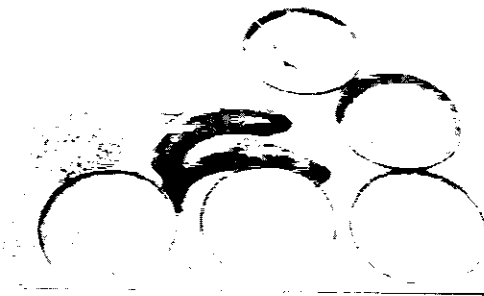
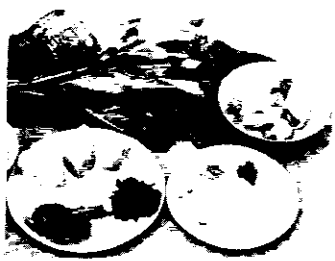
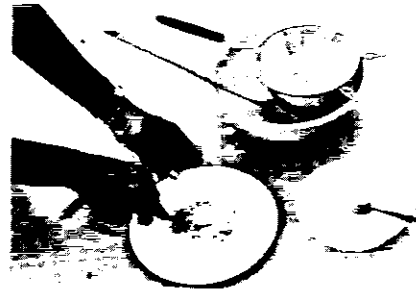


A GUIDE TO FEEDING THE WEANING AGE GROUP IN THE CARIBBEAN



Caribbean Food and Nutrition Institute
Kingston 7, Jamaica

Pan American Health Organization
Pan American Sanitary Bureau, Regional
Office of the World Health Organization

Cover Picture: Proper weaning practices are of utmost importance in the prevention of malnutrition in young children. As the infant grows, additional foods need to be given to meet his increased demands.

These photographs with the exception of the centre picture are taken from CFNI's "Breastfeeding Your Baby" slide/cassette presentation, Part III: "Weaning Your Baby". © CFNI, 1978.

Centre picture: © Jamaica Information Service

The Caribbean Food and Nutrition Institute (CFNI), serves seventeen Caribbean countries* for which it is a major technical resource providing information, direct service and training and operational research in food and nutrition. The Institute is part of the development resource network of the Caribbean Community.

CFNI is also part of the world-wide development resource network through its role as a Pan American Centre administered by the Pan American Health Organization (PAHO). PAHO represents the World Health Organization (WHO) in the Americas.

*Antigua, Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts-Nevis, Saint Lucia, St. Vincent, Suriname, Trinidad & Tobago, Turks & Caicos Islands.

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1982

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FOREWORD

Young children from about six months to three years of age are often the least well nourished members of their families. Their needs for energy, protein and iron in particular, often go unmet not only in families with limited incomes, but even in those that are more fortunate. Many parents do not realize the special needs of this age group.

In an attempt to redress this problem, the Caribbean Food and Nutrition Institute (CFNI) produced "Guidelines to Young Child Feeding in the Contemporary Caribbean", "A New Look at Multimixes in the Caribbean", "Feeding the Weaning Age Group in the Caribbean - Proceedings of a Technical Group Meeting" and "Feeding the Weaning Age Group - Guidelines for the Caribbean". There have since been numerous requests for detailed information on feeding the child from the 'family pot'.

This Guide was prepared by Mrs. P. Manchew, Public Health Nutritionist, CFNI, and is divided into two parts. Part I deals with basic nutrition facts and explains the multimix principle of meal planning based on food groups. It outlines in detail how to feed children from approximately four months until they are eating all foods from the 'family pot'. Part II presents a number of recipes, some taken from the 'family pot' and some requiring special preparation. Suggested meal plans are also included in the Appendices.

Each recipe has been kitchen tested and its nutritional value calculated using the Food Composition Tables for Use in the English-speaking Caribbean. As well as giving energy, protein, iron, vitamin A and calcium for each dish, the bulk (energy concentration) is provided and the taste is guaranteed. However, modification of the recipes is encouraged, based upon the multimix principle.

The Guide is intended for use by nutritionists, dietitians, physicians, nurses and other health and education professionals. We hope that it will be useful in their teaching programmes and facilitate preparation of educational material for the public.

Dr. J. Michael Gurney
Director
Caribbean Food and Nutrition Institute

ACKNOWLEDGEMENT

The writer wishes to express sincere appreciation to those individuals who kindly reviewed the draft document and offered many useful comments and suggestions.

The financial support of the United States Agency for International Development (US AID) which made this publication possible through its Grant No. 538-0022 is also acknowledged.

INTRODUCTION

The prevalence of malnutrition in young children in the Caribbean is high. Some 40% of children under 5 years are borderline, 12% are moderately malnourished and 1.4% are severely underweight.

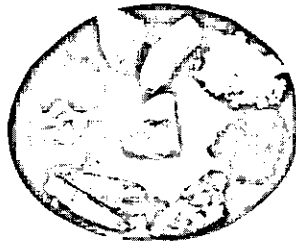
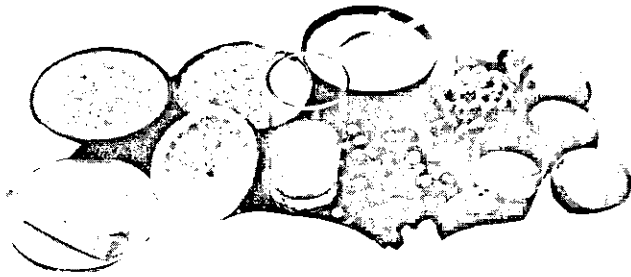
The past decline in breastfeeding and early introduction of unsuitable weaning foods have contributed to weanling diarrhoea. A Technical Group Meeting held in Barbados in 1979 identified a number of strategies which can be used to promote successful breastfeeding. National seminars have furthered the campaign.

Breastfeeding alone does not assure adequate nutrition beyond six months and the time factor in introducing appropriate weaning foods is all important. The critical transitional weaning period begins with the need to introduce food to complement breast milk and ends when the child is consuming all foods from the 'family pot'.

After successful breastfeeding of 4 to 6 months, the infant should be weaned on to a mixed diet containing nutritious foods which will provide adequate quantities of energy, protein, fats, vitamins, minerals and water. Breastfeeding should continue during this time.

Because of rapid growth, the energy and protein needs of infants and young children are considerable. Requirements for energy and other nutrients are shown in Appendix 1, which can be used as a guide when estimating the needs of the individual child.

The Caribbean Food and Nutrition Institute (CFNI) in collaboration with the University of the West Indies (UWI) and the Caribbean Community Secretariat (CARICOM) convened a Technical Group Meeting on Feeding the Weaning Age Group in Georgetown, Guyana, during 23-27 October 1978. Two approaches to feeding were recognized: (a) 'Family Pot' Feeding and (b) Manufactured Weaning Foods. This Guide deals with 'family pot' feeding.



FROM MOTHER'S MILK TO MIXED DIET

PART I

PRINCIPLES OF INFANT FEEDING

NUTRITIONAL VALUE OF FOODS

Scientists have identified more than 50 nutrients needed by the body for energy, growth, maintenance and protection from some diseases. They can be classified into carbohydrates, protein, fats, vitamins, minerals and water. The body's needs for these nutrients are all related and the requirement for one depends on others being present in adequate amounts at the same time.

ENERGY

Because of rapid growth, the energy and protein needs of infants and young children are considerable. When energy and protein needs are met, the requirements for other nutrients are more easily satisfied. Recommended Daily Intakes (Appendix 1) represent enough nutrients to satisfy the needs of nearly all children.

The energy value of a meal is usually expressed in kilocalories or kilojoules:

$$1 \text{ kcal} = 4.184 \text{ kJ} = 0.0042 \text{ MJ}$$

The proteins, fats, carbohydrates (sugars and starches) in foods supply the following energy values:

Proteins	4 kcal/g (or 17 kJ/g)
Fats	9 kcal/g (or 38 kJ/g)
Carbohydrates	4 kcal/g (or 17 kJ/g)

PROTEIN

Protein is essential for the structure and function of all cells in the body. It is part of all tissues including muscles, bones, teeth, skin and nails. Body fluids, such as blood, contain protein. The constituents of protein, the amino acids, are involved in building of new tissues and renewal of worn tissue.

All animal and plant protein contain about 22 amino acids in varying proportions. The body is unable to synthesize 8 of these in adults and 10 in children. These are considered "essential" amino acids and are as follows:

Isoleucine	Phenylalanine
Leucine	Threonine
Lysine	Tryptophan

Methionine	Histidine)	} for children
Valine	Arginine)	

It is necessary for humans to obtain an adequate amount of these essential amino acids. Some animal foods such as milk, meat, fish and cheese contain all the essential amino acids in the right proportion. In other foods, one amino acid may be present in only very small quantities and this limits the use the body can make of the others to build tissues. Mixtures of foods such as are eaten in ordinary meals become very important because the amino acids in the protein of one food can complement those in another.

Cereals, although they contain ample amounts of methionine and cystine (the sulphur containing amino acids) have little lysine, whereas legumes contain lysine in fairly large quantities. Where cereals and legumes are eaten together, their amino acids complement one another, resulting in a mixture in which the pattern of amino acids closely resembles that of animal protein.

PROTEIN AND ENERGY REQUIREMENTS

There is a strong interrelationship between protein and energy and it is not sufficient to assess the adequacy of the diet by looking at the protein content alone. The amount of energy in the diet affects the efficiency of protein utilization. If insufficient energy is supplied in the diet, some of the protein will be used for energy rather than for growth and maintenance of body tissue. The protein/energy ratio (PE%) expresses the protein concentration in energy terms (protein calories in 100 kilocalories). It has been recommended as an indicator for estimating the potential of the diet to satisfy protein needs. The PE% of weaning diets should be 8.6% to 12.6% for a mixed diet with net protein utilization (NPU) of 70%.

The Net Dietary Protein Energy percent (NDpE%) is the proportion of dietary energy supplied by protein corrected for protein quality. A diet that provides less than 5% of the energy in the form of utilizable protein is incapable of meeting the needs of the adult even when consumed at a level that meets the energy requirements; and a diet that supplies less than 8% of energy as utilizable protein is incapable of meeting the needs of infants or young children.

OTHER NUTRIENTS

In planning diets for infants, not only must energy and protein be considered but an adequate intake of all nutrients from a variety of foods must be assured.

Vitamin A is needed for normal eye function, maintenance of normal healthy epithelial tissues and proper development of the skeleton. It is available in foods of animal origin and as carotene in dark green leafy vegetables and yellow and red fruits and vegetables.

Thiamine (B₁), riboflavin (B₂) and niacin are needed for the proper utilization of carbohydrates during energy production and to facilitate the body's use of protein. Requirements for these vitamins are usually related to energy requirements. The recommended intakes of thiamine, riboflavin and niacin are 0.4 mg, 0.55 mg and 6.6 mg respectively, per 1000 kilocalories and any infant feeding mixture should contain at least the same vitamin/energy ratio. Rich sources of these vitamins are usually foods from animals, legumes and whole grain cereals.

Vitamin C (ascorbic acid) has many functions in the body, particularly in the metabolism of connective tissue and appears to be essential for the normal functioning of all cells. Rich sources of this vitamin include the West Indian cherry, citrus fruits, mango, pawpaw, guavas. It is also present in cabbage, dark green vegetables and Irish potato. It is the most unstable of all vitamins and is easily dissolved in water, is destroyed during cooking and on exposure to air. Bruised and cut fruits and vegetables rapidly lose their vitamin C.

