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Jeliffe, D. B.; Bennett, F. J.

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**health education of the  
tropical mother in  
feeding her young child**

HEALTH EDUCATION OF THE TROPICAL MOTHER  
IN FEEDING HER YOUNG CHILD

Derrick B. Jelliffe  
Professor of Paediatrics and Child Health

and

F. John Bennett  
Senior Lecturer

Department of Preventive Medicine  
Makerere Medical School  
Kampala, Uganda

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## HEALTH EDUCATION OF THE TROPICAL MOTHER IN FEEDING HER YOUNG CHILD\*

Health education is concerned with means of inducing people to modify their behaviour, with the intention of producing healthier individuals. It is universally paid lip service, but has to date usually achieved only a quasi-scientific status, carried on with little factual knowledge of its actual value. It is too often only effective in the minds of its well meaning exponents.

Malnutrition in early childhood is the dominant problem in the developing tropical regions of the world, and, although poverty is often a vital causative factor, frequently a considerable proportion of the malnutrition seen is potentially avoidable, if already available local food resources were used to better purpose by parents.

It is no exaggeration to say that the most important global target for health education is to persuade tropical mothers to feed their children in the early years of life as well as is possible with already available local foods.

### BACKGROUND INFORMATION

Before the planning of any health education, it is imperative to have as much background information as possible. (1)  
Areas of importance will include:

(1) Local Methods of Child Feeding. The following should be particularly noted: the usual length of lactation; methods of, and reasons for stopping the child breast feeding; when the first foods are introduced, and their nature; whether milk (or its products) are customarily employed; the traditional use of other protein foods (especially legumes, eggs, and fish); the commonness of such new

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Pointe Noire, Central African Republic

deleterious "prestige" practices, as bottle feeding, the use of aerated beverages and over-milled flour; and methods of feeding mothers in pregnancy, the puerperium and lactation.

(2) Local Pattern of Malnutrition. Although in some places, as in parts of S.E. Asia, infantile berberi and avitaminosis A will be common, the main problem all over the tropics is made up of the various syndromes collectively termed "protein-calorie malnutrition of early childhood", including as the two principle severe syndromes Kwashiorkor and nutritional marasmus. (2) It is exclusively with the prevention of these conditions that the present account is concerned.

(3) Local Pattern of Childhood Disease. Although not directly relevant to actual child feeding, the main local diseases acting as malnutritional "conditioning factors" must be known (e.g. hookworm disease, tuberculosis, whooping cough, etc.).

(4) Locally Available Foods. These will include those available from the family cultivation and from the shops, coupled with knowledge as to their prices and probable seasonal variations in availability. Of principal significance will be the protein foods, both from vegetable sources, but particularly those of animal origin, as these are most needed, in shortest supply and most expensive.

(5) Local Culture Pattern. Customs and beliefs in regard to foods for children and women must be known, especially "cultural blocks" that prevent the use of protein foods that are, in fact, available. (3) Other traditional feeding habits are frequently of relevance, including the numbers of meals daily, and the order of feeding within a family.

Similarly, various aspects of general child rearing may have nutritional overtones, as with the sudden geographical separation from the breast, practised in parts of East Africa.

(6) Local Home Economics. The type of kitchen, the cooking methods and utensils, the fuel, the use (or otherwise) of measures of weight, or volume, will all be relevant, and will indicate the range and complexity of the dishes that may be feasible for "village level" infant feeding.

(7) Local Status and Activity of Women. The type of work customarily expected of women will plainly determine whether mothers can care for their toddlers adequately themselves, or have to leave them at home in the care of siblings or elderly women. Also of great importance is the degree of independence women possess in relation to trying "new" methods of child rearing

and especially the spending of household money. The holders of power and authority in the house (e.g. the grandmother or father) may also be of importance.

### ECOLOGICAL DIAGNOSIS

The syndromes of protein-calorie malnutrition of early childhood are never exclusively of dietary etiology. An "ecological diagnosis" always requires to be made, and will be found to vary from region to region, implying, therefore, modification of emphasis in health education to suit the particular area. Of the various "burdens" which go to produce a breakdown into protein-calorie malnutrition, the following always require consideration:

- (i) Dietary. Poverty (or actual inavailability of protein foods), and/or lack of knowledge, and/or "wrong" knowledge (e.g. food prejudices).
- (ii) Infective. Tuberculosis, whooping cough, measles, infective diarrhoea, etc.
- (iii) Parasitic. Intestinal helminths (heavy burdens of the roundworm or hookworm).
- (iv) Psycho-social. Sudden separation from the breast (especially if "geographical"), family instability (emotional, economic and social) and illegitimacy.

### GENERAL PRINCIPLES

Assuming adequate background information and a local ecological diagnosis, certain general principles will require consideration in the planning stage.

Felt-needs. Although again paid much lip-service, "felt needs" are, in fact, not often considered. However, by discovering, what the community, including the mothers want, in relation to any topic, it becomes easier to equate health education to local anxieties and hence to have a better chance of achieving results (Appendix: I).

Range of Topics. Basically, these should be limited to the subjects of real importance - the doubtful, and the locally unnecessary are best excluded.

Methods and Media. While this will vary the channels through which the information will flow (e.g. child welfare clinics, health centres, Community Development activities, schools,

hospital wards (Appendix: II) and outpatients), direct simple informal demonstration and discussion with group participation is probably most satisfactory.

Visual aids are quite often more of "health entertainment" value than anything else, and are very likely to be misunderstood by mothers not brought up to follow the conventions inherent in photography and pictorial representation. The radio can be useful but reaches a limited audience. Booklets and pamphlets are for the literate, and are usually in losing competition with expensive, glossy brochures increasingly produced in the vernacular by commercial infant food companies.

