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EVALUATION OF NUTRITION INTERVENTION PROGRAMS

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## EVALUATION OF NUTRITION INTERVENTION PROGRAMMES\*

Two types of Nutrition Intervention Programmes are going to be discussed here:

- I. Educational Programmes (E.P.)
- II. Supplementary Feeding Programmes (S.F.P.)

I. Within the E.Ps we will consider again two types:

- (a) one dealing with an E.P. based on direct contact using community volunteers (Lambs River Project), and
- (b) another one dealing with the use of mass media (Breast-feeding Campaign).

(a) The "Lambs River Project"

In this project the specific undertaking was to measure the effect of nutrition education on nutritional status. This was to be done in a manner that would be replicable in poor rural districts, which meant that it would have to be low-cost. The educational input had to be as "pure" as possible, untarnished by supplementary feeding or similar intervention, and, in this case, generated locally without any borrowed or short-term non-indigenous support. Naturally the investigative aspect was taken care of by a special team, and some degree of training in nutrition was provided for "the educators", learning to them all direct contact with the community.

Attempts were made throughout the project to make use of all the human resources available in all related disciplines, e.g., agriculture, community development, health and education, so that these would be the largest possible input into the education of the target groups in the population. In addition, a grass-roots approach was devised, bearing in mind the principle of replicability on which the project was established. This took the form of enlisting the services of a group of women resident in the district, training them in some absolute fundamentals of nutrition and child health as well as in some basic techniques of home-visiting and record keeping, and then allocating to them homes with young children for them to visit.

The purpose of home-visiting was to provide mothers of young children with advice and encouragement in their feeding, placing emphasis on breast-feeding and on foods that were nutritious, cheap and capable of being produced in the home garden; this generally meant foods like calaloo, peas, corn and the root crops and, among the imported foods mackerel, salt fish, cheese and skim milk. Volunteers were directed to spend a portion of their time during visits carrying out food demonstrations.

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An analysis of home-visiting records, weight charts and questionnaires at the end of twenty months of home-visiting showed the following results:

Weight - These are based on the children under-3 years of age as weight records for older children were not considered sufficiently reliable.

Of one hundred and twenty-six visited and sixty non-visited children, 40% in each group showed no change in nutritional status, 34% and 32% respectively improved and 26% and 28% deteriorated.

In absolute terms, there was no statistical difference in the results. Nevertheless, there are a number of related factors which ought to be taken into account if a fair assessment is to be made of the usefulness of this form of nutrition education:

1. 44% of the children in the 'visited' group were initially malnourished, compared with 28% in the non-visited.
2. The results for the second and third degree malnutrition show that ten out of nineteen children (53%) improved, six (32%) remained unchanged in the 'visited', while both of the second degree cases in the non-visited group deteriorated.
3. None of the 'visited' group attended the Child Welfare Clinics or were visited in their homes by a nurse.
4. It is unlikely that the non-visited group living, as they were, within the heart of the overall project area could have escaped the influence of other nutrition educational activities which were in evidence. Moreover, the mere weighing of children in the home at monthly intervals must have provided opportunities for contact between project worker and householder with the inevitable transfer of some knowledge and information.

Looking now at the householders' assessment of this type of home-visiting, fifty-one out of fifty-five (93%) stated emphatically that they liked it and would recommend its continuation. 67% identified the purpose of home-visiting as being to give advice on child care and feeding; another 13% thought the purpose was to weigh babies.

Thirty-eight (69%) regarded the visits as very helpful to them and their children, while two only thought them to be of no help.

Forty-one (75%) claimed that they practised what they learnt, in particular the preparation of multimixes and Semilko, and breastfeeding.

38%, however, were of the opinion that the visiting programme should include the handing out of gifts of food as money, and should not merely give advice and information.

The volunteers, for their part, regarded the time spent in this programme as being useful both to themselves and the people they visited.

Their subjective rating of the changes in the homes visited, in terms of child feeding practices, and the overall responsiveness of parents or guardians showed:

41	out of 95	homes	(43%)	excellent or good
36	"	"	"	(38%) fair
18	"	"	"	(19%) poor

This result, in fact, does not differ greatly from the results reflected in the weight charts already discussed.

The main recognisable changes observed by these volunteer home-visitors were:

- (i) A longer period of breastfeeding by more mothers.
- (ii) More widespread acceptance and use of Semilko and multimixes.
- (iii) The establishment of more kitchen gardens.

In summary, therefore, while there was no significant difference to be found in the nutritional status of children in 'visited' and 'non-visited' homes, the evidence points to the attainment of a number of intermediate objectives on the way to the ultimate goal of improved nutritional status. Among these objectives were the favourable changes in the feeding patterns of young children, the awareness and acceptance by householders of nutrition education activities within the community, and the willingness of individuals to be trained to help educate their fellowmen.