Iron, folate and vitamin B₁₂ are essential along with protein and vitamin C for normal blood formation. Iron is found in organ meats such as liver, in meats, enriched and whole grain cereals, dark brown sugar and molasses.

The absorption of iron from foods is enhanced by ascorbic acid and a factor associated with meat, fish and poultry. Tannic acid found in tea and coffee, phytates found in cereal grains, spinach and cocoa, calcium and phosphate salts, all inhibit iron absorption.

Folate is supplied in a diet containing mature peas and beans and green leafy vegetables. Vitamin B₁₂ is found in animal protein foods such as eggs, liver and meat and is not present in plant foods. Since anaemia affects many children in the Region, it is important to ensure that weaning diets contain a variety of foods providing iron, folate and vitamin B₁₂.

Calcium is a major mineral constituent of the skeleton and contributes to muscle contractility and blood coagulation. Its absorption is influenced by vitamin D. Important sources are milk and milk products, cheese, fish with soft bones that are eaten and dark green leafy vegetables. Vitamin D is obtained from sunlight and fish liver oil.

Zinc is at present under investigation since there are indications that zinc deficiency can occur in man. Zinc forms a part of many enzymes which have catalytic functions in the body and is necessary for tissue repair. Zinc deficiency results in retarded growth. Meats, milk, nuts and beans are good sources and oysters are extremely high in zinc.

The requirements for minerals, except calcium and iron, are generally low and deficiency symptoms in the Region are rare. Calcium and iron are required in larger proportions by the young child - calcium for skeletal growth and iron for tissue growth and haemoglobin synthesis. During the first 4 months of life the healthy infant relies on iron stores acquired before birth. After 4 months the iron must be supplied from dietary sources.

Water is essential to life. An adequate water intake is necessary for infants to ensure proper kidney function. Water is found in most foods. When extra water is to be given to the infant, it should be boiled and fed from a clean cup. It should never take the place of nourishing food.

NUTRIENT CONTRIBUTIONS OF FOODS USED IN WEANING DIETS

The following food grouping system is adapted to the traditional Caribbean meal pattern which often consists of a 'family pot' meal that is built around a staple:

Staples:	(a) Cereals:	
	rice	wheat flour
	cornmeal	oats
	(b) Starchy roots, fruits and tubers:	
	yam	potato
	cassava	eddoes
	dasheen	green bananas
	plantain	breadfruit
Legumes:	lentils	pigeon peas
	split peas	blackeye peas
	soybeans	channa
	red beans	lima beans
	peanuts	
	Vegetables:	(a) Dark green leafy:
spinach		callaloo
pakchoi		cabbage leaves
dasheen leaves		
(b) Yellow:		
carrot		pumpkin
Food from Animal Sources:		beef
	pork	fish
	milk	cheese
	eggs	organ meats

Fruits:	guava	West Indian cherry
	mango	citrus fruits
	pawpaw	
Fats:	butter	vegetable oil
	ghee	shortening
	margarine	

Although sugar has not been included as a separate group, it contributes approximately 15% of dietary energy in the Region. Dark brown sugar supplies small amounts of iron and is recommended for infant feeding.

STAPLES

Cereals

All cereals have about the same nutrient value. They are good sources of protein and energy, providing 7 to 14% protein and contain up to 75% carbohydrates before cooking. They are also valuable sources of thiamine, riboflavin, niacin, calcium and iron. Whole grain cereals provide added fibre.

Cereals have traditionally formed an important part of the Caribbean diet, contributing a large percentage of protein and energy (between 28% and 59% of total energy consumption). Bread, roti, dumplings, biscuits, macaroni products, rice and cornmeal are widely used. Oats and barley are used in small amounts as porridges.

TABLE 1: Energy, Protein and Iron Content of Selected Uncooked Cereals per 100 g Edible Portion

Cereal	Energy (Kilocalories)	Protein g	Iron mg
Barley	332	11.0	3.6
Cornmeal	362	9.0	1.8
Oats	390	14.2	4.5
Rice, white, unenriched	363	6.7	0.8
Wheat flour	364	10.5	0.8
Spaghetti, macaroni	369	12.5	1.3

Starchy Roots, Fruits and Tubers

In some communities of the Region, these foods form the major ingredient of the diet. They are often eaten cooked in their fresh state, are high in energy and contain between 1% and 2% protein.

TABLE 2: Energy, Protein and Iron Content of Uncooked Starchy Roots, Fruits and Tubers per 100 g Edible Portion

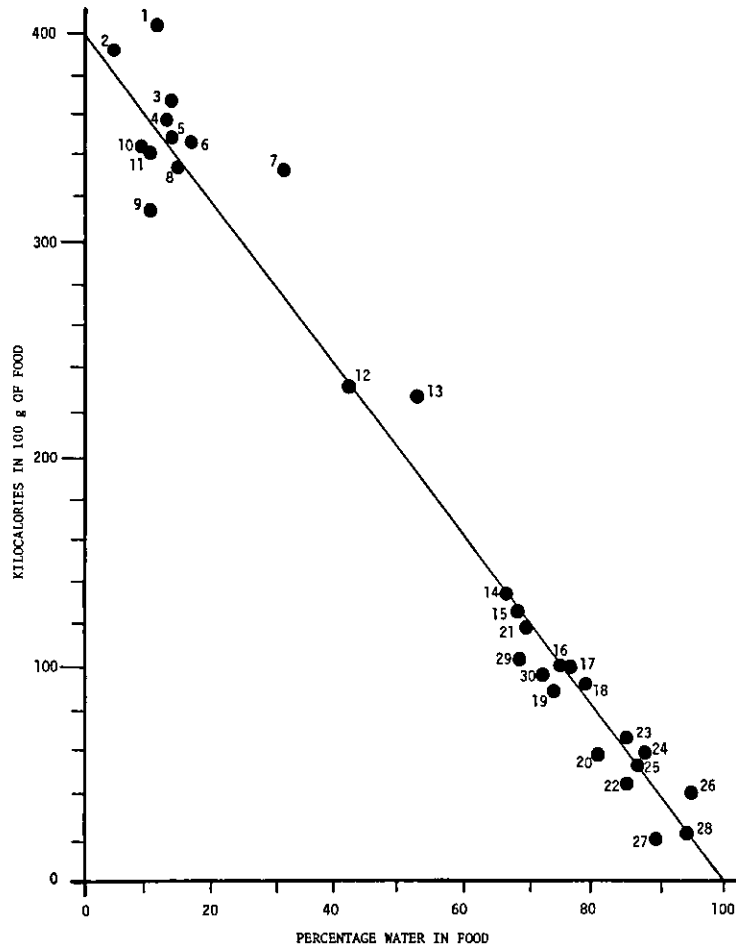
Food	Energy (Kilocalories)	Protein g	Iron mg
Banana, green	110	1.4	0.9
Breadfruit	81	1.3	1.9
Cassava	145	1.2	0.7
Dasheen, Taro	105	1.8	1.1
Plantain, green	132	1.2	0.8
" ripe	122	1.0	0.8
Potato, Irish	82	2.0	0.7
" sweet	117	1.3	1.0
Yam, Yampie	105	2.4	0.8
Tannia	133	2.0	1.0

Energy Density of Staple Foods

Cereals and starchy roots, fruits and tubers contribute a fair amount of bulk to the diet. Uncooked cereals contain approximately 12% water but when cooked the water content rises to as much as 70% which closely approximates the moisture content of the starchy roots, fruits and tubers group whether raw or cooked. Consequently, the energy density of porridges is similar for these two main sub-groups of staples (about 1 kcal per g). This concept is illustrated in Figure 1.

Cereals, as consumed, are therefore not more concentrated sources of energy than starchy roots, fruits and tubers. For infant feeding, both cooked cereals and starchy roots, fruits and tubers require the addition of compact calories in the form of fat and sugar. This will reduce the volume of food needed by the child.

FIGURE 1. ENERGY DENSITY OF FOODS



KEY

- | | |
|---------------------------|-----------------------------------|
| 1. Oatmeal | 16. Sweet potato (raw and boiled) |
| 2. Cornflakes | 17. Rice (boiled) |
| 3. Maize meal | 18. Macaroni (boiled) |
| 4. Rice (raw) | 19. Plantain (boiled) |
| 5. Cassava starch | 20. Ripe banana (raw) |
| 6. Wheaten flour | 21. Lima beans (boiled) |
| 7. Biscuits | 22. Cow peas (boiled) |
| 8. Cassava flour | 23. Potato (raw) |
| 9. Banana flour | 24. Breadfruit (raw) |
| 10. Lima beans (raw) | 25. Potato (boiled) |
| 11. Cow peas (raw) | 26. Human milk |
| 12. Bread | 27. Oat porridge |
| 13. Potato chips (cooked) | 28. Maize gruel |
| 14. Sweet potato (baked) | 29. Breadfruit (boiled) |
| 15. Cassava (raw) | 30. Plantain (raw) |

LEGUMES

Legumes, although they lack the amino acid methionine, are good sources of lysine. (They have the reverse amino acids pattern of cereals.) The protein content of dried legumes varies between 20% and 25% and they are excellent sources of food energy. They are also useful sources of thiamine, riboflavin, niacin, folate, calcium and iron depending on the method of preparation. For infant feeding, legumes should be skinned, well cooked and finely mashed to make them easily digestible. Soybeans contain approximately 40% protein and are high in fat, thereby contributing additional energy. Peanuts contain approximately 25% protein. In the Caribbean they are used primarily as snacks and in drinks.

TABLE 3: Energy, Protein and Iron Content of Selected Uncooked Legumes per 100 g Edible Portion

Food	Energy (Kilocalories)	Protein g	Iron mg	Scientific Name
Red kidney bean, red pea	337	22.0	7.6	Phaseolus vulg- aris
Chickpea, channa	364	18.2	7.3	Cicer arietinum
Lentil	340	23.7	7.0	Lens culinaris
Split pea	348	24.2	5.1	Pisum sativum
Pigeon pea, gungo pea	337	19.2	5.0	Cajanus cajan
Soybean, Soya	335	38.0	6.5	Glycine max
Lima bean, broad bean	336	20.7	4.8	Phaseolus lunatus
Peanut, groundnut	564	26.0	2.1	Arachis hypogaea

VEGETABLES

Dark green leafy vegetables are widely available in the Caribbean and are often underutilized in the diets of infants. Their protein value may vary between 2% - 10%. They are valuable sources of carotene, vitamin C, folate, calcium and iron. They can be easily cultivated in home gardens and add flavour and variety to meals.

Yellow vegetables such as carrots and pumpkin are valuable sources of carotene.

TABLE 4: Energy, Protein and Iron Content of Selected Uncooked Vegetables per 100 g Edible Portion

Food	Energy (Kilocalories)	Protein g	Iron mg	Scientific Name
Spinach, bhajee, callaloo	39	3.5	4.1	Amaranthus spp. or Chenopodiaceae spp. or Basella spp.
Beans, snap, string [young pods]	32	1.9	0.8	Phaseolus vulgaris
Chinese cabbage, pakchoi	14	1.4	2.0	Brassica chinensis
Cabbage	25	1.6	0.4	Brassica oleracea
Carrot	40	1.1	0.8	Daucus carota
Pumpkin	30	0.6	0.5	Cucurbita maxima
Tomatoes	21	0.8	0.6	Solanum lycopersicum
Ochro, okra	25	1.8	1.2	Hibiscus esculentus
Egg plant, melongene, aubergine	24	1.2	0.4	Solanum melongena
Avocado, pear	162	1.8	0.7	Persea americana
Dasheen leaves, callaloo, spinach	31	2.4	2.0	Colocasia esculenta

FOOD FROM ANIMAL SOURCES

As a group, food from animal sources are important for young children. They contain a good proportion of high quality protein (the essential amino acids), are economical when used in small quantities and are easily digested. Milk and milk products also provide vitamin A and riboflavin. Meats, especially organ meats like liver, are very good sources of iron and vitamin B₁₂.