Pre-testing of material is important in minimizing this type of misunderstanding, but, as a generalization, there is no doubt that the best media for health education of tropical mothers are the actual foods, cooking pots and other kitchen paraphernalia to which they are thoroughly accustomed and with which they work each day.

This paper is largely concerned with the education of the mother, but the importance of the father in nutrition health education in Africa is always stressed by educated Africans, but is not often heeded in practice by Europeans.

A controlled study of health education in infant nutrition directed at men would be of enormous benefit, but child welfare clinics are usually women-orientated and their work and workers are also associated in the public's minds with women. The motivation of men in regard to children and nutrition has seldom been studied.

What visual aids would be needed, what attitudes and ideas have to be changed to alter the behaviour of men in what they do for their families' nutrition?

Working with clinic-bound parents is relatively easy, and some positive results can be achieved and assessed - but what proportion of the general population do they form? And they are usually the converted anyhow. How does one reach the periphery and maintain some scientific control of the situation? All too often, when one does get to a distant village where a relatively untrained Community Development worker has been functioning, one discovers that the teaching has been singularly worthless, if not harmful. Too often it has degenerated into a stereotyped lesson about the value of beans. To maintain a fresh outlook in workers doing health education, it appears that they must be given "research motivation". They must feel

that they are part of an exciting experiment and that by continually searching for the correct methods, approaches, gimmicks, etc., they can be responsible for a great contribution to the welfare of their communities' children.

Evaluation. This should be (but rarely is) considered at an early stage of a programme. Its difficulty is apparent in that the efficiency of health education can best be gauged by:

- (a) a change in behaviour by mothers on return home,
- (b) the long term alteration in incidence of the particular condition at which prevention is aimed.

Two main tropical groups. Initially, it is useful, again as a generalization, to realise that, although, in fact, there may be a large number of different ethnic, religious, dietary and socio-economic sub-groups in various parts of a country, all with their own problems, there are, for practical purposes, usually two main groups in the present-day tropics as far as the feeding of young children is concerned, although, of course, many families fall between these two extremes.

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

The second group, the "underprivileged", who make up the vast majority, either live in villages or scattered homesteads in rural areas, or have flocked to the "septic fringe" slums or, if more fortunate, to low-rent urban housing estates. It is this group who often have little or no modern education, a very small earning capacity, dirty fly-ridden kitchens with few cooking pots, limited fuel and storage facilities and an inadequate water supply. This is the group whose children develop protein-calorie malnutrition and who require priority attention with regard to practical and practicable advice on infant feeding, although even here important sub-divisions will be found, as, for example, those with land and those without, and also those who rapidly accept new ideas and those who are more conservative traditionalists.

## PRESENT ACCOUNT

Despite the need for a wide approach to problems of infant feeding in developing areas of the tropics, the present account will deal for the most part with health education concerned with dietary and nutritional means of preventing protein-calorie malnutrition among "under-privileged" children,

### BREAST FEEDING

Basic Facts. A working hypothesis with regard to breast feeding for mothers in tropical regions must be based on the following facts:

(1) Nutritional Value. Breast milk is the mainstay of protein nutrition for the first six months of life and is usually all that is needed for this period. It is also the cheapest, cleanest, most easily available protein source. Any other food considered during this early period must be either nutritionally necessary or of real cultural significance, and its alleged advantages weighed against great risks of producing infective diarrhoea (as for example, in relation to the need for orange juice for tropical infants, among whom scurvy is usually absent).

After the first six months, it is never nutritionally adequate alone ("breast starvation"), and the child always requires additional food as well. However, at the same time, lactation prolonged for 1 - 2 years represents a significant partial protein prophylactic against the development of kwashiorkor or nutritional marasmus.

(2) Late Lactation. So called "late lactation" (e.g. up to two years or more) was usual in the Western world until the comparatively recent "milk revolution", with its improved dairying and milk conservation. In late lactation, the breast milk of poorly fed tropical mothers has a low normal protein content, although the yield is low. (4) The nutritional drain on the mother, although difficult to measure, is cumulative with successive pregnancies and protracted lactation, and emphasizes the need for attention being given to her diet.

(3) Breast Feeding 'Experts'. The world's experts on practical breast feeding are unsophisticated village mothers, among whom it is carried on as naturally as are such similar physiological events as swallowing in other parts of the world. Conscious, planned "technique" with regard to nipple preparation, positioning, regularity, fully emptying the breast, "bringing up wind" and so on is minimal or non-existent. Success is based on unconscious imitation of female relatives observed during her own childhood, and the unruffled, unthinking normality of the whole process, in which doubts or hopes as to success or failure figure not at all.

Unfortunately, in the last decade or so, the failure of breast feeding - so prominent a feature of the Western world, in the present century - has increasingly invaded the tropics, especially in urban areas. (5) Reasons for this, and for the complementary rise of bottle-feeding, are, as anywhere, manifold, but are principally related to complex socio-financial factors associated with urbanization and industrialization. These include the imitation of financio-educational "superiors" of all ethnic groups (and the prestige and modernness that is thereby acquired), the increasing pressure of misdirected advertising of milk foods, the rise of the breasts as a sex symbol and of "modesty" in relation to feeding a baby at the breast, and the tendency of women to go to work in towns, where the baby has to be left at home. As everywhere, the common denominator of lactation-failure under these circumstances is an interference with the psycho-somatic "let-down" reflex resulting from anxiety and lack of certainty. (5, 6).

(4) Dangers of Bottle Feeding. Bottle feeding is increasingly becoming the competitor of breast feeding, especially in tropical towns. The standard paediatric text book arguments concerning the relative merits of human and cow's milk, are entirely secondary and academic as far as infant feeding of the under-privileged are concerned.

Basically, with few exceptions, the majority of tropical mothers have neither the money, nor the education, nor the kitchen facilities, so that bottle feeding means the giving of an over-dilute, contaminated mixture, low in nutrients, and high in bacteria, with the resultant triad of infective diarrhoea, nutritional marasmus and oral moniliasis, often with a fatal outcome.