It is suggested that this type of approach could be and should be more widely exploited in the Caribbean, particularly in those many pockets of childhood malnutrition, often remote from a health centre, and generally more deprived than the rest of the population.

It is noteworthy that the most durable and dependable aspects of this project were the inputs of the people of the community, whereas the contributions of the "established" workers were of a more uneven quality and generally less dependable.

(b) Breastfeeding Campaign

In mid 1974, the Housewives Association of Trinidad and Tobago (HATT), having procured the cooperation of the Advertising Agencies Association and the Trinidad and Tobago Publishers and Broadcasters Association, and with the advice of the Nutrition Unit of the Ministry of Health and CFNI, launched a campaign aimed at promoting breastfeeding whose main slogan was - "Every baby deserves the BREAST". The campaign lasted six weeks and during this time the total T.V. time for the campaign was seven minutes, the total radio time was twenty minutes and eighteen issues of the newspapers carried the advertisements.

The evaluation of the campaign was divided in two phases; during Phase I, four hundred mothers in the two main hospitals in Trinidad were interviewed within the first twenty-four or forty-eight hours of delivery and information was collected as to the feeding practices with their previous baby, their knowledge and attitude on breastfeeding and their plans regarding the feeding of the baby just born. No mention was made of the recent campaign and no advice was given nor any attempt whatsoever was made to change in any way their views.

Four months later three hundred and forty-eight of these women were visited in their homes by the same interviewers and their actual feeding practices with their last baby, the one born after the campaign, was investigated. The tapes with advertisements of the campaign were played and the mothers asked whether they recognized them and if so, whether they agreed with them. The advertisements displayed in the newspapers were shown and the mothers asked again whether they had seen them before, if they had, whether they had read them and if so, whether they agreed with them.

99% of the mothers recognized one or more of the advertisements and the great majority agreed with them. In spite of it, however, there had been very little difference between the practices with the previous baby, born before the campaign, and the last baby, born immediately after the campaign. There was no difference in the age at which other milk, besides breast milk was introduced, nor in the reasons given as to why other milks had been introduced (only 14% of mothers were working at the time of the home visit).

Of the results analysed so far, only two facts seem to be of some significance; while only 2% of the children born after the campaign never received the breast, 11.3% of those born before the campaign had not been breast-fed. Also where 51% of those born before the campaign had been weaned completely by the age of four months, the percentage among those after the campaign was 41%. At the time of writing this report the results were still being analysed to determine whether these differences were significant and if so, whether they could be attributed to the campaign.

## II. Supplementary Feeding Programmes (S.F.P.)

(a) Within the MCH services in 1972 and 1973.

In spite of the fact that as far back as 1954 UNICEF was already donating dry skim milk free of charge to Caribbean countries to be used as a food supplement in the MCH services, and that free food supplement soon became a characteristic of most MCHs in the Region, no attempt has been made to evaluate whether they have been beneficial or not and what results, if any, they have achieved. By 1974, most of the agreements between the territories and donor agencies (UNICEF, U.S. AID, Catholic Relief Service, etc.) had expired or were almost expired. "Free" foods were getting harder and harder to come by and the countries, in order to continue their S.F.Ps. had either to buy the supplement now or, in many cases, they simply had to discontinue the programmes.

We decided at this point to have a look at those programmes still in existence during 1972 and 1973 and see what we could learn from them.

We emphasize again that we were concerned with those S.F.Ps. dealing with mothers and children under five years, and based on foods donated free to the countries.

The results that are presented here deal with the three major territories in the English-speaking Caribbean - Guyana, Jamaica and Trinidad and Tobago, which contain 75% of the population of the Region. The aim of this partial evaluation was to find the answer to these three questions:

1. Was the type of food supplement being provided, adequate for the nutritional needs?
2. What was the extent of coverage?
3. How much do these programmes cost to the recipient countries?

### Type of Food Supplement

Five food items are involved: Dried Skim Milk, Corn Soy Milk, Wheat Flour, Rolled Oats and Vegetable Oil. The three countries received one or more of the commodities during the two years under study (Trinidad - D.S.M. only, Jamaica - D.S.M. and C.S.M., and Guyana - all five). When more than one commodity was received, the type and amount varied between the two years, depending apparently on their availability on the international markets and facilities of transport. For the purposes of this project the commodities have been averaged between the two years for each country. On these bases, the daily amount of protein and energy provided by the "theoretical ration" is Guyana, 850 cal. and 35 gm. of protein, Jamaica and Trinidad, 132 cal. and 13 gm. protein. The "theoretical ration" was the amount of different commodities supposed to be received by the

beneficiaries and supposed to last a certain period of time. We used the work "theoretical" because whether or not the scheduled amount and composition reached the beneficiary at the scheduled time depended on whether or not the specific commodity had been received by the recipient country in time and also on the facilities for transport within the country.

