running trials on ready made liquids. But one day's liquid food costs 45p compared with four days powdered food supply for 36p.

Misuse of powdered foods can make babies too fat and it can dehydrate them. There have also been suggestions that some cot deaths are connected with an over-concentration of reconstituted cow's milk. Dr. John Emery of Sheffield, who is researching into cot deaths says that feeding might present one of "the likeliest clues to their cause."

Though research into baby feeding is increasing, very little of it has percolated down to midwives and mother level. A paediatrician said yesterday: "The profession as a whole has wanted to avoid the kind of miracle cure attitude. What needs to be done now is to see if there is sufficient evidence to change feeding habits."

The Department of Health and Social Security working party can make a start, but what will require a major effort, will be the rectification of what one London consultant paediatrician called the deeply unsatisfactory position in hospitals with regard to advice on feeding baby best.

"There is a gross degree of conflicting advice given to mothers. Every one is very ignorant, some doctors haven't ever seen a baby being breast-fed. There isn't very much understanding of the problems of what the best way of feeding a baby is."

DAVID WAS BORN IN THE CITY

By D.B. Jelliffe and E.F.P. Jelliffe

Although the majority of the population of the so-called Third World still live in rural areas, at the same time a vast flow of people has occurred, and is still occurring increasingly, to urban slums or rapidly mushrooming shanty towns. This massive migration plainly poses a host of different problems - political, social and humanitarian. Not least of these is that the major form of malnutrition in young children is altering, both in type and in age-group affected.

This situation can be illustrated by baby David who is in the hospital suffering from marasmus and from severe diarrhoea. He was born eight months previously in a slum area. His mother did not breast-feed him, although she was not working out of the house. Instead, she attempted to bottle-feed as the modern thing to do. Unfortunately, she was unable to afford to buy sufficient powdered milk, although ironically, but understandably, what she purchased was the most expensive, highly advertised commercial brand, in the mistaken impression that she was doing the best possible for her infant. The home surroundings were dirty, the water supply unclean, and storage facilities non-existent. Under these circumstances, it is not to be wondered that baby David was given insufficient amounts of very dilute feedings from an unclean bottle. The results were equally predictable - a downward spiral into nutritional marasmus (starvation) and infective diarrhoea. Even then, the child's situation was made still more serious by misguided home treatment by the desperate mother in the form of further watering down of feeds and of purgatives.

Again, the causation of baby David's present situation is complicated. However, once again, by finding the circumstances responsible in the particular community, *it is possible* to make such situations less common. For example, the life-saving properties of human milk for young infants cannot be overstressed and must be promoted by all health services. Also, for working mothers, breast-feeding may be achievable by means of creches or even by lactation leave. When artificial feeding is unavoidable, *it is possible* to recommend and to promote in health services the use of the cheapest form of suitable milk preparation that is available on the market, rather than the most advertised and statusful. *It is possible* to organise nutritional supervision by means of regular weighing of such young children to detect malnutrition at an early stage. *It is possible* to undertake the correct treatment of diarrhoea at an early stage, including the avoidance of starvation or purgation.

In a more rational world, it *might* be possible to devise food standards to avoid the disastrous sales promotions of unaffordable infant foods.

¹ Professor and Mrs. Jelliffe are well-known to 'Cajanus' readers. Professor Jelliffe is now Head of the Population, Family and International Health Division, School of Public Health, University of California in Los Angeles, and Mrs. Jelliffe has returned to student life. She is doing an M.P.H. at the same University. - Taken from "The neglected years - early childhood" published by the United Nations Children's Fund.

NEW HEAD OF WHO

Dr. Halfdan T. Mahler of Denmark, has been named as the new Director-General of the World Health Organization. He was elected by the World Health Assembly in May and takes up his appointment in January.

Dr. Mahler, born in 1923, will be the third Director-General of WHO and succeeds Dr. M. G. Candau of Brazil, who retires after twenty years' service.

As Assistant Director-General of WHO since September 1970, Dr. Mahler has been responsible for the Division of Family Health, the Division of Organization of Health Services, and the Division of Research in Epidemiology and Communications Science. He first joined WHO in 1951 and spent a period in India attached to the National Tuberculosis Programme, and since then has been a visiting professor at WHO-assisted training courses in tuberculosis control at postgraduate schools in Rome and Prague. He was Chief Medical Officer of the WHO tuberculosis unit in Geneva and Secretary to the WHO Panel on TB. In 1969 he was appointed Director, Project Systems Analysis.

NUTRITION AND WORKING EFFICIENCY - A SHORT BIBLIOGRAPHY

By Peter F. Heywood

1. Physiological and Related Aspects

Areskog, N.H., et al (1969). Physical work capacity and nutritional status in Ethiopian male children and young adults. *Am. J. Clin. Nutr.* 22: 4, 471-479.

Bonjer, F.H. (1968). Relationship between working time, physical working capacity and allowable caloric expenditure. *Muskelarbeit und Muskeltraining. Internationales Kolloquium am 19 und 20 February 1968 in Darmstadt*, pp. 86-98.

Bonjer, F.H. (1971). Temporal factors and physiological load. In Singleton, W.T. et al (Eds.). *Measurement of man at work - an appraisal of physiological and psychological criteria in man-machine systems*. Van Nostrand Reinhold Co., New York, pp. 41-44.

Cross, D.R., and Underwood, B.A. (1971). Technological change and caloric costs: sisal agriculture in Northeastern Brazil. *American Anthropologist* 73: 725-740.

¹Peter Heywood has been working at CFNI on an investigation of Nutrition and Working Efficiency amongst Jamaican cane cutters. He is a graduate student at Cornell University.

- Davey, P.L.H. (1967). Some implications of the activity component in the calorie requirements of adults in tropical Africa. Joint FAO/WHO/OAU (STRC) Regional Food and Nutrition Commission for Africa - Occasional Paper No. 1 (mimeo).
- Grande, F. (1964). Man under calorie deficiency. In Hill, Adolph and Wilber (Eds.). Handbook of Physiology. American Physiological Association. Washington, D.C. Section 4.
- Keller, W.D., and Kraut, H.A. (1962). Work and nutrition. *Wld. Rev. Nutr. Dietet.* 3, 69-81.
- Kraut, H.A., and Muller, E.A. (1946). Nutrition and Industrial performance. *Science* 104, 495-500.
- Le Blanc, J.A. (1957). Use of heart rate as an index of work output. *J. Appl. Physiol.* 10, 275-280.
- Lowenstein, F.W. (1968). Nutrition and working efficiency (with special reference to the tropics). Joint FAO/WHO/OAU (STRC) Regional Food and Nutrition Commission for Africa - Special Paper No. 3 (mimeo).
- Taylor, H.L., and Keys, A. (1950). Adaptation to calorie restriction. *Science* 112, 215-218.

2. Group Feeding

All the articles listed in this section were obtained from FAO Headquarters.

FAO/ILO/WHO Expert Consultation on Workers' Feeding. Rome, 10-14 May 1971.

Waltenberg, K. (1970). Report to the Government of Zambia - a study of workers' feeding. FAO Nutrition Consultants Reports Series No. 9.

Waltenberg, K. (1971). Report to the Government of Zambia - feasibility study on workers' feeding. FAO Nutrition Consultants Reports Series No. 26.

3. Nutrition and Economic Development

International Conference on Nutrition, National Development and Planning, October 19-21, 1971. Massachusetts Institute of Technology, Cambridge, (a number of excellent papers were given at this conference).

Lele, Uma J. The Green Revolution: income distribution and nutrition. Occasional Paper No. 48, Department of Agricultural Economics, Cornell University.

4. Labour and Economic Development

Turnham, D. (1971). The employment problem in less developed countries. OECD. Paris.

Yudelman, M. et al (1972). Technological change in agriculture and employment in developing countries. OECD. Paris.

In addition the Institute of Development Studies, University of Sussex, England, has published a number of papers relating to nutrition, employment and economic development.

CAJANAQUOTE

Let us look at the question of the development of human resources. Under this heading we have education and training which has been universally accepted as an area for maximum public sector involvement. It can readily be seen by all that the profit motive, which is crucial to private sector operations is inconsistent with the goals of an educational policy.

Allied to education in the development of human resources, in a country such as ours, is the whole question of nutrition. It is futile for us to pursue enlightened education policies if we do not recognise the necessity to ensure that the child has the ability to learn - and, a critical factor in this, is proper nutrition.

In the same way, proper nutrition is vital to the ability of the worker to perform.

It is for these reasons that Government is involved and will continue to be involved in ensuring that basic food items are available at the lowest possible cost to the populace at large to maintain adequate nutritional standards.

Michael Manley
Prime Minister of Jamaica
In a broadcast to the nation on
10th June 1973.

FOOD FADDISM

by

Manuelita Zephirin¹

"So long as women want beauty, men want virility, parents want strong children and the sick want relief from suffering - so long as people desire health and are not satisfied quickly and easily through legitimate channels, the pseudologist will emerge, ready to exploit them. It is because of this common human denominator of "perfection in wish" that quackery dating back to 1500 BC is sometimes called the second oldest profession".²

INTRODUCTION

The history of food faddism³ is interesting and would be entertaining. If it were not that this form of quackery is taking on such proportions today.

Food misinformation⁴ has become one of the major distractions of Nutritionists, Dietitians, Home Economists and all persons working in the health field.

Food faddism is not a new trend, but the ancient medicine-man has been replaced by clever, prosperous business executives, journalists and public relations experts who have something to say and sell. The message is well phrased,

¹From the Caribbean Food and Nutrition Institute. This paper was presented at a meeting of the Caribbean Association of Nutritionists and Dietitians held in Barbados on 28th and 29th of June 1973.

²Medicine at Work, October 1961. Frauds and Quackery Affecting the Older Citizen. Hearings before Special Committee on Aging. Eighty-eighth Congress, First Session, Washington, D.C. p. 133 (1963).

³Food Faddist - one who follows certain food customs for a time with exaggerated zeal such as enthusiasts for yogurt, molasses and so on.

⁴Food Misinformation - that which is not in line with scientific evidence to date. This may take the form of outright fallacies or fads which are often exaggerated half-truths and as such may be more difficult to combat than outright fallacies.

convincing, extravagant and often in sensational style. The products range from unprocessed "natural foods" and herbs, to vitamin-mineral supplements, to "diet aids" or formula foods, to nutrient-saving cooking utensils.

DESCRIPTION

Dr. Robert Olson suggests that "There is food faddism of two general kinds. The first is the individual with acute chronic aberrations as, for example, the avoidance or the craving of specific foods. The other is the collective type of faddist psychologically exploited to accept a stereotyped dietary practice by a group purporting to have the keys to improving health or to curing disease."

Several specific erroneous beliefs about food widely subscribed to by such faddists have been described by Olson:

"One is the fallacy that ascribes to a single food or groups of foods, a special attribute or power which is out of proportion to its nutritive content. Such foods, widely promoted in this manner, include yogurt, blackstrap molasses, wheat germ oil, honey and pumpkin seeds. Many of these foods are rich nutritionally; however claims that they can cure specific diseases or illness are dangerous.

Another fallacy states that currently available fresh fruits and vegetables are nutritionally barren if grown with chemical fertilizers.

The third fallacy is that which advocates the daily fortification of the diet with vitamins, trace minerals and other nutrients on the grounds that such fortification will improve health beyond that of the usual adequate diet."¹

All three types of fallacies emphasize the FOOD concept in contrast to the scientific NUTRIENT concept whereby nutrients and not specific foods perform certain physiologic functions. Since nutrients are widely distributed it is

¹Olson, R.E.: *Food Faddism - Why?* *Nutr. Rev.* 16, 97-99 (1958).

possible to meet the body's nutrient needs by any of numerous combinations of foods. We might go as far as to say that there is no such thing as an "essential food", there are only essential nutrients.

In many of the books written by food faddists, although research studies are quoted, the interpretations and conclusions are often those of the author and in many cases speculative.

Information describing the merits of some products is so cleverly written that the professional dietitian may need to read it twice before all the inconsistencies and the misinformation presented by implication stand out.

The consumer has limited knowledge of the science of nutrition but has heard the names of some of the vitamins and minerals so frequently that products seem "right" if a familiar term or two appears on the label of a highly advertised item.

WHY DO INDIVIDUALS FALL PREY TO FOOD MISINFORMATION

Understanding some of the reasons why people fall victims to food misinformation is important in attempting to combat the problem. Bernard states that "the most basic emotional source of vulnerability to medical quackery is fear though the individual may not be aware of it. Fear of death, physical or mental incapacitation and weakness, coupled with drives for survival are powerful motivators of human behaviour."

Another type characterized by Bernard is the intelligent, well-educated and often well-adjusted individual who contracts a disease for which there is no known cure. These persons need to believe in a miracle and can do so with such fervour that facts are twisted to fit emotional demands.¹

¹Bernard, Viola: *Why People Become the Victims of Medical Quackery*. Amer. J. publ. Health, 55, 1143-1147 (1965).

Food faddism persists despite scientific evidence denying its validity because an effective appeal is made by faddists to the emotional drives of people and not to their intellects. We know that emotional drives far outcry intellectual ones. It has been said that "whenever the reason and the imagination are in conflict, the imagination will win."

Food is a physiological substance supplying the essential nutrients for health but it is much more than this to the average person. It is the sum of his culture and traditions, an emotional outlet, gratification of pleasure and relief from stress, a means of communication, security, status, personal experiences. These deeply rooted feelings about food do not yield easily to reasoning nor to scientific facts about nutrition. Nevertheless the psychological and emotional reactions to food must be studied and understood before there can be progress toward acceptance of foods for their nutritive value.¹

WHY IS FADDISM SPREADING

The public has been alerted to nutrition and they want to hear about it. Diet therapy is recognized as an integral part of total patient care and rehabilitation in many common diseases. It is a well-known fact that successful control of diabetes depends, to a great extent, on dietary management. The importance of adhering to a prescribed diet is stressed in heart disease and obesity, conditions so prevalent that they are referred to as "No. 1" public health problems. Through a personal or family involvement many persons are conversant with nutrition, dietary and medical terminology, and are anxious to be well informed on these topics.

¹

Todhunter, E.N.: *Food is more than Nutrients*. *Food and Nutr. News*, 43, (Nos. 6-7). National Livestock and Meat Board; Chicago.

Nutrition education programmes have undoubtedly contributed to the public's general awareness of the relation between food choices and good health. Food guides have served as practical guidelines and as widely used teaching tools in schools, homes, health centres and hospitals, focusing attention on the main food groups.

"Instant messages" communicated through radio and television, more and more advertising in newspapers and magazines have bombarded the public with facts, figures, theories, case histories, research reports and recommendations, emphasizing food's role in maintaining ideal weight, achieving optimal good health, and in preventing or treating related diseases.

These have given wide exposure to nutrition, diet and medical terminology. The man-on-the-street speaks glibly of protein, ascorbic acid, atherosclerosis and cholesterol.

"Protect our ecology" is the theme song of the decade! The cry for "natural" foods - those grown in virgin or organically fertilized soils; those produced from fish, poultry or animals untouched by hormone, antibiotic or pesticide; those which are unprocessed, unadulterated and without additives.

WHY A PROBLEM

Food faddism can cause a person to attempt "do it yourself" dietary treatment for diseases and abnormal conditions that, contrary to the food faddists, have nothing whatever to do with dietary deficiency.

Economic extravagance is another consequence of food faddism. Foods sold by "health" food stores often cost more than the foods available at regular grocery stores and supermarkets. For the most part they may be good and nutritious foods but exorbitant prices are demanded when all the nutritious foods can be procured from the regular grocery stores at less cost.

The family food bill can also be substantially increased by vitamin-mineral preparations and dietary supplements for which there is absolutely no need in the well-planned diet.

SPECIFIC EXAMPLES OF FADDISM

The current interest in health foods has stimulated a following of several fad diets. Many are used in the treatment of obesity. Among the most notable of the fad diets is the 'Vegetarian Diet'.

Vegetarianism can be defined as the simplest dietary regime known to man - a diet dependent entirely, or to a large extent, on the plant kingdom.

Large populations of the world have lived for centuries on diets considered near vegetarian because of economic necessity and lack of availability of animal products. Today many are becoming vegetarians to conform to a fad and for their own personal reasons. Both groups can benefit from the assurance that it is possible to construct a vegetarian diet adequate in quantity and quality of protein, as well as all known nutrients, if supplemented with Vitamin B₁₂.

"Formerly vegetable proteins were classified as second-class and regarded as inferior to first-class protein of animal origin; but this distinction has now been generally discarded. Certainly some vegetable proteins, if fed as the sole source of protein, are of relatively low value for promoting growth; but field trials have shown that the proteins provided by suitable mixtures of vegetable origin enable children to grow as well as children provided with milk and other animal proteins."¹

Bressani and Behar have stated that "From a nutritional point-of-view animal or vegetable proteins should not be differentiated. It is known today

¹ *New Sources of Protein, Lancet, 2, 956 (1959).*

that the relative concentration of amino acids, particularly of the essential ones, is the most important factor determining the biological value of protein. By combining different proteins in appropriate ways, vegetable proteins cannot be distinguished nutritionally from those of animal origin. The amino acids and not the proteins should be considered as the nutritional units."¹

Health food faddists promote a variety of dietary supplements - among these are cider vinegar, and honey, tiger's milk, Brewer's yeast, etc. For each supplement, a special claim is made. Over the past few months visits were made to Health Food Stores. Time does not permit a discussion of the several products available; however, mention will be made of two of the most popular:

Garlic (garlic and parsley tablets)

Claim: Improves stamina, prevents fatigue. Has a prophylactic action on many digestive disorders. Detoxifies the entire organism will cure intestinal disorders and reduce high blood pressure.

Truth: All the numerous, non-specific and specific claims for this ancient and sometimes favourite "health food of mankind" are completely unfounded. It should be also noted that it is contrary to the Food and Drug Regulations of most countries to directly advertise a product as a cure for disease. (Health food promoters circumvent this regulation by inserting these claims in their own publication).

Vitamin E

Claim: There is at the moment great enthusiasm over Vitamin E, more commonly known as alpha-tocopherol, in the treatment or prevention of coronary heart disease and other assorted ills.

¹Bressani, R., and Behar, M: *The Use of Plant Protein Foods in Preventing Malnutrition*. In Proc. 6th Internat. Congr. Nutr. p. 182 (1964), Livingstone, E.S.

Truth: As yet the claims made have not been convincingly verified. There is no conclusive proof that pharmacologic doses of Vitamin E benefit any disease condition. Vitamin E does have a role in the human body; however, the importance assigned to it is completely out of all proportion to its demonstrated functions.

SUMMARY

Good nutrition can be achieved through a variety of ways and by the proper selection of indigenous foods. Food patterns will vary from island to island and from person to person. Our ways of eating are dependent upon agricultural and economic resources and cultural values. There is no one best pattern of eating nor is there one particular food which is exclusive in promoting health and well being. Good nutrition depends upon securing sufficient amounts of the specific nutrients and it makes little difference whether the amino acids come from beef or from iguana or from judicious mixtures of cereals, legumes and dark green leafy vegetables and small amounts of animal protein. Food faddists, and in fact many other individuals, fail to grasp this concept of nutrition that health can be achieved by a variety of foods. They preach the merits of a particular food and the demerits of others.

Enrichment of certain foods: Iodine to salt, Vitamin D to milk, Vitamin A to margarine; thiamine, riboflavin, niacin and iron to flour and fluoride to water - has been most important in bringing better nutrition and better health to both young and old in many parts of the world. Legislation is currently being sought to ensure that many of these items are also fortified and enriched in Caribbean countries. Enrichment of a few basic staples helps give assurance that good nutrition is readily available to all, via every grocery store or supermarket. So-called "health food stores" with their "health" foods, "nature" foods, and "food supplements" are unnecessary and are a great waste of money.

But of more importance, the claims that are frequently made for many of their products are deceptive.

ROLE OF THE NUTRITIONIST IN COMBATTING FOOD FADDISM

Misinformation and the temptation to mislead has a long and most frightening history; it is not likely that the problem will be entirely solved. However, it is possible that as professional nutritionists we have somehow failed to fill the gap. Nutrition education obviously becomes the responsibility of all persons providing professional services in preventive medicine, in curative medicine and in the expanding spectrum of rehabilitation. Nutritionists have the obligation to present information to the public on matters that will make for rational decisions. Information does not create motivation to behave adaptively but neither can there be motivated adaptive behaviour in the absence of information.

It is true that we are all busy people and cannot go about giving lectures continuously as if we were making our living by doing so, but we have an obligation to help those who wish to know the truth by participating in public service programmes. We also might sometimes be more alert to the educational import of the work we are doing. Is every meal we serve in our hospitals a practical lesson in nutrition? Do our employees and our patients appreciate this? Do we set a good example in our eating practices? These are little things that make a difference. Perhaps we underestimate the public's interest and ability to understand. We teach the simple facts about nutrient content of foods and the adequate diet but we say nothing about more involved matters, and this leaves an opening for the quack. Let us be more concerned about taking the public with us each step of the way as progress is made in the science of nutrition.

Once fad ideas are entrenched and people are emotionally involved with their food practices, it is pretty late to effect a change. Ideally nutrition education should begin in childhood.

In order for the nutritionist to serve most effectively in her efforts to provide positive and useful information to the public, it is essential that she be currently informed of the sources and the types of misinformation. Whether or not "all health foods" and diet plans are acceptable from a nutrition and medical point-of-view, they do focus attention on the importance of food and nutrition. So we need to appraise each theory objectively.

We must evaluate each new or different eating practice on the basis of its nutritional adequacy and its acceptance by those who favour it. Preaching good nutrition based on food guides will get us nowhere. Although, useful as a teaching tool, the guides are not meant to be the final criterion in evaluating a daily eating plan.

Our criterion must be the most recent information from nutrition, medical, biological and sociological researchers and scientists. This means continually updating our information to keep pace with the rapid advances in these fields. As our evaluations continue we should encourage the good trends and the acceptable eating practices and deal constructively with those which have a deleterious effect on the body's complex metabolic systems.

Scientific facts are established by the experimental method but folklore has in many instances been shown to be in line with scientific fact. Thus we need to determine what has and has not been established as scientific fact.

Our rebuttal to the quack therefore is the same question that we ask ourselves - "what is the evidence?"

How do we attempt to combat food faddism? Perhaps there is need for programmes that operate on a more intimate basis by providing an easily accessible

resource for answering questions of personal nutrition concern. One programme which operates on the thesis that providing sound nutrition information on a personalized basis is a positive preventive measure against the spread of food misinformation is the Dial-A-Dietitian service. This is a programme of nutrition education by telephone offered by dietetic associations in several cities throughout the United States and Canada. By dialling a well-publicized telephone number, people in these cities have their nutritional concerns referred to volunteer dietitians who return the call with specific information requested. By counselling the caller informally on the telephone, the dietitian is able to offer sound nutritional advice to a person especially susceptible to the exaggerated promises of the promoter of food misinformation. Could this type of service be introduced in the Caribbean.

Do we need to find ways to make the truth as alluring as the fiction?

Do we need a hybrid profession nutritionist-journalist?

How does the commercial world tackle the introduction of new foods when they want to promote sales? Can they teach us some lessons?

These are questions which challenge all of us. Any suggestions?

CAJANAQUOTE.

Perhaps the important function of economists and planners at this time is to indicate to nutritionists the kind of quantitative information needed for formulating priorities, rather than attempting premature analyses which can only result in reinforcing their, at present, very partisan attempts to convince administrators of the paramount importance of their own particular brand of palliative.

P. R. Payne
Amer. J. Clin. Nutr., 25 (1972) 970.

UNSUPPLEMENTED HUMAN MILK AND THE NUTRITION
OF THE EXTEROGESTATE FOETUS
(PART I)

by

Derrick B. Jelliffe*, J. Michael Gurney**
and
E.F. Patrice Jelliffe

Lactation is the most fundamental characteristic of the mammalian order, dating back some 200 million years. Biologically, it long antedated placental gestation, as can be observed to this day in such ancient mammals as the egg-laying echinoderms, characterised by the duck-billed platypus.

