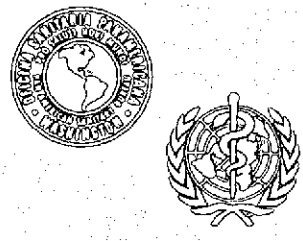
GUIDELINES TO YOUNG CHILD FEEDING IN THE CONTEMPORARY CARIBBEAN



PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION
1970

GUIDELINES TO YOUNG CHILD FEEDING IN THE CONTEMPORARY CARIBBEAN

Report of a Meeting of the
Caribbean Food and Nutrition Institute

Mona, Jamaica, 15-19 June 1970

Scientific Publication No. 217

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION
525 Twenty-Third Street, N.W.
Washington, D.C. 20037, U.S.A.

1970

CONTENTS

PARTICIPANTS

ANTIGUA

Dr. M. O'Garra, Physician, Holberton Hospital, St. Johns

BARBADOS

Miss M. Bourne, Nutrition Officer, Ministry of Health and Community Development

Dr. G.T.M. Cummins, Specialist Obstetrician, Queen Elizabeth Hospital, St. Michael

Dr. F.L. O'Rourke, Acting Chief Medical Officer, Ministry of Health and Community Development, St. Michael

Dr. Frank Ramsey, Specialist Pediatrician, Queen Elizabeth Hospital, St. Michael

DOMINICAN REPUBLIC

Dr. Hugo Mendoza, Professor of Pediatrics, University of Santo Domingo

GUYANA

Dr. P. Arjoon, Obstetrician and Gynecologist, Georgetown General Hospital

Dr. Robert Baird, Acting Chief Medical Officer, Ministry of Health, Georgetown

Dr. Walter Singh, Consultant Pediatrician, Georgetown General Hospital

JAMAICA

Dr. Ann Ashworth, Scientific Officer, Medical Research Council, Tropical Metabolism Research Unit, University of the West Indies (UWI), Mona, Kingston 7

Professor Eric Back, Professor of Pediatrics, Department of Pediatrics, UWI, Mona, Kingston 7

Mrs. P. Desai, Assistant Statistician, Epidemiological Research Unit, UWI, Mona, Kingston 7

Miss Helen Fox, Technical Officer/Nutrition Adviser, Nutrition Unit, Ministry of Health, 21 Slipe Pen Road, Kingston

Miss G. Gerlach, Interim Head, Department of Home Economics, Jamaica School of Agriculture, Spanish Town

Miss P. Maynard, Experimental Officer in Food and Nutrition, Scientific Research Council, Mona, Kingston 6

Dr. S. McGregor, Research Assistant, Department of Pediatrics, UWI, Mona, Kingston 7

Dr. K. McKenzie, Pediatrician, Children's Hospital, Camp, Kingston 5

Dr. C. Miller, Senior Lecturer, Department of Pediatrics, UWI, Mona, Kingston 7

Miss J. Tulloch-Reid, Assistant Health Education Officer, Bureau of Health Education, Ministry of Health, 21 Slipe Pen Road, Kingston

Professor Kenneth L. Standard, Head, Department of Social and Preventive Medicine, UWI, Mona, Kingston 7

MONTSERRAT

Miss Doris Bramble, Home Economics Teacher, Ministry of Social Services, Plymouth

ST. KITTS

Miss B. Welsh, Superintendent of Public Health Nurses, Ministry of Health, Basseterre

ST. LUCIA

Miss M. Niles, Superintendent of Public Health Nurses, Ministry of Health, Castries

ST. VINCENT

Dr. K. Antrobus, Pediatrician, General Hospital, Kingstown

TRINIDAD

Dr. N. Byam, Medical Officer, Nutrition Unit, Medical Center, Port-of-Spain

Dr. M. McDowall, Pediatrician, Port-of-Spain General Hospital

Dr. John St. George, Senior Lecturer in Obstetrics and Gynecology, Port-of-Spain General Hospital

UNITED STATES OF AMERICA

Dr. Frances Larkin, Assistant Professor, Nutrition Program, University of Michigan, Ann Arbor, Michigan