TABLE 5: Energy, Protein and Iron Content of Selected Uncooked Foods of Animal Origin per 100 g Edible Portion

Food	Energy (Kilocalories)	Protein g	Iron mg
Beef, medium fat	268	17.5	2.1
Chicken	170	18.2	1.5
Liver, beef	134	19.8	5.1
Eggs	163	12.9	2.3
Milk, whole fluid	65	3.5	0.1
" dried whole	506	26.0	0.7
" dried skim	360	36.0	0.9
Fish, flying	91	21.0	0.5
" snapper	90	19.8	0.8
" king	159	22.0	-
" dolphin	113	20.5	-
Codfish, semi-dried, salted	264	39.7	3.0
Sardines, canned in oil	311	20.6	3.5

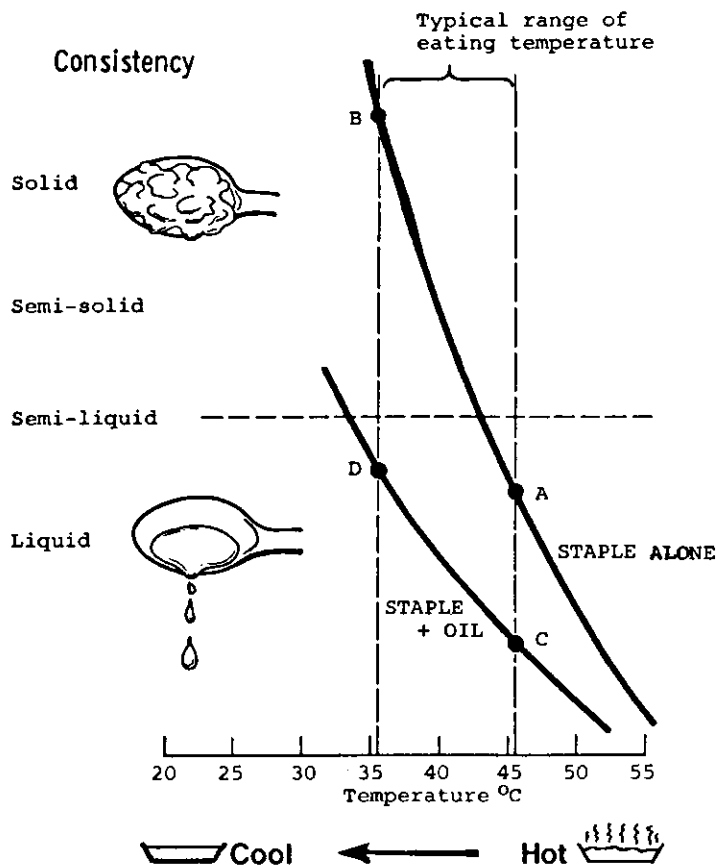
FATS

Fats are concentrated sources of energy and contain essential fatty acids which are necessary for growth of cell structures.

Traditional weaning diets in the Caribbean are frequently bulky and young children whose stomach capacity is small, have difficulty in eating sufficient amounts to meet their energy requirements. Fats added in small amounts to cooked mixtures will increase the energy content and improve the palatability of the meal.

Porridges made from staple foods solidify quickly on cooling and may be overdiluted to maintain a soft consistency resulting in reduced energy intake for the child. Current research shows that the addition of fat to the porridge reduces the viscosity and maintains the mixture in a soft easily digestible state throughout a typical range of eating temperature (35°C to 45°C) without reducing the energy density (Figure 2).

FIGURE 2: CHANGE OF CONSISTENCY OF GRUEL WITH AND WITHOUT ADDED OIL¹



A pure staple changes quickly from a liquid (A) to a solid (B) as it cools. The undernourished child is a slow eater and finds that as the food thickens his meal becomes increasingly more difficult to swallow. The addition of oil softens the food and it remains liquid throughout the typical range of eating temperature, that is, from (C) to (D).

¹From: Dearden, C., P. Harman and D. Morley. Tropical Doctor, Vol. 10, July 1980, p. 137. Reprinted with permission.

WEANING DIETS

Nutritious mixtures can be derived from the food groups using the 'multimix' principle. The 'multimix' principle is based on a mixture of foods which, when eaten together, will complement and mutually reinforce one another to ensure an intake of essential nutrients.

Multimix meals start with the staple food of the community. To this is added legumes, vegetables and food from animal sources. Fruits and fats will complete the meal. Where the starchy roots, fruits and tubers form the major staple, an animal source of food is recommended in all mixtures.

FOUR-MIX OR QUADRI-MIX

The best quality meals will include foods from each of the following four groups:

Staple

Legumes (peas and beans)

Dark green leafy or yellow vegetables

Food from animal sources

An example of four-mix meals would be:

Rice + blackeye (cow) peas + carrot + liver

THREE-MIX OR TRIPLE-MIX

A good quality meal includes foods from 3 of the 4 groups. Possible combinations are:

Staple + legumes + dark green leafy or yellow vegetables

or

Staple + legumes + food from animal sources

or

Staple + food from animal sources + dark green leafy or yellow vegetables.

Examples of three-mix meals are:

Rice + pigeon peas + pumpkin

Green banana + red peas + salted codfish

Cornmeal + fish + okra

TWO-MIX OR DOUBLE-MIX

The most economical meals may be made with foods from only two groups one of which is a staple. It is important that such meals be carefully chosen. For a two-mix or double-mix meal, always use:

Staple (cereal) + legumes

or

Staple + food from animal sources.

A two-mix meal of ground provisions with vegetables is *NOT* a nourishing meal. It does not provide enough nutrients needed for growth and is not recommended for infant feeding. Suggested two-mix meals:

Rice + peas

Cornmeal + milk

Green bananas + cheese

ADVANTAGES OF HOMEMADE INFANT FOODS

These are:

- The foods are fresh.
- The proportion of various ingredients is known.
- The nutrient quality is excellent as long as the 'multimix' principle is utilized.
- They are cheaper than commercially prepared foods of similar nutrient value.

The mother should prepare the diets from ingredients used in the 'family pot' before seasonings like hot pepper are added. Application of the multimix principle to meal planning will improve the nutritionally inadequate family diet. The mixture should be thick enough to be fed from cup or plate with a spoon.

INTRODUCTION OF WEANING FOODS

The timing of introduction of weaning foods is important. Breast milk alone is not sufficient after 6 months. Weaning diets should complement milk feeds (whether human or animal) in young children and should be started between the age of 4 to 6 months. Earlier introduction is not advisable as it will interfere with the breastfeeding pattern and may trigger allergic reactions to new foods. The process of weaning, i.e., passing from a purely liquid diet to other foods, should be gradual.

In order to guide the mother as to the adequacy of her child's nutrition, and the appropriate time to introduce weaning foods, a graph of her infant's weight (growth chart) (Appendix 2), should be kept and she should be taught its significance. Compiling the growth chart is a responsibility of the health services. However, the mother may keep the chart at home and bring it with the baby to the clinic.

Weaning Diet for the 4 Month Old Infant

At about 4 months, the porridge can be introduced. Approximately 2 feeds of thick porridge a day along with breast milk should be given. Porridges can be based on cornmeal, oats or rice. (See Recipes Part II.) The porridge is best fed from cup or bowl with a spoon and should never be made thin and fed from a bottle and nipple. The porridge should be accompanied by small amounts of fresh mashed fruit and fruit juices. Any fruits in season may be used. Soft fruits like ripe banana, pawpaw, mango, young coconut jelly may be mashed and given to the baby with a spoon. Juices of mango, sweetsop (sugar apple) and soursop do not need added sugar. Juices that are not naturally sweet such as guava, West Indian cherry and citrus juices can be mixed with boiled cooled water and small amounts of dark brown sugar. (Fruit Juices - Part II.) At 4 months old the infant can have 2 teaspoonsful of fruit or fruit juice daily. By 6 months he should be eating or drinking 6 tablespoonsful.

Weaning Diet for the 6 Month Old Infant

At about 6 months, other foods from the 'family pot' should be given to the baby. New foods should be added gradually so that the child develops a tolerance for unaccustomed food. At this time many foods are often withheld from the child because of food taboos and superstitions. Foods such as rice and fish are wrongly thought to 'give worms'. The mother should use a wide variety of foods from each food group to ensure good nutrition.

Smooth, well-cooked mixtures of staple foods, peas and beans with the skin removed, food from animal sources and dark green and yellow vegetables are best mixed together with margarine or gravy added to soften. A guide to the amount to be given is shown in Table 6. Fruits and fruit juices, about 6 tablespoons, will complete the meal. The mother should continue to breast-feed during this time. When the child starts to teethe safe solids such as sugar cane, carrot sticks or crackers can be given so that he can chew on them and massage his gums.

TABLE 6: Guide to the Amounts of Weaning Mixture That May Be Given at One Time

Age	Amounts
4 - 6 months	2 tbsp weaning mixture
7 months	4 tbsp weaning mixture
8 months	6 tbsp weaning mixture
9 - 10 months	6 tbsp weaning mixture + 2 extra tbsp staple
11 - 12 months	6 tbsp weaning mixture + 4 extra tbsp staple

Weaning Diet for Infants 9-12 Months Old

By this time, 'multimixes' can be chopped more coarsely to encourage the infant to chew. Larger amounts can be given at one time. Fruits should continue to be offered and the mother should continue to breastfeed.

By about 12 months, the child should be eating most of the foods cooked for the rest of the family. If the mother wishes to discontinue breastfeeding, this should be done gradually. Suggested meal plans are given in Appendix 3.

Daily meal plans can be made for infants of any particular age by selecting recipes for different mixes that use foods from the 'family pot'.

The suggested meal plans are intended to serve merely as guides and should not be rigidly adhered to. It is possible to exchange foods within food groups for each other in order to provide the child with a wide variety of foods. Using the multimix principle described earlier and the guide to amounts to be given, nutritious meals are assured.

The sample meal plans given are suitable for the mother who is away from home during the day. If the mother is at home, more frequent meals of breast milk should be given.

Feeding During Illness

Many diseases affect the health of infants and young children in the Region but the diarrhoeal diseases are perhaps the most widespread.

Many mothers tend to withhold food and drink during periods of illness, just when the stress of illness increases the need. They should be taught to recognise certain conditions and the foods that may be offered.

If there is no dehydration in the infant with diarrhoea, extra breast milk or other fluids such as coconut water, plain boiled water, and soups should be given until diarrhoea stops. Normal feeding should then continue.

The most important treatment for diarrhoea where dehydration is present, is rehydration, to replace the water and electrolytes lost. The mother can be shown how to give this mixture by teaspoonsful to the child.

The formula for the oral rehydration mixture is as follows:

Sodium chloride (common salt)	3.5 g
Sodium bicarbonate (baking soda)	2.5 g
Potassium chloride	1.5 g
Glucose	20.0 g

dissolved in one litre of clean boiled water. In some countries the salts are available pre-packaged and only require the addition of clean water.