During these vast periods of time, infinitely varied adaptations have occurred in the composition of the milks of different mammal species.

Man has reared his young offspring on human milk for the approximately 500,000 years of his existence. The possibility of using non-human milk for infant rearing only became feasible with the development of villages and subsequent domestication of milch animals some 11,000 years ago. By contrast, the widespread use of cow's milk formulas for infant feeding, at least in the so-called Western world, has only occurred within living memory, notably within the past fifty years, as a result of the technological revolutions in dairy farming and milk processing.

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Artificial feeding with cow's milk, so unquestioningly accepted in industrialized countries in the Western world, is, in fact, not only extremely recent, but also highly experimental and uncertain on a community basis, especially in relation to long-term consequences.

BIOLOGICAL STATES AND INFANT FEEDING

The nutrition of the young human organism can best be understood in relation to the hypothesis that the human foetal period is of eighteen months duration, as regards dependency on the mother⁽¹³⁾.

The early and nutritionally vulnerable period of human existence can, therefore, be best considered biologically as: (i) the Intrauterine foetus, (ii) the extergestate foetus (six to nine months), and (iii) the transitional.

In this continuum, plainly the nutrition of the mother and her young offsprings are intimately interrelated at all stages. During the extergestate foetal period, the baby is in traditional circumstances as dependent upon and close to the mother as is the Intrauterine foetus in the mother's womb. The breast takes the place of the placenta and, indeed, in a number of traditional cultures the extergestate foetus is marsupialized on the mother's back, with continuation of the same type of sensory stimulation as occurs *in utero*.

UNSUPPLEMENTED HUMAN MILK

The purpose of the present paper is to consider the present state of knowledge concerning the ability of unsupplemented human milk to satisfy the nutritional needs of the extergestate foetus.

Time does not permit consideration of other aspects of this important subject, such as the psychobiological effects of different forms of infant feeding and of mother-baby interaction, or of economic considerations of

artificial feeding compared with breast feeding.

The subject may be considered under three headings:

1. Biochemical uniqueness of human milk
2. Anti-infective properties of human milk
3. Human milk as a sole food.

1. *Biochemical Uniqueness of Human Milk*⁽¹³⁾

Gross differences in the basic composition of human milk and cow's milk have been well known for a century, and this understanding has enabled cow's milk to be modified domestically and commercially for easier digestibility and to supply in an approximate manner the infant's needs of major known nutrients.

However, very recent research has re-emphasized the uniquely complex nature of human milk, made up of over 100 constituents, present in proportions and chemical composition that are quite different from the equally complex composition of milks of other mammals.

Rather than old-style comparison confined to proximate principles, such as the casein: lactalbumin ratio, lactose milk 'fat', or of major minerals such as calcium, it is increasingly apparent that the milks of all species of mammals are very different from one another, as regards range and type of all constituents.

In the last decade, over 300 scientific papers have been published on the biochemical properties of human milk, and yet the imperfectness and still developing knowledge in this field is indicated, for example, by the recognition as recently as 1966 of six previously undescribed polysaccharides in breast milk.

Major recent biochemical findings of practical significance include the high level of linoleic acid in human milk, which is of importance in view of the clearcut syndrome recognized in deficient babies.

Also, human milk not only supplies specific fatty acids, and high levels of cystine and lactose (and hence easily available galactose) for growth during early infancy and particularly for brain development, but is also designed for easy digestion and assimilation, as for example, with the fat already in the process of digestion by the action of lipase present in breast milk. Calcium absorption and metabolism are more efficient with human milk than with cow's milk, so that hypocalcemic tetany of the newborn is rare.

In addition to the highly efficient use of fat (as the main source of calories) and of calcium, the curd tension of human milk and the consequent pattern of stomach emptying are different, and, together with the possible protein-synthesizing effects of the specific pattern of nucleotides present, may play a part in the clinically well-recognized, highly efficient utilization of human milk.

2. *Anti-Infective Properties of Human Milk*

Human milk, including colostrum, is probably never strictly sterile microbiologically when it reaches the neonate, and may contain 'skin organisms' and enterobacteria, presumably derived from the mother's nipples and fingers. Nevertheless, the bacterial level is low, as there is no opportunity for growth and multiplication of microorganisms.

Additionally, and often unappreciated, human milk has inherent positive and anti-infective properties, including the 'intestinal guardian' function of the bifidus flora (which appears to check the growth of undesirable pathogenic organisms), the high lysozyme content (3,000 times greater than in bovine milk), and the range and level of immunoglobulins, especially in colostrum.

Also, recent work emphasizes the cellular content of colostrum, including not only 'colostrum corpuscles' (macrophages engorged with fat droplets),

but also motile, phagocytic macrophages, containing abundant lysozyme and synthesizing immunoglobulins.

The inherent and active anti-infective properties of human milk in early infancy are most strikingly evident against enteral infections, such as *E. coli* diarrhea of the newborn and poliomyelitis.

The protective functions of human milk are, of course, of even greater importance in 'less developed circumstances', that is, in areas *all over the world* where the community is impoverished, with accompanying low educational levels, a highly contaminated environment, an inadequate water supply and waste disposal, and with little culinary equipment for food preparation or storage. The relationships between weaning, artificial feeding, and diarrhea (weanling diarrhea), and conversely, the 'antidiarrheal function' of human milk, especially in the highly susceptible early months of life, cannot be overstressed in developing countries.

3. *Human Milk as Sole Food*

A basic concern in infant feeding during the exterogestate foetal period, especially in so-called less developed, mainly tropical areas of the world, is not only the vital importance of human milk in the earlier months of life, but also *the length of time for which it can be used alone and unsupplemented, particularly with poorly nourished mothers.*

Considerable difficulties exist in such assessments, including the design of different trials and the various methods employed. Many variables can exist, including for example, the effects of infections on growth, different forms and degrees of maternal subnutrition, and such important psychophysiological considerations⁽¹⁾ as the culturally employed methods of breast-feeding, in relation to suckling stimulus and to the let-down reflex.

The protein-calorie adequacy of breast milk alone can be assessed by estimating the output, either by test-feeding on each occasion the child is fed or by expressing breast milk, together with qualitative assays of the composition of milk.

However, these methods are, plainly, fraught with many difficulties and most experienced workers would agree that it is more usually practicable to observe the effect of breast-feeding on infant growth compared with standards considered to be most appropriate locally.

WELL-NOURISHED MOTHERS

Evidence from various parts of Europe and North America has shown that *full-term infants of well-fed mothers can be successfully breast fed for some six months of life without additional feeds of cow's milk or semi-solid foods and without vitamin or mineral supplements.* The best documented account has been given by Jackson and colleagues in the U.S.A. (11)

Current scientific evidence gives no basis for the present-day Western fashion of early introduction of semi-solids to the infant's diet in the first weeks of life, but rather indicates the danger that by so doing the seeds of 'multi-cell obesity' may be sown as a result of over-feeding, with potential for life-long ill-consequences. (21)

POORLY-NOURISHED MOTHERS

Of more immediate consequence to the pediatric nutritionists in less developed parts of the world is the question of the nutritional adequacy for the exuterogestate foetus of unsupplemented human milk when derived from poorly-nourished mothers.

Again, many variables come into the picture and there is much need for further investigation.

However, as regards *vitamin levels*, recent evidence indicates that in general terms these are related to the nutritional adequacy and stores of the mother in pregnancy and even more in the actual period of lactation. Thus in India, *Belavady*, has shown that maternal supplementation increases levels of vitamins A, B₁, C and riboflavin in the milk of poorly-nourished mothers;⁽⁵⁾ while in Bombay, lacto-vegetarians have been found to have low levels of B₁₂ in their breast milk.⁽¹²⁾

A considerable amount of information has become available in the last decade concerning the apparent adequacy of unsupplemented human milk as regards *calorie and protein needs* in young infants, at least as reflected by the composition and volume of milk produced, and, more usually, by growth curves of breast-fed babies.

As might have been expected with manifold ecological variables, considerable differences occur from one area to another. Thus, *Bailey* found significant variations in volume of human milk produced in different localities in the New Guinea Highlands.⁽²⁾

Also, difficulties in interpreting the growth curves exist in relation to the prevalence and significance of low birth weights in the particular community, and in the selection of the standard curve thought to be the most appropriate reference for the particular group being studied.

However, as a generalization more recent studies from such varied, but poorly-nourished, parts of the world as New Guinea, Ethiopia and Tanzania, show comparable weight curves as those of Western standards of reference up to about four months of age.^(2,4,7,9,18) However, in some studies growth has continued to be similar up to five months of age as in Malaysia,⁽⁸⁾ while in northeastern Tanzania weight increase was reported to have become inadequate after three months.⁽¹⁹⁾

However, as has been frequently noted, the proximate principles in human milk are usually surprisingly little affected in poorly-nourished communities.^(20,21) Nevertheless, protein and fat levels are usually at the lower range of normal levels, as is the volume of milk produced.^(2,3,14,23) Conversely, increasing maternal protein intake has been shown to lead to an increased volume of breast milk produced; while supplementation of the diets of poor lactating mothers in India with fat and protein showed breast milk levels of both to increase to a ceiling level.⁽¹⁷⁾

Also of significance in the continuum of mother-child nutrition is the fact that in many less well-fed communities in developing countries, mothers do not have a physiological gain in weight in pregnancy, especially the laying down of calorie reserves in the form of subcutaneous fat; and also give birth to low weight neonates, partly due to inadequate maternal nutrition during gestation.

Conversely, supplementary feeding in pregnancy has been shown both to raise birth weights and also to increase the body weight of the mother during pregnancy.⁽⁵⁾ Likewise, vitamin supplementation during pregnancy in various parts of India, have led to subsequently raised levels of vitamin B₁ and C in the breast milk of poorly-nourished women.⁽⁶⁾

The remainder of this paper, comprising the practical conclusions arising from the evidence presented here will, be published in the next issue of 'Cajanus' along with the references for both parts.

NUTRITION AND FERTILITY

by

C. Gopalan¹ and A. Nadamuni Naidu¹

SUMMARY

Malnourished populations are generally thought to have high fertility-rates, but in fact poor diets impose restraints on fertility by affecting sex ratios, raising age at menarche, and increasing pregnancy wastage and child and maternal mortality. When family size is large, the nutrition of the family is affected. It is suggested that to overcome the twin problems of malnutrition and population a concerted approach is needed rather than compartmentalised programmes as is so often the case.

INTRODUCTION

In the interrelated problems of malnutrition and population growth there are the effects of poor nutrition on fertility and reproductive performance, and the effects of uncontrolled fertility on nutritional status. In this paper we will review evidence on these two aspects, drawing largely on Indian experience.

EFFECT OF MALNUTRITION ON FERTILITY

It is generally believed that malnourished populations have high fertility-rates. However, a careful scrutiny of the data indicates that malnutrition, in fact limits fertility.

¹From the National Institute of Nutrition, Indian Council of Medical Research, Hyderabad-7, India. Reprinted, with permission, from the Lancet 18th November, 1972 pages 1077 to 1079.

SEX RATIO OF POPULATIONS

In almost all affluent countries the F/M ratio (females per 1000 males) is above 1000, while in the developing countries the ratio is uniformly below 1000:

Country	Sex Ratio
U.S.A.	1031
U.K.	1056
France	1050
Japan	1036
Philippines	983
Israel	943
Pakistan	900
Thailand	996
India	941

Source: U.N. Demographic Year Book
1965

In India the F/M sex ratio has fallen over the past few decades (Fig. 1).

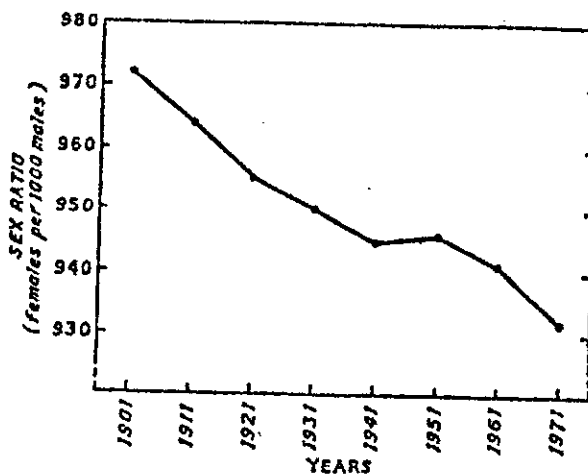


Fig. 1—Decline in sex ratio in India, 1901-71.
Source: Census of India.

A comparison of the sex ratio of populations at different age periods in three countries of the world reveals some striking differences (Fig. 2).

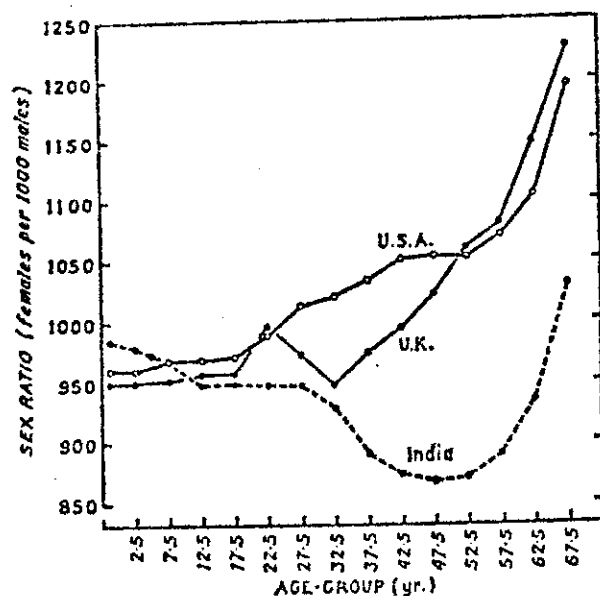


Fig. 2—Sex ratio at different ages in U.K., U.S.A., and India.
Sources: U.N. Demographic Yearbook, 1955, and Census of India, 1963, paper no. 2.

In India, unlike the U.S.A. and U.K. the ratio declines from 984 at the age of 1 year to 948 at the age of 12 years. Between the 12th and the 25th years this trend is arrested, to be followed again by a sharp decline between the 25th and the 45th years. After the age of 50 years, in all the three countries, the ratio tends to increase.

The decline in the sex ratio in the age range 1-12 in India is attributable to the higher mortality among girls than among boys. For example, among the under-5s death-rates (per 1000 live births) are:

Country	Year	Male deaths/1000 male live births	Female deaths/1000 female live births
U.S.A.	1964	4.3	3.6
U.K.	1964	3.1	2.7
Japan	1964	5.1	4.8
Australia	1964	4.3	3.7
India	1966	86.7	95.7

Source: U.N. Demographic Year Book, 1965

The most important cause of toddler mortality in developing countries is malnutrition. Our field studies indicate that among children with kwashiorkor females outnumber males by 4 to 3 in poor communities, but on hospital admission records males outnumber females by 53 to 47, suggesting that although more girls have kwashiorkor, mothers tend to bring boys more readily to hospital for treatment. Among children admitted to hospital with kwashiorkor, however, there was no significant difference in mortality-rate as between the males and females. The greater mortality among female children in malnourished populations could arise from relative neglect of girls.

The decline of sex ratio in the reproductive period is largely attributable to maternal mortality, again arising mainly from malnutrition. The maternal-mortality rate in India has been as high as 252 per 100,000 live births in the past two decades. The decline in sex ratio starts after the 25th year - an observation in keeping with the finding that the incidence of maternal mortality is greatest after the third child.

The higher mortality of females in childhood and in the reproductive period is also reflected in the fact that in India, unlike affluent countries, the expectation of life at birth in females is actually lower than in males.

Clearly a low sex ratio in the reproductive period, which seems to be a characteristic feature of malnourished populations, will result in a limitation on fertility.

AGE AT MENARCHE

The generally higher age at menarche among the relatively malnourished populations than among the well-nourished groups holds true when two different socio-economic classes belonging to the same ethnic group are compared. This was shown by an extensive nationwide survey of more than 24,000 girls in India:

Per caput income per annum (Rs)	Mean age at menarche (yr.)
≥900	13.20
≤100	14.56

Source: Prabhakar et al.¹

In another survey the mean age at menarche was higher in rural populations than in urban ones - an observation which might be significant in the light of findings that dietary status in India is poorer in the country than in the towns.

	Sample size	Mean age at menarche (yr.)
Urban	785	12.86
Rural	1010	14.30

Source: Shantha Madhavan²

However, delay in the onset of menarche induced by malnutrition is likely to make only a marginal impact on fertility.

PREGNANCY WASTAGE

In undernourished rats the litter size is reduced and fetal resorptions are common. An earlier study from our Institute³ had suggested that 16-19% of pregnancies among low-income groups ended in miscarriages and abortions, but more detailed work indicates that 16-19% is a gross underestimate of the true extent of pregnancy wastage in malnourished Indian communities. Sundar Rao⁴ systematically followed up a large number of women before the first missed period until the end of the pregnancy. These women belonged to the low socio-economic groups (2537 rural, 2021 urban) subsisting on diets providing less than 1850 kcal. and 44 g. protein daily. The pregnancy wastage observed in the study was about 30%, so wastage must be considered a major constraint on fertility in malnourished populations.

MATERNAL MORTALITY

Another major limitation on fertility is maternal mortality. In India, more than 20% of maternal deaths⁵ are caused by anaemia, indicating that malnutrition is a major determinant of the high maternal mortality.

STILLBIRTH-RATE

The stillbirth-rate in relatively undernourished countries is higher than in the affluent parts of the world⁶ - 11 per 1000 live births in India. A major cause of stillbirth is prematurity, again largely attributable to maternal malnutrition. Prematurity is also the major factor underlying neonatal mortality.

LACTATION

Practically all mothers in malnourished communities breast-feed their children for anything up to two years.⁷ This practice is attributable to cultural and to economic factors (many mothers cannot afford to give their babies

artificial supplementary foods). The relative infertility associated with successful lactation is generally recognised, so prolonged breast-feeding in malnourished communities is also a constraint on fertility. In India the mean interval between pregnancies in poor-income groups, where no contraception is practised, is about 32 months.

POTENTIAL FERTILITY

Malnutrition clearly constrains fertility. However, the "potential fertility" of a well-nourished population, which might be expected to be higher than that of a malnourished group, will be largely masked by contraceptive practices. To appreciate the effect of malnutrition the fertility-rates of malnourished populations must be compared with those of affluent countries before family planning was widely adopted:

Place	Fertility-rates (/1000 exposure-years) in age group:					
	20-24	25-29	30-34	35-39	40-44	45-49
French Canada (marriages of 1700-29)	509	496	484	410	231	30
Norway (1874-76)	519	430	360	300	181	33
Finland (1880-81)	406	357	322	261	156	27
New South Wales (1871)	441	408	337	271	134	7
Yunlin (Taiwan) (1952)	365	334	306	263	114	8
Delhi ward (1952)	354	308	267	176	77	15
Hyderabad (1972)*	290	295	209	116	66	0

Source: Savitri Thapar (papers contributed by Indian workers to the World Population Conference, Belgrade, Yugoslavia; issued by the Office of the Registrar General of India, 1965)

*National Institute of Nutrition, 1972 (unpublished).

If we improve the nutrition of people who are at present malnourished, but do not bring about any socioeconomic changes at the same time, the result will be a significant increase in population growth. However, this prospect need not alarm us - nor need it be interpreted as an argument against improving nutrition. Sustained nutritional uplift of a people can be brought about only as part of an all-round socioeconomic improvement, not as an isolated operation. The very social changes which are an essential prelude to better nutrition are themselves powerful constraints on fertility - through promoting increased acceptance and wider use of family planning - and such constraints will more than offset any increase in "potential fertility" arising from nutritional improvement. This conclusion is borne out by studies which show an inverse relation between family size and dietary intake:

Dietary Intake (kcal./day)	Family Size	
	Rural	Urban
<2000	5.61	5.56
>2000	4.90	3.69
Pooled (all India)	5.14	4.65

Source: National Sample Survey,
1969, No. 200

EFFECTS OF UNCONTROLLED FERTILITY

On Nutrition

In malnourished populations subsisting on marginal or deficient diets uncontrolled fertility will have inevitable deleterious effects on health. In an earlier study from this Institute it was found that nearly 61% of cases of protein-calorie malnutrition were of birth orders 4 and above, while among all children admitted to the same hospital, children of birth-order 4 and above constituted only 34%.^{8,9} It was

concluded on the basis of this study that a limitation of family size to three children would reduce the incidence of severe protein-calorie malnutrition by nearly 60%.

On Maternal Health

Among the poor in India, women of childbearing age take less than 2000 kcal. and 44 g. protein, largely as vegetables. This diet does not improve much during pregnancy or lactation, and is clearly inadequate. Nitrogen-balance studies during pregnancy and lactation, done in our Institute, show that on such diets the retention of nitrogen during pregnancy is minimal, while during lactation there is actually a negative nitrogen balance.

Because of the high pregnancy wastage among the poor, a woman has to go through eight pregnancies to attain a family size of five. The mean interval between two pregnancies is about 32 months, but for much of this time the women are nursing their infants. Thus, throughout their reproductive lives, women in the poor groups are either pregnant or lactating. The nutritional demands of pregnancy and lactation superimposed on women living on marginal diets must be reflected in their health. We have found that body-weights of women of child-bearing age ranged from 39 to 44 kg; 44% of pregnant women had vitamin-B-complex deficiency, 15% had hypovitaminosis A, and nearly 10% had hypoproteinaemia.

A haemoglobin survey of pregnant women,¹⁰ selected at random in the third trimester, showed that 56% of them had a haemoglobin value less than 10 g. per 100 ml. The incidence of anaemia and signs of nutritional deficiency were higher in women of later parities.^{8,9}

Women in the reproductive period constitute nearly 23% of the Indian population. As a result of uncontrolled fertility, the health and nutritional status of this vast segment of population is greatly undermined.

CONCLUSION

Family-planning programmes and nutrition programmes must be closely integrated. Unless nutritional status is improved so that the desired family size can be achieved with minimum number of pregnancies, family-planning programmes will not be accepted: unless family planning is accepted and practised, nutritional improvement will be difficult. In many developing countries, unfortunately, the problems have been handled separately. What are needed are composite "package programmes" which will include such mutually reinforcing components as nutrition, health education, sex education, family planning, immunisation, and improvement of sanitation. Social changes aimed at raising the age of marriage and providing increased opportunities for employment, and education for women, and social security measures which will guarantee minimum living wages for families, will, in the long run, produce greater impact on nutrition and wider acceptance of family planning than ad hoc crash-feeding programmes and family planning campaigns. In the end the problem will be solved by instilling into the community a genuine desire to achieve an increased standard of living and by providing the means for realising this goal.

References

1. Prabhakar, A.K., Sundaram, K.R., Ramanujacharyulu, T.K.T.S., and Tasker, A.D. *Indian J. med. Res.* 1972, 60, 789.
2. Shantha Madhavan, *ibid.* 1965, 53, 669.
3. Venkatachalam, P.S., Kalpakam, S., and Gopalan, C. *ibid.* 1960, 48, 511.

4. Sundar Rao, P.S.S. Personal communication, 1972.
5. Menon, M.K.K. *In: Proceedings of the Nutrition Society of India Symposium on Nutrition and Anaemias; No. 2, p.1. Hyderabad, 1967.*
6. World Health Statistics Annual 1967. World Health Organisation, 1970.
7. Someswar Rao, K., Swaminathan, M.C., Swaroop, S., and Patwardhan, V.N. *Bull. Wld. Hlth. Org.* 1959, 20, 603.
8. Visweswara Rao, K., and Gopalan, C. *J. Nutr. Dietet.* 1969, 6, 258.
9. Visweswara Rao, K., and Gopalan, C. *In: Proceedings of the First Asian Congress of Nutrition (edited by P.G. Tulpule and Kamala S. Jaya Rao); p.339. National Institute of Nutrition, India, 1971.*
10. Gopalan, C. *J. trop. Pediat.* 1957, 3, 3.