Mr. T. Marchione, Sociologist, 6213 64th Avenue, Riverdale, Maryland

Dr. Miriam Morris, Assistant Professor of Public Health in Residence, School of Public Health, University of California, Los Angeles

Mrs. Marion Tompson, President, La Leche League International, Franklin Park, Illinois

PAN AMERICAN HEALTH ORGANIZATION

Dr. P. Cavalié, Country Representative, Jamaica

Dr. Carlos Daza, Nutrition Adviser, Dominican Republic

Miss Jean Kincaid, Nutritionist, Bridgetown, Barbados

Miss C. Olivencia, Nutritionist, Guyana

Dr. Dorothy Wilson, Nutrition Adviser, Caracas, Venezuela

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Miss Isabel Foster, Nutrition Education Officer, Trinidad

Miss A. Poortenaar, FAO Associate Expert

CARIBBEAN FOOD AND NUTRITION INSTITUTE

Dr. D.B. Jelliffe, Director

Dr. J.I. McKigney, Deputy Director

Dr. R. Cook, Medical Nutritionist

Dr. J.M. Gurney, Medical Officer

Mrs. E.F.P. Jelliffe, Research Fellow/Nutritionist

Dr. J. Neill, Statistician

Dr. S.K. Reddy, Nutrition Officer

Miss M. Schorin, Visiting Fellow

Dr. P.N. Sen Gupta, Food Policy Expert

Miss M. Zephirin, Public Health Nutritionist

PREFACE

Malnutrition in early childhood is always the result of numerous factors, and preventive programs have to be individualized for specific areas or regions.

In all cases, however, the method, quality, and form of infant feeding practiced is a major consideration, and this is certainly true of the Caribbean area.

In December 1968 a preliminary meeting of leaders in the field of child nutrition in the English-speaking Caribbean area was held for the purpose of discussing general problems. The need for modern, up-to-date information was pointed out, as was the desirability of arriving at authoritative general guidelines on young child feeding for the area.

In the following 18 months, a great deal of factual data were collected on current patterns of child feeding in most Commonwealth Caribbean countries, including information on present practices, prevalent forms of malnutrition, cost of foods, cultural attitudes, nutrition education by health staff, and activities of commercial manufacturers of infant foods.

From 15 to 19 June 1970, a Meeting on Young Child Feeding in the Contemporary Caribbean was held at the University of the West Indies, Mona, Jamaica, under the auspices of the Caribbean Food and Nutrition Institute. It was attended by leading pediatricians, obstetricians, nutritionists, and educators from the area.

The program included the presentation of papers and discussion on the recently acquired new information, which is to be published in the *Journal of Tropical Pediatrics.*

The main practical points emerging after full discussion were collected by two rapporteurs for each day's session. Their report was presented the following morning and a final modified version was again discussed at the closing session.

The present document is an edited version, approved by the participants, of the text agreed upon at the final session. It is intended, as its name suggests, to provide guidelines applicable for the whole

area, but not those specific details that require modification to suit local circumstances. Details for Guyana, for example, will differ from those that will obtain in Antigua.

These guidelines represent the authoritative and considered views of leading pediatricians, obstetricians, nutritionists, and public health workers in the English-speaking Caribbean. They have been designed to deal with real problems, with known practices, and with recognized patterns of malnutrition.

It is intended to disseminate these guidelines widely, especially to training schools.

They are by no means a final answer, and they need detailed interpretation and practical adaptation to differing circumstances in the countries of the area. Their presentation in forms most suitable for health staff and auxiliaries, for teachers of home economics, for agricultural and other extension agents, and for parents themselves will also be necessary.

DERRICK B. JELLIFFE
Director, Caribbean Food and
Nutrition Institute

1. *Maternal Nutrition (1, 2)*

Good maternal nutrition in pregnancy includes provision for:

a) The growth and development of the fetus *in utero.*

b) Nutrient stores for use by the infant.

c) The development of the uterus, placenta, and breasts.

d) The provision of maternal stores for lactation.

e) The prevention of nutritional maternal depletion with high parity.

f) The correction of any previous malnutrition.