Starvation is especially harmful during an illness such as diarrhoea. Breastfeeding should continue if the child is on breast milk. If the infant is unable to suckle, the breast milk should be expressed and then fed by spoon. In partly breastfed infants, the supplementary food should be temporarily replaced by rehydration fluids. When signs of dehydration begin to disappear (6-12 hours after treatment began) foods should be reintroduced. Small frequent feedings of diluted milk ($\frac{1}{2}$ strength) are first used. When stools become less frequent, usually within 24-36 hours after treatment began, full strength milk could be started. For breastfed infants, more frequent feedings should be instituted. Thick porridges, soups, mashed fruits could be reintroduced. High fibre foods, e.g., coarse fruits and vegetables, skins of fruits and vegetables as well as highly seasoned foods should be avoided during diarrhoea as they worsen the condition. Foods high in potassium, such as citrus juices, coconut water, pineapple and bananas are advised. If complications do not arise, the child should be back on a normal diet in 3 or 4 days.

Between 1-2 years, children often contract measles, whooping cough or other infectious diseases. A sore mouth or troublesome cough may make it necessary to alter the diet temporarily. Since appetite is affected by infection, the child should be encouraged to eat by offering foods he particularly likes.

Illness may precipitate malnutrition in an infant especially if he is in a borderline nutritional status. Infections can retard a child's growth. The more days a child is ill during the year, the more noticeable growth retardation tends to be. When the child recovers from any type of illness, his energy and protein intake should be increased to facilitate 'catch-up' growth.

Preparation and Service of Safe Weaning Foods

Bacterial contamination of homemade weaning foods can be avoided if proper attention is paid to good hygienic practices. The following simple guidelines are suggested:

The family should be advised to:

- Select good quality food
- Store food properly
- Keep containers and surroundings clean
- Practise good personal hygiene
- Use clean boiled water

Selecting Good Quality Food

- Fresh meat should smell fresh and should not have a dark brown or greenish colour.
- Fresh fish should possess the following qualities:
 - gills - reddish pink and free from slime
 - eyes - bright, clean and bulging (frozen fish do not have bulging eyes, even if fresh)
 - scales - tight to the skin, bright and shiny
 - flesh - firm and elastic
 - odour - fresh smelling
- Poultry should be free of odour and blemishes in the skin.
- Cereals and legumes should be free from weevils, dirt and stones.
- Fresh fruits and vegetables should not be wilted, shriveled or bruised. They should be carefully washed with clean water before use.

Learning to select good quality food saves time and money.

Storing Food Properly

- Whether food is purchased or home grown, it should be properly stored until ready for use.
- Foods should be stored in clean covered containers to avoid infestation by insect pests.

- Dry foods such as cereal grains, legumes and sugar may be stored in glass jars, tin cans or bottles. Containers should have tight lids.
- Perishable foods such as:
 - fresh meat, fish and poultry
 - some fresh fruits and vegetables
 - milk, butter, margarine and leftoversshould be kept in a cool place and used up quickly.
- Well ventilated cupboards or safes are ideal for storage of most dry foods.
- Insecticides, pesticides, disinfectants and other household poisons should be carefully labelled and stored away from food.
- Cooked food should be treated with care. Multimix meals for infants should be served shortly after being cooked and should not be allowed to stand for hours at room temperature. Mothers with refrigerators may wish to store or freeze sufficient home-made weaning diets for more than one meal. Frozen diets should be defrosted in the refrigerator before serving. For mothers without refrigerators, the diets should be made fresh for each meal.

Keeping Containers and Surroundings Clean

- All equipment and dishes used for preparing meals should be washed and rinsed carefully and protected from dust, flies and insects.
- Pets and other animals should be kept out of the kitchen.
- Cutting boards and work surfaces should be scrubbed well with soap and water (hot if practical) after each meal is served.
- Garbage should be carefully placed in a covered trash container. Exposed garbage will attract household pests and animals.

Personal Hygiene

- Hands should be washed *before*:
 - handling food, dishes or eating utensils
 - eating
 - feeding the baby

- Hands should be washed *after*:
 - using the toilet
 - coughing or sneezing
 - handling animals
 - handling anyone who is ill

- Food should not be touched with infected cuts, burns or sores on the hand.

- Food should preferably not be prepared by anyone with a cold, fever or other infection. This does not mean that when the mother has a cold the baby should go unfed. If she has to prepare the baby's food she should ensure that she does not sneeze or cough over it.

Equipment

The preparation of homemade weaning diets should not require any sophisticated equipment. Some of the following items may be useful:

1. *Sieve/strainer* - It should have a small mesh. Foods are pressed through with the back of a spoon. It is ideal for removing skins from cooked peas and beans, for making fresh fruit juices and for making smooth mixtures from soft fruits, vegetables and cereals.

2. *Spoons, forks and potato mashers* will mash soft foods such as ripe soft fruits, eggs, rice and starchy roots, fruits and tubers to the needed consistency. Knives will scrape cooked meats that do not sieve easily.

3. *Mortar and pestle* - A small mortar and pestle will be adequate for pounding most foods.

4. *Grater* - A grater may be used for cheese and meats that will not sieve easily.

5. *Food mills or grinders* - Food is placed in the basket and as the handle is turned the food is pressed through the holes in the bottom.

6. *Blender* - This represents a large expenditure and should only be considered if the means are adequate and electricity is available.

7. *Plastic ice-cube trays* - Individual cubes can be used for freezing extra portions of food prepared.

Cost

Homemade weaning foods should be as inexpensive as possible. The cost will be influenced by:

- (a) Purchasing practices
- (b) Proper storage facilities
- (c) Equipment
- (d) Use of home grown foods

Purchasing Guides

- Good quality food should be selected using the guidelines outlined in the section on "Preparation and Service of Safe Weaning Foods".
- Foods purchased in bulk are often cheaper. There should be adequate storage for large quantities of food as improper storage is likely to result in losses due to spoilage.
- The housewife should compare prices in order to obtain good value for money spent.
- Loose cereals are cheaper than bagged cereals.
- Brown sugar is cheaper than granulated sugar and provides additional nutrients.
- Canned fish (sardines, mackerel, herring) is good value for money as there is no waste.
- Margarine and butter provide the same nutrients. Margarine is often less expensive.
- Purchasing meat with a high proportion of bone, fat and gristle increases the cost of the edible portion.
- Tins of food that are bulging, rusted or dented should not be bought even at a reduced price; they may contain poisons.
- Fruits and vegetables are less expensive when in season.

Proper Storage Facilities

Foods, whether home-grown or purchased should be properly stored until ready for use. Losses due to spoilage will increase the cost of the diet since replacements will have to be sought. Simple guides for proper storage have been outlined.

Equipment

Since homemade weaning foods utilize ingredients cooked for the rest of the family, the question of additional cost of cooking facilities does not arise. Equipment needed for rendering cooked food soft and digestible include sieve/strainer, spoons, forks, knives, food mills or grinders.

Home-Grown Foods

Many vegetables can be produced in the backyard garden. Okras, dasheen leaves, callaloo, string beans, bodi beans and pigeon (gungo) peas require little intensive care and their production considerably reduces the cost of the family diet. Mothers are at times reluctant to give green leafy vegetables to their infants and consider them unattractive and undigestible in mixtures. Nutrition education is required in this instance.

Commercially Prepared Baby Foods

Many mothers, including those in the lower socio-economic bracket, purchase commercially prepared baby foods in jars. While these may be convenient, they are very expensive. If the mother can afford to purchase these foods, she must be able to assess the nutrient/cost value of the mixtures in order to obtain the best buy. Often the commercially prepared mixtures containing a larger percentage of meat are more expensive; those containing largely fruit or vegetables are usually cheapest. The low income mother is only able to afford the latter. Properly selected and prepared mixtures of food from the 'family pot' are just as, or more nutritious than commercially prepared products and much less expensive.

General Considerations

1. Weaning should always be gradual. It takes time for a young child to become used to new foods. It also takes time for the child to learn to handle a mouthful of semi-solid food after being accustomed to liquids.
2. Appetite will vary from child to child, from meal to meal, from food to food and from time to time. There must be flexibility in feeding schedules and volumes in particular so as to take account of this variability while ensuring overall dietary intake.

3. The capacity of the child's stomach is limited, hence the need for frequent small portions. Some of the meals may be fed with the rest of the family but the child should have its own feeding dish and utensils.
4. Weaning foods should be digestible, being semi-soft at first and becoming more varied and demanding in texture as the child develops teeth and as his alimentary tract develops. For the 4-6 month old, foods should be sieved or blended to a smooth but thick consistency. For the older child, the food can simply be mashed with a fork, chopped or cut into bite-size pieces.
5. New foods should be offered gradually and preferably at the beginning of a meal when baby is hungry. Offer a small amount of the food from the tip of the spoon. As the child is fed different foods, it will become accustomed to new flavours and varied textures. Even if the child appears not to like the food at first and spits it out, the mother should try again at another time.
6. Foods should be at the correct temperature as foods that are too hot may be rejected.
7. Bush teas may be harmful and should not be used as replacements for food, particularly during periods of illness.
8. In preparing baby foods at home, the highest standards of hygiene should be maintained. In homes where refrigeration is unavailable, foods for the infant must be prepared before each meal.
9. During periods of illness, the needs of the child will be temporarily altered. Food should not be withheld during this period. After the illness, the baby should be coaxed into eating in order to facilitate 'catch-up' growth.
10. Homemade weaning foods need not be costly. Low cost foods of good nutritional value mixed in the correct proportions and using simple equipment will ensure this.
11. It is important that mothers understand that *enough* of the *right* kind of food must be given or the child will become undernourished.

12. The best indication of whether the infant is getting enough is a satisfactory weight gain as shown by the infant's growth chart. Regular visits to clinic should be advised.
13. The child will best benefit from the food he eats if he is healthy. The mother should ensure that he receives the necessary immunizations to prevent infections.

PART II

RECIPES

RECIPES

In the recipes that follow, various foods have been mixed together in proportions which will assure a protein/energy ratio (PE%) of approximately 8.6% to 12.7%. Energy density ranges from 1.1 kcal/cc to 2.3 kcal/cc. Recipes in this section are made from mixtures of cooked foods from the 'family pot'. Recipes in which the baby's food is cooked separately using foods available to the rest of the family are given in Appendix 4.

Nutrient values are given in terms of edible portions of foodstuffs and have been determined by using Food Composition Tables (Appendix 5). Values for energy, protein, iron, available iron¹, vitamin A and calcium have been calculated for each recipe, given the fact that the main nutritional deficiencies among infants in the Caribbean are related to a lack of these nutrients. Iron absorption would be greatly enhanced by the inclusion of ascorbic acid in the meals.

The quantities used in these recipes are expressed in terms of teaspoons (tsp.), tablespoons (tbsp.) and cups (8 fl. ozs.). They can be easily reproduced in the home, using available household utensils (Appendix 6).

CHOICE OF INGREDIENTS AND PRACTICAL COOKING HINTS

Rice

Rice used in these recipes is white rice cooked in a quantity of water that was completely absorbed by the rice. Cooked rice from the 'family pot' may be used for baby's porridge. This reduces the time required for preparing the porridge by one half.

Starchy Roots, Fruits and Tubers

Starchy roots, fruits and tubers cook quickly when cut in thin slices and started in boiling water. Cover pot and let simmer on a low flame.