CAJANAQUOTE

"If all the women in mainland Asia were to cease breast-feeding, an extra herd of 114,000,000 cattle would be needed to make good this loss".

D.B. Jelliffe
 "Mother's milk and other home
 foods" Gazette (PAHO) 5, No. 2. p.11.

COMMUNICATION: THE ART OF SELLING IDEAS

by

T. H. Henderson¹

Nutritionists and dietitians in the region are understandably very concerned about the nutritional patterns and eating habits of a large section of the Caribbean community. They wish to see effected a functional change in nutritional practices and hence are seeking a form of social change.

Theorists identify three steps in the process of social change: invention, diffusion and consequence. Invention is the process by which new ideas are created or developed. Diffusion is the process through which these new ideas are communicated throughout a social system. Consequence is change occurring within the system as a result of the adoption or rejection of the innovation.

Nutritionists and dietitians in the Caribbean have developed ideas about utilisation of food and feeding patterns in the region which are considered more desirable than those currently widely practised. It is felt that the consequence of adopting these new ideas would be greatly increased community health standards as well as economic and socio-psychological benefits of which members present are too well aware. The extent to which we achieve adoption of these ideas in Caribbean communities is dependent on how effectively we can communicate these ideas to have them implemented at the individual and family level. In other words, our success at social change depends on our ability to

¹From the University of the West Indies Department of Agricultural Extension. This paper was presented at the Caribbean Association of Nutritionists and Dietitians' meeting held in Barbados on 28th and 29th June 1973.

communicate effectively, how well we can SELL OUR IDEAS.

COMMUNICATION

Put very simply, communication is the process by which messages are transferred from a source to one or more receivers. Furthermore, there must be mutual understanding of the content of the message and of the response expected of the audience before communication can be considered complete.

The above definition identifies the three major elements in the communication process, viz:

1. The source, or communicator of the message
2. The message, and
3. The receivers of the message, or the audience.

Careful attention to various aspects of each of these elements is necessary if purposive communication is to be effective.

AUDIENCE

The audience, or the receivers of the message form the key link in the communication process. The manner in which they react or respond to the message determines the outcome of all of the source's efforts. In order to be able to frame his message in a manner most likely to elicit the desired response the source needs to have specific information about the audience in the following areas:

1. The specific audience - whom are we trying to reach:
 - an individual?
 - a group, e.g. a village, a particular socio-economic sector of the population, nursing mothers, etc?
 - a mass audience?

2. Attitudes and Behaviour

How deep is the audience's dissatisfaction with the present situation?

What is their economic situation, and how will the new idea affect this?

Are there social and religious characteristics which will influence their behaviour?

How strong are their beliefs and taboos, and what is their value system?

Are there human limitations which must be considered, e.g. education and age?

Has the audience a preference for one or other communication approach e.g. individual visit vs. lecture, small group meetings vs. large group meetings?

Does the audience perceive the content of the message as relevant or irrelevant to its needs?

With regard to the subject-matter content of the message, where are the members of the audience in terms of adoption: are they totally ignorant of the subject? Are they aware but not interested? Have they already indicated some interest and some have even tried out the idea?

What is the source's credibility rating with the audience? Do they perceive him as capable of understanding and helping them?

It must be remembered that for every individual there is a perceptual screen, conditioned by his personal knowledge, skills, attitudes and socio-cultural background, through which is filtered all messages received. There is therefore a personal, as distinct from a general, interpretation of each message before individual action is taken.

An individual may fail to accept a message and act upon it because it attacks his self-image. For example, he may reject using a particular item of food because he perceives its use as lowering his status or his perceived

standard of living. Fear, particularly fear of ridicule from neighbours, can act as a powerful influence in an individual's rejection of a message.

THE MESSAGE

If communication is to be effective the message must be coded in such a manner that the idea intended by the source is so interpreted by the receiver. The treatment given to a message by the source, i.e. the actual content of the message, the symbols used, the complexity of presentation, and the channels used (e.g. speech in lecture or on radio, written work in newspaper or circular letters) will be influenced by:

1. The source - his capabilities
2. The audience - their capabilities and preferences. With a less sophisticated audience visual presentation, e.g. a film, may be the drawing card. With another audience the content, e.g. a lecture or written paper with presentation of facts following an objective analysis of a situation, may be more important.
3. Type of content of the message - some messages can only be communicated effectively through a demonstration.
4. Facilities which are available, e.g. radio, newspaper, television, etc.

THE SOURCE

The source is primarily the encoder. Like the audience, he is a product of a particular socio-economic background, and has certain knowledge, skills, experiences and attitudes which will influence the way he perceives the audience and the manner in which he encodes the message.

Frequent self-analysis is needed by the source to evaluate these following factors which influence how he encodes and presents his message, and the way in which it is interpreted by the audience.

1. Attitude towards audience (human relationship).
2. Communication skills.
3. Attitude toward subject-matter. (Is he really sold on the idea?)
- 4 Knowledge level with regard to subject-matter of knowledge.

Communication is a two-way process, and the process is complete only after the audience has received the message, taken some action on it in the light of a mutual understanding of its content, and the source perceives and understands the action taken by the audience. In social change, therefore, the source or initiator of purposive communication is a salesman, a seller of ideas. He should therefore do well to follow the following basic elements of salesmanship:

1. Know your product - Know all there is to know about the content of your message. This includes knowing about competing ideas and products and how they compare.
2. Get the customer to talk. Ask searching questions to get clients to reveal their problems and needs.
3. Listen, and keep listening.
4. Watch for clues that give an indication of how the client is disposed towards your idea.
5. Find out what he likes most about the idea and emphasise these in your presentation. Emphasise positive aspects of the innovation and defuse negative aspects.
6. Wherever possible let audience personally try out or experience the innovation. The commercial salesman would say, "let the customer handle or operate the commodity. Possession is nine-tenths of the sale." Therefore demonstration and audience trial are always advisable.
7. "Go after volume of business. Real profit depends on number of units of sale." Therefore try to sell the idea to as many people as possible.

Telling is not selling. Aggressive selling may change the slope of the demand curve. Therefore be aggressively positive in selling ideas upon which you are really sold.

CAJANAQUOTE

When you don't have any money the problem is food. When you have money, it's sex. When you have both you worry about getting ruptured or something. If everything is simply jake then you're frightened of death.

J.P. Donleavy
'The Ginger Man'

NUTRITION NEWS AND OPINION FROM THE CARIBBEAN

MALNUTRITION LOWERS CANE CUTTERS' PRODUCTIVITY¹

Peter Heywood, of Cornell University, until recently on secondment to the Caribbean Food and Nutrition Institute, examines the effect of malnutrition on Jamaican cane cutters.

As reaping of the 1973 sugar crop draws to a close amidst indications that sugar production will again show a decrease, most sections of the industry are looking for the reasons. One of the reasons given is that the productivity of many Jamaican cane cutters is low.

It is not our aim here to consider all the reasons given, but to concentrate on the labour productivity question. Why is the productivity of many Jamaican cane cutters low? Perhaps a clue to one of the factors involved is contained in an address to the Board of Governors of the World Bank in 1971 by the President of the Bank, Robert McNamara.

He acknowledged that malnutrition was one of the basic problems affecting the lives of people in developing countries and that one of the effects of malnutrition on adults was to limit their productivity.

In a way, malnutrition gets two chances during the lifetime of a person to limit his productivity - one chance in childhood when malnutrition may limit physical and mental development resulting in a decreased capacity for production in later life, and another chance during adulthood when malnutrition, particularly a shortage of energy in the diet, may limit both how hard and how long a person can work.

What is the basis for this rather definite statement by Mr. McNamara? A summary of much of the research on the relationship between nutrition and productivity is contained in a publication by L.I.F.E. (League for International Food Education) published in October 1972.

Nutritionists and physiologists know a great deal about performance in laboratory situations under strictly controlled conditions and the ways in which lack of food for relatively short periods of time will modify this performance. But this type of information is usually not very helpful when it comes to assessing the effects of malnutrition, which occurs over a relatively long period of time, on performance in the work situation.

¹This article first appeared in the Jamaica Daily News on 31st May, 1973.

Motivation

One of the important early studies which did attempt to make such an assessment was carried out by H.A. Kraut and E.A. Muller in Germany during and just after World War II. The twenty men studied were dumping debris from railway cars.

When measurement began in 1942 the rations received by the men were inadequate for heavy work. Under these conditions the men were dumping 1.5 ton of debris per man per hour.

Subsequently the rations adequate for heavy work were supplied to these men and within a year they were dumping 2.2 tons per man per hour.

In that same year body weight increased by an average 9 lbs./man.

During the next six months a cigarette bonus was offered to the men but the rations were not increased. Under these conditions average output eventually increased to almost $3\frac{1}{2}$ tons/man/hour.

During this time however, the men lost nearly all of the 9 lbs. weight they had gained in the previous year. Kraut and Muller argue that when the cigarette premium was not offered, production varied according to the calories available. When the motivation of the men was changed by offering the cigarette premium the men used up more energy than they were eating and lost weight.

Although this study suggests very strongly that nutrition has an important influence on production it also indicates some of the problems involved in studying this question. The first problem is that the relationship between food intake and productivity must be seen as a long-term one.

The fact that the men took a year to gain 9 lbs. in weight and only six months to lose it again illustrates the need to keep time in mind.

Applying this to the cane cutters, where the season lasts six to seven months, it is not enough to take weight at the beginning of crop and look for a relationship with production. It is equally important to detect any changes in weight during the crop and relate them to productivity also.

The second problem is motivation. For the men Kraut and Muller were studying, motivation apparently changed very markedly when the reward for a certain amount of work was increased.

But many will be objecting by now that it is a long way from dumping debris in Germany during World War II to cutting cane in Jamaica in 1973. And so it is. L.I.F.E. also recognized this problem, and, in an effort to obtain some "real-life" data in developing countries, mailed 292 questionnaires to "industrial organisations with experience in employee nutrition education, provision of food as a part of pay, provision of free or low-cost on-the-job meals and the like.

"The organizations queried were located all over the world, but the focus of the survey was the developing nations".

Local Study

Although the results of the survey do not lend themselves to rigorous scientific analysis a number of interesting points emerged in countries as varied as Mexico, South Africa, Saudi Arabia, Zaire, Colombia and Brazil, industrial feeding programmes were credited with improved productivity, lowered absenteeism and sickness rates, improved general health and vigour of the worker and in one case - where a public health and maternal and child health programme was also included - with a sharp drop in the infant mortality rate.

Despite all this evidence which suggests quite strongly that in many situations poor nutrition of adults limits the amount of work they can do, what can we really say about the situation in Jamaica? Are there results which will confirm or deny our earlier suggestion that nutrition may be one of the factors limiting the productivity of cane cutters?

To what set of results can the economist in the planning unit turn to assess the importance of the problem? If it is a problem, what policies are likely to be most beneficial?

At the moment the answers to most of these questions must rely on guesswork and hunches by the planner. However, the time may not be too far off when more factual answers can be given to these questions, particularly for cane cutters.

The Caribbean Food and Nutrition Institute and Cornell University, in cooperation with two sugar estates and with the assistance of the Sugar Industry Labour Welfare Board, the trade unions and the cane cutters are currently studying the effect of nutritional status of cane cutters on their productivity.

A total of two hundred cutters on both estates are being weighed at the beginning of crop and every two weeks from then till the end of crop. Blood samples are being taken to test for anaemia, food intake is being measured and energy expenditure may also be assessed.

Other Factors

At the same time productivity is being measured as well as factors other than nutrition which may limit productivity, such as days lost due to factory breakdown, rain and strikes.

Data on absenteeism and sickness rates are being collected. An attempt is being made to increase the food intake of the cutters during the second half of the crop to see whether an increase in productivity follows.

A number of other factors which may affect motivation and performance are also being measured. Such factors include size of family, number of dependents, indebtedness, employment during the off-season and the public health and living circumstances of a number of families and the nutritional status of the children.

When the results of this study are analysed at the end of the crop it is hoped that a clearer picture of the association between malnutrition and productivity in cane cutters in the Jamaican sugar industry will emerge and that a more factual basis for policy making will exist.

It will then be up to the politicians, planners, trade unions and leaders in the industry to put the information to use in a way which will benefit the industry, and in particular, the cane cutters.

One final word of warning. By the very nature of the cane industry, the cane cutter is cutting against a machine - the factory. If the capacity of the machine is too low in relation to the number of cane cutters, productivity will always be low as whenever the capacity of the machine is exceeded, production will be curtailed.

Less Food

As a result the productivity, and therefore, the earnings of the cutter will be low. Low earnings mean, among other things, less food to eat which means a lower nutritional status. So perhaps we should also be asking the question - which comes first, low productivity of labour, or low productivity of the machines?

The answer to some of these questions will, we hope, come from the study by the Caribbean Food and Nutrition Institute.

GRAIN LEGUMES - ANSWER TO THE PROTEIN SHORTAGE¹ *By Roy Reynolds*

A recent seminar sponsored by the Crops and Soils Department of the Ministry of Agriculture, Jamaica, has highlighted the importance of grain legumes in the diet of this country. This was as timely as it was important.

Jamaica today, in common with most of the countries of the world is faced with a serious shortage of animal proteins accompanied by unprecedented high prices of these products. It has therefore become a matter of high priority to find alternate means of proteins to feed a growing population.

Grain legumes provide the best and most readily available source of alternate protein, capable of being produced locally. Research scientists have established that not only can these legumes become major protein suppliers to the adult diet, but that they can provide a significant portion of the protein needs of young children.

¹This article first appeared in Volume I, Number I of the Jamaica Daily News on 31st May 1973.

As one authority observed: "Whole legumes can be blended for feeding the young child from four months of age Feeding the child from the family pot at an early age should be the aim of all families, if the child is to be well fed at an economical rate."

When viewed against the background of widespread malnutrition among young children in Jamaica the importance of this statement can be easily appreciated.

Legumes in their dry form contain nearly seven times less water and yield almost as many calories per unit of weight as cereals such as flour, rice and cornmeal.

In addition, most legume grains contain seventeen to twenty-five percent protein and about two percent fat. It is important to note that a legume producing a twenty-five percent protein yield is doing slightly better than meat, fish or eggs. It must be conceded though that proteins from legumes are not as complete as those from animal sources.

Vitamins

However, nutritional research carried out by agencies such as the Caribbean Food and Nutrition Institute and the Scientific Research Council, has demonstrated that the quality of legume proteins can be vastly fortified by combining them with cereals. Many such combinations are known in various parts of the world.

In Jamaica the most widely known such combination is rice and peas. Perhaps if it was sufficiently appreciated how good a food our dear "rice and peas" is, Jamaicans with an eye to economy and proper nutrition would bemoan less the gradual demise of their favourite meats. Other notable legume-cereal combinations are roti and dahl (split peas and wheat flour); and tortilla con frijoles (beans and corn meal).

But apart from supplying calories and proteins our legumes give appreciable yields of the 'B' group of vitamins. They are also important sources of iron and calcium.

The two most widely used legumes in Jamaica are red kidney beans, popularly referred to as "red peas", and gungo peas (pigeon peas). However, the country is not self-sufficient in either of these.

One contributory factor to this situation is that traditionally, our farmers are guided in their selection of varieties to plant by personal preferences, rather than by yields and adaptability. Thus farmers in the hills of St. Andrew plant the Cockstone variety, farmers in Christiana plant Round Red, and the Miss Kelly variety is preferred in the Mile Gully area.

A variety recently introduced from the United States has shown itself to be resistant to several diseases which have created severe losses to farmers and this variety has been described as having "better eating qualities than all other types of red peas". According to preliminary reports it is expected to be a good producer.

Bright Future

In the case of gungo peas, production has always been restricted. The main reasons given for this are that it is a labour intensive crop, being expensive to harvest, and that yields are frequently not high enough to compensate for production costs. Because of these limiting factors production of gungo has been confined usually to the handling capacity of the farmer and his family.

The main problem therefore, seems to be to develop a variety or varieties that will mature all at one time and which do not grow very tall. To this end much research has been directed by the Ministry of Agriculture in collaboration with the Faculty of Agriculture of the University of the West Indies.

Six experimental varieties have already been produced and are being tested. Meanwhile the research is continuing.

Another legume crop that Jamaican farmers are showing great interest in is soy beans. This crop is well-known throughout the world for its high nutrient capacity.

Six years ago the Crops and Soils Department of the Ministry of Agriculture started a series of investigations into the culture of soy beans, again in cooperation with the Faculty of Agriculture of the University of the West Indies. Sixty-four varieties of seeds collected from various countries have been tested and screened in two trials. Six varieties were found suitable to Jamaica in the first trial tests.

In a nation hungry for food generally and protein foods in particular, grain legumes seem to be headed for a bright future indeed.

FOOD SHORTAGE: THE FACTS¹

For many months Jamaica has been experiencing shortages of many food items. We have been short of some essential food items such as cooking oil, red peas, canned milk, onions, rice and flour. There are many reasons for these shortages some of which are beyond our control.

World Food Problems

The foreign countries from which we buy prepared food and raw materials to make food products have not been able to sell us the usual amounts which we need. Some countries which produce large quantities of food for export have lost portions of their harvests because of droughts or floods. The Guyana rice

¹ Anonymous. From the Public Opinion (Jamaica) 27th July 1973.

crop for instance failed in 1972 because of drought. There are world shortages of wheat and other grains, milk solids, meat and animal feeds. Some countries which used to export food, began to import food in 1972 which means that on the world market there is less for everyone. This also means that food prices have increased dramatically all over the world.

Money Problems

Because of world inflation and devaluation caused by difficulties in the world money situation, we have to pay more for the foods we import. Since importers have to pay more for their goods they naturally want to charge higher prices, but because the prices of some goods are controlled they cannot do this without permission. While price adjustments are being made, there is sometimes a shortage of these goods.

Some Local Problems

Some shortages have been caused by strikes. For instance the most recent shortage of condensed milk has been caused by a strike at the Bybrook Condensery. The Flour Mill was recently closed because of problems within that industry.

This led to a shortage in baking flour and less bread on sale.

Our cooking oil supply has been affected by Lethal Yellowing Disease which has destroyed many of our coconut trees. There has been massive replanting of the Malayan Dwarf which is able to resist the disease but many of these plants will not be bearing in economic quantities for some years to come.

Another problem in the coconut industry is that the crop which existed could not be fully reaped as there was a shortage of labour to pick the nuts.

Increased Demand for Food

In 1972 the Government provided \$17 million to ease the unemployment situation through its "Impact Programme". This meant that there were more people earning more money and wanting to buy more food. The mercantile community did not realise in time that the demand for food would increase so they were caught with insufficient supplies of various items.

The Government has not been willing to allow importation of goods at just any price as this would mean that where prices rose too high only a few people in our country would be able to buy what they need. But the fight to restrict price increases sometimes results in shortages.

The most important problem is the fact that Jamaican farmers have not been producing enough food to feed our growing population and we are still too dependent on foreign countries to supply our basic food items.

What the Government Has Done

As pointed out, many of the shortages go hand-in-hand with higher prices. The Government has been concerned to keep the price increases at the lowest possible level. In the fight to control the cost of living, the Government was able to hold back increases in the price of salt fish for some months, also to keep the price of the cheapest type of condensed milk by introducing Dawn milk.

The Government has also sent trade missions to different countries to seek out new and if possible cheaper sources of food.

What Must Be Done

The Government knows that it must make sure that enough supplies of the basic food items are available at all times. This is important if we are to avoid being badly affected by world shortages such as those which now exist. Most of all it has to develop the economy so that we produce more of what we need and thus become less dependent on foreign countries to feed us.

What Government Plans

The Government has both short-term and long-term plans to ease the situation. It is providing subsidies which will hold baking flour and tinned milk at present prices for this year.

The Tonnage Tax on imported flour and on milk solids has been taken off. Also excise duty on locally manufactured flour will not be collected.

A marketing company is being formed. This will be responsible for buying certain basic foods which we need. In this way we will be certain to have adequate supplies of goods to satisfy the needs of the people. The marketing company will not only buy finished goods and raw materials but will also process our own raw materials.

In addition to the Nutrition Complex on Marcus Garvey Drive which is responsible for the School Feeding Programme, there will be a People's Food Complex which will include - a banana processing plant, a cassava processing plant, a soya bean processing plant and a milk processing plant.

This forms part of the long-term programme to solve our problems by increasing local production. The Government has set definite targets for local production of corn and soya which make up the bulk of animal feeds. It has also set a target for increased rice production.

The important thing is that we must begin to feed ourselves by our own efforts. When we begin to do this, many of the present problems of shortages will disappear.

KITCHEN GARDEN CONTROVERSY

Overleaf we reproduce an article against urban kitchen gardens and a reply defending them.

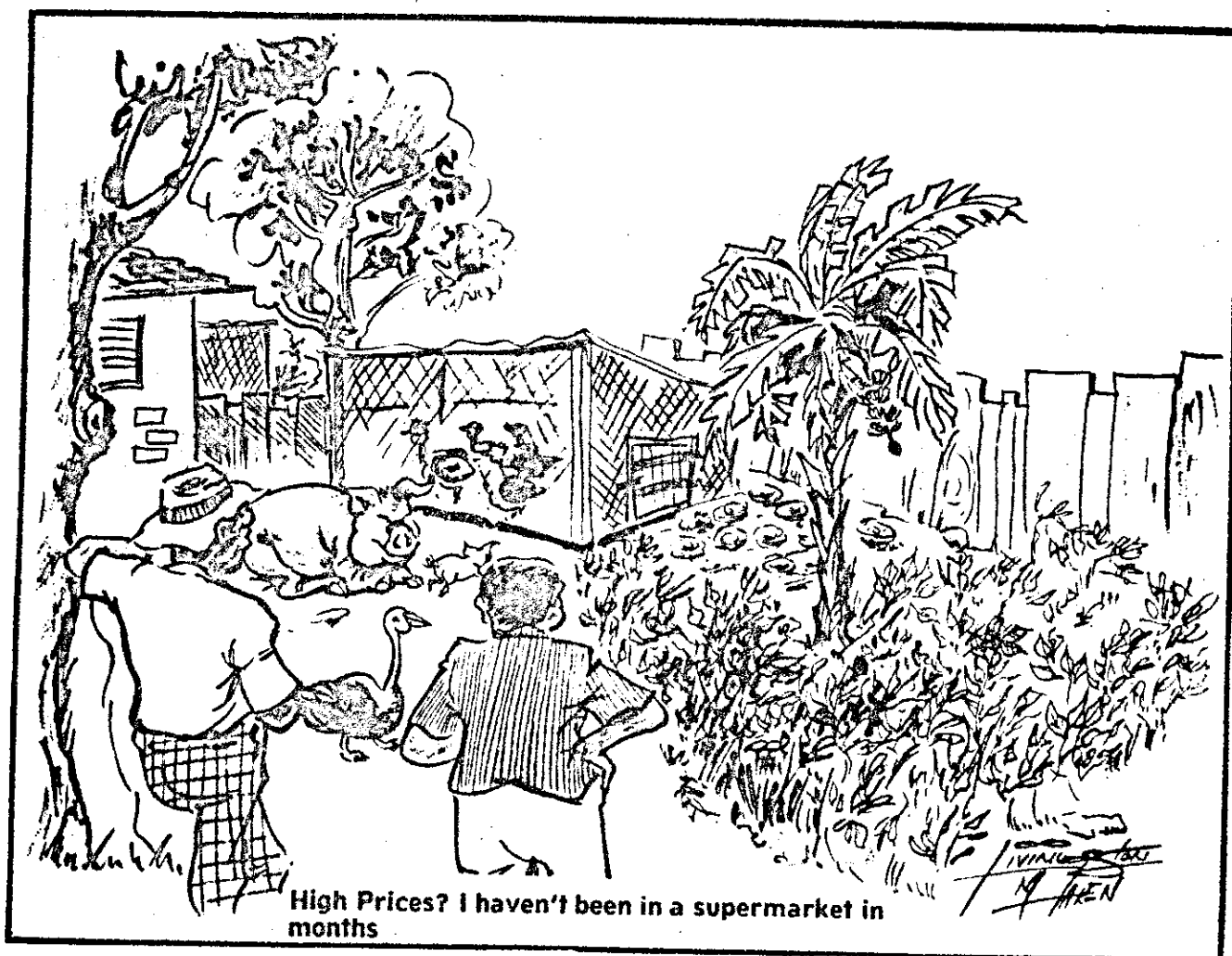
A quick-run around the Jamaican Centre of CFNI shows that of eleven people in the office at the time, six have both vegetables and fruit trees in their yards, three have trees alone, one has vegetables alone and one has no food produced.