Adequate spacing of pregnancies and avoidance of pregnancy at too young an age contribute to good nutrition in pregnancy. Much malnutrition in pregnancy is related to nutrition in early life, including young childhood and adolescence.

2. *Nutritional Status*

Both pregnancy and lactation require an increased intake of calories (except in obesity), protein, minerals, and vitamins (Appendix 1). Nutritional assessment during pregnancy, by means of weighing and measuring, clinical examination and hemoglobin estimations, is also desirable, followed by advice on a suitable balanced diet, based on mixtures of locally available food.

3. *Supplements*

Present knowledge stresses the need in this area for the oral administration, routinely throughout pregnancy and lactation, of iron (60 mg elemental iron–for example, 180 mg ferrous sulfate[1] daily) and folic acid (0.1 mg daily) *(1, 2).* These can be given by selecting cheap, available, acceptable and convenient products, which may sometimes contain other supplements. A single once-daily tablet, containing at least both iron and folic acid, is far more acceptable than several tablets several times a day, and more likely to be taken.

[1] 3 grains of ferrous sulfate are usually available in one standard tablet.

4. *Diet*

Advice on the delivery of nutritional requirements needs to be interpreted in terms of locally available food preferences, dietary habits, and meal patterns. They can often be based on the principle of multimixes *(3)*, that is, mixtures of a staple (preferably a cereal), legumes (peas and beans), dark-green leafy vegetables, and animal products (Appendix 2). There is a need for the development by home economists and nutritionists in each country of economical recipes based on knowledge of nutritional values of locally available foods *(4)* and methods of food preparation. There should be no restriction on the intake of animal protein. A substantial body of opinion believes also that salt restriction is rarely indicated and use of diuretics more rarely still.

II. PREPARATION FOR BREAST FEEDING

1. *Education*

a) Antenatal education by teaching, by demonstration, and by the example of lactating mothers themselves is essential to reinforce the positive benefits and convenience of breast feeding.

b) Such education should be directed not only to pregnant women, but also to health personnel and to girls and women of child-bearing age.

c) The advertising of commercial milks in antenatal clinics should not be allowed, as this interferes with the afore-mentioned teaching.

d) Education concerning the scientific benefits and practical advantages, and the anatomy and psycho-physiology of breast feeding, should be aimed at all health personnel, both trained and in training, including doctors, nurses, midwives, and auxiliaries.

2. *Care of Breasts (5)*

Confidence, motivation, and the likelihood of successful breast feeding will be increased through the following procedures undertaken during pregnancy:

a) Detection of nipple abnormalities and amelioration of such abnormalities where possible, by specific measures designed to increase nipple suppleness or protractility, or by the use of a nipple shield, such as the one available through UNICEF *(6)*.

b) Nipple cleanliness, without the use of soap, which may make the nipple "dry."

c) Mechanical support of the breasts (brassiere) and appropriate exercises for chest muscles.

d) There may be a place for expression of small amounts of secretion from the breasts once or twice daily during the last six weeks of pregnancy.

All the above measures should be used, but with care to avoid destroying the simplicity and naturalness of breast feeding by excessive ritual.

III. NUTRITION OF THE NEWBORN

Establishment and Maintenance of Breast Feeding

1. Breast feeding is desirable—this is amply shown by all recent scientific data.

a) It supplies all nutrients needed for the first 4 months of life, including water. Studies have shown that even inadequately nourished mothers provide milk of sufficient quantity and quality (protein and calories), though the vitamin levels may be low if the mothers are themselves vitamin deficient (Appendix 3).

b) It is adapted to the precise metabolic needs of the infant.

c) It is readily available and convenient.

d) It is low-cost. It is cheaper to provide a nutritious diet for the lactating mother than to feed the infant on artificial milk.

e) It possesses, in addition to its relative sterility, specific unique anti-infective properties.

f) It promotes an ideal, close initial mother-child relationship.

g) It could have a protective effect against the development of breast cancer in mothers.

