MATERNAL AND INFANT NUTRITION REVIEWS

JAMAICA

A Guide to the Literature

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INTRODUCTION

MATERNAL AND INFANT NUTRITION REVIEWS: A RESOURCE FOR NUTRITION PLANNERS AND EDUCATORS

The MATERNAL AND INFANT NUTRITION REVIEWS (MINR) profile existing data on nutritional status and nutrition-related beliefs and practices of mothers and children in developing countries. MINRs also contain information on current nutrition policies and programs of governments, the United States Agency for International Development, and other bilateral, international agencies and Private Voluntary Organizations (PVO). There are thirty-five MINRs in all, profiling forty-four different countries. (See list on next page.)

Maternal and Infant Nutrition Reviews summarize important information obtained from available literature, government documents, consultant reports, and personal correspondence. The data is presented in bulleted form under six major headings: nutrition and health status, dietary beliefs, dietary practices, nutrition status correlations, nutrition and health policies and programs, and commentaries. A bibliography at the back of each monograph describes the listed documents in terms of type of study, methodology, sample characteristics and location, and a summary.

Nutrition planners and policy makers can use MINRs to help identify a given country's data base. For example, the information contained in each review enables the reader to identify key planning factors such as problem areas of malnutrition, prevailing beliefs about breast feeding, the extent of bottle feeding, types of weaning foods, the government's inter-agency five-year nutrition plan, the amount of donated food being distributed at MCH centers, and major PVOs involved in administering food and nutrition programs.

MINRs can be used as background documents for consultants going into the field and for program developers in-country. They can provide a frame of reference for an in-country workshop aimed at developing a national nutrition strategy. Technical assistance in organizing a workshop of this kind is available through the International Nutrition Communication Service. MINRs can also be used as a resource document in the development of journal articles and textbooks.

MINR data is stored on a computerized word processing system that allows for updates and individualized literature searches on specific topics. Patterns in a particular country or group of countries can be analyzed in accordance with user needs. A nutrition information retrieval service is available free to those working in developing countries and for a small fee to all others. Orders, inquiries, and comments should be addressed to:

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MINR Country Reports:

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Cameroon	Egypt	Bangladesh	Bolivia
Gambia and Senegal	Jordan	Burma	Costa Rica
Ghana	Morocco	India	Dominican Republic
Kenya	Tunisia	Indonesia	Ecuador
Lesotho	Yemen	Nepal	Guatemala
Liberia		Pakistan	Haiti
Mali		Philippines	Honduras
Sudan		South Pacific*	Jamaica
Tanzania		Sri Lanka	Panama
Zaire		Thailand	Peru

*South Pacific Region includes the nations of Cook Islands, Fiji, Kiribati, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, and Western Samoa

MATERNAL AND INFANT NUTRITION REVIEWS

CLASSIFICATION SYSTEM

1. Nutrition and Health Status

   1.1 General
   1.2 Women, Pregnant
   1.3 Women, Lactating
   1.4 Infants 0-6 Months
   1.5 Infants 6-24 Months

2. Dietary Beliefs

   2.1 General
   2.2 About Pregnancy
   2.3 About Lactation
   2.4 About Breast Milk Substitutes (including bottle feeding)
   2.5 About Weaning

3. Dietary Practices

   3.1 General
   3.2 Women
      3.2.1 During Pregnancy
      3.2.2 During Lactation
   3.3 Infants 0-24 Months
      3.3.1 Breast feeding
      3.3.2 Weaning
      3.3.3 After Weaning
   3.4 Health and Medicine