The vegetables are cabbages, gungo pea (pigeon pea), tomato, cerasee, calaloo, banana, pepper, skellion, corn, pumpkin, bhajee (basella spp.), kale, thyme and mint.

The trees are orange, mango, breadfruit, avocado pear, soursop, ackee coconut, grapefruit, cherry, sweetsop, plum and guinep.

Readers' comments on this controversy are very welcome.

The picture below is reproduced with permission from the 24th August issue of the Jamaica Daily News.



JAS Board States Views - Fruit Trees, not Kitchen Gardens, for City Homes

Fruit-tree cultivation in the backyards and other open spaces of residences in the Corporate Area should be encouraged for the added production this will cause of goods constantly in demand, but kitchen garden activity in the same area should receive no sponsoring.

This was what some leading members of the Jamaica Agricultural Society's board of management said, on Wednesday, when a proposal from Mr. R. J. Blake, retired school headteacher, came before the regular monthly meeting for consideration.

Mr. Blake's suggestion was that the Corporate Area should be organised on a constituency basis to go in for kitchen garden production as an adjunct to the national effort to be self-sufficient in food. He offered personally to donate \$100 as a first prize in such a competition.

Commenting on the proposal and the offer, Mr. Ivan Tomlinson, a direct member's representative on the board of management, said he could go along with tree crops cultivation being sponsored in the Corporate Area by the Society, but not kitchen gardens.

Kitchen gardens would cut into the area in which small farmers were striving to make their contribution to the national effort, but there was also another objection that he saw. This was the expense of the water to irrigate all those gardens, the speaker said.

Water in the Corporate Area was expensive water insofar as tax payers were concerned. It was water purified and chlorinated, and he did not see how it would make economic sense from the community's point-of-view to use such water to grow vegetables and tubers. Fruit trees were a different matter.

Supporting, Senator the Hon. A. G. R. Byfield said that if the J.A.S. took up Mr. Blake's idea, that meant it would be obliged to find staff to supply the information participants in the plan would want, and also to give technical assistance. He did not see the Society being able to afford to do this in the present state of the country.

A decision was finally taken that if Mr. Blake wished to take up the matter with the J.A.S. St. Andrew Association of Branches, and if the branches wished to sponsor such a competition among its members and supporters, it could do so. The proposed competition was not a matter for a national body like the J.A.S., speakers said.

The meeting agreed that a reply should be sent to Mr. Blake to that effect.

Kitchen Gardens, Certainly

THE EDITOR, Sir:- In the Gleaner of Saturday, March 17, the farming section carries an item headlined "Fruit Trees, Not Kitchen Gardens, for City Homes", with which the National Consumers' League disagrees.

Leading members of the J.A.S. Board of Management felt that kitchen gardens would cut into the area in which small farmers are striving to contribute to the National effort. Our Organization takes the view that, by planting a kitchen garden, the householder would be contributing to the national effort, and the health and well-being of his family, because very little of small farmer's produce reaches the Corporate Area homes. When it does, by way of distributors and retailers, it is too expensive.

With the advent of austerity, the National Consumers' League strongly advised householders to plant vegetables, even if only in their flower beds (and thereby use no more water than they would to grow flowers anyway). We hear reports that families are now reaping. These people are doing their own little thing, asking for no assistance from J.A.S., and are now enjoying the benefits of fresh, inexpensive nutrition.

We are asking that this planting and rotating continue. Where there is no land space, plant lettuce or skellion in window boxes. Plant cherry trees and gungo peas in open spaces.

Householders are not competing with farmers in attempting to grow a little of their own fresh food. The cost of living is high and consumers are determined to make things a little easier for themselves and to help the economy of the nation.

I am

Vie Mendes (Mrs.)
President
National Consumers' League

NEWSPAPER CLIPPINGS

BREAST FEEDING (Editorial)
From The Star (Jamaica) 4th June 1973

The best food for babies is mother's milk. But, according to Dr. Derrick Jelliffe, formerly Director of the Caribbean Food and Nutrition Institute, "breast feeding began to decline in the western world in the present century" and in the last few decades the fashion of bottle feeding has caught on with the better-off classes in suburban areas of developing countries and, even worse, continues to spread among the less well-to-do.

The doctor points out that "not only is breast milk unique and impossible to imitate, but at the same time home hygiene makes it almost a certainty that the artificially-fed baby gets a very dilute, contaminated feed in urban and suburban areas of developing countries, which leads to an increase of diarrhoeal diseases and marasmus."

Commercial advertising has, of course, encouraged baby food products; but another cause for the falling off in breast feeding is the desire of so many mothers to return to work as speedily as possible. Many mothers hardly think it worthwhile to breast feed, say, for a single month's postnatal maternity leave. But Dr. Jelliffe insists that even a month's breast feeding is better than none at all. Indeed, even part-time breast feeding, where whole time breast feeding is inconvenient should be continued for as long as is feasible.

GIVING OUR PEOPLE GOOD NOURISHMENT (Editorial)
From The Advocate News (Barbados) 30 June 1973

As would be expected, a number of interesting points have emerged from the second annual meeting of the Caribbean Association of Nutritionists and Dietitians. The meeting which is being held at Marine House, has come at a time when throughout nearly the whole West Indian area, varying shortages of a number of staple foods is causing more than ordinary concern.

With increased knowledge and better education, an increasing number of people in the area no longer eat for the sake of just having a full stomach. More and more the aim is for a balanced diet since many have grown to realise that body functions depend heavily on the kinds of foods that are eaten.

Apart from this, however, we have witnessed a growing sophistication in eating habits, partly encouraged by advanced advertised techniques and status consciousness.

In Barbados, for example, it will be difficult to find a pile of garbage from any house, which did not show evidence of a certain volume of canned, imported foods being consumed. At the same time, we have not been able to produce

In enough quantities the volume of local food to meet daily demands; nor have we come anywhere near producing the amount of protein-rich foods required for our people. This alone makes it imperative that we import these.

Still for all this, it cannot be said that we have done all we can to provide these protein-rich foods. One example that easily comes to mind is our failure to make the most of the feasibility study made of the fishing potential in the area through the UNDP/FAO Project. This Project showed that with capital investment channelled along certain lines, our fishing in the area could become more sophisticated, providing a lot more fish for our people.

However, not much has been done to accept the challenge, and it serves little purpose if International agencies, with the necessary expertise, show areas for development and then we fail to pursue these.

Fish is still one of the cheapest sources of protein, and if we doubt this we only have to consider how the Japanese have gone all out in getting catches of fish, at times thousands of miles away from home, for their people.

There is a school of thought that where nutritional problems are concerned, the chief solution lies mainly in increasing the purchasing power of our people. Unfortunately, to hold this view is to deal only with part of the problem. For one thing, prices today never spiral in isolation. In fact, to the untrained mind the trend would seem to be that as soon as people get greater purchasing power, the more money they are expected to pay for everything. The end result being that they find themselves back at square one.

The challenge, therefore, is trying to provide cheap food. We know this is no easy task, but a lot depends on the volume of food produced since the prices of commodities always react to degrees of scarcity.

Day-to-day experience has shown, for example, that when food items are in short supply, their prices always go up. When the supply is good the prices tend to be stable.

What makes us more conscious of our problem is the fact that today more of us know what is required for a balanced diet. This is why, when we exhort our people to eat local, we cannot just think in terms of giving them a bellyful of starches. They will need fruit, vegetables and meat or other protein-rich foods.

So that while it is true many of us still have a lot to learn about the near magic we can achieve in serving local foods prepared with some imagination, we cannot get away from the fact that a dish, however tasty, must still carry with it certain nourishment and food value to benefit our bodies.

BARBADOS FOOD PRICES HIGHEST
From The Advocate News (Barbados) 3 June 1973

A survey on the comparative prices of goods in the four Caribbean countries of Jamaica, Trinidad and Tobago, Barbados and Guyana, between November 1972 and January 1973, shows that Barbados was "consistently higher on most items."

This is stated in the latest issue of 'Cajanus' the quarterly newsletter of the Caribbean Food and Nutrition Institute.

Under the heading "Comparative Prices of Foods in Four Caribbean Countries" by Isabel Foster, CFNI, the article states:

"These prices for four countries have been collected as follows: Jamaica, November 1972; Trinidad and Tobago and Barbados, December 1973; and Guyana, January 1973."

The article continues: "It is noticeable that Barbados is consistently higher on most items. In October there was a strike at the harbour in Barbados resulting in shortages of bread, flour and rice. We are not in a position to say whether prices rose at that time and have remained high."

"This price information was prepared at the request of the Government of Guyana. For purposes of comparison, all prices have been converted to Guyanese currency. Foods listed for comparison are those commonly used, particularly by low income groups."

The Guyanese dollar is worth 92 cents in Barbados and the East Caribbean Currency Authority's dollar which Barbados still uses is worth \$1.08 in Guyana.

FEEDING PROJECT PLANNED
From The Advocate News (Barbados) 15 May 1973

The Ministry of Health in Barbados is considering the introduction of a supplementary feeding project for weaning infants, pre-school children and pregnant and lactating mothers, through assistance from the World Food Programme.

This was announced yesterday by Health Minister, Dr. Ramases Caddle, who said that problems of inadequate storage facilities for supplies, pre-packaging and distribution of the food had delayed progress with the project.

Addressing the opening of a seminar on Nutrition and National Development of Barbados at "Marine House" yesterday, the Minister said that in 1968 a National Nutrition Committee was formed and, in 1969, in collaboration with the Caribbean Food and Nutrition Institute (CFNI) the Committee set about the task of diagnosing the nutritional status of the population of Barbados, through a National Nutrition Survey.

According to the Minister, the results of the survey, published by the Pan American Health Organisation (PAHO) in 1972, included important recommendations for improving the level of nutrition in Barbados.

This survey, which was representative of all classes of the community showed inter alia, that Barbados had problems associated with malnutrition in the pre-school child, anaemia, dental caries, obesity in middle-aged women, a lack of organised health education and the need for better housing.

Dr. Caddle said that perhaps one of the most significant findings regarding food consumption was that even though the percentage of people who were able to satisfy their nutrient requirements was high, yet a large percentage of pre-school children and pregnant and lactating women failed to satisfy these requirements.

The Health Minister said the survey indicated also that the rich were eating too much of the right kinds of food and that the poor and young children were not getting enough of such foods.

On behalf of Government, Dr. Caddle expressed thanks to the Caribbean Food and Nutrition Institute, and all those who participated in the survey, for focussing attention on these nutritional problems which could undermine the health of our people and consequently the economy of Barbados.

Dr. Caddle spoke of his Ministry's awareness of the situation and said it was actively engaged in programmes to improve conditions. He said also that he had no doubts that the recommendations of the current seminar would also be a useful guide to the Government in improving the nutritional status of the people.

He also spoke of some of the success that has been achieved in improving the level of nutrition on the island.

DEGREE COURSE IN NUTRITION AT UWI URGED *From The Guyana Graphic, 5 July 1973*

Caribbean governments are being urged to give priority to the establishment of a degree course in nutrition at the University of the West Indies.

The demand was made in a resolution adopted at the conference of the Caribbean Association of Nutritionists and Dietitians held in Barbados last week, it was officially announced Tuesday night.

Other resolutions also dealt with legislation to control the advertisement of "exaggerated claims of certain food products" and the initiation of a "dial a dietitian-nutritionist" Programme in the region to help spread nutrition information on a personalised basis.

The conference also asked governments to include an adequate number of public health nutritionists within the framework of an integrated health service.

The conference was attended by representatives from the Commonwealth Caribbean, Bermuda, Surinam, and the U.S. Virgin Islands.

CAJANAQUOTE

It is now possible to state publicly and without giving offence that there is little point in a country embarking on elaborate programmes for increased agricultural production unless there is a corresponding programme for the post-harvest treatment of the products of agriculture.

Francis Aylward
In "The Responsibility of the
Food Industry" Ceres, Vol. 5,
No. 4, p.47, 1972.

CFNI NEWS

FAREWELLS

We say good-bye to three CFNI staff members and one postgraduate fellow.

Y. H. Yang - our Deputy Director since 1970 brought to CFNI a wealth of experience. Influenced by Buddhist philosophy, Y. H. has been invariably kind and always enthusiastic. His assistance with the compilation of food balance sheets by different countries and his revision, enlargement and improvement of the Food Composition Table for the Contemporary Caribbean (In press) stand out as monuments to his work here. An excellent and creative photographer, he has left us a comprehensive collection of slides for educational purposes. Two articles by Y. H. were published recently in 'Cajanus': One is "Soybean Foods for the Caribbean" (vol. VI, No. 1, p. 6); the other, in collaboration with Dr. Cook, is on "National Food and Nutrition Policy in the Commonwealth Caribbean" (vol. VI, No. 2, p. 77). To Y. H., Pearl and family we send our best wishes and our thanks.

Elena Quiogue - was seconded from the Government of the Philippines to CFNI, Trinidad Centre for six months. She was appointed a member of the National Nutrition Council of Trinidad and Tobago. A lady, who combined her competence with charm, she helped in the definition of food consumption patterns and prospects and in food and nutrition policy planning. Her paper in the recently published 'Food and Economic Planning in Trinidad and Tobago' (available from CFNI) on "Results of the National Household Food Consumption Survey in Trinidad and Tobago" is a model of clarity.

Tom Marchione - was the first social anthropologist to join CFNI. He did considerable work for the National Food and Nutrition Survey of Guyana and thereafter contributed much to increasing awareness of the sociological and cultural aspects of our nutritional problems. His most recent work here was an evaluation of the nutritional and family planning aspects of the work of the community health aides in Jamaica. We extend best wishes for the future to Tom, Janna and Adriana.

Peter Heywood - is now back at Cornell University, U.S.A. after finishing his fieldwork for his PhD, and before returning to his native Australia. Peter combined a jocular mien with a commitment to the people with whom he worked. A short description of his project and some preliminary findings can be found on page 181 of this issue of 'Cajanus.' His description of the early feeding of his baby, Jacqueline, written with his wife Alison, is found in volume VI, No. 2, page 95 under the title of "Please Breast Feed Your Baby - And Keep the Bottle For Yourself." We wish the three Heywoods success and a bright future.

ANOTHER NUTRITION DAY AT LAMBS RIVER¹

The Lambs River district was again the scene of community activity recently in the field of nutrition - this time at the Kew Park School.

About fifty citizens came together for the second in the series of Nutrition Information Days organised by the Nutrition Education Action Committee.

The all-day programme was varied, informative and at times entertaining. There was an enthusiastic role playing session directed by Miss Maria Rankine of the Bureau of Health Education performed by the participants depicting the real-life situations of the indigent family striving towards the goal of self-sufficiency, and the dilemma of the pregnant teenager overcoming her initial anxieties and facing up to caring for herself and her baby.

There were illustrated talks on childhood malnutrition and on home accidents given respectively by Public Health nurse Vacianna and Mrs. Cynthia Sadler, Family Planning Education Officer, both of Westmoreland.

The highlight of the afternoon session was a sketch depicting the harmful effects of some superstitions relating to the feeding of young children and the benefits of following good nutrition advice. This was directed by Miss Althea Ulett, Field Assistant in the Freedom From Hunger Campaign Nutrition Education Project, and acted by the group of volunteers who are engaged in home visiting in the district.

Adding further to the variety was the film "Hungry Angels" which prompted some more discussion on the subject of malnutrition.

NUTRITION SEMINAR IN BARBADOS

In May the Government of Barbados convened, jointly with CFNI, a seminar on nutrition and national development. The meeting lasted five days and there were about sixty participants from different ministries and from outside of Government.

The subjects discussed included health, agriculture and education in nutrition, the marketing corporation, community development, trade, economic development, private industry and the role of voluntary groups in nutrition.

Many recommendations were agreed upon. The proceedings are to be published.

¹From the Public Opinion (Jamaica) 10th August 1973, page 3.

NUTRITION MADE SIMPLE

CALCIUM IN HUMAN NUTRITION: Or why do we worry so much - Dr. J. M. Gurney

Calcium has the following main functions in the body: It hardens the skeleton and it is necessary for normal nerve 'excitability' (tone). Hence a low plasma calcium level will result in 'tetany' (not to be confused with 'tetanus'). Calcium is necessary for normal muscle tone, so children with rickets (vitamin D deficiency, resulting in abnormal calcium metabolism) are usually late in standing and walking and have flaccid muscles and bent legs. Calcium is necessary for blood clotting. Therefore, if we wish to prevent a blood sample from clotting we may mix it with sodium oxalate which precipitates the blood calcium. Calcium is necessary for normal rennin activity (milk digestion in the newborn).

The Calcium Content of our Bodies

Adults contain about $2\frac{1}{2}$ lbs. (1200 g.) of calcium in their bodies. 99% of this is in the skeleton in the form of calcium phosphate; a little is in the plasma. The concentration of this 'miscible pool' of plasma calcium is carefully kept constant under the control of a hormone from the tiny parathyroid glands in the neck (parathormone).

A rich common source of calcium is milk. Cow's milk contains about 1.2 g per litre. It can be seen that the body calcium content of human adults (1200 g.) is equivalent to that in 1000 litres (220 gallons) of cow's milk. All this calcium must be taken in from the diet during the period of growth. After growth has ceased, requirements are only for maintenance, pregnancy and lactation. Other good sources of calcium are mentioned later on.

It is important to realize that the calcium in bone is mobile, i.e. it can be removed from the bone and is continually turning over via the 'pool' of serum calcium. The bone calcium acts as an enormous reservoir for the serum calcium.

The Calcium Cost of Pregnancy and Lactation

A newborn baby contains about 30 g. of calcium, all of which must, when we come to think of it, have been provided by the mother. Human breast-milk delivers between 150 mg. and 300 mg. of calcium per day. In a year's lactation, therefore, up to 100 g. of calcium (300 mg. x 365) are given to the baby. Including the 30 g. lost in pregnancy this comes to about one-ninth of the mother's total calcium supply in her bones. Even if her dietary calcium intake is very low, this loss is unlikely to lead to any appreciable weakening of the bones (osteomalacia) or teeth. On the other hand, repeated pregnancies and lactations, coupled with a very poor intake of dietary calcium may result eventually in a significant drain.

The Calcium Cost of Growth

In the pre-school years about 100 mg. of calcium is retained each day in the growing bone. During adolescence this amount doubles for girls and triples for boys. After the age of eighteen, when bone growth slows right down, less than 10 mg. of calcium are retained in bone daily. There are as we all know great variations in growth rates in adolescence and in the ultimate sizes attained by adults. Calcium requirements also vary widely.

The Absorption of Calcium

Calcium in our food is usually in a complex form, although if absorbed it is broken down and can be excreted easily via the kidneys in the urine. The absorption of calcium is remarkably incomplete; usually more than half the dietary intake is passed out in the faeces. That passed out in the urine depends on the difference between the amount absorbed and the amount utilized.

There are three main factors affecting calcium absorption. They are:

- (a) the body's vitamin D content (a deficiency can result in rickets);
- (b) the dietary protein (calcium is absorbed linked with certain amino acids); and
- (c) the adaptation of the individual to his usual calcium intake (the lower the intake the more efficient the absorption).

There are two important factors that, if present in the food, combine with dietary calcium and potentially inhibit its absorption. They are phytic acid which is present in the outer part of many cereal grains, and oxalic acid which is present in some vegetables. In Britain during the 1939-45 war bread was made of high extraction flour so as to preserve protein and thiamine (vitamin B₁)*

To counteract the effects of the resultant increased phytic acid content of the bread extra calcium was added to the flour. Nevertheless there is now abundant evidence that the human gastro-intestinal tract can adapt quickly to a high content of dietary phytic acid. Calcium fortification of the bread was perhaps unnecessary. Similarly there appears to be no evidence that oxalate found in human diets affects calcium absorption.

The older textbooks used to emphasize the calcium/phosphorus ratio. However the FAO/WHO expert group on calcium requirements had this to say: "Variations in the calcium/phosphorus ratio in habitual diets are of no practical significance in human nutrition" (WHO tech. Rep. Ser. 230, 1962).

*The word "extraction" when applied to cereals is most confusing. The higher the extraction rate the less of the outer layer of the grains - and therefore the less thiamine - is removed. Dentists use the word quite differently.

Calcium Requirements

As described above, the human powers of adaptation are so great and the bony store of calcium so large that it is undesirable to attempt to specify definite human requirements of calcium and difficult even to make estimates.

There is little evidence of ill-health due to insufficient calcium in the diet. Calcium deficiency does not cause rickets, dental caries or stunting of bone growth. There is no evidence of disease due to excessive intake (e.g. in milk drinkers) except possibly kidney stones (calcium is easily excreted in the urine). Osteoporosis, which starts in most of us in our forties, is no more caused by calcium deficiency than is grey hair or any other of the signs of ageing. It is possible that an inadequate intake of calcium during adolescence might affect the nature of bone growth but there is conflicting evidence on this matter.

The FAO/WHO suggested practical allowance for all ages is between 400 and 700 mg. daily (varying slightly with age and between the sexes). The practical allowance for pregnant or lactating women is between 1000 mg. and 1200 mg. daily. It must be emphasised that a "practical allowance" is calculated as a "catch all" and is more than a minimal or even an average requirement.

Age	FAO/WHO suggested practical allowances of calcium (mg. per day)
0 - 12 months (not breast fed)	500 - 600
1 - 9 years	400 - 500
10 - 15 years	600 - 700
16 - 19 years	500 - 600
Adult	400 - 500
Pregnant and lactating women	1000 - 1200

The minimum daily requirement of calcium for all age groups is thought to be about 200 mg. or even less. Many adults take 300 mg. daily without any evidence of calcium deficiency. One pint of cow's milk (about 600 mg. calcium) or the equivalent daily for growing children and pregnant and lactating women ensures an adequate calcium intake. However, milk is not essential, and is often impracticable. There are other good sources.

Dietary Sources of Calcium

Many varied foodstuffs contain calcium. Those given below are among the major ones:

1. Breast milk
2. Milk from other mammals and milk products such as cheeses. Calves lay down a bony skeleton much faster than human babies. Because of this increased need for calcium there is four times as much calcium per unit volume of cow's milk, than human milk.
3. Cereals - cereals are often the major source in human diets. They do not contain a high concentration of calcium but the amount of cereal eaten is often great.
4. Whole fish - small fish are often fried and eaten, bones and all. We usually eat the bones of sardines and tinned mackerel, for example. Calcium is only in the bones, not in the flesh.
5. Dark green leafy vegetables.
6. Peas and beans and nuts.
7. Drinking water - the concentration varies enormously with the 'hardness' of the water.

Conclusions

Present-day knowledge of the nutritional aspects of calcium while considerable, is incomplete. However human dietary calcium deficiency does not appear to be an important nutritional problem anywhere in the world. Neither does calcium excess. This is mainly due to three factors:

Firstly, the amazing ability of human beings to modify the absorptive efficiencies of their intestinal tracts in response to calcium intakes. Secondly, the large and readily available stores of calcium in our bony skeletons. Lastly, dietary calcium is available from many different sources.

References

Anything before 1962 is likely to be out-of-date. To delve into the subject more deeply than has been possible here the following references are recommended.

1. FAO/WHO (1962) *Calcium Requirements*. Report of a FAO/WHO Expert Group. WHO tech. Rep. Ser. No. 230.
2. Davidson, S., Passmore, R. and Brock, J.F. (1969) *Human Nutrition and Dietetics*, 5th ed. Edinburgh: Livingstone.
3. Hegsted, D.M. (1967) *Present Knowledge of Calcium, Phosphorus and Magnesium*, in *Present Knowledge in Nutrition*: New York: Nutrition Foundation.