2. To ensure acceptance of the concept of breast feeding and successful lactation among all newly delivered mothers, there should be a continuum of education on breast feeding by highly motivated health staff—including doctors, nurses, and auxiliary personnel—in schools, antenatal and child welfare clinics, and maternity and postnatal hospital wards. Special emphasis should be paid to the nutrition education of primiparae and vulnerable teen-age mothers.

3. Mothers delivered in hospital are often the victims of conflicting advice, received from doctors, nurses, "commercial milk" nurses, other patients, visiting relatives, and friends. Concerted efforts should be made to standardize the advice given by hospital and maternal and child health clinic staff.

4. Following delivery, the infant should be offered breast feeding as early and at as frequent intervals as possible, using both breasts. Ideally, the infant's cot should be placed by the side of the mother's bed.

5. The newborn infant requires only to be breast fed to obtain necessary nutrients and water. The high protein content, excellent nutritive value, and anti-infective properties (immunoglobulins, etc.) of colostrum must be emphasized to hospital health staff and newly delivered mothers. There is no need for routine early supplementation with either milk or glucose feeds, as they decrease the baby's appetite and the vigorousness of sucking. If really indicated, boiled water can be given by spoon feeding and not by bottle.

6. Practicing doctors, midwives, ward sisters, and all other nursing personnel should receive intensive education in the psychophysiology and anatomy of lactation, and in breast feeding methods. They should also be made aware that breast engorgement and mastitis are not indications for stopping breast feeding. This reorientation is especially needed in training schools for medical students, nurses, midwives, and auxiliaries.

7. The services of successful lactating mothers should be enlisted in prenatal clinics, health centers, and hospital wards, since they are

more experienced with the practical aspect of breast feeding and are thus more likely to be convincing.

8. Demonstration of breast feeding techniques should be given to teen-age girls in schools in order to acquaint them early with a sound knowledge of infant feeding practices.

9. Breast milk alone is sufficient for the adequate nutrition of the infant up to the age of 4 to 6 months. The introduction of semisolid foods between 4 and 6 months should be individualized, depending on the home situation.

10. Strong action should be taken to prevent:

a) Advertising of commercial milk products on government premises, especially hospitals, health clinics and schools, by the distribution and use of calendars, diaries, posters, milk samples.

b) Access of "commercial milk" nurses to government premises, especially hospital wards, health centers, and schools.

c) Acceptance of "free" milk samples. If, however, the need arises to supplement diets of malnourished children, these milks should be issued only in unlabelled containers.

11. The promotion of breast feeding should be pursued via the mass media, including radio, television programs (including "spot announcements" and incidental use in family serials, "soap operas," etc.), press articles, and the use of posters in government hospitals and clinics in order to counteract high-pressure advertisements by commercial firms.

12. Modern information on the scientific superiority of human milk should be made widely available to all practicing physicians, health staff, and other extension services.

13. The enlistment of the help of La Leche League International[2] should be sought to organize and promote a breast feeding campaign in the Commonwealth Caribbean.

---

[2]LLLI, 9616 Minneapolis Avenue, Franklin Park, Illinois 60131, U.S.A.

IV. ARTIFICIAL FEEDING (INCLUDING VITAMIN AND MINERAL SUPPLEMENTS)

A. GENERAL RECOMMENDATIONS

1. The use of glucose and water for *feeding* healthy infants should be discontinued. Glucose is costly and has no significant, relevant special qualities compared with the cheaper cane sugar (sucrose) in cases where an addition to the calorific value of a feed is desired.

2. Bush teas should not be used as a substitute for food. Some bush teas are harmful. Health personnel in each territory should know these and advise mothers accordingly.[3]

3. Considerable emphasis should be given in all clinics to the importance of cleanliness in infant feeding. The use of transparent pyrex-type or thick plastic bottles is recommended, as they are easier to clean and less likely to warp with repeated boilings. Ideally, terminal sterilization[4] of bottle feeds should be practiced. If circumstances do not permit this method, feeds should be mixed in cooled boiled water in a previously boiled bottle and teat and used immediately after preparation. Chemical sterilization with hypochlorite solution is not recommended.