4. Nutrition Status Correlations

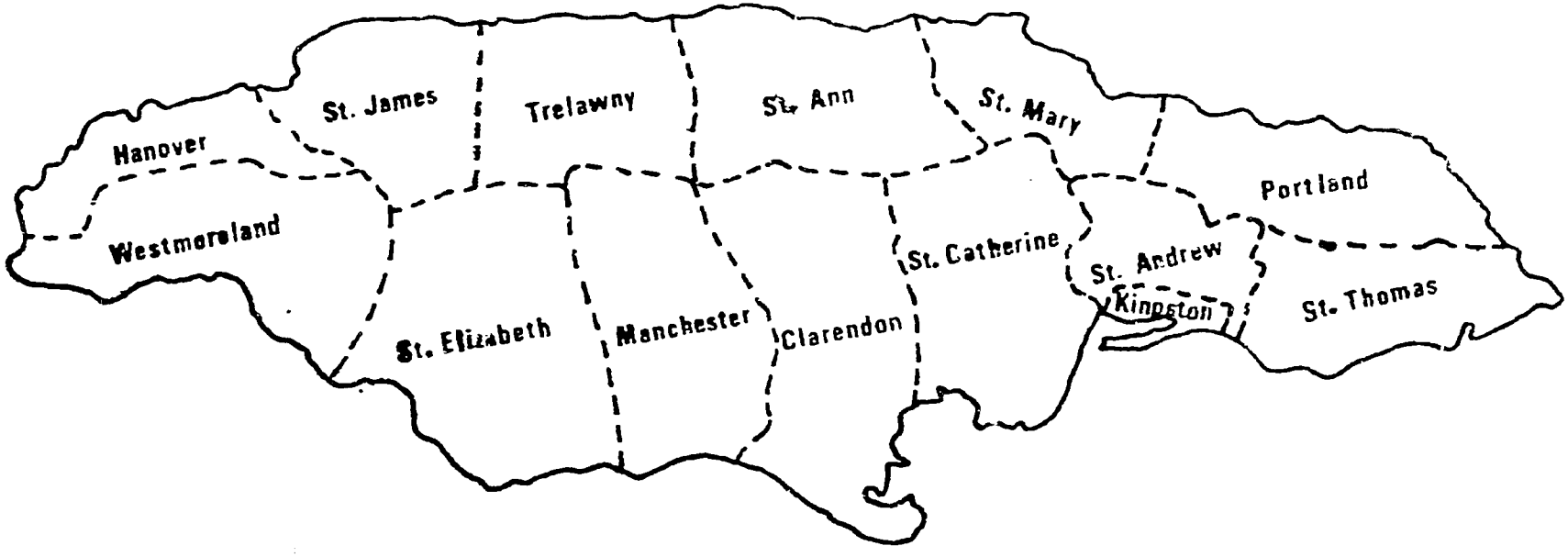
5. Nutrition and Health Policies and Programs