Legumes

Dry peas and beans boiled for 5 minutes and allowed to soak for 1 hour absorb as much water as beans soaked overnight. The beans are then cooked in the water used for soaking. Baking soda should not be added as this destroys the B vitamins present. The skins of the larger legumes may be removed

¹Iron in food from animal sources is on the whole better absorbed than iron from vegetable sources. Various factors affect the absorbability of dietary iron. Assessment of available iron takes these matters into account. Ref: Monson, E.R. et al (1978). Estimation of Available Dietary Iron. Amer. J. Clin. Nutr., Vol. 31, p. 134.

manually after soaking or cooking, or the beans may be sieved using a fine mesh sieve. It is important that these skins be completely removed. They cause flatulence in babies who eat them.

Fresh Vegetables

These should be washed carefully and cooked in a minimal amount of water to retain nutrients.

Meats

Cooked chicken, lean meats and liver do not always sieve easily but can be grated when cooled.

Fortified Margarine (With Vitamin A) and Oil

Fortified margarine should be used in preference to the unfortified product. Where oil has been included in a recipe, any type of cooking will suffice. The vitamin A value in recipes containing oil will be considerably less than those using fortified margarine.

Dark Brown Sugar

Dark brown sugar has been chosen in preference to granulated sugar in these recipes because it contains more iron, calcium and B vitamins. It is also a cheaper product in member countries of CFNI.

Salt

Salt has been excluded from these recipes since the addition of salt to baby foods has been questioned because of its relation to hypertension. Young babies do not have a taste for salty food although they may develop an unhealthy liking for salt if introduced to them. Mothers should be advised to avoid oversalting of foods cooked for the family.

FOOD SUBSTITUTIONS

In the recipes that follow, it is possible to provide additional variety without substantially altering the energy and protein value if the following foods are substituted for each other within groups:

Staples

Cereals

Cooked Rice	-	4 tbsp
" Oatmeal	-	"
" Wheatflour	-	"

Cereals (cont'd)

Cooked Cornmeal	-	4 tbsp
" Macaroni	-	"
" Spaghetti	-	"

Starchy Roots, Fruits and Tubers

Cooked Green Banana	-	4 tbsp
" Plantain	-	"
" Tannia	-	"
" Dasheen, Coco	-	"
" Yam	-	"
" Irish Potato	-	"
" Sweet Potato	-	"
" Breadfruit	-	"

Legumes

Cooked Split Peas	-	2 tbsp
" Pigeon (Gungo) Peas	-	"
" Channa (Chickpea)	-	"
" Lentils	-	"
" Red Kidney Beans (Red Peas)	-	"
" White Beans	-	"
" Blackeye Peas (Cow Peas)	-	"
" Broad Beans (Lima Beans)	-	"

Vegetables

Cooked Callaloo	-	1 tbsp
" Dasheen Leaves	-	"
" Young String Beans	-	"
" Spinach	-	"
" Carrot	-	"
" Pakchoi	-	"

Vegetables (cont'd)

Cooked Pumpkin	-	1	tblsp
" Melongene (Egg Plant, Aubergine)	-	"	
" Beets	-	"	
" Okra	-	"	

Note: The vitamin A value of the recipe is considerably reduced when melongene, beets and okra are used as substitutes.

Food From Animal Sources

Cooked Beef	-	1	tblsp
" Liver	-	"	
" Mutton	-	"	
" Fish	-	"	
Canned Fish	-	"	
Cooked Chicken	-	"	
" Egg	-	½	
Grated Cheese	-	½	tblsp
Milk Powder	-	½	"
Salted Codfish (15g)	-	1	"

Note: Use of milk powder and cheese increases the calcium value and decreases the iron value of recipes.

Fats

Butter	-	1	tsp
Ghee	-	"	
Vegetable Oil	-	"	
Fortified Margarine	-	"	

Note: When vegetable oil is used instead of butter, margarine or ghee, the vitamin A value of the recipe is considerably reduced.

4-MIX RECIPES

YAM, PIGEON (GUNGO) PEAS, FISH AND CARROT

4 tbsp cooked, mashed yam
2 tbsp cooked, mashed peas
1 tbsp finely flaked fish
1 tbsp cooked, mashed carrot
3 tbsp boiled liquid
1 tbsp margarine

Method:

Mix yam, peas, liquid and margarine and rub through sieve. Combine with fish and carrot.

Yield: 8 tbsp

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>			
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>	
Energy	251 kcal (1.05 MJ)	27	25	21
Protein	7.7 g	38	38	37
Iron	2.4 mg	34	34	34
Available Iron	0.24 mg			
Vitamin A	178 mcg R.E.*	59	59	71
Calcium	42 mg	8	8	9

PE%** = 12.3

Energy Density = 1.3 kcal/cc

*R.E. - Retinol Equivalentents

**PE% - Protein Energy Percent (the proportion of the energy in the dish that comes from protein).

CORNMEAL, LENTILS, OKRA AND SARDINES

- 4 tbsp cooked cornmeal
- 2 tbsp cooked, mashed lentils
- 1 tbsp mashed sardines
- 1 tbsp cooked, chopped okra
- 1 tbsp margarine
- 1 tbsp boiled water

Method:

Mix cooked, mashed lentils with water and rub through sieve. Add cornmeal, margarine, sardines and okra and mix well.

Yield: 8 tbsp

<u>Nutrient Value</u>		<u>% Of Day's Requirement For Infants</u>		
		<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy	318 kcal (1.3 MJ)	35	32	27
Protein	10 g	30	30	29
Iron	2.3 mg	32	32	32
Available Iron	0.17 mg			
Vitamin A	177.0 mcg R.E.	59	59	71
Calcium	82.6 mg	15	15	18

PE% = 12.5

Energy Density = 2.3 kcal/cc

RICE, RED PEAS, CHICKEN AND SPINACH

- 4 tbsp cooked, mashed rice
- 2 tbsp cooked red peas
- 1 tbsp cooked, grated chicken
- 1 tbsp cooked spinach
- 2 tbsp liquid in which spinach was cooked
- 2 tsp margarine

Method:

Mix red peas, spinach, liquid and margarine and rub through sieve with wooden spoon. Combine with rice and chicken.

Yield: 8 tbsp

<u>Nutrient Value</u>		% Of Day's Requirement For Infants		
		<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy	260 kcal (1.08 MJ)	28	26	22
Protein	8.3 g	42	42	40
Iron	2 mg	28	28	28
Available Iron	0.12 mg			
Vitamin A	180 mcg R.E.	60	60	72
Calcium	34 mg	6	6	7

PE% = 12.7

Energy Density = 1.9 kcal/cc

POTATO, BLACKEYE PEAS, SALTED CODFISH AND PUMPKIN

- 4 tbsp cooked, mashed potato
- 2 tbsp cooked, mashed blackeye peas (cowpeas)
- 1 tbsp cooked, finely flaked salted codfish
- 1 tbsp pumpkin
- 3 tbsp liquid in which pumpkin was cooked
- 1 tbsp margarine

Method:

Mix blackeye peas, pumpkin and liquid and rub through sieve. Combine with potato, margarine and flaked codfish.

Yield: 8 tbsp

<u>Nutrient Value</u>		% Of Day's Requirement For Infants		
		<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy	226 kcal (0.95 MJ)	25	23	19
Protein	7 g	35	35	33
Iron	1.7 mg	24	24	24
Available Iron	0.10 mg			
Vitamin A	195 mcg R.E.	65	65	78
Calcium	24.6 mg	5	5	6

PE% = 12.4

Energy Density = 1.2 kcal/cc

3-MIX RECIPES

RICE, RED PEAS AND PUMPKIN

- 4 tbsp cooked, mashed rice
- 2 tbsp cooked red peas
- 1 tbsp cooked pumpkin
- 2 tbsp liquid in which pumpkin was cooked
- 1 tsp margarine

Method:

Mix red peas, pumpkin, liquid and margarine and rub through sieve with wooden spoon. Combine rice.

Yield: 7 tbsp

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>			
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>	
Energy	200 kcal (0.84 MJ)	22	20	17
Protein	5.4 g	27	27	26
Iron	1.5 mg	21	21	21
Available Iron	0.05 mg			
Vitamin A	95 mcg R.E.	32	32	38
Calcium	24 mg	4	4	5

PE% = 10.8

Energy Density = 1.8 kcal/cc

TANNIA, CARROT AND MILK

- 4 tbsp cooked, mashed tannia
- 1 tbsp cooked carrot
- 1 tbsp skim milk powder
- 1 tbsp margarine
- 1 tbsp boiled water

Method:

Mix tannia and carrot with water. Add milk powder and margarine and mix well.

Yield: 6 tbsp

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 248 kcal (1 MJ)	27	25	21
Protein 7 g	35	35	33
Iron 0.8 mg	12	12	12
Available Iron 0.02 mg			
Vitamin A 180.0 mcg R.E.	60	60	72
Calcium 205.2 mg	37	37	45

PE% = 11.2

Energy Density = 2.1 kcal/cc

SWEET POTATO, FISH AND CALLALOO

- 4 tbsp cooked, mashed sweet potato
- 1 tbsp cooked, flaked fish
- 1 tbsp cooked callaloo
- 3 tbsp liquid in which callaloo was cooked
- 2 tsp margarine

Method:

Mix sweet potato, margarine, callaloo and liquid and rub through sieve. Mix with finely flaked fish.

Yield: 6 tbsp

<u>Nutrient Value</u>	% Of Day's Requirement For Infants		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 168 kcal (0.7 MJ)	18	17	14
Protein 4.4 g	22	22	21
Iron 1.1 mg	16	16	16
Available Iron 0.04 mg			
Vitamin A 193.5 mcg R.E.	65	65	77
Calcium 48 mg	8	8	11

PE% = 10.5

Energy Density = 1.3 kcal/cc

GREEN BANANA, CANNED MACKEREL AND PUMPKIN

- 4 tbsp cooked, mashed banana
- 1 tbsp canned mackerel
- 1 tbsp cooked, mashed pumpkin
- 2 tbsp liquid in which pumpkin was cooked
- 1 tsp oil from mackerel

Method:

Mix banana, mackerel, pumpkin, liquid and oil and rub through strainer with wooden spoon.

Yield: 6 tbsp

<u>Nutrient Value</u>	% Of Day's Requirement For Infants		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 142 kcal (0.6 MJ)	15	14	12
Protein 4 g	20	20	19
Iron 0.9 mg	13	13	13
Available Iron 0.07 mg			
Vitamin A 180 mcg R.E.	60	60	72
Calcium 118 mg	21	21	26

PE% = 11.2

Energy Density = 1.1 kcal/cc

MACARONI, CHEESE AND PAKCHOI

- 4 tbsp cooked, mashed macaroni
- 1 tbsp grated cheese
- 1 tbsp cooked, chopped pakchoi
- 1 tbsp liquid in which pakchoi was cooked
- 1 tbsp margarine

Method:

Mix macaroni, cheese, pakchoi, margarine and liquid.