4. Careful serial weighing is the best way of assessing a young child's growth and nutrition. A frequently checked beam-balance scale and weight charts are essential equipment at all health centers. All health staff need training in weighing procedures, charting of weights, and the interpretation of results. It should also be appreciated that an excessively fat baby is not healthy and this excess may lead to a permanent tendency to obesity in later life *(7)*.

B. ARTIFICIAL FEEDING

1. Governments should take measures to assure that all imported dried skim milk is fortified with vitamin A. If this goal is achieved,

---

[3]The Caribbean Food and Nutrition Institute would be happy to assist, where possible, those requiring more specific information.

[4]Boiling bottle, containing milk mixture and with teat and cover on, for 15 minutes.

the use of cod liver oil should be discontinued. Until then, use of cod liver oil should be restricted to areas where there is widespread use of unfortified dried skim milk.

2. When artificial feeding of the infant up to 4 months of age has to be undertaken, the use of the lowest cost, adequately nutritious, and acceptable milk-based products should be encouraged, with added sugar. This will often be a less advertised dried whole milk.[5] It should be selected and actively promoted by those concerned with infant feeding, who should at the same time be thoroughly familiar with its use. Particular emphasis should be placed on the need for proper strength of the product and provision of adequate amounts to meet the infant's daily nutrient requirements.

3. Left-over bottle feeds should be disposed of immediately, preferably by giving them to older children.

C. VITAMIN AND MINERAL SUPPLEMENTATION

1. In order to increase iron stores in the infant, late clamping of the umbilical cord[6] should be encouraged *(8).*

2. If the child is fed only from the breast, no vitamin or mineral supplementation is required during the first 6 months.

3. The present widespread use of fruit and vegetable sources of ascorbic acid, preferably home-produced, should be encouraged, although emphasis must be given to cleanliness in preparation. These include citrus fruits, guava, mango, West Indian cherry, tomatoes, callaloo, etc.

4. Distribution of low-cost iron and folic acid supplements through health clinics is recommended for all infants from 4 months to 2 years of age. Recommended intakes are 20 mg of elemental iron (approximately 60 mg of ferrous sulfate)[7] and 0.1 mg of folic acid per day.

---

[5]Dried skim milk can best be employed *added* in powder form to "multimix" weaning foods (p.11). It is not optimal for artificial feeding, but *can* be used when whole (full or half cream) milks are not available. Only preparations fortified with vitamin A should be used.

[6]Keeping the baby 40 cms (16 inches) below the level of the mother for 30 seconds is adequate to drain the placental blood into the baby.

[7]60 mg of ferrous sulfate is commonly contained in 4 ml (1 teaspoonful) of standard infant iron mixtures.

5. Fluoride is a normal component of the diet, and fluoridation of the community water supply up to a level of 1 part per million of fluorine is recommended to prevent dental caries in areas where the water contains little or none of this mineral, and where the practice is feasible and safe.

V. WEANING AND TRANSITION TO FAMILY DIET

A. WEANING PROCESS

1. Breast feeding may be continued with benefit for as long as possible, and preferably for at least one year.

2. In addition to milk, human or animal, other foods should be introduced from 4-6 months onwards. Fruit juice would have already been introduced for the bottle-fed child.

3. Cereal porridges (cornmeal, rice) reinforced with milk or other available animal protein are recommended as the first semisolid food to be given. They should be given by cup and spoon and not by bottle.

4. Smooth, well-cooked mixtures of other solid foods such as staple, animal products, peas and beans, and dark-green and yellow vegetables should be added in gradually increasing range and quantity.

5. As far as possible, these ingredients should be taken from the family meal before the addition of irritant condiments, especially hot pepper. The ingredients should be soft, digestible, clean, and of a fairly thick consistency.

6. Attention should be given to the use of pulpy, soft-fleshed natural convenience foods, requiring no cooking and preferably supplying compact calories (e.g., ripe banana, avocado, etc.) and/or vitamins (pawpaw, mango, etc.).