4. Garn, S.M., and Wagner, B. (1969) *The Adolescent Growth of the Skeletal Mass and Its Implications to Mineral Requirements*, in Heald, F.P. (ed.) *Adolescent Nutrition and Growth*. New York: Appleton-Century-Crofts.
5. Walker, A.R.P. (1972) *The Human Requirement of Calcium: Should Low Intakes Be Supplemented?* *Amer. J. clin. Nutr.* 25, 518-530.

TERMS USED BY NUTRITIONISTS - Compiled by Isabel Foster

Adaptation (Physiological)

The modification of physiological processes in man or animals resulting from changes in physical environment, food or nutrient supply.

Additive

Generally refers to substances intentionally added to food to improve colour, taste, preservative quality, or to act as stabilizers, emulsifiers, thickeners and anti-oxidants. The term occasionally embraces substances which may get into food unintentionally, e.g. adulterants, contaminants such as - components of packaging material, pesticides.

Agri-business

This is two-fold: the agro-industries (1) which produce goods or services required by the farmer to assist in increasing production (efficiency and quality); (2) those utilizing his produce as raw materials giving a stable market or converting raw materials into food products for the consumer. Agri-business suggests a large-scale commercial business, e.g. manufacturers of farm machinery may give support to marketing, storage and milling a crop.

Aflatoxin

Generic term for a group of toxic substances produced by the *Aspergillus flavus* group of molds (which grow on peanuts and cereals) and which have a toxic effect in many animal species.

Availability (Physiological)

The extent to which a nutrient is present in a form that can be absorbed and utilized in metabolic processes. (Some nutrients may be bound to a compound, be insoluble, or combine in the intestinal tract with some other compound to form an insoluble substance, and therefore not be absorbed and hence not available for nutritional processes).

As Purchased (A.P.)

Refers to food as offered for sale in the retail market. Appears in Food Composition Tables e.g. the nutrient content is stated in terms of the weight of a food before the inedible portions are removed.

Basal Metabolic Rate

A measure of oxygen consumption (under standard conditions) of an individual, after fasting twelve hours, awake but at complete body rest; usually determined by indirect calorimetry.

Calculated Nutrient Content

The nutrient content of a diet or a food recipe calculated from Food Composition Tables, and not determined directly by analysis of that specific food or dietary composite.

Calorie

Unit used to express food energy; the amount of heat required to raise the temperature of one kilogram of water 1°C. (Recently the Joule has been referred to as the correct unit of food energy measurement
1 Joule = 4.185 cal.)

Carbohydrate Available

Represents the portion of the carbohydrate of foods which is available for absorption by the human body for glycogen formation (starch, sugars).

Carbohydrate Indigestible

Substances which make up the cell wall structure of plants, consisting of cellulose, hemicellulose, lignin, pectin, gums, mucin, etc., not hydrolysed by enzymes of the human gastrointestinal tract.

Ceremonial Foods

Foods having specialized use or meaning; frequently they are associated with religious ceremonial procedures.

Chemical Score or Protein Score

The content of each essential amino acid in a food protein is expressed as a percentage of the content of the same amino acid in the same quantity of a protein selected as a standard. The amino acid showing the lowest percentage is called the limiting amino acid and this percentage is the chemical or protein score.

Convenience Foods

Foods in which one or more steps in preparation have been completed before the product is offered for retail sale, e.g. mixes, ready-to-bake, heat and serve.

Corn-Soy-Milk (CSM)

Partially gelatinized cornmeal, toasted soy flour, nonfat dry milk, fortified with minerals and vitamins.

Cost-Benefit Analysis

The evaluation of a procedure or programme on the basis of cost input versus value of benefits gained.

Cost of Living Index

The current cost of a defined amount of goods and services expressed as a percent relative to a baseline period. For most countries this is broken down so one can find percent cost in food, housing, and transportation.

Cross-Sectional Study or Survey

These may be a single study of a population over a short interval (days or weeks). These also may be repeated at prescribed intervals.

Dietetics

The combined science and art of feeding individuals or groups under different economic or health conditions according to the principles of nutrition and management.

DMF Index

The total number of decayed, missing and filled teeth.

Ecology

The interrelations between organisms and their environment. In the broad sense it expresses multiple overlapping and interacting factors in the physical, biological, socio-economic and cultural factors of the environment of a family, community or population.

Edible Portion (E.P.)

The part of a food which is ordinarily considered edible.

Enriched Flour

Flour to which thiamine, riboflavin and iron have been added within the limits specified by government.

Faddism

A practice or interest followed for a time with exaggerated zeal.
Examples re food:

- (1) A single food or group of foods to which is attributed power out of proportion to nutritive content - honey, yogurt.
- (2) Fresh fruits and vegetables are of poor quality nutritionally if grown with chemical fertilizers.
- (3) The daily use of mineral and vitamin capsules will improve health to a far greater extent than those contained in an adequate diet.
- (4) Certain foods have specific value out of proportion to established fact in the treatment of certain disease conditions - diabetes, obesity.

Family Composition

The number of persons in a family group, including the age, sex and kinship of the group.

Family Eating Patterns

The order of serving food to family members; who eats with the men of the family, and when and with whom the children and women eat.

Family Food Distribution

How food is distributed within the family, the kind and amount of food given to men, women and children.

Food Balance Sheets

Annual total national food production and imports minus exports gives the food supply available for the year; divided by the population number this gives the food available per person for distribution.

Food Patterns

The kinds of food customarily used by people in a given area, or region or ethnicity and the way those foods are prepared and served.

Fortification

The process whereby nutrients are added to foods to maintain or improve the quality of the diet of a group, a community, or a population.

Frequency Of Eating

Number of times a day an individual consumes food or nutrient containing beverages.

'Health' Foods

These cover a wide variety, eg. "organic" (grown with natural fertilizer, compost); "natural" not processed or refined; "dietetic" (packed without sugar); "vegetarian" etc. The term health is misleading as it implies these foods are superior to regular foods.

Hot - Cold Foods

Hot or cold qualities are ascribed to foods in some cultures. These qualities do not necessarily refer to the thermal state or to taste but to innate qualities believed to be associated with the food.

Gross National Product (GNP)

The dollar value of an economy's gross production of goods and services for any given time period, usually one year. When GNP is divided by the population, the result is known as GNP/capita.

Leaf Protein Concentrate

A high protein powdered product prepared from green leaves and grass by disintegration, extraction and purification. The powder may be as high as 50-60% protein.

Longitudinal Study (Or Survey)

Continuous or repeated observations and measurements carried on for many years with the same group of human subjects (usually at least a one year period).

Net Protein Utilization (NPU)

The proportion of nitrogen intake which is retained in the body, i.e. the product of biologic value (content of essential amino acids) and digestibility (actual absorption by the body).

Nutritional Status

The condition of health of an individual as influenced by his intake and utilization of nutrients, determined from the correlation of information gained from physical, biochemical, clinical and dietary studies. It is based on the body's relative need and ability to utilize nutrients.

Protein Efficiency Ratio

Weight gain per weight of protein eaten. (Usually measured with male rats under standard conditions).

Snacks

Any food or beverage consumed in large or small amounts at another time than a regular meal period.

Staple Foods

Any food which supplies a substantial part of the calorie requirement and is regularly consumed by a community or country.

Textured Proteins

Products from bland, isolated vegetable proteins, textured by spinning and extrusion; suitably flavored and coloured these products simulate foods such as bacon, chicken, beef and seafood.

Vegans

Individuals who eat only food and food products from plant sources; all animal foods including meat, fish, poultry, milk, eggs, cheese and seafoods in any form are avoided.

Vegetarians

Those who refrain from meat of any kind but use milk, milk products and eggs; these may be described as OVA-LACTOVEGETARIANS.

Those who refrain from eating meat and eggs specifically called LACTO-VEGETARIANS.

Those who eat only foods from plant sources; pure (true) vegetarians or VEGANS.

Weaning

The period from the first consistent addition of a food supplement until breast (or bottle) feeding ends.

CANDI NEWS

The Second Annual Meeting of the Caribbean Association of Nutritionists and Dietitians (CANDI) took place in June in Barbados. The programme included papers presented in five areas.

- (1) Opening Session - The Role of Nutritionists and Dietitians in the Caribbean Health Services; Education and Training for Nutritionists and Dietitians.
- (2) Renal Diseases in the Caribbean.
- (3) Food Faddism.
- (4) Obesity.
- (5) Organisation of Health Services.

(1) OPENING SESSION

Dr. M. Henry's paper *"The Role of Nutritionists and Dietitians in the Caribbean Health Services"* will be published soon in 'Cajanus'.

Miss Warner dealt with *"Education and Training of Nutritionists and Dietitians"* stressing the changes which have been taking place. She mentioned the traditional universities and colleges in the United Kingdom and North America, but that the need for an undergraduate course in nutrition, dietetics and home economics in the Caribbean has already been recognised and a manpower study should currently be in progress. There is a postgraduate M.Sc. course in nutrition at Mona and a course leading to a Diploma in Community Nutrition for persons already working in related fields, organized by the Caribbean Food and Nutrition Institute.

Relating school curricula to University courses, she stated that most universities require at least two Advanced Level subjects. A speaker from the floor emphasized the importance of basic science in nutrition and dietetic courses.

At secondary school level nutrition education is getting more prominent in the form of "Human and Social Biology" an alternative subject to biology for 'O' Level examinations.

(2) RENAL DISEASES IN THE CARIBBEAN

Two technical papers were presented, the first by Dr. R. Mahabir entitled *"Current Aspects of Treatment in Renal Disease"* and the second by Miss L. Clifton who dealt with *"Dietary Treatment of Renal Disease"*.

Dr. Mahabir brought to our attention the high incidence of renal disease particularly:

- (I) epidemics of glomerulonephritis where 20% of patients die from chronic renal failure;
- (II) the number of diabetic patients who die from renal failure;
- (III) the number of abortions which lead to acute renal failure and death.

Most of the deaths are among young people. The advances in treatment are rapid and although the personnel are available in the region, the Governments have not responded to the seriousness of the situation and facilities are lacking. Given up-to-date facilities many of these young people could have been saved.

Miss Clifton described in detail the specific aspects of Renal Dietary Treatment indicating:

- (I) that the dietary regime is according to the type and severity of renal failure;
- (II) that amino acid therapy may become the therapy of the future. The problems encountered are:
 - (a) lack of haemodialysis facilities in the region;
 - (b) the innate unpalatability of conventional renal diets.

She stressed that dietary regime should be specific, carefully taught and planned in close association with the patient so that the patient not only appreciates and understands, but is also able to tolerate and consume the recommended diet ensuring medical benefits be derived.

It is recommended that (a) technical information should be 'on the desk' of every dietitian; (b) that every dietitian establishes a system for the specific prescription of renal diets in exact accordance with the biochemical data made available by the medical team.

(3) FOOD FADDISM

Food faddism, a paper presented by Miss M. Zephirin, is published in this issue of 'Cajanus'.

Dr. Henderson pursued the question of communication in his paper "*Communication to Sell Ideas*" which is also published in this issue of 'Cajanus'.

The third paper in this session dealt with a particular food fad - "*Chemically Fertilized Soils Cause Poor Nutrition - A Myth*". Dr. Bairnes pointed out that without chemical fertilizers we would have very poor yields of crops. Thus total food available would be less, leading to poor nutrition. The plant metabolism does not distinguish between artificial chemicals and chemicals derived from organic matter. Dr. Bairnes illustrated his points with figures and slides of Barbados crops.

(4) OBESITY

Dr. Cook presented "*Statistics on Obesity in the Caribbean Region*". He pointed out that there is little published data on the subject and that two terms are used (i) overweight, and (ii) obesity. For practical purposes the terms are synonymous.

In the West Indies, obesity is the problem of adult women, for there are four obese females to one obese male. In Barbados, for example, one-fifth to one-third of all the women are obese. The onset of obesity in women appears to be during adolescence and worsened after pregnancy. There appears to be a relationship between weight loss after pregnancy and lactation.

Dr. Hassel outlined the "*Health Hazards Pertaining to Obesity*". This paper will be published in 'Cajanus'.

Mrs. Campbell described in detail the "*Dietary Control of Obesity*". She stressed that the main object in the dietary regime should be to modify the normal diet by reducing the carbohydrate and increasing the protein and mineral intake, but ensuring that the general pattern of the original diet is maintained. The diet should aim at a gradual decrease in weight of 8 lbs to 10 lbs. monthly until the desired weight is attained. Mrs. Campbell uses seven to eight food groups and plans diets of 1,000 - 2,000 calories according to the age of the patient. She emphasized that patients must be treated as individuals.

(5) ORGANIZATION OF HEALTH SERVICES

Dr. Wells explained how health services are organised, pointing out the shortcomings. He feels that the low income groups are not adequately serviced and that integrated medical services are necessary for continuity of patient care.

Dr. Wells recommended:

- (i) the abolition of private practice;
- (ii) the formation of a national health and insurance service;
- (iii) skilled training for ancillary personnel;
- (iv) revision of medical students' curricula.

RESOLUTIONS EMERGING FROM THE CONFERENCE

Opening Session

- (1) Be it resolved that the recommended courses in Nutrition, Dietitics and Home Economics leading to a Bachelor of Science degree at U.W.I. be made a matter of priority by the Governments of the region.

- (2) Be it resolved that, in view of the enormity of the public health problems related to nutrition, Governments take steps to include an adequate number of public health nutritionists, within the framework of an integrated health service.

Renal Disease

- (3) In view of the incidence of renal failure in the region and the limited treatment facilities available, be it resolved that the Governments give attention to the setting up of a regional dialysis centre.

Food Faddism

- (4) Be it resolved that CANDI call upon the Governments of the region to consider legislation controlling the advertisement of exaggerated claims of certain food products.
- (5) Be it resolved that attention be given to initiating a 'Dial-a-Dietitian/Nutritionist' programme in the several countries of the region in view of the need for providing nutrition on a personalized basis.

CAJANAQUOTE

An effective food and nutrition plan will lead to an increase in effective demand which will need to be matched by an increase in supply..... Food planning is very largely a question of inducing changes in supplies to match desired patterns of consumption and planned market demand..... nutrition planning is a matter of ensuring that need is translated into effective demand. Unless it is so translated there is no point in planning for supplies to meet needs.

*Leonard Joy
"Food and Nutrition Planning"
J. agric. Econ., 24, No. 1 (Jan. 1973)*

EDITORIAL

As this is the season for the exchange of gifts it might be worth our while to look at an example of what the commercial giftmen have to offer.

A certain company puts out a "Request Pack" of six assorted breakfast cereals (if you live in the USA or Puerto Rico and have \$2.00 and an old "Request Pack" wrapper you can get an 'early American table-saver' as well). The "Request Pack" costs 59¢ in Jamaica - 10¢ per serving.

The cornflakes come in a 'late American plate-saver'; they can be eaten "right from the 'pac'". 'Cajanus' readers may have noticed that one 'pac' is advertised as containing 25% of minimum adult daily requirements of vitamins A, D and C and of niacin, thiamine and riboflavine. Fantastic! Only four packs and you are fully fed! But no: One 'pac' contains only 5.3% of iron requirements. But it contains 81 calories; that seems like a lot - except that we need 2-3000 a day. 81 is 4% of 2000.

Feeling rather disillusioned your editor ground up the contents of one such packet of cornflakes. They disintegrated into a powder which fitted neatly into one eggcup. The 'pac' weighed the same as the contents, three-quarters of an ounce.

Also in the "Request Pack" is the company's special high-protein cereal, "the unusually nourishing cereal". "Low in calories" (that's true), the company's special high-protein cereal produces in one such carton only 3.6 grams of protein. The carton does not print it that way. It states "protein 20.0%" (20% of five-eighths of an ounce), or "when served with skim milk it provides the complete high-quality protein (and other nutrients) needed to get going."

As the immortal Bessie Smith sang* in a rather different context:

"He's got me goin'. He's got me goin'.
But I don't know where I'm headed for."

N.B. If you have not already done so please send in your 'Cajanus' evaluation quickly. We have received many already. They are proving very helpful.

THE EDITOR

*With James P. Johnson on piano, in 1929.

NUTRITION FACTS ON STAPLES

by

J. M. Gurney
Caribbean Food & Nutrition Institute

The staple foods of a country or community can be defined as those foods that provide the single largest amounts of dietary energy (Calories) primarily through their carbohydrate content. They also may or may not provide useful amounts of protein, vitamins and minerals. Because of this:

*The nature of the staple largely influences
the nutrition of the household.*

Staples can be considered as "cultural superfoods"¹ in that they have great cultural or sociological importance to food habits. They take up a large proportion of families' budgets. In their production they utilize considerable agricultural resources and, in such parts of the world as the Caribbean where a major production of food is imported they consume foreign exchange.

There is increasing interest in looking for alternatives to such widely consumed staples as imported wheat flour. This is not only to reduce the import bill but also to diminish dependence on price fluctuations that are out of the control of the importing country.

Table I shows that:

Pound for pound cereals (wheat, rice, corn, etc.) contain more energy and protein than do fresh roots and tubers (yam, potato, etc.) or starchy fruits (bananas, breadfruits, etc.). Flours made from roots, tubers or starchy fruits approach the energy value of cereals but may fall short in protein.

*Jelliffe, D.B. (1968) Child Nutrition in Developing Countries. Washington: USAID.

Table I: The Approximate Energy and Protein Values of the Principle Staple Foods Consumed in the Caribbean

	Energy (Cals.) per lb. as purchased	Protein as % of edible portion by weight	% of energy from protein	% water as purchased
<i>Cereals</i>				
Wheat flour	1651	10.6	11.5	12
Corn (maize) meal	1651	7.9	8.7	12
omit * Rice, parboiled	1674	7.4	8.0	10
Rice, boiled	558	2.4	8.0	70
Rice flour	1651	7.2	7.9	12
Bread (wheaten, white)	1220	8.7	12.9	36
<i>Fresh Roots and Tubers</i>				
Yam	410	2.4	9.1	72
Sweet potato	440	1.3	4.5	70
Irish potato	316	2.0	9.7	78
Coco (Dasheen)	391	1.8	6.9	72
Cassava	493	1.2	3.3	62
Arrowroot	570	2.4	6.1	57
<i>Starchy Fruits</i>				
Breadfruit	250	1.3	6.4	77
Plantain, green	413	1.2	3.7	63
Banana, green	319	1.4	5.1	69
<i>Flours from Roots, Tubers or Starchy fruits</i>				
Yam flour	1438	3.5	4.4	18
Irish potato flour	1583	8.5	9.7	7
Cassava flour	1533	1.5	1.8	14
Arrowroot flour	1542	0.2	0.2	15
Plantain flour	1383	2.8	3.7	14
Banana flour	1429	1.8	2.3	11

Table 1 is compiled from draft (1973) of Food Composition Tables for the Contemporary Caribbean, CFNI. Protein-energy is calculated on the assumption that every gram of protein provides four calories.

When we consider young child feeding the *concentration* of energy and nutrients in the food as given is a major determinant of adequacy of intake. Boiled cornmeal, for instance, provides useful and quite concentrated amounts of energy and protein when prepared thick but is far too dilute if thin enough to give through a bottle. It is clear from Table I that cereals are, on the whole, more concentrated sources of both energy and protein than are starchy fruits, tubers or roots.

Table II: The Percentage of Total Dietary Energy and Protein Derived from the Different Staple Foods (the figures, which are calculated from National Food Balance Sheets, are averages for each country).

Food Group	Jamaica (1966)		Barbados (1966)		St. Lucia (provisional) (1970)		Guyana (1967)	
	Energy	Protein	Energy	Protein	Energy	Protein	Energy	Protein
All cereal products	34	38	35	31	27	33	38	39
Wheat products	-	-	20	19	24	30	22	26
Rice	-	-	12	9	3	3	16	13
Roots, tubers and starchy fruits	15	10	9	6	16	11	10	6
Sugars and syrups	18	2	16	1	15	0	19	0

Table II shows that:

The cereals are extremely important sources of protein and energy in the Caribbean. Wheat flour is outstanding in this respect.

Notwithstanding the above statement any move to reduce our food import bill is also very important. Thought is currently being given to the production of flours made from locally grown products so as to replace some of the

Imported wheat. At present local starchy roots and fruits are often being 'dumped' (for example, bananas rejected for export). If local flours are to be substituted for or combined with wheat flour the resulting alternatives must contain amounts of nutrients equivalent at least to those of the cereals they replace; this applies particularly to those nutrients that are consumed in deficient or borderline amounts. Nutritional fortification can be done, by adding skim milk, bean flour and so on. However, if the resulting product costs the housewife more than the original, she will buy less and the nutritional status of her family may suffer.

Composite flours must at least equal the nutritional qualities of what they replace without costing the consumer more.

Wheat is certainly a cultural superfood in the Caribbean, despite its being all imported. Consider the many ways it can be used: e.g. bread, biscuits, roti, flour dumplings (including spinners, Johnny cakes), bullas, cakes, in fritters, corn hominy, and potato pone. Any substitute must have the same cooking properties unless we accept a drastic change from traditional food habits.

Any flour that replaces wheat must be widely accepted by the people whose nutritional state currently depends heavily on wheat flour.

We are writing to ask local and other people who are knowledgeable in this field for their comments and suggestions on this statement on "nutrition facts on staples" and will publish them in a forthcoming issue of 'Cajanus'. We invite any 'Cajanus' reader to contribute to this most important and timely subject by writing to the editor.

TOPICS AND COMMENTS

HOW MUCH FOOD DOES MAN REQUIRE

By J.V.G.A. Durnin, O.G. Edholm, D.S. Miller and J.C. Waterlow*

We believe that the energy requirements of man and his balance of intake and expenditure are not known. Paradoxically, we conclude this from results of the increasingly sophisticated studies of food intake and energy expenditure which show that in any group of twenty or more subjects, with similar attributes and activities, food intake can vary as much as two-fold.¹⁻⁵ In those surveys where both intake and expenditure are measured, there is often good agreement between the two estimates for the average of the group, but usually very large discrepancies between individual intake and individual expenditure. The results of careful studies in a number of countries suggest that some people, perhaps through some mechanism of adaptation, are able to be healthy and active on energy intakes which, by current standards, would be regarded as inadequate. On the other hand, there are also studies in which subjects have been given large quantities of additional food with little or no increase in body weight.^{6,7} In contrast, there are the difficulties experienced by the obese in reducing body weight in spite of a drastic reduction of food intake, and the well recognized fact that many fat people eat no more, and sometimes less, than those who are not obese. These observations underline the extent of our ignorance about the mechanisms by which energy balance is maintained.

When the energy requirements of large populations are calculated, using the currently available international standards prepared by the Food and Agriculture Organisation and the World Health Organisation, then it may be, and often is, concluded that a large proportion of the world's population is undernourished; present standards put this proportion at about 70%. This estimate is based on a careful examination of all available information; such estimates are essential for governmental planning of, for example, food production. Some of us have assisted in this preparation and suggest these estimates with all their faults are the best that can be achieved on present knowledge.

It is possible, however, that the 30% of the world's population who have an 'adequate' intake are really eating too much and that an unknown proportion of the rest are not undernourished. Our present information does not provide a satisfactory basis for more accurate estimates, as the methods commonly used are not precise enough and cannot be validated. Furthermore, the measurement of normal daily food intake and energy expenditure poses many technical and logistic problems, requires large teams of skilled staff and is expensive; hence so far only small populations of individual men and women have been studied. It is difficult to finance such work and there are relatively few surveys in which individual food intake has been measured with acceptable levels of accuracy.

*From *Nature*, Vol. 242, April 6, 1973.