#### Content.

The content of health education concerning breast feeding can be extracted from the above basic facts and can be summarised as follows:

- (1) Maternal Nutrition. Attempts must be made to persuade mothers to feed themselves better, both on locally available foods, especially legumes, and if available, on such protein supplements as dried skimmed milk, during pregnancy and prolonged lactation.
- (2) First six months of life. (i) Breast feed alone, unless definite nutritional need or strong culture pressure.  
(ii) Avoid pre-lacteal feeds, unnecessary fruit juice or dangerous bottle feeds.

- (3) After six months of age. (i) Breast feed for at least one year, and preferably for two years, as a small, but significant protein supplement.
- (ii) Introduce semi-solids, based especially on protein foods available, so that the diet includes all items of the adult diet by the time the child is one year old.

#### Breast Feeding among the Traditional and the Semi-sophisticated

As noted, the situation is considerably complicated by the fact that in more traditional parts of the tropics breast feeding is carried on easily by the vast majority, whereas, among the semi-sophisticated of urban areas, the situation has altered, and is changing still further, with the incidence of breast feeding falling and with usually unsuccessful attempts at bottle feeding taking over.

Plainly the emphasis to be given to health education concerning breast feeding, in these two social circumstances should be different\*:

(i) Traditional Communities. When breast feeding is already an unqualified success, it is unnecessary, presumptuous and dangerous (in that it may sow seeds of doubt) to include advice on such very scientifically doubtful Western fads as are sometimes termed the "technique" of breast feeding. It is quite incorrect to try to touch nipple preparation, regularity of feeds, positioning, need for emptying breasts, and "bringing up wind" (a Western emphasized ritual, probably only associated with incorrect bottle feeding).

For this group, then, the first six months or so are usually taken care of by breast feeding alone. Health education is really unnecessary, but with the rapid culture change, characteristic of the world at the moment, it may be considered advisable as a "situational prophylactic" not to mention questions of technique, but rather to underscore in an unobtrusive way the value of breast feeding and the dangers of bottle feeding. This type of advice could flow through various channels, including child welfare centres, antenatal clinics, and parents' clubs, but, most importantly, to school children, who are likely to be affected by the anti-breast feeding trend by the time they themselves become parents. Also in

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\* The evaluation of the efficiency and extent of breast feeding in a community is not difficult and can be obtained by prevalence surveys (5) and welfare clinic records. Negative evaluation by recording the rise of the bottle and powdered milk (and gastroenteritis occurrence) is even more important, as it heralds the need for action in re-establishing lactation.

some cultures breast feeding is terminated prematurely due to the beliefs in the milk becoming bad or poisonous. Sometimes, as amongst the Zulu, this is due to ideas of bewitchment (and sometimes only one breast might be considered poisonous), while in some other tribes this is thought to be due to the mother being pregnant again.

In groups stopping lactation prematurely because of some beliefs, it is necessary to elaborate health education to alter this attitude. In the group becoming pregnant (which is a not inconsiderable percentage of all lactating women) some directive is usually asked for, if there is no existing positive idea about the dangers of continuing lactation. Education in this situation should be individual and also related to the particular community circumstances.

(2) Semi-sophisticated Communities. The problem among the under privileged in semi-sophisticated, usually urban, communities is complicated by the fact that the trend away from the breast towards the bottle has usually commenced, while health education is made more difficult by the widespread advertising of infant foods and milks by commercial companies and by the patent success of artificial feeding carried out by privileged mothers of all ethnic groups living in the same region.

Under these circumstances, health education for school children, parents' clubs, and antenatal and child welfare clinics, must stress the positive value of breast feeding and the dangers of bottle feeding. In the latter case, health education would aim at building up the recognition of the association between the bottle and gastroenteritis and marasmus. This is done very rapidly in medical students' minds and can be attempted for mothers presenting in hospital wards, so that the train of events is not repeated with subsequent babies.

The difficulties here are apparent. The increasing pressure of advertising and the successful use of artificial feeding by the well-to-do minority often make under-privileged mothers feel that they are being persuaded towards the second best and are being denied the rights to modern living!

Health education likely to convince is difficult to devise. It is perhaps sometimes possible to appeal to nationalist sentiment, stress being given to breast feeding as a feature of the ancient culture of pre-European times. At the same time, it must be emphasized that in such an "advanced" country as the U.S.A., there is a present-day move to try to return to breast feeding among more educated mothers, as exemplified by "La Leche

League", while in Russia, breast feeding is still the usual method of rearing infants.

Perhaps the greatest need for education in respect of breast feeding lies in the staff of medical and other social agencies. Many come from Western areas and do not realize the need for breast feeding in the tropics, In their own lives they are no example as they are either spinsters or working, bottle-feeding mothers. Much of the unnecessary early introduction of cow's milk and too easy acceptance of the "not enough milk story" has come from expatriate staff, or staff taught by expatriates uneducated in the normal practice of lactation except that of cows. If the only person available to give health education to mothers is a young unmarried woman, then it may be best for her to admit her ignorance and inability to give advice on breast feeding and rather leave the subject alone.

#### ARTIFICIAL FEEDING

Health education with regard to artificial feeding requires especially careful handling. It should not usually be included in routine series of child welfare demonstrations, but confined to those who need it.

The bacteriological risks of using a feeding bottle among underprivileged, semi-sophisticated mothers are great, and, in many parts of the tropics, it may be considered less dangerous to advise the use of the cup and spoon or metal feeding cup, either temporarily if complementary feeds are needed, or continuously if there is real need, especially if the mother is not available because of death or desertion. With this type of method, which is employed in the "Save the Children Fund Home-Feeding Kit" (Appendix III) in Kampala, there is a greater probability of cleanliness than with the narrow-necked feeding bottle.