7. Mothers should be advised on (a) including all food groups in the family diet, (b) using ingredients of high nutritional value in relation to cost *(9)*, and (c) utilizing whenever possible produce from home gardens.

8. Mothers should be convinced as to the desirability of using the entire edible portion of egg, meat, fish, and sieved peas and beans

rather than only selected portions such as gravies, teas, or broth.

9. It is desirable that children by the age of one year should largely share in the general family diet, and generously so in reference to their special needs.

B. CUSTOMS INFLUENCING HEALTH

1. Young children have high nutrient needs and small stomach capacity. They should have more frequent meals than adults, at least four per day, mainly containing nutritious components in compact form.

2. All communities have many nutritionally related customs *(10)*. There is a need to appreciate the existence of these, identify them, and study their influence on health and dietary intake, especially in young children and pregnant and lactating women. Some of these practices may be harmless and should be ignored. Others however are harmful, e.g., withdrawal of all food in illness, and administering of purgatives and laxative herb teas in various situations, such as weaning. These should be actively discouraged.

3. So-called "tonic foods"[8] are by no means essential. They have no particular "tonic" value, are expensive, and are therefore not advised. If they are being used, however, they should only be given with milk.

C. FOOD SUPPLEMENTS

1. There is great need for cheap subsidized foods for children:

   a) In the form of a full or half cream milk for young children who cannot be breast fed.

   b) A multimix weaning food, preferably locally blended and including, where possible, locally available ingredients. Selective distribution and use should be through hospitals, clinics, health centers, day care centers, and basic schools. These foods should also be available through commercial channels.

---

[8]Products advertised as assuring such benefits as health, strength, energy, vigor, vitality, healthy sleep, or other such undefinable and non-existent "tonic" qualities.

D. NUTRITION EDUCATION *(11)*

1. The teaching of general principles of nutrition—including wise buying—and infant and young child feeding should be compulsory for students of *both* sexes and be included in *all* schools, including primary schools, and in teacher training colleges, and should be included in the training of appropriate health, agriculture, and community development staff.

2. Teaching—utilizing all available methods—should also be promoted through all extension agencies and channels, including mass media. It is vital that there be coordination, so as to ensure uniformity in the message given.

3. Infant feeding should be taught wherever possible accompanied by practical demonstration using actual foods, available cooking equipment, and methods feasible in home situations.

Special attention should be paid to demonstrating ways in which nutritious items not sufficiently used at present—such as peas, beans, dark-green leafy vegetables, and dried skim milk—can be incorporated into existing feeding patterns. Guidance is required with regard to (a) wise buying practices, (b) economical, uncomplicated recipes, and (c) actual quantities to be fed to children of varying ages.

REFERENCES

(1) Pan American Health Organization. *Maternal Nutrition and Family Planning in the Americas.* Scientific Publication No. 204, Washington, 1970.

(2) U.S. National Research Council, Committee on Maternal Nutrition. *Maternal Nutrition and the Course of Human Pregnancy.* Washington, 1970.

(3) Jelliffe, D.B. *Child Nutrition in Developing Countries.* U.S. Government Printing Office, Washington, 1968.

(4) Caribbean Food and Nutrition Institute. "Interim Food Composition Table for Use in the Caribbean" (mimeographed). Kingston, Jamaica, 1970.

(5) Applebaum, R.M. "The Modern Management of Successful Lactation." *Pediat Clin N Amer, 17,* 203, 1970.

(6) Wennen, C.A.M. "Breast Feeding by Mothers with Flat Nipples." *J Trop Pediat 15,* 163, 1969.

(7) *Nutrition Reviews 7,* 184, 1970. "Excessive Weight Gain in Infancy."

(8) Yao, A.C. and J. Lind. "The Effect of Gravity on Placental Transfusion." *Lancet* ii, 505, 1969.

(9) McKigney, J.I. "Economic Aspects of Infant Feeding in the Caribbean." *J Trop Pediat 14,* 55, 1968.