The proportion of daily requirements provided by the "theoretical ration" is considerably higher for protein than for energy. This ration does not take into consideration the age, nutritional status and physiological status of the recipient, whether it is a malnourished twelve-month old baby or a thirty-year old pregnant woman.

#### Extent of Coverage

The system of reporting distribution of supplement in the countries under study does not allow for an assessment of the number of people who did benefit from the programmes, neither the length of time during which they did benefit. Figures showing "beneficiaries" and "recipients" usually indicate, in fact, the number of rations or portions of rations distributed during the year. Theoretically however, it is possible to estimate the overall coverage given by the programme by estimating the total daily requirements of energy and protein of a given population group and comparing it with the total amount of protein and energy provided by the total amount of foodstuffs distributed; for instance, the average amount of D.S.M. distributed in Trinidad and Tobago for 1972-73 was 98,842 lbs. or 268 lbs. a day, which provides a total of approximately forty-five million calories and 4.5 million gms. of protein. On the other hand we know the total population under-five years in the country and we can estimate their total daily requirements of protein and energy and calculate what percentage of the total requirements could be provided by the D.S.M. The problem is compounded by the fact that in some cases pregnant women in addition to pre-school children are eligible for supplement. However, for the present paper, the calculations are going to be carried out considering only the population under-five years whose daily requirements of energy has been averaged to 1,095 calories and that of proteins to 12.4 gms., and it is going to be assumed that all the food supplements during 1972 and 1973 were distributed to this age group. The proportion of daily requirements which could be provided by the programmes in relation to the needs of the population under-five years is very small. Energy - 0.3% in Trinidad, 1.9% in Guyana and 2% in Jamaica; protein 2.6% in Trinidad, 5% in Guyana and 16% in Jamaica. However, if we were to assume that the objectives of the supplementary feeding programmes in the three countries were to provide dietary supplement only to those children whose weight for age was below 75% of the standard (Gomez's second and third Degree Malnutrition), the situation would be considerably different.

The National Nutrition Survey in Guyana showed that 17% of the children under-five years present a weight for age below 75% of the standard, the proportion in Jamaica is 10.8% (Gurney et al) and although no figures are available for Trinidad and Tobago, it is reasonable to assume, in the light of the material published (Gurney, Byam, McDowell, Mohammed), that the situation is similar to the rest of the Caribbean and that the prevalence of second and third degree malnutrition, is in the region of 10% of those under-five years. On this basis, around one-third of the daily requirements of proteins for all children with severe and moderately severe malnutrition in Guyana and in Trinidad and Tobago could have been provided by the programmes, while in Jamaica, the programme could have provided almost 1½ their protein requirements. As far as energy is concerned, however, the percentage of energy provided fall far short of the needs.

#### Cost to the Recipient Countries

The countries receiving these food commodities did not incur any expense up to the point of landing the foodstuffs; from there on, they were responsible for the expenses involved in the landing and storage, transport to warehouses and points of distribution, and actual distribution to beneficiaries. The three countries have units organized to deal with foods received not only for MCH services but for other programmes such as schools, hospitals, general development, etc. It is not difficult from the budget of these units to assess approximately the percentage which corresponds to expenditure incurred dealing and distributing food supplements to MCH services. This will be referred to as the "visible cost" of the programme. Much more difficult, is to assess the "hidden cost". For the purposes of this paper, "hidden cost" of the S.F.P. is given by:

1. The cost of storing the commodities.
2. The value of the foodstuffs condemned and spoilt.
3. The monetary value of the time spent by the person distributing the supplement to the beneficiaries.

1. Although storage usually takes place in government-owned warehouses and therefore regarded as "free" storing, the capital value of the land and buildings has to be taken into consideration in addition to which it can be argued that the warehouses could be rented to private enterprises. In this article, the cost of storage has been calculated on the figures used by FAO(1) in dealing with other foodstuffs.

2. The value of the food items spoilt or condemned is given by the actual retail value of those food items.

3. The person who usually distributes the supplement is the Public Health Nurse at Pre-Natal and Child Welfare Clinics. In addition, she is responsible for the considerable amount of paper work involved, for arranging storage in the clinic building, checking, ordering, writing coupons or records, etc. It is



practically impossible to assess the economic value of all those activities; on the basis of personal observation and discussions with public health staff, we have estimated (taking into consideration all the different activities involved in, and resulting from, the distribution of the supplement) at one minute per pound of foodstuff distributed. From there on, it is easy to give a value to that time, knowing the average salaries for Public Health Nurses in the three countries during 1972 and 1973.

On the basis of the "visible cost" plus the "hidden cost" the "estimated cost" to the countries for supplying a unit of food (lb. of D.S.M.; pint of oil or whatever), expressed as a percentage of the average price of the same unit of food in the retail stores is 21% in Jamaica, 50% in Trinidad and 76% in Guyana.