These are some of the reasons that prompt us to assert that we do not know how much food man requires. If there is merit in this assertion, and no doubt many will question it, we would stress that to determine man's energy need with more precision should be regarded as a major and urgent task. We believe that appropriate methods can be developed; for example, if a calorimeter suitable for man was available it would be possible to calibrate the various ways by which food intake, energy expenditure and energy balance are assessed. Calorimeters for domestic animals have been constructed, but none suitable for man exists today. This work would not be easy or cheap, but we suggest the social and political advantages of obtaining accurate answers could be immense.

References

1. Widdowson, E.M., *Spec. Rep. Ser. Med. Res. Coun. No. 257* (1947).
2. Widdowson, E.M., *Proc. Nutr. Soc.*, 21, 121 (1962).
3. Rose, G.A., and Williams, R.T., *Brit. J. Nutr.*, 15, 1 (1961).
4. Ashworth, A., *Brit. J. Nutr.*, 22, 341 (1968).
5. Wynn-Jones, C., Atkinson, S.J., and Nicolas, P., *Proc. Nutr. Soc.* 31, 83A (1972).
6. Miller, D.S., and Mumford, P.M., *Amer. J. Clin. Nutr.*, 20, 1212 (1967).
7. Miller, D.S., Mumford, P.M., and Stock, M.J., *Amer. J. Clin. Nutr.*, 20, 1223 (1967).

SOYBEANS INTERCROPPED WITH MAIZE AND EATEN YOUNG

By Richard Bradfield*

In our Multiple Cropping Experiments in the Philippines, we found that the yield of protein and dry matter in the seeds of soybeans is reached by the time the bottom leaves begin to turn yellow, just before falling off. With the vegetable variety from Taiwan, which we were growing then, this occurred at 60-65 days after planting. If harvested at this stage and immediately replanted to soybeans, a hectare of land would produce four crops a year of about 2.0 metric tons each, or a total of eight tons per hectare, per year. These beans contain 40% protein, giving a yield of 3,200 kg. of protein per hectare per year, a higher yield than can be obtained in one year from any other annual crop! The amino acid distribution in the soybean resembled that in meat more closely than that of any other plant protein.

*Taken from Center for Tropical Agriculture, University of Florida, Institute of Food and Agricultural Sciences Publication, Vol. 7, No. 3, August 1973.

When harvested at the immature stage described above, the beans had not yet started to shrink and could still be easily cooked in ten minutes and served as a vegetable. Most people find them delicious in this form. They resemble green garden peas or lima beans and can be prepared for the table in the same way. The Chinese and Japanese usually boil the pods in salted water for about ten minutes and then serve them without shelling. The beans are then squeezed out of the pods at the table. The shells are tough and are discarded.

In the tropics soybeans can usually be planted any month of the year if water for irrigation is available during the dry season or prolonged dry spells.

We found that sweet corn, a 60-70 day variety and a 60-70 day variety of vegetable soybeans made a very good rotation with which considerable time could be gained by interplanting each crop in the other before it reached the harvesting stage. The technique used was as follows:

A good seed bed was prepared and then the soil was 'bedded' by making a furrow, about six inches deep and a foot wide, every three feet. This gave a bed about two feet wide on which both crops were planted, the soys on one side of the bed and the sweet corn on the other. The soys were planted about 10-14 days before the sweet corn was harvested and the sweet corn was planted when the soys were 30-40 days old and setting pods. The following is a typical cropping calendar for one year:

No. of Crop	Crop	Date of		No. of Days Each Crop Is Growing
		Planting	Harvesting	
1	Corn	Jan. 20	April 1	70
2	Soys	Mar. 15	May 25	70
3	Corn	April 25	July 5	70
4	Soys	June 25	Sept. 5	70
5	Corn	Aug. 5	Oct. 15	70
6	Soys	Oct. 1	Dec. 10	70
		Total 320 Calendar days		Total 420 crop growing days

This rotation gives three soybean and three sweet corn crops in twelve months in a favorable tropical climate! $420 - 320 = 100$ crop growing days gained by interplanting. Please note that the first crop is planted on January 20 and the sixth and last one for the year is harvested on December 10. This allows a total of 40 days for any adjustments needed in the cropping schedule because of heavy rains, accidents or losses of time due to any other causes. In our experience this is a liberal allowance.

ORAL CONTRACEPTIVES AND LACTATION

By R. L. Kleinman (Ed.)*

In most countries the survival of the majority of babies is totally dependent on an adequate supply of breast milk. Lactation is also an important factor in extending the interval between pregnancies in many parts of the world.

There is conflicting evidence about the effect of combined oral contraceptives on lactation. It has been claimed that these agents have no significant effect on lactation, and this may be largely true of low-dose combined oral contraceptives given to Western women after lactation has been established. However, carefully conducted trials in Egypt, with adequate controls demonstrate a slight reduction in the milk volume, a moderate change in its constituents, and a possible shortening of the time of weaning with combined preparations, although no profound change in infant growth has been noted.

Progestagens alone by mouth have no effect on lactation, while further studies in Chile, Egypt and other parts of the world show that the use of certain injectable progestagens is associated with a raised milk yield and a small but measurable increase in protein and lactose.

Although traces of exogenous steroids are excreted in the mother's milk, no harmful effects have been noted in breast-fed babies of mothers using steroidal contraceptives.

Clinical Implications

Once lactation is well established, and while an effective and potent sucking stimulus persists, it is most unlikely that a good milk production will be affected by low-dose combined oral contraceptives. However, in developing countries, caution may still be necessary in the use of combined oral contraceptives so that lactation is not interfered with. Depot medroxyprogesterone acetate has been shown to be of value in stimulating lactation, quite apart from its contraceptive action. It has also been demonstrated that the intrauterine devices are unusually well tolerated during lactation.

*From 'Systemic Contraception' a booklet published this year by the International Planned Parenthood Federation, 18-20 Lower Regent Street, London SW1Y 4PW, England.

NUTRITION ACTIVITIES IN LOCAL HEALTH SERVICES*

by

*Robert Cook
Director, CFNI*

This subject is a large one, and for the purposes of this symposium it would be best to give a brief conspectus of what nutrition activities in the local health services are, or can be, or could be, or ought to be.

Let us first define terms. Local we take to mean neither national nor intermediate. At the local level, corresponding usually to a district or department or province, we have the institutions in most direct contact with the people, usually one or two small general hospitals, some health centres, health sub-stations or clinics. In urban terms the local level will be the city or a sector of the city. Nutrition activities we may define as those activities which if successfully carried out will improve nutrition status or prevent or cure malnutrition. If one accepts this definition, then many activities such as family planning and immunization must be included, since they fit the definition (and thus it is a mistake to omit them).

On the other hand for this paper I will omit such nutrition services as school meals, hospital food services, nutrition of the elderly, and services aimed at dealing with overnutrition and its effects. These are all matters which will become more important in developing countries with the passage of time. However, at present, the nutritional problems of mothers and children so predominate, that the paper will be confined to these.

*This paper was presented at: The 9th International Congress of Nutrition, held in Mexico in 1972 and will be published in the Proceedings of the Congress (Kargen).

PROMOTION OF LACTATION

The importance of breast-feeding to the nutritional well-being of the baby needs no explanation; and thus the inclusion of its promotion as a significant activity of local health services needs no justification, however novel it may seem. Three things can be done at the local level to promote lactation.

1. *Preparation for Breast-Feeding*

This applies particularly to primigravidae and should be chiefly an activity of pre-natal clinics. It consists not only in the detection and correction of nipple abnormalities; but also explanation of the advantages of breast-feeding. Now that it is possible in some areas for a girl to reach puberty without ever seeing a baby suckle, it may be desirable to have a successfully nursing mother demonstrate the process.

2. *Establishment of Breast-Feeding*

The practice of many maternity wards are obsolete and inadvertently unkind. Unless very ill or feeble, the baby should not lie in a separate nursery, but in a cot by the mother's bed. The mother's breast should not be withheld from the baby for twelve or twenty-four or forty-eight hours or other such fixed period - for such periods are based on no scientific evidence - but the breast should be offered to the baby as soon and as often as mother and infant desire. The establishment of the baby's sucking reflex should not be impeded by its being given a rubber teat (Applebaum).

3. *Protection of Lactation*

This is mainly a matter of consultation with the mother during the first few months after her child's birth. Nothing is so potent an enemy to successful breast-feeding as anxiety and worry (Jelliffe and Jelliffe). The allaying of such anxieties, often ill-founded, is both a kindness and a duty. Add to

this the correct management of engorgement, and many failures in lactation could be converted to success, if the basic motivation is present in the mother, and she does not have to leave the baby to go out to work.

FAMILY PLANNING

Since it is almost everywhere demonstrable on a community basis that a high rate of dependent children to supporting adults is significantly associated with less adequate satisfaction of nutrient requirements (Government of Trinidad) and a higher incidence of moderate or severe Protein-Calorie Malnutrition (PCM) (Wray and Aguirre) then family planning likewise needs no justification as a nutrition activity of the local health services. Every mother should, on any occasion suitable, be offered, in private and in a manner respecting her dignity, advice on contraception and also the means wherewith to achieve it. One of the most suitable occasions is at post-natal examinations (Taylor and Berelson).

PREVENTION OF INFECTIONS

The well-known interaction of malnutrition with measles, pertussis and tuberculosis (Scrimshaw et al) renders immunization against these diseases an essential part of nutrition services. Simple immunization schedules can easily be devised, for clinics or for mass campaigns, which include these and other vaccines (Stanfield 1967). The target should be at least ninety percent coverage, and expense is not the true reason why even half of this target is scarcely ever achieved.

In areas where a high level of malarial infection is endemic, anti-malarial prophylaxis in pregnancy will result in a decreased proportion of low-weight babies (Jelliffe, E.F.P. 1968). For the prevention of gastro-enteritis, ascariasis and hookworm, all of which combine with inadequate diet to produce

severe PCM and/or anaemia, the provision of clean water and the sanitary disposal of excreta is an essential service.

NUTRITIONAL SUPERVISION

The aim of a local health service, which cannot in reality wholly prevent malnutrition, ought to be to detect it early, and remedy it before it reaches a clinically recognizable form. There are two important aids to this early detection:

1. *Special Attention to 'At Risk' Families or Individuals*

'At risk' criteria can be compiled both from common experience and epidemiological study (Stanfield 1968). Such children should be seen more frequently and receive a larger ration of supplementary foods than usual.

2. *The Regular Use of a Growth Chart*

The type of chart is hardly important, so long as it is not too complex for auxiliaries to use and facilitates discrimination between various grades of undernutrition. What is important is (1) that the number of visits of the child should be enough for the chart to be of use; (2) that the weighings and recordings should be accurate; (3) that the chart should be made up and considered at each visit; (4) that the pattern of growth be interpreted according to clearly defined standards; and (5) that appropriate action should follow, according to norms and procedures established. One of the chief values of a chart is that it should enable the nurse or auxiliary to advise more or less frequent visits, to spend more or less time in consultation and to offer more or less in the way of supplementation of diet, thus promoting the most cost-effective use of the service itself. Moreover the chart has value as a tool both in the training of health staff and the education of the mother.

Whether these charts should define the child's status in terms of weight-for-age or weight-for-length is a matter for debate. Personally, I prefer weight-for-age when possible, because the measurement of length as an additional procedure, needs additional equipment and seems relatively more prone to error than weighing. To what age this type of nutritional supervision should continue depends both on the individual child's progress and on the age distribution of PCM in the community.

The growth chart however, essential tool though it is, cannot be the only kind of nutrition supervision. The responsible health worker must also be able to recognize such key clinical signs as oedema, pallor and signs of riboflavin deficiency, and in some areas, of hypovitaminosis A, rickets or scurvy. In both mother and infant one must be on the alert for signs and symptoms of infectious or parasitic diseases with well-known interactions with malnutrition, such as in the mother emebiasis; both in the mother and child, tuberculosis or hookworm; and in children especially also malaria, ascariasis and congenital syphilis, as well as the common acute infections.

Routine reasonably accurate haemoglobinometry is an almost essential service for both pregnant woman and pre-school child.

NUTRITIONAL SUPPLEMENTATION

Supplementary feeding programs will be specifically discussed later.

Here I confine myself to supplementation in the course of services such as pre-natal and young child clinics.

Just about everywhere in the world routine iron supplements in pregnancy are justifiable, and in some areas folic acid also. The same case for iron, or iron plus folic acid, applies to the infant and pre-school child in many developing countries. Vitamin A is also necessary in many areas, and in a few Vitamin D. Wherever there is a high incidence of any specific vitamin or

mineral deficiency it is often cost/effective to provide *routine* prophylaxis.

But the most important supplement of all, which in many countries is not available, is an adequate supply of weaning food, containing in compact form much of the child's daily requirements of calories especially, and protein and other nutrients; sold at a mere token price in quantities varying with the child's nutritional status. Inability to supply such a food in the local health service, like failure to use growth charts, is a grave deficiency in the service. In circumstances of sheer poverty there is probably a limit to what can be achieved by even the most skilful and relevant nutrition education. Mixtures more balanced and less dependent on violent price fluctuations than dry skim milk, are to be preferred. Such mixtures should be culturally acceptable and should not be expected to be a self-supporting commercial success in the short-term.

TREATMENT

The next speaker will deal with the subject of treatment of PCM, and I will not repeat my own views on the subject which are published elsewhere (Cook). All I wish to say is that along with many others I feel the concept of a 'well-baby clinic' as such is outmoded. Early treatment, by nurse or auxiliary, of gastro-enteritis and bronchopneumonia and other nutrition-related infections is often life-saving, and would greatly reduce the number of children requiring treatment for severe PCM. The norms of treatment must be simple and clearly defined as to indications and limitations, and the treatment should be available daily at health centres and aid-stations within walking distance of the homes of the people.

Under this heading we add also the important role, nutritionally, of anti-malarial prophylaxis in pregnancy and infancy in endemic areas; and of periodic

de-worming in areas where over 50% of pre-school children are infested with ascaris, hookworm or trichuris.

NUTRITION AND HEALTH EDUCATION

This cannot really, as I indicated in the figure opposite be dealt with as a separate activity, but should be part of every activity I have described. I mean not merely formal, planned, group instruction, which we often think of in this context, but more importantly perhaps informal instruction and advice to the individual whenever opportunity arises. At the same time there is danger that, if we emphasize only informal and individual health and nutrition education, it may well go by default in a busy clinic or hospital. Appropriate visual aids should be within an arm's reach of the health worker throughout his daily task, and explanation of what is being done and why should become almost a reflex habit for everyone from professor of pediatrics to the humblest dresser or clerk.

ORGANIZATION OF SERVICES

On this topic one can sum up all one has to say with the Fifth Axiom from M. King's excellent book, slightly adapted thus: The Health and nutrition service needed by the people should be provided as close to home as possible, in the smallest, cheapest, most humbly staffed and most simply equipped unit capable of providing that service adequately.

Before concluding I wish to point to certain other objectives which can be achieved by means of these nutrition activities in the local health services:

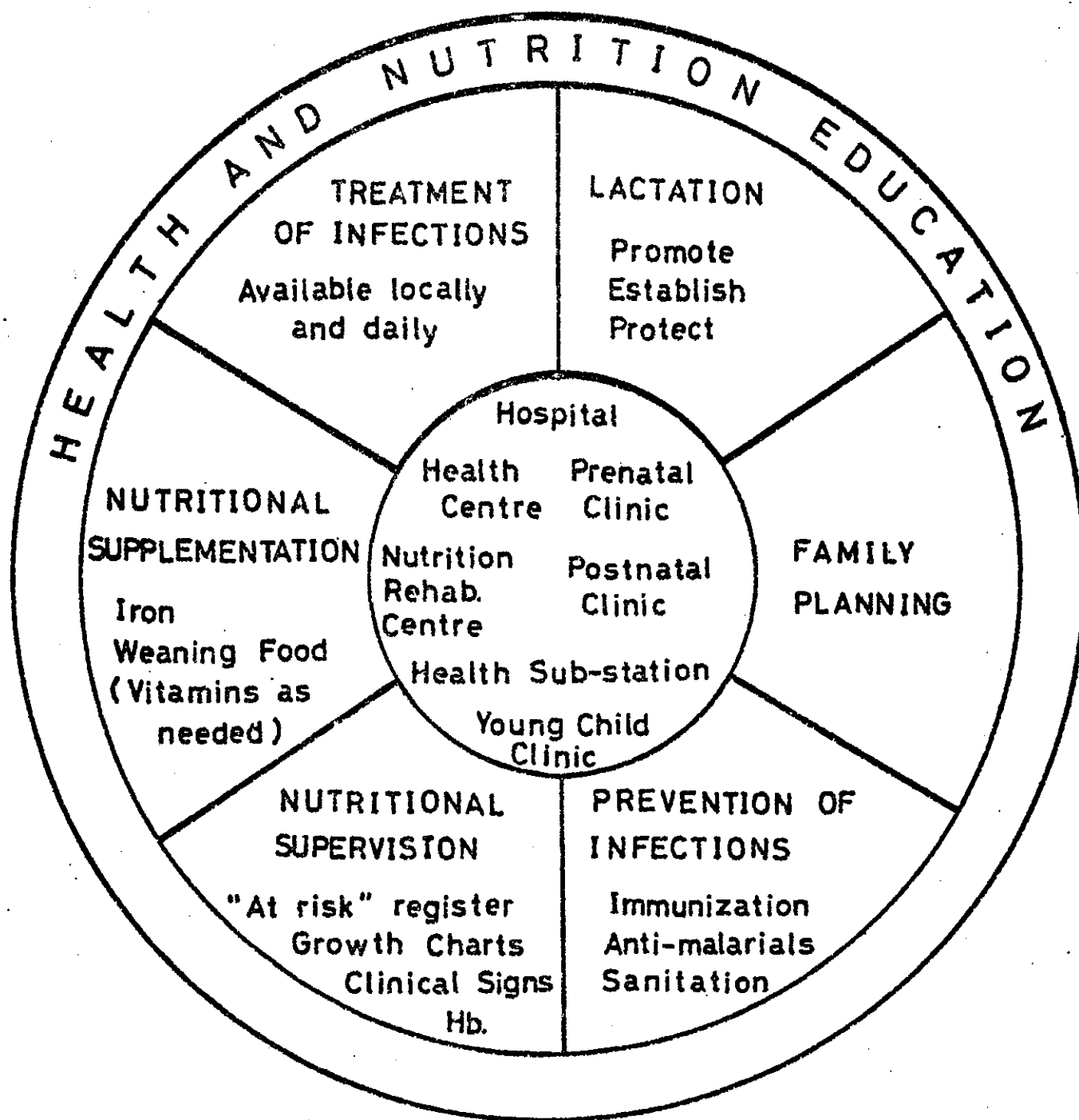
1. Training, of medical students, doctors, nutritionists, nurses, midwives, auxiliaries, volunteers and others.
2. Research of the most-needed kind, viz. operational, cost/benefit research, into how to apply present scientific knowledge to present problems.
3. Gathering of vital and health statistics.

When one looks at these activities, one sees how simple almost commonplace is the listing of them. If they were carried out we would see very little need for *special* programs.

References

1. Applebaum, R.M. "The Modern Management of Breast Feeding." *Pediat. Clinics of N. Amer.* 17: 203-225 (1970).
2. Cook, R. "Is Hospital the Place for the Treatment of Malnourished Children?" *J. trop. Pediat. and Environmental Child Health*, 17: 15-25 (1971).
3. Jelliffe, D.B., and Jelliffe, E.F.P. "How Breast Feeding Really Works." *J. trop. Pediat. and Environmental Child Health*, 17: 62-64 (1971).
4. Jelliffe, E.F.P. "Low Birth Weight and Malarial Infection of the Placenta." *Bull. Wld. Hlth. Org.*, 38: 69-78 (1968).
5. King, M. (1966). "Medical Care in Developing Countries." (Oxford University Press, Nairobi, 1966).
6. Scrimshaw, N.S., Taylor, C.E., and Gordon, J.E. "Interactions of Nutrition and Infection." (WHO Monograph Series No. 57, World Health Org., Geneva, 1968).
7. Stanfield, J.P. "Organization of MCH Services in Developing Regions (vi) Immunization." *J. trop. Pediat.*, 13: 102-116 (1967).
8. Stanfield, J.P. "The 'At Risk' Concept." *J. trop. Pediat.* 14: 201-204 (1968).
9. Taylor, H.C., and Berelson, B. "Maternity Care and Family Planning as a World Program." *Amer. J. Obstet. Gynec.*, 100: 885-893 (1968).
10. Trinidad and Tobago, Government of. "National Food Consumption Survey, 1970. (Government Printers, Port-of-Spain, Trinidad, 1972).
11. Wray, J.D., and Aguirre, A. "Protein-Calorie Malnutrition in Candelaria, Colombia." *J. trop. Pediat.*, 15: 76-98.

NUTRITION ACTIVITIES IN THE LOCAL HEALTH SERVICES



DIETARY TREATMENT OF OBESITY

by

V.S. Campbell*

INTRODUCTION

Many people think what they like to eat must be what they need, so they are tempted to eat any and everything. Had they only given serious thought when foods tempt them to - "A minute on the lips, forever on the hips" they would have avoided the trauma of obesity or overweight.

Avoidance is easier said than done and over-eating soon becomes a habit. This may stem from family customs, having to maintain social relationships, including rich party foods in addition to usual mealtime eating, eating excessive amounts of carbohydrate foods which are cheaper and more available or maintaining irregular habits of eating including continuous snacks.

A continuous excess of dietary calories over and beyond the body's need results in obesity. The problem is intensified in these days of reduced activity in the form of labour saving devices in home and factory, riding rather than walking to school and work, non-participation in sports (particularly middle-aged women), change in occupation and the repose and reduction of muscle tension in the middle and later years.

Genetic constitution, glandular disturbances and psychological aspects come into play but various authors have agreed that these factors account for less than five percent of the total incidence.

*Mrs. Campbell is a Principal Scientific Officer in the Scientific Research Council, Jamaica.

When is a person considered obese? Some authors claim that levels of ten percent over the "desirable" is the beginning. What is the "desirable?" There are standards of overweight for height from different sources. Can we use those as our standards? They are certainly a guide.

Obesity is prevalent in adults as well as in children and may be considered a form of malnutrition. The obese, though jolly and extrovert in total action, may prove a social misfit in company of his peers; there are side effects such as increases in blood pressure, serum cholesterol and subcutaneous fat. These lead to hazards in surgery. These undesirable effects are not dealt with here.

The appearance of an obese child may elicit the comment "What a healthy child" the assumption being falsely made that the fat child is the healthy child. Research has shown that when the deposition of fat cells has started in childhood it is apt to persist and to be more difficult to control in adult life. Obese children or adolescents may be exposed to uncomfortable situations because of ridicule from their own age group. Likewise they may be left out of activities, all of this tends to lead to a personality change.

REDUCTION

Of the various forms of therapy, diet is usually the most important. The main objective of the dietary regime should be a *modification* of the normal diet to achieve reduced energy intake yet providing adequate intake of all essential nutrients.

This main objective must fit into the social and economic patterns of people. Drastic reduction regimes should only be done in conjunction with medical supervision, so that immediate attention can be given to side effects.

The process of reduction should be a gradual one - say a loss of eight to ten pounds per month until a desirable weight is achieved. Occasionally however, a starvation regime must be imposed. Weight loss will then be much more rapid. Diuretics are sometimes prescribed. These however only decrease the water content of tissues; they do not remove subcutaneous fat. In other cases unrealistic proportions of carbohydrate, protein and fat are prescribed and, in an attempt to comply, the meals planned are unappetizing, monotonous and truly disgusting to the patient who passes on this disgust to the dietitian. In general, we can say that one gram of adipose tissue yields six calories. To lose one to two pounds a week would require a daily reduction of 500-1000 calories from the food intake. It is our task to make this reduction yet also provide a diet adequate in all other respects and in the way most acceptable to the patient.

DIETARY REGIMES

Different regimes have been suggested in the literature. Many have been tested and tried and some proven successful under certain conditions. "The Mayo diet" is a case in point. It is rather expensive however as it is basically a high protein diet - of great concern to us in the tropics is the cost and availability of protein foods.