(10) Jelliffe, D.B. *Infant Nutrition in the Subtropics and Tropics* (2nd ed.). World Health Organization Monograph No. 29, Geneva, 1968.

(11) Ritchie, J. *Learning Better Nutrition.* Food and Agriculture Organization, Rome, 1968.

Appendix 1. Recommended Maternal Daily Dietary Allowances
Institute of Nutrition of Central America and Panama (INCAP), 1969[a]

Category	Calories	Protein (gm)	Calcium (mg)	Iron (mg)	Retinol (mg)	Thiamin (mg)	Riboflavin (mg)	Niacin[c] (mg)	Vitamin C (mg)
Adult women[b] (not pregnant or lactating)	2,000	65	450	18	750	0.8	1.1	13.2	50
Pregnant women	2,200	75	1,100	18	750	0.9	1.2	14.5	60
Lactating women	3,000	90	1,100	18	1,200	1.1	1.5	18.5	60

[a]Taken from: *Recomendaciones nutricionales diarias,* by Flores, M. and M.T. Merchú, G. Arroyave, and M. Béhar. INCAP, revised edition, February 1969.
[b]Reference women 55 kg in weight.
[c]Niacin equivalent.

Appendix 2. Economical, Locally Available Caribbean Foods, Grouped into Staples, Legumes, Animal Protein, and Dark-Green Leafy (or Yellow) Vegetables (*3,4*)

Staple	Legumes	Animal protein	Vegetables
Wheat flour	Red beans[a]	Dried skim milk	Spinach[a]
Cornmeal	Pigeon peas[a]	Fresh milk	Callaloo[a] *(Amaranthus)*
Rice	Split peas	Canned fish	
Rolled oats		Salt fish	Eddo heart[a]
	Cow peas		Pumpkin
	Lentils		shoots[a]
Macaroni	Navy beans	Fresh fish	Sweet potato tops[a]
	Chick peas		
		Chicken	Indian kale
Bread	Peanuts[a]	Fresh beef	
Irish potato[a]	Peanut butter	Fresh pork	
Banana[a]		Fresh goat	
Sweet potato[a]	Broad beans	Fresh mutton	
Yam[a]		Canned meats	
Eddo[a] *(Colocasia esculenta)*		Eggs[a]	
Tania[a] *(Xanthosoma spp.)*		Dried whole milk	
Breadfruit[a] *(Artocarpus communis var. incisa)*		Evaporated milk	
Cassava[a]		Condensed milk	
		Cheese	

[a]Often available from home production.

Appendix 3. Protein and Calorie Requirements in Early Childhood[a]

(Summary of recommended intakes proposed by WHO and FAO)

Age	Weight (kg)	Calorie intake		Reference protein		Practical protein allowance (Total/day)
		Cal/kg/day	Total/day	g/kg/day	Total/day	
Birth	3.5	120	420	2.3	8	10
3 mos.	5.7	120	680	2.3	13	16
6 mos.	7.6	110	840	1.8	14	17.5
1 yr.	10.0	100	1,000	1.2	12	17.5
1.5 yrs.	11.4	100	1,150	1.1	13.5	19
2 yrs.	12.6	100	1,300	1.1	13.5	19
3 yrs.	14.6	100	1,450	1.1	15.5	22

[a]Courtesy Prof. J. Waterlow.

Notes:

1. Weights=Harvard standard, 50th percentile, boys. If subjects are underweight for their age, they should still have the proper amount for their age. Excellent results have been achieved with calorie intakes of 150 cal/kg/day and over, in the treatment of malnutrition.

2. Calorie requirements taken from FAO Nutritional Studies No. 15, 1957.

3. Protein requirements taken from WHO Technical Report Series No. 301, 1965.

4. "Reference" protein=protein which is 100% utilized (ideal). "Practical"=assuming that from birth to 6 months, protein is from milk with utilization of 80% and from 6 months onwards protein is mixed protein with utilization of 70%.

5. It is of interest to note that breast milk provides a ratio of protein to calories similar to that recommended above.