Yield: 6 tbsp

<u>Nutrient Value</u>	% Of Day's Requirement For Infants		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 223 kcal (0.93 MJ)	24	22	19
Protein 6 g	30	30	29
Iron 0.54 mg	8	8	8
Available Iron 0.02 mg			
Vitamin A 246 mcg R.E.	82	82	98
Calcium 122 mg	22	22	27

PE% = 10.8

Energy Density = 1.9 kcal/cc

YAM, PIGEON (GUNGO) PEAS AND FRESH FISH

- 4 tbsp cooked, mashed yam
- 2 tbsp cooked, mashed peas
- 1 tbsp finely flaked fish
- 2 tbsp boiled liquid
- 1 tbsp margarine

Method:

Mix yam, peas, liquid and margarine and rub through sieve.
Combine with fish.

Yield: 7 tbsp

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 245 kcal (1.02 MJ)	27	25	21
Protein 7.5 g	37	37	36
Iron 2.3 mg	31	31	31
Available Iron 0.23 mg			
Vitamin A 148 mcg R.E.	49	49	59
Calcium 37 mg	7	7	8

PE% = 12.2

Energy Density = 1.4 kcal/cc

2-MIX RECIPES

CORNMEAL PORRIDGE

2 tbsp cornmeal
1 cup water
1 tsp margarine
1 tbsp dark brown sugar
1 tbsp skim milk powder

Method:

Bring to the boil $\frac{3}{4}$ cup water. Mix cornmeal in remaining $\frac{1}{4}$ cup water and add to boiling water, stirring constantly. Cook covered for 5 minutes. Blend in sugar, margarine and milk powder.

Yield: 7 ozs.

<u>Nutrient Value</u>		<u>% Of Day's Requirement For Infants</u>		
		<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy	208 kcal (0.8 MJ)	23	21	18
Protein	6 g	30	30	29
Iron	0.9 mg	13	13	13
Available Iron	0.03 mg			
Vitamin A	65.3 mcg R.E.	22	22	26
Calcium	107.2 mg	20	20	24

PE% = 11.5

Energy Density = 1.1 kcal/cc

RICE PORRIDGE

2 tbsp rice
1 tbsp skim milk powder
1 tsp margarine
1 tbsp dark brown sugar
 $1\frac{1}{2}$ cups water

Method:

Place rice in saucepan in water and bring to the boil. Lower flame and simmer for 30 minutes. Sieve while hot and add margarine, sugar and skim milk powder.

Yield: 6 ozs

<u>Nutrient Value</u>		% Of Day's Requirement For Infants		
		<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy	236 kcal (0.9 MJ)	25	24	20
Protein	6 g	31	31	29
Iron	1.3 mg	19	19	19
Available Iron	0.04 mg			
Vitamin A	51 mcg R.E.	17	17	21
Calcium	201.8 mg	37	37	45

PE% = 10.2

Energy Density = 1.4 kcal/cc

WHEAT FLOUR PORRIDGE

- 6 tbsp enriched flour
- 1 tbsp dark brown sugar
- 2 tbsp whole milk powder
- 2 cups water
- 1 tsp margarine

Method:

Bring to the boil 1½ cups water. Add flour to ½ cup water and stir well. Add flour mixture to boiling water, stirring constantly. Cook covered for approximately 6 minutes. Blend in brown sugar, milk powder and margarine.

Yield: 10 ozs

<u>Nutrient Value</u>	% Of Day's Requirement For Infants		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 331 kcal (1.4 MJ)	36	33	28
Protein 9 g	45	45	43
Iron 1.9 mg	27	27	27
Available 0.06 mg Iron			
Vitamin A 103 mcg R.E.	34	34	41
Calcium 146 mg	26	26	32

PE% = 10.8

Energy Density = 1.1 kcal/cc

SWEET POTATO AND FISH

- 4 tbsp cooked, mashed sweet potato
- 1 tbsp cooked, flaked fish
- 3 tbsp liquid in which potato was cooked
- 2 tsp margarine

Method:

Add liquid to sweet potato and margarine and rub through sieve.
Mix with finely flaked fish.

Yield: 5 tbsp

<u>Nutrient Value</u>	% Of Day's Requirement For Infants		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 164 kcal (0.7 MJ)	18	16	14
Protein 4 g	20	20	19
Iron 0.7 mg	10	10	10
Available 0.04 mg Iron			
Vitamin A 105 mcg R.E.	36	36	42
Calcium 22.4 mg	4	4	5

PE% = 9.8

Energy Density = 1.3 kcal/cc

MACARONI AND CHEESE

4 tbsp cooked, mashed macaroni
1 tbsp grated cheese
1 tbsp margarine

Method:

Mix all ingredients well.

Yield: 4 tbsp

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 221 kcal (0.92 MJ)	24	22	19
Protein 5.6 g	28	28	27
Iron 0.52 mg	7	7	7
Available Iron 0.02 mg			
Vitamin A 211 mcg R.E.	70	70	84
Calcium 112 mg	20	20	25

PE% = 10.1

Energy Density = 2.0 kcal/cc

GREEN BANANA AND CHEESE

4 tbsp cooked, mashed green banana
1 tbsp grated cheese
1 tsp margarine
2 tbsp boiled water

Method:

Combine banana, cheese, margarine and water. Sieve for young infants.

Yield: 5 tbsp

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 160 kcal (0.67 MJ)	18	16	12
Protein 5 g	25	25	24
Iron 0.7 mg	10	10	10
Available Iron 0.02 mg			
Vitamin A 169.5 mcg R.E.	56	56	68
Calcium 110.8 mg	20	20	25

PE% = 12.5

Energy Density = 2.2 kcal/cc

RICE AND RED PEAS

- 4 tbsp cooked, mashed rice
- 2 tbsp cooked red peas
- 1 tbsp boiled liquid
- 1 tsp margarine

Method:

Mix red peas, margarine and liquid and rub through sieve. Combine with rice.

Yield: 6 tbsp

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 196 kcal (0.82 MJ)	21	20	17
Protein 5.3 g	26	26	25
Iron 1.4 mg	20	20	20
Available Iron 0.04 mg			
Vitamin A 50 mcg R.E.	17	17	20
Calcium 21 mg	4	4	4

PE% = 10.8

Energy Density = 2.0 kcal/cc

EGG AND RICE

4 tbsp cooked, mashed rice
1 cooked, mashed egg
2 tsp margarine

Method:

Mix rice, egg and margarine.

Yield: 6 tbsp

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 261 kcal (1.1 MJ)	29	26	22
Protein 7 g	35	35	33
Iron 1.9 mg	27	27	27
Available Iron 0.10 mg			
Vitamin A 159 mcg R.E.	53	53	63
Calcium 36.2 mg	7	7	8

PE% = 10.7

Energy Density = 2 kcal/cc

FRUIT JUICES*

WEST INDIAN CHERRY

Ingredients:

15 small cherries
¼ cup (2 ozs) cooled, boiled water

Method:

Remove stems and wash cherries. Mash and rub through strainer. Add water to cherry puree. Mix well and serve desired amount.

N.B. If cherries are tart, add ¼ cup water and 1 tsp sugar.

Preparation Time - 10 minutes
Yield - 3 ozs
Vitamin C - 822 mg/100 ml

GUAVA

Ingredients:

1 tbsp guava pulp
3 tbsp cooled, boiled water
1 tsp dark sugar

Method:

Cut (washed) guavas in halves. Scoop out pulp with a spoon. Mash and strain pulp. Add water and sugar to strained pulp and mix.

N.B. Skin of guava tends to make mixture slightly bitter.

Preparation Time - 10-15 minutes
Yield - 3 ozs
Vitamin C - 18 mg/100 ml

*Source: V.S. Campbell, Principal Scientific Officer, Scientific Research Council, Jamaica.

GRAPEFRUIT

Ingredients:

4 tbsp freshly squeezed, strained grapefruit juice
2 tbsp cooled, boiled water
1 tsp dark sugar

Method:

Combine all ingredients and mix well.

Preparation Time - 10 minutes

Yield - 2 ozs

Vitamin C - 43 mg/100 ml

ORANGE

Method:

Cut washed orange in halves and squeeze. Strain and serve desired amount.

*N.B. If orange is tart, dilute 1:1 with boiled, cooled water.
Sugar need not be added.*

PINEAPPLE

Ingredients:

¼ lb (1½ cup) grated pineapple
½ cup (4 ozs) cooled, boiled water

Method:

Pour water over pineapple and let sit for 5-10 minutes. Rub through a fine-meshed strainer.

For 2 oz portion, mix together:

3 tbsp juice
1 tbsp cooled, boiled water
1 tsp sugar (optional)

Preparation Time - 15-20 minutes
Yield - 2 ozs
Vitamin C - 62 mg/100 ml

SWEET SOP (SUGAR APPLE)

Ingredients:

1 small (2 ozs) sweet sop (sugar apple)
 $\frac{1}{2}$ cup (4 ozs) cooled, boiled water

Method:

Wash fruit and scoop out pulp. Add water and mash with a fork. Leave for 10-15 minutes. Rub through strainer with a wooden spoon.

Preparation Time - 10-15 minutes
Yield - 5 ozs
Vitamin C - 44 mg/100 ml

SOURSOP

Ingredients:

1 medium-sized ($\frac{3}{4}$ lb) soursop
3 cups cooled, boiled water

Method:

Wash fruit, remove skin and inner core. Add water to pulp and beat well with fork or food masher. Let sit for 10-15 minutes. Rub through strainer with a wooden spoon. Add sugar or sweetened condensed milk to taste.

N.B. Some fruits need no sweeteners.

Preparation Time - 15-20 minutes
Yield - 4 cups
Vitamin C - 29 mg/100 ml

REFERENCES

1. Araya, H. Examining the Nutritive Value of Basic Foods as a Tool for the Study of Diets in Poor Countries. *Food and Nutr. Bul.*, 3(2):21, 1981.
2. Cameron, M. and Y Hofvander. Manual on Feeding Infants and Young Children. 2nd edition, New York, Protein Advisory Group, 1976.
3. Caribbean Food and Nutrition Institute. Breastfeeding Your Baby: A Teaching Package for the Caribbean. (Produced with the support of UNICEF and the USAID) Part III: Weaning Your Baby.
4. Caribbean Food and Nutrition Institute. Food Composition Tables for Use in the English-speaking Caribbean. Kingston, CFNI, 1974.
5. Caribbean Food and Nutrition Institute. Feeding the Weaning Age Group: Guidelines for the Caribbean. Kingston, CFNI, 1979.
6. Caribbean Food and Nutrition Institute. Feeding the Weaning Age Group in the Caribbean: Proceedings of a Technical Group Meeting. Kingston, CFNI, 1979.
7. Dearden, C., P. Harman and D. Morley. Eating More Fats and Oils as a Step Towards Overcoming Malnutrition. *Trop. Doctor*, 10:137, 1980.
8. Ebrahim, G.J. A Handbook of Tropical Paediatrics. Rev. ed. London, Macmillan, 1978.
9. Gurney, J.M. Unpublished Data.
10. Gurney, J.M. Available Data on the State of Food and Nutrition of the Peoples of the Commonwealth Caribbean. *Cajanus*, 8(3): 150, 1975.
11. Jelliffe, E.F.P. A New Look at Multimixes for the Caribbean. Monograph No. 16, *J. Trop. Ped. and Environ. Child Health*, 135, 1971.
12. Mosen, E.R. et al. Estimation of Available Dietary Iron. *Amer. L. Clin. Nutr.*, 31:134, 1978.
13. National Nutrition Centre. Low-Cost High Nutrition Weaning Diets. Barbados, National Nutrition Centre, 1974.
14. Scrimshaw, N.S. and B.A. Underwood. Timely and Appropriate Complementary Feeding of the Breastfed Infant - An Overview. *Food and Nutr. Bul.*, 2(2):19, 1980.