### Conclusions and Comments

National Food Consumption Surveys in Trinidad and Tobago<sup>(2)</sup> and in Guyana<sup>(3)</sup>, and studies in Jamaica<sup>(4)</sup> have demonstrated that on the average, the population meets a greater percentage of their protein requirements than of their energy. Clinical and anthropometric evidence (Guyana<sup>(3)</sup>: Gurney<sup>(5)</sup>, Mohammed<sup>(6)</sup>, McDowell<sup>(7)</sup>), also point towards the fact that in the Caribbean today lack of protein among pre-school children is less marked than lack of energy. In view of this, it would seem more appropriate, at this point in time, to distribute a food supplement more balanced in energy and protein than the supplement provided during those years referred to in this paper, so obviously lacking in energy content.

From the present investigation it is evident that the proportion of population which the programmes could cover was very small, but that better use can be made of available resources if the food supplement is administered according to individual needs, clear priorities and specifically stated objectives. Rations should provide a specific percentage of requirements, based on the age, nutritional status and physiological status.

As far as cost of the S.F.P. to those countries who received freely donated foods is concerned, it is probably higher than is generally assumed and probably it would be a much better economic proposition if the foodstuffs were distributed through the regular retail outlets rather than through the health clinics; let the shop attendants get on with the business of giving or selling food and the health staff the business of deciding what nutrients and how much.

The fundamental question still remains: How effective were those programmes in preventing or combating malnutrition? Lack of baseline data and lack of adequate records make the evaluation absolutely impossible. For all we know, all the money spent by donor and recipient countries could have been wasted. However,

early studies in the Region (Waterlow(8), Back(9), Standard(10), Jelliffe(11,12)), seem to indicate that kwashiorkor was indeed more common than it is today. Better knowledge in nutrition and general improvement in the standard of living have no doubt been partly responsible for this but, considering the amount of protein distributed by the S.F.P., one is tempted to postulate that in spite of what possible faults the programmes might have had, they may very well have played an important role in narrowing the "protein gap".

(b) In the treatment of severe and moderately severe PCM.

The mortality rate among those admitted into hospital for malnutrition varies from 15% in a highly specialized unit(13), to 22% in a large City General Hospital with paediatricians to 26% in some rural hospitals. There is no doubt that many of those children who died in hospital are already beyond recovery when they are admitted, and that the mortality would probably be much lower if only uncomplicated cases of PCM were admitted. In any case however, the scanty evidence available in the Region suggests that many children treated in hospital not only do not improve nutritionally but in some cases actually deteriorate. The fate of many of these children after discharge is very often further deterioration, re-admission or death.

The average length of stay in hospital varies from about three weeks to four to five months(14). The cost of treatment varies from US\$460.00 to US\$1,790.

Having on one side a supplementary feeding programme whose effectiveness is unknown, and on the other hand an in-hospital treatment of malnutrition whose results, short-term and long-term, are not completely satisfactory, we are now attempting to use a closely supervised supplementary feeding programme for the treatment of severe and moderately severe PCM. It is hoped that with the supervision which involves frequent home-visits, nutrition education will prevent malnutrition in the contacts and recurrence in the index cases.

The food supplement given in the form of high calorie milk provides 50% of the daily energy and protein required for rehabilitation for those children with second degree malnutrition, 75% of daily requirement for those with third degree malnutrition older than twelve months and 100% for those under twelve months. It started in late January based in a Child Welfare Clinic in a small village of the cane sugar area of Trinidad. Phase I of the Pilot Project consisted of the treatment of twenty to twenty-five children and the same number of controls. Up to 12 May 1975 there were four third-degree malnutrition cases and sixteen second-degree. The age varied from four to fifty-six months, the weight on admission to the study from 3.6 to 12.65 kg., their nutritional status from 52% of the standard weight for age to 74% and the length of treatment from three to seventeen weeks. During this time, the increase in weight was from two hundred and fifty to one thousand seven hundred grams. The average child then was, on admission to the project, a 23.5 months old child weighing 7.99 kgm. or 65% of the

standard weight for age who after 12.7 weeks of receiving a food supplement based on full cream milk, corn oil and dark brown sugar ( 135 cal. and 3 gms. of protein per 100 ml.) providing about 18 gms. and 741 cal. per day or 56% of the D.R. required for rehabilitation; put 990 gms. and his weight is now 70% of the standard.

The cost per child per day in food supplement is US\$0.25 and US\$0.49 in personnel which includes one full time community health aide, one research assistant, working about sixteen hours a week on the project, and a physician one hour a week.

The food supplement will be discontinued in each case at about seventeen weeks. The cases will be compared with the controls and periodically again every four months.

The project will expand shortly to add one hundred children more and if successful it is hoped that the government will take it over as a regular system of supplementary feeding programme.

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