If this philosophy is adopted, it is particularly important to avoid using feeding bottles in children's wards of hospitals, as this implies tacit approval and is a form of ill-health education. Thus, in the past two years, the feeding bottle has not been used at all in the Pediatric Division, Mulago Hospital. If artificial feeds have been required, temporarily or continuously, they have been given by cup and spoon, or by feeding cup.

#### Re-establishment of lactation

(1) Community basis. A reversal of the present trend away from the breast towards artificial feeding can be envisaged if such moulders of fashionable behaviour, as the wives of nationalist leaders and royalty, or film stars and artistes, should be known

to breast-feed their children. Fundamentally, however, such a change in pattern might be most likely to be successful if originating from Europe and North America.

If, as is the case at the moment, the move towards ill-advised, often unnecessary bottle-feeding continues to grow in the tropics, an increasing harvest of death and disease can be expected from infective diarrhoea and nutritional marasmus, and a point of economics that is rarely appreciated, a major source of good quality "animal" protein, will be increasingly lost to a world actively seeking to expand protein production, and even to use such previously unexploited sources as algae, cotton-seed and plant leaves. \*

(2) Individual basis. With individual mothers who are giving their babies bottle feeds alone or with occasional breast feeds, for largely unnecessary reasons of the Western psychosomatic pattern (e.g. "not enough milk", "baby doesn't like the milk", etc), it has been shown in the Paediatric Division, Mulago Hospital that re-establishment of lactation can be achieved in about 75% (Appendix IV), although which components of the regime employed are the effective ones are not known.

#### Commercial advertising

In this age of mass persuasion, there are three main species of opinion moulder - political propaganda, commercial advertising and health education.

In the field of nutrition, it is health education which is the amateur anaemic pygmy, compared with the professionally experienced and financially full-blooded giant of commercial advertising.

While with many commodities, an increasing awareness of beneficial modern ways of life may result from advertising in developing countries, the situation with regard to infant foods and medication deserves close scrutiny. Briefly, difficulties have arisen as a result of numerous reputable, but highly competitive, tinned milk firms marketing their costly, high grade wares in tropical countries using the same pattern of advertising as for the educated populations of their affluent homelands. The results are excellent for the privileged minority, but disastrous for the infants of uneducated poor

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\* In Uganda with a total population of about 6.5 million, if all African mothers were to cease breast-feeding abruptly it may be estimated that more than 100 million pints (50 million litres) of cows milk would be needed yearly.

parents, who are increasingly impelled by the glossy glamour of this type of advertising towards ill-advised, impossibly expensive\* and frequently fatal attempts at prestige bottle-feeding. There is little doubt that what is most needed is a re-orientation of commercial thinking in relation to infant feeding products to be marketed in developing tropical regions. In fact for the poorer segment of the population what is needed is:

- (a) a cheap or subsidized full cream milk\*\*, which can best be given via a cup and spoon or a feeding cup for the occasional baby whose mother is dead or unavailable, and
- (b) an inexpensive high protein food, which could be dried skimmed milk, or a mixture containing skimmed milk and vegetable protein ingredients, or a variety of other possibilities, which could be used for infants over six months of age which need never be reconstituted as a liquid, but used either in powder form mixed in with the rest of the diet, or made into a gruel.

It is neither a liquid milk nor a "milk substitute" that is needed, but a high protein food, which can be truly supplementary to both breast milk and a locally available toddler diet, and not a replacement for breast milk at an early age. (7)

Liquid milk should be handled as a potentially harmful medicine rather than being thrust at random at an unprepared community (8); in fact, "it can only be used safely if a reliable piped water is available and if cooking equipment is adequate. Even then knowledge is needed if it is to be used to advantage". (8)

#### TRANSITIONAL DIET\*\*\*

In tropical Africa, health education for the transitional dietary period must be directed towards the prevention of protein-calorie malnutrition, including especially kwashiorkor:

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\* To correctly bottle feed with full cream milk, a four month old baby in Kampala at present (March 1962) costs about Shs.30 (\$10<sup>70</sup>.) per month, or about one-third or one-quarter of a labourer's earnings.

\*\* Possibly an acidified milk has various advantages, an important one being that it cannot usually be used in adults' tea or coffee.

\*\*\* Semantic difficulties are due to there being no exact equivalent in English to the French word "severage". The term "weaning" (Anglo-Saxon wenian, to accustom) is used with various different meanings, including "accustoming to foods other than milk" and "the stopping of breast feeding". The term "transitional diet" refers here to the diet given the infant between the time when he is exclusively breast-fed and when he has achieved the relative omnivorousness of the adult.

- (i) by encouraging the best use of the protein foods, available from the cultivation, from shops or from child welfare centres, together with an adequate intake of carbohydrate calories;
- (ii) by attempting to decrease the incidence of such "conditioning" diseases as hookworm, tuberculosis etc.;
- (iii) by considering ways of minimising or changing psychosocial situations of nutritional importance (e.g. the sudden "geographic" separation when breast feeding is stopped).

#### General Nutritional Considerations.

(1) Mixed Diet in the Second Semester. One of the main principles in the prevention of kwashiorkor, and similar less clear-out syndromes, is gradually to introduce the full mixed diet of the particular community, and especially its protein foods during the second six months of life. Failure to do this is often a defect of traditional feeding practices. Kwashiorkor usually has its main incidence in the second year of life; its prevention under present-day tropical circumstances lies principally in breast feeding alone for the first six months, and in the introduction of the available mixed diet, including animal and vegetable proteins, together with human milk from the beginning of the second semester onwards.

#### Length of Lactation.

(2) Length of time suggested in health education will vary with indigenous cultural considerations, but should be for not less than one year, and preferably for two years. Again it must be stressed that up to about six months, breast milk is the sole food; after this, it must be considered as a small, but valuable protein supplement to the exogenous foods that should make up the bulk of the diet.