APPENDICES

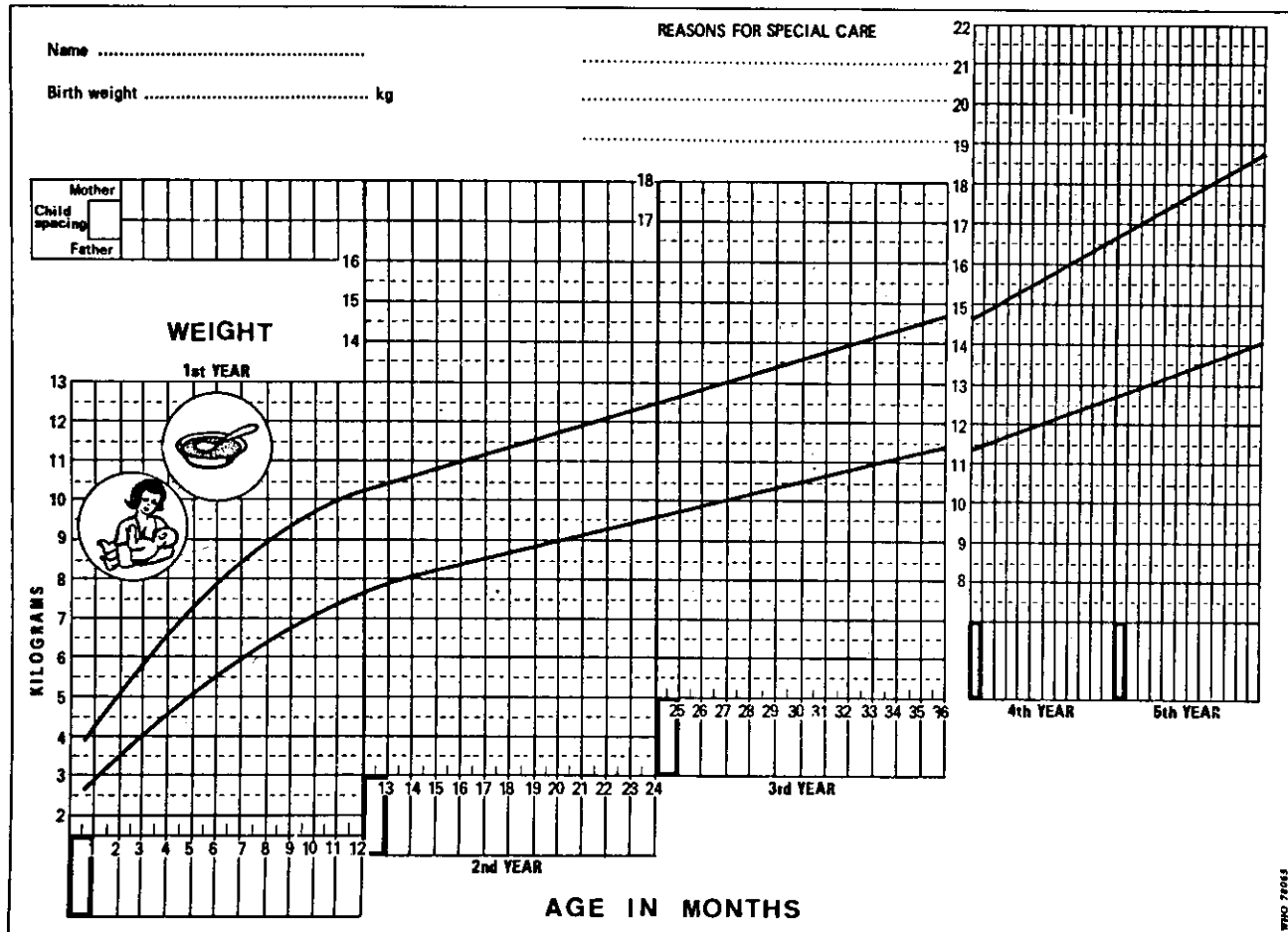
APPENDIX 1: RECOMMENDED DAILY INTAKES FOR INFANTS
3 MONTHS TO 3 YEARS

AGE	Body Wt. kg	Energy kcal MJ	Protein g	Vit. A mcg	Vit. D mcg	Vit. C mg	Thiamine mg	Ribo- flavin mg	Niacin Equiv. mg	Folate mcg	Vit. B ₁₂ mcg	Iron mg	Ca. mg
3-5 mths	6.7	770 3.2	13	(a)	10	20	(a)	(a)	(a)	40	0.3	7	
6-8 mths	8.3	915 3.8	20	300	10	20	0.36	0.50	6.0	60	0.3	7	550
9-11 mths	9.6	1000 4.2	20	300	10	20	0.4	0.6	6.6	60	0.3	7	550
1 year	11.4	1180 4.9	21	250	10	20	0.47	0.65	7.8	100	0.9	7	450
2 years	13.6	1360 5.7	23	250	10	20	0.54	0.75	9.0	100	0.9	7	450
3 years	15.6	1560 6.5	27	250	10	20	0.62	0.86	10.2	100	0.9	7	450

(a) Breastfeeding is assumed to be adequate if mother is well-nourished.

Source: Manual on Feeding Infants and Young Children, Cameron & Hofvander, 1976.

APPENDIX 2: WHO GROWTH CHART



APPENDIX 3a: SUGGESTED MEAL PLAN FOR INFANTS
ABOUT 6 MONTHS OF AGE

(Average weight 7.4 kg)*

Breast milk presumed to be
available per day - 600 ml

	g or ml	Measure	Energy kcal	Protein g	Iron mg	Available Iron (mg)
<u>Morning Feed</u>						
Breast milk	300 ml	-	231	3.3	0.3	.15
<u>Mid-morning</u>						
Fruit juice, orange	90 ml	6 tbsp	40	0.6	0.2	.04
Cornmeal porridge	60 ml	¼ cup	60	1.6	.25	
<u>Mid-day</u>						
Sweet potato, fish and callaloo	60 g	4 tbsp	112	2.9	0.7	.03
<u>Afternoon Snack</u>						
Mango	60 g	2 tbsp	35	0.3	0.5	.04
<u>Afternoon Meal</u>						
Rice and red peas	45 g	3 tbsp	98	2.7	0.7	.02
<u>Evening Feed</u>						
Breast milk	300 ml	-	231	3.3	0.3	.15
Total for day			807	14.7	3	.43
Average requirements per day			800	14	7	-

*This plan is suggested for the mother who is away from home during the day. If the mother is at home, breast milk should be given at more frequent intervals.

APPENDIX '3b: SUGGESTED MEAL PLAN FOR INFANTS
ABOUT 9 MONTHS OF AGE

(Average weight 8.3 kg)*

Breast milk presumed to be
available per day - 500 ml

	<u>g or ml</u>	<u>Measure</u>	<u>Energy kcal</u>	<u>Protein g</u>	<u>Iron mg</u>	<u>Available Iron (mg)</u>
<u>Morning Feed</u>						
Breast Milk	250 ml	-	192	2.7	.25	.12
<u>Mid-morning</u>						
Bread (buttered)	15 g	½ sl.	58	1.3	.36	.01
<u>Mid-day</u>						
Egg and Rice	90 g	6 tbsp	261	7.0	1.9	.10
<u>Afternoon Snack</u>						
Orange	30 g	¼	16	0.2	.12	.01
<u>Afternoon Meal</u>						
Rice, red peas, chicken and spinach	120 g	8 tbsp	260	8.3	2.0	.12
<u>Evening Feed</u>						
Breast Milk	250 ml	-	192	2.7	.25	.12
Totals for day			979	22.2	4.9	.5
Average requirements per day			950	20.0	7	-

*Adapted from Cameron and Hofvander "Manual on Feeding Infants and Young Children".

APPENDIX 3c: SUGGESTED MEAL PLAN FOR INFANTS
ABOUT 1 YEAR OF AGE

(Average weight 11.4 kg)*

Breast milk presumed to be
available per day - 200 ml

	g or ml	Measure	Energy kcal	Protein g	Iron mg	Available Iron (mg)
<u>Morning Feed</u>						
Breast milk followed by	100 ml	-	77	1.1	0.1	.05
rice porridge	120 ml	½ cup	157	4	0.9	.02
<u>Mid-morning Snack</u>						
Orange	60 g	½	32	0.4	0.2	.02
<u>Mid-day Meal</u>						
Cornmeal, lentils, okra, sardines	150 g	10 tbsp	397	12	2.9	.18
<u>Afternoon Snack</u>						
Bread	30 g	1 sl.	80	2.6	.72)	.02
Margarine	5 g	1 tsp	36	-	-)	
<u>Evening Meal</u>						
Breast milk followed by	100 ml	-	77	1.1	0.1	.05
macaroni and cheese	90 g	6 tbsp	332	8.4	0.8	.02
Totals for day			1188	29.6	5.7	.36
Average requirements per day			1180	21	7	-

*Adapted from Cameron and Hofvander "Manual on Feeding Infants and Young Children".

APPENDIX 4: RECIPES THAT MAY BE COOKED SEPARATELY FOR THE BABY

RICE AND PIGEON PEAS

- 1/3 cup rice
- 2 tbsp pigeon peas (dry)
- 1 tsp margarine
- 2 cups water

Method:

Boil peas for 5 minutes and let soak for 1 hour. Boil until soft and rub through sieve to remove skin. Add soft, cooked rice and blend in margarine.

Yield: 6 ozs

<u>Nutrient Value</u>	% Of Day's Requirement For Infants		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 394 kcal (1.64 MJ)	43	39	33
Protein 11.6 g	58	58	55
Iron 2.4 mg	34	34	34
Available Iron 0.07 mg			
Vitamin A 51.3 mcg R.E.	17	17	20
Calcium 88 mg	16	16	19

PE% = 11.8

Energy Density = 2.2 kcal/cc

POTATO AND CODFISH DINNER

- 4 ozs Irish potato
- 2 tbsp salted codfish
- 4 tsp margarine
- 2 cups water

Method:

Cook potato in water until soft. Mash and add margarine and flaked codfish.

Yield: 4 ozs

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 252 kcal (1.25 MJ)	27	25	21
Protein 6 g	30	30	28
Iron 1.0 mg	14	14	14
Available Iron 0.08 mg			
Vitamin A 198.0 mcg R.E.	66	66	79
Calcium 17 mg	3	3	4

PE% = 9.5

Energy Density = 2.0 kcal/cc

DAHL AND RICE

- 1/3 cup rice
- 2 tbsp split peas (dry)
- 2 tsp margarine
- 2 cups water

Method:

Boil peas for 5 minutes and let soak for 1 hour. Boil until soft. Add soft, cooked rice and blend in margarine.

Yield: 6 ozs

<u>Nutrient Value</u>	% Of Day's Requirement For Infants		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 416 kcal (1.7 MJ)	45	42	35
Protein 12 g	60	60	57
Iron 2.2 mg	31	31	31
Available 0.06 mg Iron			
Vitamin A 102 mcg R.E.	34	34	41
Calcium 51 mg	9	9	11

PE% = 11.5

Energy Density = 2.3 kcal/cc

GREEN BANANA AND LIVER DINNER

- $\frac{3}{4}$ cup green banana, diced
- 1 tbsp beef liver, chopped
- 2 tsp oil
- $1\frac{1}{2}$ cups water
- Few drops lime juice

Method:

Boil diced green banana until soft in water to which lime juice has been added. Pound. Cook liver in banana water until soft. Add to banana. Add oil and mix well. Sieve for young infants.