The same problem of cost is found in the grapefruit, hard cooked egg regime practised by some. This diet calls for six eggs daily and two to three grapefruits.

It is believed that the combination, but primarily the grapefruit helps to "melt" the fat. Just how this is supposed to work is beyond our powers of thinking - one thing we do know however, is that on this regime there is likely to be an accumulation of fat in the arteries and ultimately circulatory problems. On such a diet too there is not the necessary bulk and the tendency is

to snack on the items nearest at hand - e.g. bread, biscuits, etc., simply because the individual eats for a "bellyful" not for nutritional or any other consideration.

An even worst plight can befall the individual who takes the liquid "Wait On", "Metrecal" or other brand name preparations which are alleged to be complete meals, or liquid nourishment. Alas! The liquid is readily absorbed and the taker is hungry again in but a few hours. Food, of a more solid nature must be sought and the vicious cycle begins again.

Diets such as the Mayo, the grapefruit-egg and the more recent Atkins' diet are fad diets, all proclaimed in glowing terms to the public yet seeming to quickly fade into oblivion. These fad diets are very often nutritionally inadequate and present an unnatural way of eating.

Formula diets may be nutritionally adequate. They too are not natural, as no one wants to continue on a liquid diet, yet they may serve as a crutch for certain individuals to get started down the scale.

It cannot be over-emphasized that any weight reduction regime should be a practical, consistent one, which the patient would be induced to follow. This demands the use of local foods. Are we enough acquainted with the nutritional values of local foods, of preparation methods and dietary habits of our people? We have made inroads but this vast field needs to be further explored. Such exploration should be one of the functions of CANDI.

The role of exercise in a weight reduction programme should be viewed in its proper perspective. You can lose weight on a reduction diet without exercising, but you cannot lose weight by exercising and eating what you please. Moderate exercise is a proper supplement to a low calorie diet, especially if it is performed regularly and frequently.

A diet history is a useful tool as it helps us to learn of the individual's eating pattern in regard to caloric intake, types of meals, adequacy, food preferences and approximate expenditure. If we can make a plan as close to the individual's pattern as possible, he will be much happier in his effort to follow the modified plan.

CONCLUSIONS

A gradual decrease in weight to desired level of equilibrium and maintenance at this level is the best reward that any dietitian or nutritionist could have for teaching a patient on a weight reduction regime. This then is the most practical means of evaluation.

Fad diets are expensive and ineffective. A scientifically sound, practical and consistent regime is best. Plan the diet within the normal eating pattern; know the food supply, food patterns and habits, prejudices, and purchasing power of the person or group for whom the planning is to be done.

A knowledge of the nutritional values of local foods is an asset and education and motivation are necessary to effect changes in eating habits. Frequent small meals may be the most practical measure to appease the appetite and ward off hunger.

My personal view is that to counteract obesity - eat less of everything, have a variety by all means; ensure some systematic exercise over and beyond house work or other chores.

CAJANAQUOTE

"We cannot continue with even our present standard of living if we allow our population to increase through the practice of new health techniques, while we maintain our use of old agricultural techniques."

Tanzanian African National Union

THE ROLE OF NUTRITIONISTS AND DIETITIANS IN CARIBBEAN HEALTH SERVICES

by

Dr. M. U. Henry*

Let us take a look at some of the major factors which must be taken into account in any serious attempt to identify such a role. With regard to our economy for example, in spite of the presence of oil and bauxite in some of the territories, and the very commendable regional efforts to diversify the economy and to industrialize, we are still an agricultural community, and agriculture remains the greatest employer of labour in the Region. The problem is that our agriculture is export oriented and far from sufficient attention has been paid to producing food crops for local consumption. Imminent changes in international trading relationships make a reappraisal of regional policy an urgent imperative if disaster is to be avoided. It must be remembered that a per capita income of approximately J\$431 for Jamaica; and US\$760 for Trinidad and Tobago, does not leave governments much money with which to import food that can be grown locally.

THE PEOPLE

By and large our education is such that the average West Indian is fully alive to the finer things of life even though one may have doubts about the intensity of his motivation to acquire them. More and more throughout the Region an educational system is being devised to allow each child to develop his maximum potential so that students are being prepared for secondary or vocational schools or University education according to their aptitude.

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Our University has not yet developed degree courses for dietitians and nutritionists so that these personnel still have to be trained abroad, but the Caribbean Food and Nutrition Institute has for several years been promoting an inter-disciplinary diploma course in Community Nutrition for health visitors, public health inspectors, teachers and agricultural extension officers and more recently an M.Sc. Course in Nutrition has been started by the University of the West Indies.

With regard to manpower in the health services, whereas in 1969 Barbados had 19.5 graduate nurses, 0.6 dentists, and 5.2 doctors per 10,000 population, the corresponding figures for Jamaica were 26 nurses, 0.9 dentists, and 6.7 doctors, and for Trinidad and Tobago 13.8 nurses, 0.6 dentists and 4.3 doctors. What these figures do not reveal is the dearth of medical manpower in preventive medicine. Latest figures for dietitians and nutritionists are 20 in Jamaica; one in Barbados and twelve in Trinidad and Tobago, most of these being employed in an institutional setting.

Until recently delivery of health care was in the traditional pattern in which there was a clear distinction of function and personnel in curative and preventive categories. In most instances in the interest of better manpower utilization the traditional system is being replaced by an integrated system of health care delivery.

THE NUTRITIONAL PROBLEMS

Clinically, anaemia, malnutrition, diabetes, obesity and dental caries are among the most important nutritional problems encountered. Doctors Chopra and Byam in Trinidad and Tobago, and the National Food and Nutrition Survey in Barbados provide documentary evidence of the incidence of anaemia in the peoples of the region. From a survey conducted in 1964/65, Doctors Chopra and Byam reported that women of child bearing age and small children were most

prone to anaemia, that the main cause was a deficiency of iron, although folic acid was of some importance, particularly in pregnancy. The Barbados National Food and Nutrition Survey showed that anaemia was most prevalent among infants and pre-school children - one-third of whom were anaemic and among adult women, one in five of whom were anaemic. In small children the anaemia appeared almost equally distributed between iron deficiency and folate deficiency. Most of the anaemic women were iron deficient, although a few were folate deficient.

Dr. Jelliffe *et al* have written extensively on malnutrition in the Caribbean which has a multifactorial causation - early weaning, high cost of food, large family size, and ignorance. It has been estimated that one-fifth to one-quarter of infants and toddlers in Trinidad and Tobago have moderate malnutrition, that thirty-eight percent of all infant deaths in Trinidad and Tobago are due directly to malnutrition, and that malnutrition/infection syndrome is a serious cause of ill-health and takes up many hospital beds.

With regard to diabetes mellitus it is estimated that twenty-five percent of adult beds at the hospital of the University of the West Indies are occupied by patients with diabetes mellitus, that Jamaica has about 50,000 diabetics and that Trinidad and Tobago has about 20,000 diabetics. The Caribbean Region as a whole has the unenviable reputation of having the highest death rate for diabetes mellitus in the Hemisphere.

Food and Nutrition Surveys have been conducted in Barbados and Trinidad and Tobago. In the Food Consumption Survey in Trinidad and Tobago, the objective of which was to determine the nutritional inadequacies of the household diets for use as basis for formulation of a food and nutrition policy for the country, 1,050 households and 5,822 persons were examined.

The findings indicate that sixty-one percent of the households met their requirements for calories; sixty-nine percent for protein; sixty-eight percent

for calcium; sixty-six percent for iron; seventy-one percent for vitamin A; sixty-eight percent for thiamine and eighty-eight percent for ascorbic acid. Only forty-nine percent and fifty-six percent met with their requirements for riboflavin and niacin respectively.

Factors found to influence the quantity and quality of household diets were the number of household members, income and food expenditure.

Diets were generally adequate for household sizes up to five members, but beyond the size, problems of riboflavin and niacin intakes come up, and from nine members up, additional deficiencies were shown for calories, protein and thiamine.

At incomes \$250.00 per month and below intakes of riboflavin and niacin were inadequate.

There was considerable increases in fat and animal protein intake with increase in income in both urban and rural areas. In the lower and middle income groups in rural areas, intakes of iron, thiamine, riboflavin and niacin could not meet with requirements. Food expenditure did not assure the nutritional quality of the diets.

In the 1969 Barbados Food and Nutrition Survey which involved about 700 families and over 2,000 individuals, the findings indicate about 16.5% of 248 under 5-year children were suffering from malnutrition and one-third of them were anaemic; in school children there was general moderate retardation of growth; adult women had a considerable problem with obesity while about twenty percent of them showed iron deficiency anaemia.

A significant association was demonstrated between low income levels and failure to meet family nutrient requirements and attendant malnutrition among the children in these families.

The Food Consumption Survey which involved 139 householders showed a deficit in calorie intake as related to requirements in a significant number of households, and a lesser deficit in protein quantity and quality, with some deficiencies in calcium, iron, thiamine, niacin, riboflavin and vitamin C.

The Region as a whole has a population problem the result of low or falling mortality rates, coupled with high birth rates. Growth rates between two and three percent or higher are the norm. This has resulted in a demographic structure wherein forty-two percent of the population is under fifteen, women of child-bearing age constitute about twenty percent of the population; there is a high dependency ratio and an uncomfortably high level of unemployment. The impact of all this on the nutrition of the community is self-evident. Most Caribbean governments have therefore thought it prudent to support family welfare planning activities.

World food prices have been rising steadily *pari passu* with the increasing non-availability of important items of food. The severe drought in the Caribbean is only now about ending; the effect this has had on local sugar, rice and other agricultural and livestock production is well known; similar adverse weather conditions have been reported in Latin America, in Africa and in India; and in Africa in particular, much foreign assistance has been necessary to mitigate the human suffering which accompanied the food shortage which was the direct result of the drought.

A recent United Nations publication stated that massive crop failures forced the U.S.S.R., to make huge grain purchases from North America last year. These purchases had the dual effect of lowering reserves and driving prices up seventy to eighty percent higher than one year ago. The result is that developing countries which find themselves short of grain take a financial beating when they go to the international market place.

In the picture of the Caribbean that I have tried to present - In order to provide some background information on the factors which are relevant to nutrition in the Caribbean - we are portrayed as a community whose agricultural policy has been geared for producing crops for the export market without appropriate emphasis on crops for local consumption. Our educational system, our historical past, and our social customs have combined to relegate agriculture and nutrition into a very subordinate role with the result that we develop an appetite for imported foods and we are faced with spiralling food costs which will inevitably compound our nutritional problem.

Although there is widespread interest in the development of education in the Region and much planning for University expansion, there is still insufficient attention paid by all levels to nutrition education.

Health Service Systems which were divided into curative and preventive and in which the doctor played a dominant role are now being replaced by integrated systems with emphasis on the team approach.

Anaemia, malnutrition, diabetes mellitus, obesity and dental caries are major clinical nutritional problems of the area.

Our nutritional problems have not been assisted by the high growth rate of the population.

THE DIETITIANS AND NUTRITIONISTS

It is in this context that the role and responsibility of the dietitians and nutritionists in the Caribbean now becomes clear and well defined.

First she must keep herself well-informed of the complex of factors such as those outlined above which are responsible for the nutritional status of the local community and she must be prepared to use her professional knowledge and skill to minimize the effect on the individual and the community of any adverse trends or influences. In these days of food scarcity and shortages

and rising food prices, cost-nutrient values are important, especially to the vulnerable lower income groups and the dietitian/nutritionists has an important role to play in making factual information available through public lectures, newspaper articles, radio talks or television interviews. The dietitian/nutritionist must project the importance of her profession to all levels of society and all strata of government and it is in this context that particular attention must be paid to organizations like consumer guidance groups, standard bureaus, where these exist, and to national nutritional councils so that expert opinion would be available in the formulating of national food and nutrition policy. The Caribbean Association of Nutritionists and Dietitians as the mouthpiece of dietitians/nutritionists is particularly suited to this important educational task; and one looks forward to meaningful contributions from the Association in attempts to solve the Region's nutritional problems.

The dietitian and nutritionist must show concern for the development of her profession. She must realize that her professional education did not end when she left the University at the end of a three-year period of study. She must appreciate the need for in-service and refresher training and indeed for postgraduate training, to keep abreast of the changing needs of the community.

The need to develop a local degree course in nutrition now seems well established. This was a recommendation of a Pan American Health Organization sponsored conference held in Caracas in 1966, and this opinion was reiterated at the 1972 Annual Advisory Committee Meeting on Policy of the Caribbean Food and Nutrition Institute where the Progress Report states:

"The 1971 Policy Committee recommended that consideration be given to the training of nutritionists and dietitians at University level. The opinion is widely held in the area in government and university circles that the time has come for the establishment of B.Sc. courses in these two subjects and in home economics."

Referring to the lack of local training opportunity locally for the degree level nutritionist and dietitian the report makes the pertinent observation:

The results of the situation are:

1. All who wish to pursue this type of career go to the United States, or Canada or the United Kingdom. Some return to work in the Caribbean, but many do not and their potential services are lost.
2. They learn during their university courses in these countries much that is universally applicable but usually with examples and practice in circumstances of food habits and availability quite different from those which obtain in their native countries. Some who return to work in this area adapt themselves quickly and wholly to the area's needs, but many do not.

So much for the need for these degree courses which one hopes will soon be a reality, especially as it is understood that active consideration is now being given to the establishment of a Department of Applied Nutrition and Community Studies at the University of the West Indies.

While promoting the development of graduate and postgraduate courses for dietitians and nutritionists, one should not neglect the need simultaneously to promote the development of auxiliary categories like the Food Service Supervisor and other dietitian aides to do the more routine duties which will permit the dietitian or nutritionist to utilize her time in professional functions for which she has been specifically trained.

In addition to promoting the educational development of her own profession the dietitian or nutritionist must assist in the professional education of other members of the health team - nurses, health visitors, public health inspectors and medical students, and her tutorial activities should extend

into related Ministries like Agriculture, Education and Community Development.

Most dietitians and nutritionists in the Region are employed within the health sector and it is in this field whether employed in an administrative, clinical or other capacity that the dietitian or nutritionist has the opportunity to exert the greatest influence on the nutrition of the individual and the community. At present most of our trained nutrition personnel like our physicians, are hospital based; few nutrition personnel and few physicians are in the field of preventive medicine. This is one severe criticism of delivery of health care in the Region, and most governments are moving toward the introduction of integrated health services. In keeping with this trend the dietitian and nutritionist must be prepared to give service in areas where service is needed - whether it be at the bedside, in the outpatient clinic, in the health centre or if necessary in the home. Throughout the Region undue preoccupation with inpatient care has for too long hindered the development of outpatient and community service which will without doubt reduce the heavy inpatient load.

Although the association of the dietitian with inpatient care has been well established and the dietitian's skill in special diets like low sodium or fat free diets is well known, the dietitian has been accused of, to borrow Miss Zephirin's elegant phrase, 'lack of aggressive rapport' with her medical and para-medical colleagues.

I am sure she can be relied upon to remedy this defect tactfully and to respond to the new inpatient challenges which will emanate from intensive care and renal dialysis units now being established within the Region.

With regard to outpatient and community health services, the dietitian and nutritionist must realize the importance of Maternal and Child Health Programme to the health of the local community and the importance of her role in this programme. She must recall that Local Food and Nutrition Surveys have repeatedly

shown the need for iron and folic acid supplements in pregnant and lactating mothers, that breastfeeding should be encouraged as the best form of infant feeding and that there is a tendency to anaemia among the pre-school child. She must realize that malnutrition is still too common and can become worse, if for example, food prices are not kept in check. She must learn that the place to treat malnutrition is not in hospital which may expose the child to hospital infection, but as the Barbados programme so well demonstrates, in the home where the mother can be taught how to cope with the problem with the resources at her disposal and a bacterial environment with which the child is familiar. Aware of the association between malnutrition and infection and of the harmful effects of the combination, the dietitian and nutritionist must support national immunization programmes. Aware too of the association between malnutrition and the number of children in the household, the dietitian and nutritionist will support Family Planning Programmes which have been adopted by many Caribbean governments as an integral part of Maternal and Child Health Services.

Almost twenty years ago an advisor on health affairs to the Secretary of the Department of Health, Education and Welfare stated that 'the physician who tries to discuss diet with a diabetic patient is not using his time wisely.' More recently this viewpoint has been re-echoed by the Canadian Dietetic Association in their brief to the Community Health Centre Project Director - Dr. John Hastings.

With our high local incidence of diabetes mellitus, high morbidity and mortality, the result of poor control, it is evident that dietitians and nutritionists have a clear mandate to become more actively involved in the dietary regime of the diabetic patient. The place to stabilize the diabetic is not in a hospital bed - which should be reserved for the diabetic with severe complications - but on the job where he is performing the tasks that will secure

an economic future for himself and his family. Dietitians and nutritionists should be deployed throughout our health centres to assist the nurses and doctors in the care of the many diabetics who attend or who should be referred from the large central clinics.

May I be permitted to quote from an as yet unpublished article at this stage:

"The Inaugural meeting of the Caribbean Association of Nutritionists and Dietitians at which one of the themes was diabetes mellitus, so stimulated the medical social worker at one of our hospitals that she wrote the dietitian of that hospital to consider a new approach to the treatment of patients with diabetes. In her letter, the medical social worker suggested that group therapy methods be employed and specialists such as the physiotherapist, medical officer and occupational therapist be involved. A preliminary meeting was held to which members of the nursing team were invited."

Eventually, eight one-hour group therapy sessions were held consisting of seven staff members and eleven patients. The experience was most rewarding and beneficial both to patients and staff, and most gratifying I am sure to the Caribbean Association of Nutritionists and Dietitians.

Time does not permit any elaboration on obesity and the role of the dietitian or nutritionist. Suffice it to say that once organic cause for obesity is excluded, the dietitian is the professional best trained to monitor and supervise the reducing effect of a diet.

With regard to dental caries the undoubted role of the dietitian and nutritionist is to support water fluoridation schemes and to liaise with the dental hygienist.

Finally the dietitian and nutritionist must function as a resource person in two specific situations, namely:

1. Where groups of people are required to remain together for any length of time, for example, in day care centres, youth camps, geriatric homes or penal institutions;
2. In areas of research, e.g. in the development of weaning foods, in the acceptability of new highly nutritious foods and in food and nutrition surveys.

To summarize therefore the special problems of nutrition in the Caribbean make the role of the dietitian and nutritionist one of special importance at this stage of our development. The dietitian and nutritionist must be a health education and public relations officer so that knowledge of the contribution she can make to improve nutritional status of the community becomes more widely known; she must interest herself in the development of human resources to ensure that sufficient adequately trained personnel are available to perform tasks that are identified; she must be prepared to give service within a health service system whose orientation is changing from the traditional to integrated health care because the concept of patient care being extended beyond the walls of the hospital is now being better understood, and the role of the other members of the health team is now gaining wider acceptance.

It appears that the positive role envisaged for dietitians and nutritionists in the Caribbean accords well with the stated aims and objectives of the Caribbean Association of Nutritionists and Dietitians and, whatever our difficulties, the existence of this Organization, which is an outstanding example of what can be accomplished almost unaided by the youth of the Region augurs well for the future of nutrition in the Caribbean.

UNSUPPLEMENTED HUMAN MILK AND THE NUTRITION
OF THE EXTEROGESTATE FOETUS
(PART II)

by

Derrick B. Jelliffe, J. Michael Gurney
and
E. F. Patrice Jelliffe

The first part of this paper was presented in the last issue of 'Cajanus' (Vol. VI, No. 3, pp. 156-163). This is the second and final part.

PRACTICAL CONCLUSIONS

While it is difficult to draw overall conclusions from the still limited information in the very varied circumstances of the different reports available, certain generalizations do seem warranted, which can, in time, lead to practical guidelines for infant feeding in majority circumstances - that is in developing countries of the world.

Firstly, there is increasing evidence of the *biochemical uniqueness of human milk*,⁽¹⁴⁾ which, it must be stressed, is quite beyond the range of imitation. It appears that human milk has specific metabolic functions and adaptations of universal value in all parts of the world.

Secondly, the human milk has *anti-infective properties*.⁽¹⁴⁾ The overriding danger of diarrheal disease in poorly sanitized tropical countries means that the possible value of any ingested food other than human milk in the early months of life has to be weighed against the extreme risk of precipitating weanling diarrhea, with its intimately related nutritional ill-consequences.⁽¹⁶⁾

Thirdly, current evidence indicates that *unsupplemented human milk is all that is needed for feeding the extergestate foetus for the first six months of life in well nourished communities* - that is, where mothers have been

adequately fed in pregnancy, where the newborn is of good birth weight and possesses sufficient foetal stores, and where mothers are, in turn, well fed during lactation.

The opposite situation applies in varying degrees in most developing countries. Mothers are poorly fed in pregnancy, often lose weight and indeed may develop cumulative signs of maternal nutritional depletion with each pregnancy-lactation cycle. Indeed, their nutritional inadequacy usually has its roots in malnutrition in their own childhood and in the over early commencement of child-bearing. Among their offspring, birth weights and foetal stores will be below optimal.

Lastly, evidence in the past ten years suggests that at least in some communities the adequacy of breast milk alone as regards calories and protein may become less than optimal from about four months of age onwards.

Where this is the case, it is necessary to devise *the most appropriate practical guidelines for infant feeding, based not only on the immediate nutritional needs of the growing infant, but also on the intimately connected nutritional inadequacy of the pregnant and lactating woman, and on the baby's low birth weight and defective foetal stores.*

Also, it is necessary to gear such guidelines to the ever present danger of weanling diarrhea in the sanitary and culinary circumstances usually found in developing countries, and to the relative costs and availability of human and cow's milk in relation to limited family and national incomes.

Three main alternative approaches to this problem may be suggested:

1. *Cow's Milk Supplementation*

If growth, as evidenced by the weight curve, becomes inadequate at four months, a theoretical solution may be to introduce bottle feeds with cow's milk as from this age or just prior to it.

In the circumstances of most tropical countries, this approach must certainly be avoided. It introduces the danger of weanling diarrhea at an early vulnerable age. It decreases the secretion of breast milk as it interferes with the key sucking stimulation and proportionate release of pituitary prolactin. It is an additional endorsement by the nutritionist of the unfortunate and unaffordable trend away from breast feeding. Lastly, if viewed on a large-scale community basis, it has economic, agronomic and food production consequences of very considerable dimensions.

2. *Early Introduction of Semi-Solids*

Again, under majority circumstances in the world the risks of diarrheal disease are great if semi-solids are introduced before necessary. Also, in average kitchen circumstances in tropical countries and with the foods most usually available, it may be very difficult to prepare digestible well-tolerated and nutritionally adequate supplementary semi-solids for a child of this early age. However, the introduction of semi-solids by cup or by spoon would have less effect on lactation performance than cow's milk by bottle and should be based on the use of locally available foods, nutritionally blended as 'multi-mixes.'⁽¹⁵⁾

3. *Feed the Mother*

Current knowledge seems to clearly suggest that the most economical, safe, physiological and practicable method of approaching the situation is by laying maximum emphasis on feeding the mother during pregnancy and lactation.

Adequate feeding, again based on 'multi-mixes' of locally available foods, or on maternal diet supplements during pregnancy can insure adequate maternal weight gain and sufficient calorie reserves in the form of subcutaneous fat, as well as a newborn of good weight and with sufficient nutritional reserves. Similarly, an appropriate maternal diet, again based on locally

available foods, should be the emphasis during lactation, with semi solids slowly introduced to the extergestate, probably from about the age of four to six months onwards, depending on local circumstances.

Evidence for the adequacy of human milk as the sole food for young infants is available; at least in well-nourished communities, as is the improvement in lactation performance with dietary supplementation in less well-fed circumstances. The message seems clear - that is, that as in so much else with regard to the health and nutrition of young children, the emphasis should be in large measure on the mother. By feeding the mother with locally available foods during pregnancy and lactation, it is possible to avoid the infective dangers and the economic and distributive complexities of introducing cow's milk and bottle feeding unnecessarily, and also to avoid assisting still further a decline in breast feeding on a community basis.