The actual mechanics of separation from the breast (severage) vary greatly from one culture to another. (9) In many societies this used to be postponed by such family spacing techniques as the postponement of sexual intercourse until the child could walk or had a certain number of teeth.

This is a difficult time in any culture, and vastly more so for the permissively breast-fed tropical child upon whom it can have the impact of a second birth. (10)

Health education should, as always, be based on a knowledge of local practices, and should attempt to dissuade from customs considered, after due reflection, to be harmful, as for example, the use of bitter herbs on the breasts or the sudden sending away of the child to a relative. Beneficial "compensatory" practices

found in some parts of the world may well deserve recognition and imitation, as when the mother makes a particular effort to comfort her "displaced" child and to offer him specially prized portions of the diet, especially if these are protein rich.

(3) Local concepts of Nutrition and Infant Foods. Major difficulties with nutrition education among uneducated tropical populations are a lack of realization of the correlation between the health and growth of children and good feeding, and conversely, between an ill-balanced diet and malnutrition. Foods are usually classified culturally, sometimes on a complicated basis, (11) but only rarely, and accidentally, is there an overlap with scientific divisions. The main purpose of food in Africa is largely to satisfy hunger and to fill, if possible to repletion. (12)

As far as the young child is concerned, only too often the first foods given, apart from breast milk, consist of portions of the adult dietary, fed to the infant at the one or two daily meals. Points for emphasis often not found in traditional methods are the young child's priority as far as protein foods are concerned, and his need, if practicable, for gradually increasing quantities of soft, easily masticated and digestible foods, possibly specially cooked for him, and given at four meals daily.

(4) Other Local Factors. As noted earlier, many factors in the local ecology and way of life have to be known and nutrition education adapted accordingly. Of paramount importance are the actual local methods of cooking\* and the range of possibilities in simple home economics (e.g. costs of foods, pots likely to be available, fuel supplies, storage etc.).

As protein is almost always the critical nutrient, it is valuable for health educators to have a "protein sources list" available for the region. In this can be listed the protein foods, both animal and vegetable, that are found in the area, both cultivated, on sale in shops and available at child welfare centres, together with their seasonal variations in supply and cost, with possibly some simple form of nutritional rating. Ideally, this list should also include protein foods possibly becoming available in the near future, and would be of most value if revised at intervals, perhaps six monthly.

(5) Triple Mixture Infant Protein Foods. In most tropical circumstances, insufficient animal protein will be found for the young, rapidly growing child, and means have to be considered as to how to best use what is, in fact, available.

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\* An example of this among the Baganda of Uganda is the use of the traditional cooking in plantain leaf packets to prepare high protein infant foods, so-called ettu pastes. (Appendix: V)

The concept of "triple mixture infant protein foods" is useful as the most economical and nutritionally advantageous way of combining available animal protein foods, with their rich surplus of essential amino-acids, with mixtures of local vegetable protein foods, deficient themselves in certain amino-acids.\*

Triple mixture infant protein foods should be digestible, soft, specially cooked preparations consisting of:

- (i) a local staple (and preferably the higher protein staple, if alternatives exist), which may be a cereal, a tuber or a something else (e.g. the plantain);
- (ii) a local legume, selected on the basis of protein content, alleged digestibility and likelihood of acceptance by mothers;
- (iii) a small quantity of expensive animal protein, such as an egg, fish, dried skimmed milk or fish flour, mixed in, either before or after cooking depending upon the particular food.

As examples of this principle, a gruel of soft rice-toasted Bengal gram (Cicer arietinum) flour with a little added milk, may be quoted as a possibility for parts of India, while in Buganda, plantain and steamed beans (Phaseolus vulgaris), with a raw egg beaten in, are one form of triple mixture infant protein food (ettu paste) (Appendix: V)

#### Practical Policy

Second six months of life. First Food. Usually the first dish introduced to the infant is and should be, a gruel, a soft paste, or a portion of some local staple food (i.e. maize gruel, soft boiled rice, soft outer part of baked sweet potatoes, portion of steamed plantain). This seems to be a general practice all over the world, including Europe and North America, and in tropical regions, it is equally valid as a first feed, preferably in a gruel form with more miscible animal protein (such as milk or egg) added.

Subsequent foods. Following this, a triple mixture infant protein food should be aimed at, based on locally available and acceptable foods, and the limited culinary possibilities. Small portions should

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\* This principle has, in fact, come about empirically in the traditional dietaries in numerous parts of the world, and, for example, in India is exemplified by the milk, and rice-dhal (legume) basis of the Hindu diet.

be offered at first once daily, and then gradually increasing up to four times per day.

Most usually this type of dish requires special preparation, apart from the adult foods, so that the availability of cheap, lidded, small cooking pots at child welfare clinics may be important aids to practical infant feeding.