Yield: 8 ozs

<u>Nutrient Value</u>	% Of Day's Requirement For Infants		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 225 kcal (0.9 MJ)	25	23	19
Protein 5.4 g	27	27	26
Iron 1.9 mg	27	27	27
Available 0.21 mg Iron			
Vitamin A 95.0 mcg R.E.	32	32	38
Calcium 10.2 mg	2	2	2.3

PE% = 9.6

Energy Density = 1.1 kcal/cc

POTATO, CODFISH AND CALLALOO

½ cup Irish potato
2 tbsp salted codfish
4 tsp margarine
¾ cup callaloo leaves
2 cups water

Method:

Boil potato and when nearly cooked, add callaloo leaves. Mash potato, add margarine, flaked codfish and callaloo leaves and blend well.

Yield: 5 ozs

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>			
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>	
Energy	270 kcal (1.1 MJ)	29	27	23
Protein	7.8 g	39	39	37
Iron	2.8 mg	40	40	40
Available Iron	0.17 mg			
Vitamin A	596 mcg R.E.	198	198	238
Calcium	132 mg	24	24	29

PE% = 11.5

Energy Density = 1.8 kcal/cc

RICE, PEAS AND MINCED BEEF

⅓ cup rice
2 tbsp pigeon peas (dry)
1 tsp minced beef
1 tsp margarine
2 cups water

Method:

Boil peas for 5 minutes and let soak for 1 hour. Boil until soft. Rub through sieve to remove skins. Lightly fry minced beef in margarine. Add peas and minced beef to soft cooked rice. Stir well.

Yield: 6 ozs

<u>Nutrient Value</u>	<u>% Of Day's Requirement For Infants</u>		
	<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy 416 kcal (1.7 MJ)	45	42	35
Protein 13.3 g	67	67	64
Iron 2.7 mg	38	38	38
Available Iron 0.17 mg			
Vitamin A 51 mcg R.E.	17	17	20
Calcium 88 mg	16	16	19

PE% = 12.7

Energy Density = 2.3 kcal/cc

RICE, PEAS, MINCED BEEF AND CARROTS

- 1/3 cup rice
- 2 tbsp pigeon peas (dry)
- 1 tsp minced beef
- 1 tsp margarine
- 2 cups water
- 2 tbsp carrot finely chopped

Method:

Boil peas for 5 minutes and let soak for 1 hour. Boil until soft. Rub through sieve to remove skins. Cook carrots. Lightly fry minced beef in margarine. Add peas, beef, carrots to soft cooked rice. Blend well.

Yield: 7 ozs

<u>Nutrient Value</u>		<u>% Of Day's Requirement For Infants</u>		
		<u>6-8 mths</u>	<u>9-11 mths</u>	<u>1 yr</u>
Energy	426 kcal (1.8 MJ)	46	42	36
Protein	13.6 g	68	68	65
Iron	2.9 mg	41	41	41
Available Iron	0.17 mg			
Vitamin A	101 mcg R.E.	33	33	40
Calcium	97 mg	18	18	21

PE% = 12.7

Energy Density = 2.0 kcal/cc

APPENDIX 5: COMPOSITION OF UNCOOKED FOODS IN 100 g
EDIBLE PORTION

Food and Description	Water %	Energy (kcal)	Protein (g)	Calcium (mg)	Iron (mg)	Vit. A (R.E.)	Riboflavin (mg)
Cornmeal, unenriched, dry	12.0	364	7.9	6	1.1	45	0.05
Oatmeal	8.3	390	14.2	53	4.5	0	0.14
Rice, white, unenriched	12.0	363	6.7	24	0.8	0	0.03
Flour, all purpose, enriched	12.0	364	10.5	16	2.9	0	0.26
Spaghetti, macaroni, enriched	10.4	369	12.5	27	2.9	0	0.37
Banana, green	69.0	110	1.4	8	0.9	95	0.02
Plantain, green	62.6	132	1.2	8	0.8	125	0.04
Breadfruit	77.3	81	1.3	27	1.9	0	0.06
Arrowroot flour	15.0	340	0.2	7	1.0	0	0
Dasheen	72.5	105	1.8	23	1.1	0	0.02
Potato, Irish	78.0	82	2.0	8	0.7	0	0.03
Potato, sweet, pale	70.0	117	1.3	34	1.0	10	0.05
Tannia	65.0	133	2.0	20	1.0	0	0.03
Yam	72.4	105	2.4	22	0.8	0	0.03
Sugar, dark brown	2.1	373	0	85	3.4	0	0.03
Kidney bean, red peas	12.0	337	22.0	86	7.6	0	0.19
Blackeye peas, cowpea	10.6	341	24.1	77	7.2	5	0.23
Broad bean	12.6	339	24.0	77	6.3	10	0.30
Lentils	12.2	340	23.7	68	7.0	5	0.33
Split peas	9.3	348	24.2	33	5.1	10	0.29
Pigeon peas, congo peas	12.2	337	19.2	137	5.0	5	0.17
Coconut milk	65.7	252	3.2	16	1.6	0	0
Calaloo leaves	86.6	39	3.5	256	4.1	885	0.23
Carrot	88.6	40	1.1	34	0.8	200	0.04
Pakchoi	95.0	14	1.4	100	2.0	350	0.03
Dasheen leaves	90.0	31	2.4	98	2.0	1800	0.35
Spinach	90.7	26	3.2	93	3.1	810	0.20
Pumpkin	91.0	30	0.6	19	0.5	305	0.04
Okra	89.2	25	1.8	75	1.2	35	0.07
Beef, medium fat	62.1	224	18.7	4	3.2	0	0.17
" salted, raw	59.4	155	24.5	50	7.9	0	0.22
Chicken	70.6	170	18.2	14	1.5	20	0.16
Liver, beef	71.2	134	19.8	11	5.1	8660	2.37
Tripe, beef	79.1	100	19.1	127	1.6	-	0.15
Egg	73.7	163	12.9	54	2.3	125	0.30
Codfish, salted, semidried	36.9	264	39.7	50	3.0	0	0.60
King fish	69.7	159	22.0	-	-	-	-
Mackerel, canned, solid and liquid	66.0	183	19.3	185	2.1	130	0.21
Sardine, canned in oil	50.6	311	20.6	354	3.5	55	0.16
Snapper	77.4	90	19.8	16	0.8	-	0.02
Milk, whole	87.3	65	3.5	119	0.1	40	0.18
" skim	90.5	36	3.6	121	0.0	0	0.18
" evaporated	73.7	138	7.0	240	0.2	95	0.35
" dry, whole	4.0	506	26.0	858	0.7	360	1.25
" dry, skim, regular	4.0	360	36.0	1235	0.9	10	1.80
Cheddar cheese	37.0	387	25.0	700	1.0	420	0.45
Butter	15.5	716	0.6	15	0	960	0
Fortified margarine	15.5	720	0.6	20	0	990	-
Oil	0	884	0	0	0	0	0

- = No available data or available data not reliable.

R.E. = Retinol Equivalents.

Source: CFNI Food Composition Tables for Use in the English-speaking Caribbean.

APPENDIX 6: APPROPRIATE HOUSEHOLD MEASURING EQUIVALENTS

	Weights	Tea- spoon	Table- spoon	Dessert spoon	Cook spoon	Condensed milk can	Drinking cup	6-oz Juice glass	Pint	Crude Measure
Condensed milk	2 oz	9	3	-	-	-	-	-	-	-
Evaporated milk	2 oz	12	3	-	-	-	$\frac{1}{4}$	$\frac{1}{3}$	-	-
Skimmed milk powder	1 oz	12	4	$5\frac{1}{2}$	-	-	$\frac{1}{4}$	$\frac{1}{3}$	-	-
Water*	4 fl. oz	-	10	12	-	$\frac{1}{3}$	$\frac{3}{4}$	$\frac{3}{4}$	-	-
Water	20 fl. oz	-	-	-	-	$2\frac{1}{2}$	-	-	1 Imperial	-
Water	16 fl. oz	-	-	-	-	$1\frac{3}{4}$	-	-	1 U.S.	-
Water	10 fl. oz	-	-	-	-	$1\frac{1}{2}$	-	-	$\frac{1}{2}$ Imperial	-
Rice	2 oz	12	4	5	2	-	$\frac{1}{4}$	-	-	-
Plantain	3 oz	-	-	-	-	-	-	-	-	$\frac{1}{2}$ of a medium-sized plantain
Cornmeal	2 oz	21	7	10	4	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	-	-
Oats	2 oz	-	10	10	5	$\frac{1}{2}$	-	-	-	-
Green banana (peeled)	3 oz	-	-	-	-	-	-	-	-	$1\frac{1}{2}$ medium-sized banana or 1 lg. banana
Sweet potato (peeled)	3 oz	-	-	-	-	-	-	-	-	$\frac{1}{2}$ of a medium-sized potato
Irish potato (peeled)	3 oz	-	-	-	-	-	-	-	-	1 medium-sized potato
Carrot (peeled)	1 oz	-	-	-	-	-	-	-	-	$\frac{1}{2}$ of a medium-sized carrot
Red peas	2 oz	-	-	-	1 heaped	$\frac{1}{4}$	$\frac{1}{4}$	-	-	-
Sugar D	1 oz	$9\frac{1}{4}$	3	4	-	-	-	-	-	-
Sardine	1 oz	-	-	-	-	-	-	-	-	3 sm. sardines or 2 medium-sized sardines
Margarine	$\frac{1}{2}$ oz	3	1	-	-	-	-	-	-	3 sm. sardines or 2 medium-sized sardines

*Cow's and reconstituted skimmed milk as for water.

Source: Campbell, V.S. Family Pot Feeding of Weaning Age Children in "Feeding the Weaning Age Group in the Caribbean: Proceedings of a Technical Group Meeting" (CFNI-J-26-79), p. 75, 1979.

APPENDIX 7: BASIC MEASURES WITH EQUIVALENT WEIGHTS

Abbreviations Used

1 tsp	=	1 teaspoon
1 tbsp	=	1 tablespoon
1 g	=	1 gram
1 mg	=	1 milligram
1 ml	=	1 millilitre
1 mcg	=	1 microgram
1 oz	=	1 ounce
1 lb	=	1 pound
1 pt	=	1 pint
1 qt	=	1 quart
1 cc	=	1 cubic centimetre

Weights and Measures

1 tsp	=	5 g = 5 cc = 5 ml
3 tsp	=	1 tbsp
1 tbsp	=	½ oz = 15 g = 15 cc = 15 ml
2 tbsp	=	1 oz = 30 g (actual 28.35 g) = 30 cc = 30 ml
16 tbsp	=	8 oz = 1 cup = 250 g = 250 cc = 250 ml
2 cups	=	16 oz = 1 pint (US) = 500 g = 500 cc = 500 ml
2 pints	=	32 oz = 1 quart = 1000 g = 1000 cc = 1000 ml
1 litre	=	1000 ml = 1.0567 quarts
1 microgram (mcg)	=	one thousandth of a milligram
1 milligram (mg)	=	one thousandth of a gram
1 gram (g)	=	one thousandth of a kilogram = 1 cc = 1 ml
4 quarts	=	1 gallon
1 kilogram	=	2.2 pounds
1 pound	=	453.6 g