References

1. Applebaum, R.M., (1970). *Pediatric Clinics of North America*, 17, 203.
2. Bailey, K.V., (1965). *J. trop. Pediat.*, 10, 35.
3. Bassir, O., (1957). *West Afr. J. biol. Chem.*, 1, 15.
4. Beal, V., (1969). *J. Amer. diet. Ass.*, 55, 31.
5. Belavady, B., (1969). *Indian J. med. Res.*, 57, 63.
6. Belavady, B., and Gopalan, C., (1960). *Indian J. med. Res.*, 48, 518.
7. Cravtoto, J., Birch, H.G., DeLicardie, E.R., and Rosales, L., (1967). *Acta Pediat. Scand.*, 56, 71.
8. Dugdale, A.E., (1971). *Brit. J. Nutr.*, 26, 423.
9. Eksmyr, R., (1969). A trial to Change Infant Feeding Practices in an Ehtiopian Village. Ehtiopian Nutrition Institute, Addis Ababa.
10. Gopalan, C., and Narasinga Rao, B.S., (1971). *Indian J. med. Res. Suppl.* p. III.

11. Jackson, R.L., Westerfeld, R., Flynn, M.A., Kimball, E.R., and Lewis, R.B., (1964). *Pediatrics*, 33, 642.
12. Jathar, V.S., Kamath, S.A., Parikh, M.N., Rege, D.V., and Satoskar, R.S., (1970). *Arch. Dis. Childh.*, 45, 236.
13. Jelliffe, D.B., (1972). *World Rev. Nutr. Diet.*, 16, 1.
14. Jelliffe, D.B., and Jelliffe, E.F.P. (editors) (1971). *Amer. J. clin. Nutr.*, 24, 968.
15. Jelliffe, E.F.P., (1971). *J. trop. Pediat. env. Child. Hlth*, 17, 135.
16. Kanaaneh, H., (1972). *J. trop. Pediat. env. Child. Hlth*, 18, 302.
17. Karmakar, M.G., Rajalakshmi, R., and Ramakrishnan, C.V., (1963). *Acta. Paediatr.*, 52, 473.
18. Malcolm, L.A., (1970). Growth and Development in New Guinea. A Study of the Buidi People of Madang. Institute of Human Biology, Monogram No. 1.
19. Poeplau, W., and Schlage, C., (1969). Nutrition and Health - Usambara. In: Investigations into Health and Nutrition in East Africa. Editors: Kraut, H., and Cremer, H.D., Weltform Verlag, Munich.
20. Read, W.W.C., Lutz, P.G., and Tashjian, A., (1965). *Amer. J. clin. Nutr.*, 17, 180.
21. Taitz, L.S., (1971). *Brit. med. J.*, 1, 315.
22. Underwood, B.A., Hepner, R., and Abdallah, H., (1970). *Amer. J. clin. Nutr.*, 23, 400.
23. Venkatachalam, P., (1962). A Study of the Diet and Health of the People of the Chimu Area. Monogram 4. Port Moresby, Department of Public Health.

CAJANAQUOTE

"In the last analysis the nutritional level of a community depends on the availability of food and on purchasing power and the possibility of free choice."

Dr. O. Lopes da Costa

NUTRITION NEWS AND OPINION FROM THE CARIBBEAN

BANANA FLOUR**By Colin Gregory*

It is good news that at long last the Government has got around to the idea of investigating the possibility of our using banana flour to cut down on the high cost of wheat flour we have been importing. The Prime Minister announced this at Leamington, Westmoreland on Wednesday of this week.

This has been such an obvious way of Jamaica's trying to save on foreign exchange that it is almost incredible (and would be incredible except for the fact that we know human nature) that it has not been officially sponsored long ago.

I have been looking up some old writings on this subject and found one which appeared in the Gleaner of January 25, 1965, which reads in part: "Isn't there a possibility of our making banana flour as a means not only of supplying local food but of using what will soon be surplus bananas?" (This was just when the Windward Islands began to take Jamaica's place as the main supplier of Caribbean bananas).

The piece went on: "Economically, Jamaica is fooling itself and has been doing so for a very long time. Something drastic will one day have to be done to compel us to change our eating habits. Now seems an excellent time to do it. A call to help the banana industry can be the sort of thing to satisfy our higher ideas, while at the same time the Government compels us to eat our bananas and like it. It could be the start of a general move to make ourselves self-supporting where food is concerned."

Why is it that we have had to wait so long before we are doing what was suggested by a mere Gleaner columnist over eight-and-a-half years ago? And there is no prize for guessing who the columnist was.

The Taste

And for those who are scared about what banana flour may taste like, let me quote yet a few more lines from that ancient piece. ".....If you can't stand the taste of bananas you can always feel that you are suffering for the good of your country which may be better than disguising the taste with mayonnaise or ketchup."

But let's forget that old-time comment which appeared when another party ran the government. Last year, July 25, I referred to a visit I had paid to a factory on the North Coast operated by Windsor Foods Ltd. where they were making banana products including banana flour, I may add, for the American market. Shortly after this reference appeared I was sent a cutting by a reader taken from an American paper in which the American businessman to whom Windsor Foods Ltd. sold their banana products for the American "natural foods" market said that there was a fortune to be made out of rejected bananas in products such as this.

*From The Daily Gleaner (Jamaica) October 13, 1973.

BANANA BY-PRODUCTS**By Colin Gregory*

I have had an interesting letter from Mr. Alfred Lakhan, the managing director of Tapes, Adhesives, Glues, Ltd., on the subject of products from the banana about which I wrote the other day, referring to the work done by Dr. Clive Mendes on developing such things as banana flour (there were others such as "cream of banana", "cocobanana" and banana "raisins").

Mr. Lakhan tells me that a study has been done "which indicates how intensive any such development could be to the Agricultural sector of the community." He asserts that the internal market in products, from the banana to "be well in excess of \$25,000,000 per annum." This would include the following products: "Baking and counter-grade flours, flocculants, edible and commercial grade starches, adhesives, baby foods and from the skin and other wastes, animal feeds."

You will note that Mr. Lakhan refers only to the internal market. It seems to uninformed me that there is an enormous potential in an overseas market and this does not even include things such as banana figs and banana crisps.

With the present need to boost our economy, the Government ought to be looking into such things. Maybe it is so doing but it would be reassuring to the public, including me, if we could be told something of this.

The banana has been unexploited except as a fresh fruit. As we know, manufacturing adds a great deal to the cost of the finished product. If we manufactured things from the banana a great deal of money would be spent in Jamaica, a number of people would be employed and some foreign currency obtained, apart from the circulation of \$25,000,000 internally, if this is indeed the figure.

Aren't we missing a bus which has been driving past us for many, many years?

*From The Daily Gleaner (Jamaica) November 6, 1973.

NEWSPAPER CLIPPING

SELF-SUFFICIENCY IN FOOD IS NEEDED*From The Advocate News (Barbados) 5th September 1973*

The United Nations Food and Agriculture Organisation (FAO) does not paint a pretty picture of the world food supply for next year. In an annual review of the world commodity market, the FAO has predicted that there will be shortages of certain staple foods. The report did not take into consideration the flooding that has already hit certain parts of the world and which must of necessity increase demand for certain foods since local crops in a number of areas have been wiped out.

We in Barbados rely heavily on imported foods. Because of this any world trend of shortage must be felt by us unless we get down to business from now and see what we can do to cushion any adverse trends. Shortages of commodities always bring higher prices because of the effects of supply and demand. So apart from having problems of getting our vitally needed food supplies it can be anticipated that we will be called upon to pay more for our food.

This does not sound encouraging but then there is no substitute for food. The most that can be done is use more locally grown food wherever possible. This then is the challenge that we face.

For nearly three consecutive years, the Eastern Caribbean area has experienced conditions of drought that hit locally grown food crops fairly hard. In Barbados we felt it somewhat more than in a number of other islands because we ventured to change up our land use policy as it related to food crops. However, the authorities have indicated that steps will be taken to correct any miscalculations made so that more land should be put under food crops this year than was the case last year.

We are not alone in our efforts to beat the food shortage problem. As the FAO report has indicated it is a world trend. But at the same time we must not assume that we are doing all we can at the moment to increase our food supplies. This is far from the case.

It is anticipated that in the long run, because of the Caribbean Community and Common Market (CARICOM) with the various facilities that will be made available for agricultural expansion in the area, the drive to produce more food will be part of our regional effort. It has also been mooted that zoning of agricultural products could help increase this output. The feasibility of such zoning promises to be a controversial matter, with one school of thought holding the view that because of the similarity of climate in the Caribbean area there is not much that can result from zoning. However, at least one source connected with meteorology in the area has put forward the view that there is much practicality in such a move.

All these are matters which will have to be fully explored as we seek to do all we can to provide more food for our people. The demand for more food will be there in both the short and long term, but it is the short term results that cause the biggest anxiety.

However, it is not to the land alone that we must look as we seek to provide our people with more food. Our fishing facilities also must play an important role if we are dead serious about this business of increasing food supplies. There is still a lot more that can be done in our fishing. It is one area in which we have been dragging our feet for sometime. It is not that we are not getting results with what we have. The question is whether we are getting as much as we can from the waters around our shores.

We might never reach the point where we can hope to be completely self-sufficient where our food supplies are concerned. But at the same time we must endeavour to do all we can to come as close as possible to this. Whenever we face difficulties in getting food supplied by other people to our tables, we must ponder over the fact that such embarrassment can only be further aggravated if we do not do more in the effort to feed ourselves. It is a bold challenge. It will demand bold actions.

CAJANAQUOTE

"It is important to recognize what a Minister of Health can and cannot do. Malnutrition involves many factors, including agriculture, the technology, manufacture and supply of food, education, inadequate purchasing power, maldistribution, the inability to reach preschool children, malabsorption of food in the intestinal tract because of enteric disease, lack of awareness of the options for planners, and ignorance of opportunities for dietary improvement using food available within countries without the need for imports.

Knowledge of those factors is important, but the single most important first step is to consider the malnutrition problem at the national planning level. Such an examination would yield a plan for nutrition that could be integrated with all other sectors in each country's growth plan."

Dr. L. M. Howard

CFNI NEWS

NEW STAFF MEMBERS

We welcome three new staff members to the Jamaica Centre of CFNI: Dr. Alex Campbell, Mr. Peter Jutsum and Ms. Ida Daum.

Dr. Campbell has joined us as Deputy Director after retiring from Government service in Canada. For two years before joining CFNI he was Acting Director of the Nutrition Bureau of the Department of Health and Welfare.

Before that he was Senior Scientific Advisor (Foods) in the same Department. In that capacity he was involved in various aspects of food legislation.

Dr. Campbell also spent a year in the Department of Food Science and Technology at the American University of Beirut in Lebanon.

Mr. Peter Jutsum has been a member of the Physics Department of the University of the West Indies for the past fourteen years. During the latter two years he was Acting Head of the Computing Centre of the Mathematics Department on the Mona Campus. He has joined CFNI as our Computer Scientist.

Ms. Ida Daum, an anthropologist, is spending a year in Kingston as a Research Fellow at CFNI. She is studying the social background of urban malnutrition. The research is for a Ph.D. at the University of Washington, USA. She is on the Faculty of Anthropology at the Evergreen State College in Olympia, Washington.

NEW DCN COURSE

Twenty-six fellows from ten Caribbean countries and Malaysia assembled in Jamaica on 1st October to start the Diploma in Community Nutrition Course. The group consists of public health nurses, public health inspectors, agricultural extension officers, teachers and community development officers.

On January 8th the students will leave Jamaica for Montserrat, where they will spend the first week of the second term engaged in a week of intensive practical teaching. From here they will go to St. Lucia for approximately four weeks, to carry out in collaboration with Government colleagues, a National Food and Nutrition Survey.

The remainder of the term will be spent in Trinidad.

LETTER TO THE EDITOR

From Marion Frazao, Nutrition Programming Coordinator, USAID/Brazil.

Dear Sirs:

There is much debate in Brazil at the present moment about the relative importance of protein in the diet vs. the Net Dietary Protein per Calorie Percent theory.

In your October-December 1972 issue just received, you ask for suggestions on subjects to be dealt with in "Nutrition Made Simple". Since there is much debate on this, now world-wide, I would like to suggest that this be discussed in an early issue. You will be making a great contribution to enlightenment in the field of nutrition (as, of course, you already are!)

Sincerely yours

Marion Frazao

2 May 1973

EDITOR'S NOTE:

We thank Marion Frazao for this letter. "Nutrition Made Simple" has a piece on proteins in this issue (page 260).

NUTRITION MADE SIMPLE

PROTEINS - What they are, how they differ, where they come from, how much we need - J. M. Gurney

What Proteins Are

The nutrients found in foods can be classified into five categories. These are carbohydrates, fats, proteins, vitamins and minerals. Of these the first three contain carbon, hydrogen and oxygen. Proteins contain nitrogen and sulphur as well.

These elements - C, H, O, N and S - combine to make the molecule of protein. It takes energy (measured as Calories or Joules) to join the elements together and if they are separated energy is released.

Proteins - as well as carbohydrates and fats - can be broken down in the body to provide energy.

However, provision of energy is not the main use of proteins. Most of the protein in our bodies is found in muscles. People who suffer from a deficiency in protein have wasted muscles. If they are children they do not grow adequately and if the condition is serious and persists they develop the disease of *kwashiorkor*.

Proteins are essential constituents of every cell in the body.

Protein molecules are very large. They are made up of chains of *amino acids* (do not be confused by the word *acid*; they do not burn like battery acid). If we think of a protein molecule as a word (or even a sentence - a string of words) the amino acids are the letters that make up each word. Just as there are only twenty-six letters in the alphabet but innumerable words constructed from these letters, so there are only about twenty known amino acids but many different proteins.

For example, protein in hair is different from that in skin which, again, is different from that in flesh. The proteins of meat vary slightly between species. The proteins in plants are very different from animal proteins and vary one to another. These differences are in the arrangement of amino acids that go to make up the molecule of each protein.

Proteins differ and the difference is found in variations in their amino acid composition.

Amino acids are so named because they contain an *amino group*. This is the name given to an atom of nitrogen (N) joined to two atoms of hydrogen (H). It is written like this: $-NH_2$. Amino acids also contain the other elements mentioned above - carbon, hydrogen and oxygen. Some amino acids (methionine and cystine) contain sulphur as well.

Nutrients, when they enter the body can be used for different purposes. For example, the body can make some of its fat from carbohydrate. Carbohydrate can be formed from protein (this is rather wasteful as the amino group is split up and the nitrogen lost, mainly as urea in the urine). However, because the amino group cannot be made in the body, all the proteins in the body must come from proteins in food. Some of the amino acids can be switched around so that one protein can be formed from another. This process, which occurs in the liver, is called *transamination*. But there are eight *essential amino acids* that cannot be made in the body.¹

Essential amino acids must be provided by the diet. They must be taken in the right amounts and in the right proportions one to another to be fully utilized.

Protein Quality

When we consider whether the protein in a diet is adequate or not we must find out:

- (a) how much total protein there is (quantity)
- (b) how much of each essential amino acid is present (quality)

If the quality of protein in a diet is poor a very large amount will be required to make sure enough of every essential amino acid is taken. This is often impractical - it may be very expensive and may not be tolerated by an infant or toddler with a small stomach and undeveloped digestive and metabolic system.

We test the quality of protein in a diet by totaling up the amount of each essential amino acid and checking these amounts with the required pattern. In this way we calculate the *amino acid score* (sometimes called *chemical score*). The essential amino acid that is most lacking in the diet is called the *limiting amino acid*.

Humans have a known required pattern of essential amino acid intake in the diet. The quality of the dietary protein intake is determined by the amount of the most deficient essential amino acid - the limiting amino acid.

The limiting amino acid limits the utilization of all others. Let us return to the analogy of a protein being a word, while the amino acids are letters. Let us take the word *FOOD*. To write this word we need one F, two Os and one D. If we were given two Fs, four Os and two Ds we would be able to

¹The essential amino acids are isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophane and valine. Infants need histidine as well, but this latter is not essential for adults.

write *FOOD* twice. But if we had two *F*s, four *O*s but only one *D* we could only write *FOOD* once and we would have an *F* and two *O*s left over. In this case *D* is equivalent to the limiting amino acid. We needed two *D*s but only had one. If these letters were really essential amino acids the *F* and two *O*s would be wasted as far as protein was concerned and their nitrogen atoms would be lost to the body in the urine.

A similar wastage of protein occurs if there is not enough energy in the diet for the body's needs. In this case some of the dietary protein is broken down to provide energy, not body protein. That is why we sometimes read about the *protein-sparing* properties of carbohydrates and fats which provide energy.

If more protein is present in the diet than the body requires a similar wastage occurs.

There are three main causes of incomplete utilization of dietary protein:

1. *It can be lacking or deficient in one or more essential amino acid (quality).*
2. *It can be present in excess of requirements (quantity).*
3. *It can be diverted to provide energy if there is a deficiency of dietary energy from other sources (energy).*

This concept of quality of dietary protein is sometimes measured in terms of the *net protein utilization* (NPU). This is the proportion of the dietary nitrogen that is retained in the body, expressed as a percentage. This is not a very easy concept. A diet or food with an NPU of 100 has its protein perfectly retained. Breastmilk has an NPU of about 90. So does hen's egg. Wheat however has an NPU of 48 - the protein in wheat is not well utilized if wheat alone is eaten. A diet with an NPU of 75 is a good diet as far as protein is concerned. Caribbean dietaries often have an NPU of around 65.

The amino acid score (chemical score) has already been mentioned. It is similar to the NPU. The score is calculated theoretically knowing the essential amino acid content of the food or diet being measured. The NPU is calculated by direct experiment on animals.

The net protein utilization (NPU) and the amino acid score of a food or of a diet are measures of protein quality. They both express the percentage of the protein intake that is fully utilized.

A more complicated term is the *net dietary protein energy percent* (in older terminology it is called *net dietary protein calories percent* - NDpCals%). This has the great advantage of expressing both protein quality and quantity in the diet as one figure. How is this done?

We remember that proteins can be used to provide energy. Each gram of protein can provide 4 Calories. Let us consider a one-year old child who is taking 20 grams of protein daily in the diet. He could be said to be taking 80 protein calories ($20 \times 4 = 80$).

Suppose the same child is consuming 800 calories altogether each day (from all his diet whether carbohydrate, fat or protein) it is clear that 10% of his total energy comes from protein ($\frac{80 \times 100}{800} = 10$). His diet contains 10% protein energy.

If this child's diet had an NPU (or score) of 70 this means that his dietary protein is only being 70% utilized. His net dietary protein energy percent is therefore:

$$\frac{10 \times 70}{100} = 7\%$$

i.e. net dietary protein energy percent is defined as:

$$\frac{\text{protein energy}}{\text{dietary energy}} \times \text{NPU}$$

Net dietary protein energy percent (or NDpCals%) is a measure combining both protein quantity and quality.

Sometimes one sees dietary protein, or protein requirements referred to in terms of *reference protein*. A reference protein is one that is fully utilized (it contains all the essential amino acids in the right amounts). Mathematically the amount of hypothetical reference protein in a diet is derived from:

$$\text{total protein} \times \frac{\text{NPU}}{100}$$

Sources of Protein

In the world at large cereals are the single greatest supplier of dietary protein followed by animal sources, then peas and beans. Cereals are not very concentrated sources of protein, however they are widely consumed. They are also good sources of energy. About one-third of both dietary protein and energy in the Caribbean is derived from cereals.

Animal sources provide more than half the average total protein intake in the USA. In some parts of the world they provide around one-seventh. Animal food consumption varies considerably in the Caribbean depending on income and other factors.

These major protein sources contain the following amounts of protein (as a percentage of total uncooked weight:)

Cereals	7 - 15%
Meat and fish	15 - 20%
Peas and beans	20 - 40%

The basic source of all our dietary protein is the soil and atmospheric nitrogen, with the sun providing the energy. Plants can synthesise amino acids from simple inorganic chemical substances; animals cannot. Some plants,

especially legumes, are able to fix atmospheric nitrogen and all plants obtain nitrogen, and other elements that make up protein, from the soil (including from N.P.K. fertilizer). We eat the plants either directly or by eating animals (or derived animal products) that have themselves eaten plants. Our wastes are eventually returned to the soil as are, when we die, our bodies.

Protein Mixtures

Proteins in animal foods have good amino acid scores (over 80). They are well utilized. Proteins from plant sources have much lower scores. This is because their essential amino acid contents are very unbalanced. However mixtures of plant foods can right the imbalance.

The most important mixture from the nutritional point of view is that of cereals with legumes (peas and beans). Examples are rice and peas, roti and dahl or channa, stewed peas with dumplings, tortillas con frijoles, baked beans on toast, peanut butter sandwiches. Numerous different examples of such *cereal-legume mixtures* can be found in many parts of the world.

The limiting amino acid in cereals is one called *lysine*. That of legumes is *methionine*. Cereals are rich in methionine and legumes have extra lysine. Put the two together at a meal and the amino acid score becomes excellent. The protein quantity is almost as high as that in animal foods and little of the protein is wasted (both cereals and legumes are good sources of energy which imparts the protein sparing effect already mentioned).

A double-mix of cereal and legume is a basic nutritional concept. Double mixes provide good quality protein in adequate quantity, along with enough energy to ensure its use.

Requirements

There is much controversy over protein requirements or safe levels of intake. Such requirements can be expressed in different ways.

1. An adult man probably needs about 10% of his total energy consumption to be derived from protein. Growing children and pregnant or lactating women need more. It is likely that men can do perfectly well if only 6% of the energy intake is derived from protein.
2. If a person is receiving 1 gram of protein for each kilogram of their body weight daily they are probably getting enough. Grown men may need considerably less (about 0.52 g/kg/day) and growing infants (1.5 g/kg/day) and toddlers (1.2 g) require more. However 1 g/kg/day is a useful practical approximation.
3. If more than 70% of the total protein intake comes from a single vegetable source (N.B. not a mixture of vegetables) the quality is likely to be extremely low.
4. The daily safe levels of intake of protein with a score of 70 recommended by WHO and FAO in 1973 are as follows:

Age	Safe level of intake of proteins (g/day)
<i>Infants and children</i>	
6 - 11 months	20
1 - 3 years	23
4 - 6 years	29
7 - 9 years	35
<i>Male adolescents</i>	
10 - 12 years	43
13 - 15 years	53
16 - 19 years	54
<i>Female adolescents</i>	
10 - 12 years	41
13 - 15 years	45
16 - 19 years	43
<i>Adults</i>	
Men	53
Women	41
Pregnancy	add 13
Lactating	add 24

We must not forget that protein cannot be fully utilized, however much there is in the diet, if total energy intake is inadequate. In diets of much of the world, and certainly in the Caribbean, total energy deficiency overrides any lack of protein. So the problem is not primarily one of protein deficiency.

Pure protein deficiency is rare. Protein-energy malnutrition (protein-calorie malnutrition - PCM) is common. The importance of the 'protein gap' has been exaggerated. People need enough energy, including protein energy, of the right quality.

References

1. Jelliffe, D.B., (1969). *Child Nutrition in Developing Countries*, Washington D.C.: U.S. Government.
Pages 16 and 17 give an excellent, very simple and practical account of this subject.
2. Davidson, S., Passmore, R., and Brock, J.F., (1972). *Human Nutrition and Dietetics*, 5th Ed. Churchill Livingstone: Edinburgh.
Chapter five goes into some more detail, particularly about the different amino acids.
3. FAO/WHO (1973). *Energy and Protein Requirements*. Geneva: WHO techn. Rep. Ser. No. 522.

This is extremely difficult to read and goes into deep and controversial detail. It is essential reading for the addict.

CAJANAQUOTE

"As a boy, I learned a tremendous lot about vegetable production in the little half-acre garden attached to my school. It was mandatory for all boys to participate. We did so with joy and shared the fruits at reaping time.

William Strong
'Daily Gleaner', November 5, 1973