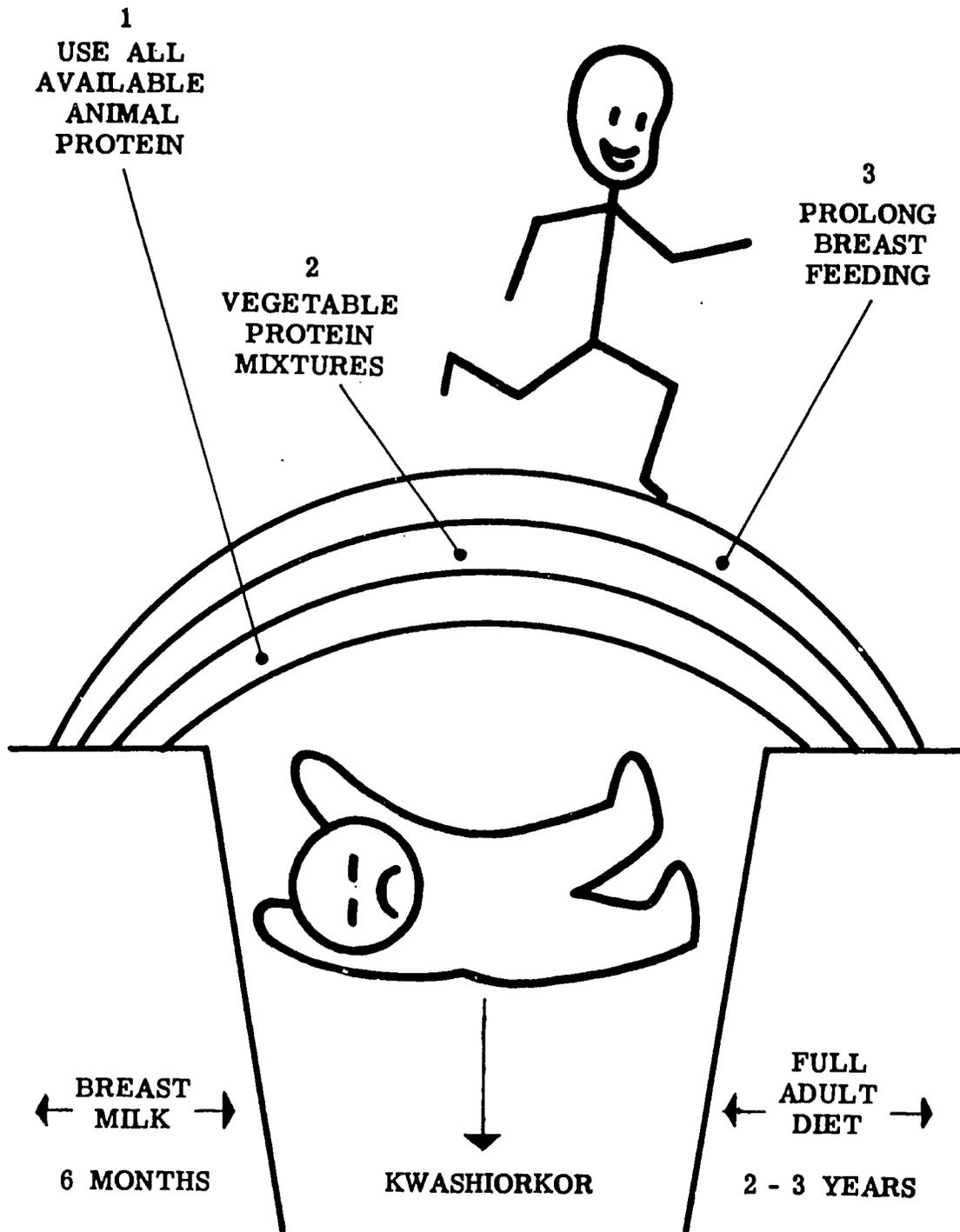
Sometimes this may not be necessary, as with the Baganda who cook their staple food in plantain leaf packets in a large pot, to which a special packet for young children can easily be added. (Appendix: V)

Adult Diet. As first foods for infants, apart from breast milk, in these communities which have neither the facilities nor incentive to prepare separate dishes for their young children, and in all tropical groups later during the second semester of life, the softer, more protein-rich portions of the adult diet should be given.

Health education must, therefore, be guided by a detailed knowledge of the indigenous meal pattern and intra-familial food priorities. In Buganda, for example, it would be based on trying to ensure that the older infant received a share of the enva (groundnut and vegetable "sauce") and bijanjala (beans, which could be mashed and have the skins removed), mixed with the universal and dominant, but protein-poor, staple matoke (steamed plantain).

"Three-Plank Protein Bridge" (Fig:1) As protein is the critical need in feeding of young children in developing tropical regions, the concept of the "Three Plank Protein Bridge" is useful for teaching purposes (for students and junior medical personnel, but not for mothers). It has the value of simplification and emphasizes the need for the use of all protein sources, represented pictorially by the three "planks" of prolonged breast feeding, and of animal and vegetable protein foods, if the child is to bridge the nutritional divide between the age of six months and 2 - 3 years, without crashing into the chasm of kwashiorkor.

FIGURE 1



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## APPENDIX: I

### "Felt-needs of Baganda women in relation to infant nutrition"

In an attempt to discover the felt needs of Baganda women on this topic, twenty women in a rural area were invited to ask the health educator any questions that they would like answered concerning lactation, the stopping of breast feeding and child feeding. Surprisingly and inexplicably, most women asked if there was any special way to hold the child while breast feeding. The next most frequent comment was that there was nothing they wanted to know about breast feeding. Two women asked how to increase the amount of breast milk, and one asked why modern women do not have breast milk.

With regard to "weaning", some asked how they should take the child off the breast, as though conceding that there might be some better method than the one they practiced, but again there was a group of women who felt they had no questions to ask on that subject.

Questions related to feeding after "severage" were:- how should one give cow's milk to a child, what should one give instead of the breast, at what time should a child be fed. Many asked what food must be given to their children--a vague and general question, rather like an invitation to provide some form of entertainment. Perhaps this was a polite question indicating that they would quite enjoy listening to the whole topic.

10% of the sample did not wish to know anything about feeding children, presumably because they were quite satisfied with the traditional methods. On the whole there did not appear to be much interest in learning about the correct feeding of the child.

From this it would appear that there is little realization on the part of the Baganda mothers of the relationship between nutrition and disease and that therefore she is not interested in this subject.

As is known, (11) kwashiorkor is recognized among the Baganda by four names - obwosi (child displaced by a subsequent pregnancy), omusana (the sun, referring to the lightening of skin and hair color), empewo (child exposed to cold), obusoro ("little animals", which are thought to have got into the child). In no instance is the condition related to food and nutrition. Until this relationship between illness, lack of growth and feeding the child is established in people's minds, they will continue to have no real interest in learning anything about food.

## APPENDIX: II

### Mulago Parents' Club

A low cost (£100 or \$280) model house, built according to available Ministry of Health plans, has been erected adjacent to the Children's Wards, Mulago Hospital with money generously supplied by Save the Children Fund (Uganda). This, together with the adjacent kitchen, forms the basis of the Mulago Parents' Club.

A young Uganda woman has been trained as a practical Health Educator. She comes round the Ward on the doctor's rounds as part of the team, talks to mothers at leisure later, and, especially, each afternoon has a meeting with the mothers, who are staying in the ward with their children, either sitting on mats under a tree or in the model house.

A variety of topics are covered dealing with the practical prevention of locally common childhood diseases (e.g. kwashiorkor, infective diarrhoea, hookworm anaemia). These take the form of demonstrations, with group participation.

An evaluation of the usefulness, or otherwise, of these activities is being carried out.

### APPENDIX: III

#### "Save the Children Fund" Home Feeding Kit\*

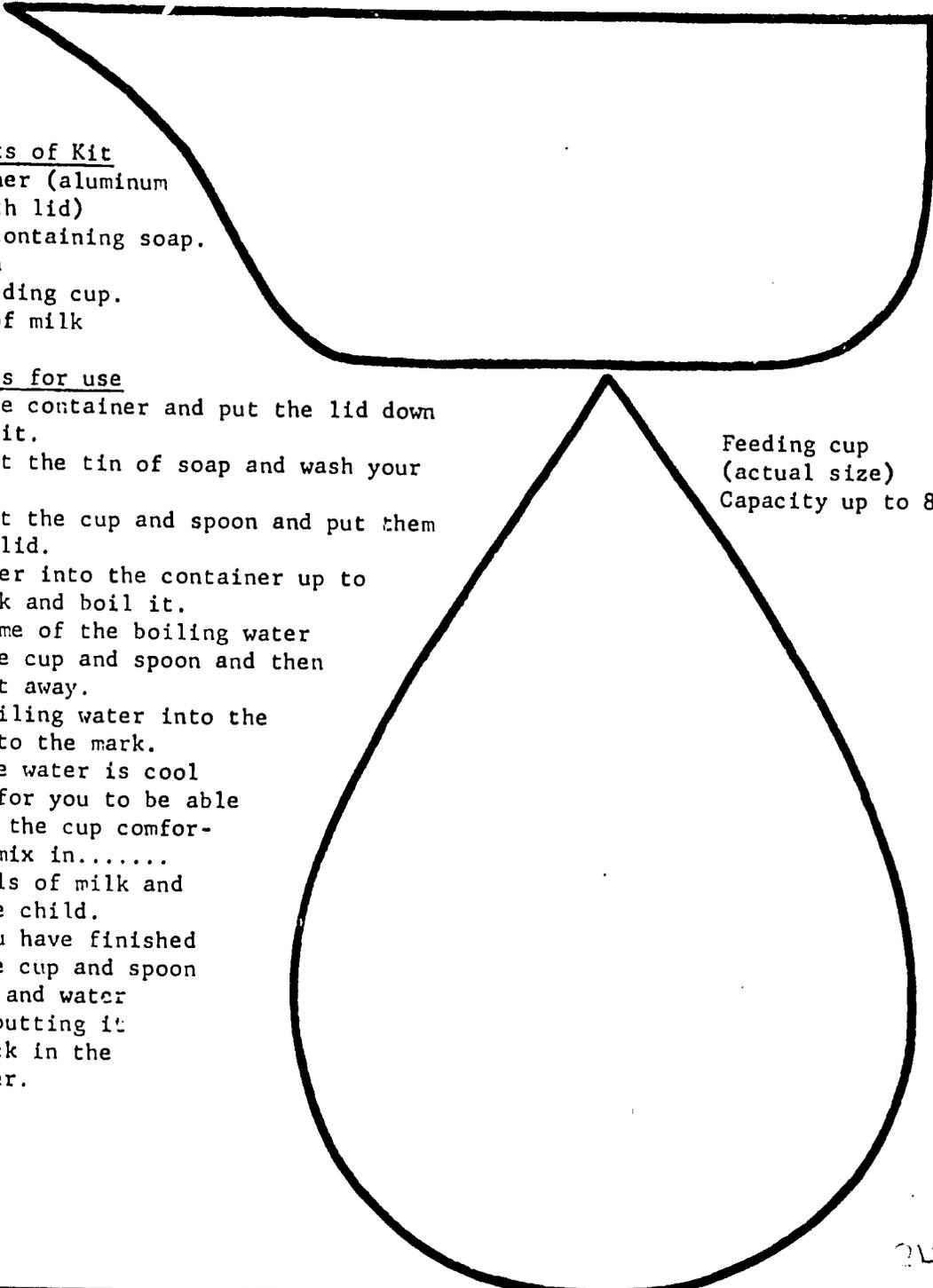
This kit is designed for the feeding at home by foster parents of babies who have to be artificially reared. Because of the difficulty of cleaning a feeding bottle and teat, with the consequent grave danger of infecting the baby with diarrhoea and vomiting, the feed is mixed and given in a special aluminum cup which is very easy to keep clean.

#### Components of Kit

1. container (aluminum pan with lid)
2. A tin containing soap.
3. A spoon
4. The feeding cup.
5. A tin of milk

#### Directions for use

1. Open the container and put the lid down beside it.
2. Take out the tin of soap and wash your hands.
3. Take out the cup and spoon and put them on the lid.
4. Put water into the container up to the mark and boil it.
5. Pour some of the boiling water over the cup and spoon and then throw it away.
6. Pour boiling water into the cup up to the mark.
7. When the water is cool enough for you to be able to hold the cup comfortably, mix in..... spoonfuls of milk and feed the child.
8. When you have finished wash the cup and spoon in soap and water before putting it away back in the container.



Feeding cup  
(actual size)  
Capacity up to 8 ozs.

APPENDIX: IV

Re-establishment of Lactation

Ward Regime

- (1) Mother. Encouragement and explanation  
1 pint milk/day (mainly psychotherapy in Buganda)  
Chlorpromazine 100 mgm tabs t.d.s. 10 days  
(Nasal synthetic oxytocin, if required -  
artificial "let-down" reflex)
- (2) Infant. (i) Frequent, at least approx. 2 - 3 hourly breast  
feeds. Complementary feeds by tube/spoon/cup
- (ii) Other treatment (i.e. antibiotics, rehydration,  
etc.)

- - - - -

Assessment of Results

Wt. increase, clinical improvement of flow of  
breast milk, test feeding at end of chlorpromazine.

Ultimately discharge on breast alone.

APPENDIX: V

ETTU PASTES IN INFANT FEEDING IN BUGANDA

D. B. Jelliffe

Shortage of protein with an excess of calories in the diet of the young child often leads to malnutrition including kwashiorkor.

It is necessary to try to persuade village mothers:

- (1) to continue to breast feed their babies for a year;
- (2) to warn mothers of the dangers of bottle feeding;
- (3) to introduce animal and vegetable protein foods to their children from the age of 5 to 6 months onwards. \*

Staples:

In Buganda (and some other parts of Uganda), the plantain and the sweet potato are the staples, and are cooked by steaming in a plantain leaf packet. (ettu).

Protein Foods:

The principal sources of vegetable proteins are groundnuts and beans (Phaseolus vulgaris). Animal protein foods are expensive and usually short supply, but the following may be available:

- (a) in the village - eggs, dried or fresh fish;
- (b) in shops - dried skimmed milk.

Ettu Pastes:

The idea with ettu paste is for the mother to be able to prepare for her child aged from 6 months or so upwards, a special packet (ettu) which would contain in paste form a mixture of a staple, together with both vegetable and animal protein foods. This would have the advantages of using the traditional method of cooking, of being economical of fuel, as it would be cooked along with the family matoke, and of allowing the prepared paste to be kept cleanly wrapped up and used, either cold or re-heated, for the next meal.

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\* There are various other ways of trying to do this, including the recipes given by Dr. Hebe Wellbourn in "Health in the Home". All, including ettu pastes, should be known to, and used by, the Community Development worker.

## BASIC RECIPES OF ETTU PASTES

<u>Exact or kitchen measures:</u>	<u>Household measures:</u>
1. 12 ozs. <u>matoke</u> (weighed after peeling). 3 ozs. dry beans. 5 tablespoon water pinch salt.	6 average "bananas" (fingers, pieces). 6 large spoons dry beans (English dessertspoon) <u>or</u> 1 large handful 10 large spoons water pinch salt.
2. 12 ozs. <u>lumonde</u> (weighed after peeling) 3 ozs. dry beans. 5 tablespoons water. pinch salt.	1½ medium sized roots <u>lumonde</u> . 6 large spoons dry beans (English dessertspoon) <u>or</u> 1 large handful dry beans. 10 large spoons water pinch salt.
3. 8 ozs. <u>matoke</u> or <u>lumonde</u> (weighted after peeling). 4 ozs. groundnuts (pounded). 5 tablespoons water pinch salt.	4 average "bananas"(fingers, pieces). 8 large spoons groundnuts (English dessertspoon). 10 large spoons water pinch salt.

to ONE of these basic mixtures ONE of the following foods must be added:

- |                          |  |
|--------------------------|--|
| (a) 1½ ozs. liquid egg.  | (a) 1 beaten egg.  |
| (b) 1½ ozs. D.S.M.       | (b) 5 heaped teaspoons D.S.M.                              |
| (c) 5/8 ozs. dried fish. | (c) 1 side of a fresh or dried medium sized <u>ngege</u> . |

### PREPARATION AND COOKING OF ETTU PASTES

The following is the general method for the preparation and cooking for ettu pastes using matoke (plantain) or lumonde (sweet potato), dry beans and egg or D.S.M.

- (1) Measure dry beans, wash and put to soak overnight in clean water. This softens the skins and makes removal easy. An alternative method of skinning beans is to put them on to boil for about 45 minutes, put into cold water and they skin easily.
- (2) Next day when starting to prepare the child's food, remove outer skin from the beans.

- (3) Peel matoke or lumonde, wash and cut into small pieces.
- (4) Wrap prepared matoke or lumonde, beans and spoons of water inside the banana leaves; tie carefully and put the ettu in the cooking pot with the food for the rest of the family. Steam the ettu for about 2-2½ hours. (Use smoked banana leaves, luwombo, to prevent the leaf breaking or cracking.
- (5) Open the ettu and mash up the cooked food very well. Measure the D.S.M. and sprinkle over the food and again mix well. The mixture must be really soft.  
OR, beat up the egg and add it to the cooked food, again mixing in well to make a soft mush.

Method for ettu pastes using matoke or lumonde, pounded groundnuts and egg or D.S.M.

As above substituting groundnuts for the beans. The nuts may be roasted and skinned before pounding when possible.

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Method for ettu paste using matoke or lumonde, beans or groundnuts and fish (fresh or dried). The only difference in making this ettu paste is that the fish is cooked in the ettu.

Soak dried fish in clean water or wash fresh fish. Separate the fish meat from the bones and skin, and use about ½ a medium sized ngege in the ettu.

Note. Any one of these mixtures makes enough for a midday and evening feed for 1-2 year old child and preferably should be given warm. After the first meal, the ettu should be tied up and can then be given a second time later in the day, either cold or after re-heating.

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