   5.1 Policies
   5.2 Programs

6. Commentaries

Bibliography

MAP OF JAMAICA SHOWING THE VARIOUS PARISHES



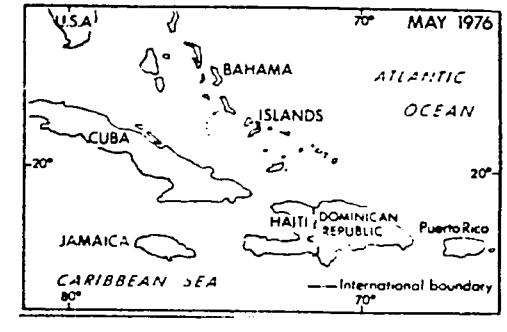


TABLE I

Locations Studied

	Alderman, M.H. et al., 1978	Alderman, M.H. et al., 1973	Alleyne, C. et al., n.d.	Almroth, S. G., 1978	Almroth, S. and Latham, M. C., 1982	Ashworth, A. and Pico, D., 1976	Butler, N., 1981	Brooke, O. G., 1972	Bonaroff, A., 1975	Grantham-McGregor and Back, 1970	Grantham-McGregor, S. M. et al., 1980	Grantham-McGregor, S. M. et al., 1977	Grantham-McGregor, S. M. et al., 1974	Harland, P. S. E. et al., 1981	Hibbert, J. M. and Goolden, 1981	Hibbert, J. M. et al., 1980	Jamaica National Planning Agency, 1981	Kielman, A. et al., 1980	Landman, J. and Hall, J., 1983	Landman, J. P. and Shaw-Lyon, V., 1976	Marchione, T. J., 1977	Marchione, T. J. and Prior, F. W., 1981	Miall, W. E. et al., 1970	Miller, C. G. and Chutkan, 1976	Sheffer, M. L. et al., 1981	Simmons, M. L. et al., 1982	Stoopler, M. et al., 1974	Wheeler, E. F., 1974
National						X			X								X									X			
Kingston			X				X	X		X	X	X	X	X	X	X			X	X			X	X	X		X	X
Bangor Ridge				X																								
Elderslie		X																									X	
Hanover Parish	X																	X										
Hectors River				X																								
Port Antonio				X	X																							
Portland Parish					X																							
St. James Parish																				X	X							
Trelawny																		X										

HIGHLIGHTS

1. **NUTRITION AND HEALTH STATUS:** Significant nutrition and health problems do exist in Jamaica, and the nutritional status of the poor appears to have deteriorated since 1978. Malnutrition has been ascribed as a major cause of, or as a contributing factor in, up to 60 to 85% of all deaths among children between six months and two years of age. PEM in infants is a major nutritional problem, which usually manifests itself as either mixed marasmic-kwashiorkor or as marasmus. An estimated 25 to 30% of all children under the age of three are moderately malnourished, while another one percent is severely malnourished, requiring hospitalization.

Anemia is another major national health problem. A 1972 island-wide survey of 167 pregnant or lactating women from both rural and urban areas indicated that 45% of those women who were pregnant or in the first six months of lactation were anemic. Forty-seven percent of children surveyed in 1978 had hemoglobin levels below 11 g/dl. One quarter of the iron intake of children aged 1 to 3 years was from corn. A study of anemia showed that the mean absorption of iron from corn was only 4.3% in children 5 months to 2 years of age. Nutritional anemia is therefore probably a problem of inadequate iron intake with a decreased absorption.

Diabetes has been recognized as a priority public health problem, and tuberculosis remains a significant cause of death. Diarrhea and acute respiratory diseases are still a problem for children. The proportion of infants (0-12 months) who had ever had diarrhea, according to the method of their feeding, was as follows: only bottle, 80%; mostly bottle, 60%; mostly rbeast, 42%; breast only, 27%; and population overall, 54%.

2. **DIETARY BELIEFS:** Rural mothers differed in the type of foods considered best for infants. Sixty percent felt that a combination of breast and bottle was best, whereas only 36% felt that the breast alone was enough. In the rural areas of Jamaica, education in child care is obtained mainly through direct observation and instruction received informally from older, more experienced women, usually relatives who belong to the mother's same socioeconomic class.

Diagnostic symptoms indicating marasmus were identified by non-clinic mothers and indigenous practitioners as worms or as of the swallowing of "teething water" (diarrhea). Although all mothers believed that improper feeding was a cause of marasmus in one study, many nanas, the traditional midwives, associate marasmus with having a cold rather than with the child's nutritional state.

3. **DIETARY PRACTICES:** Jamaica's major domestic food crops include potatoes, plantains, calaloo, peanuts, pumpkin, corn, rice, cassava, dasheen, sorghum, and soya. The major staple is wheat, which is imported and usually consumed as bread. Overall milk consumption is low, although canned milk is bought for infants. Prior to 1976, there was a move on the part of higher income groups to purchase expensive imported foods. Lower income groups tended to imitate this pattern, to the detriment of their nutritional status. This trend has been partially overcome by stringent foreign exchange regulations.

The food supply in Jamaica is characterized by serious imbalances in distribution between high and low income groups. In low income groups, dietary energy intakes fall short of requirements by about 27%, and in protein intake by about 14%. The most important sources of energy for low income groups are sugar, flour, and rice. The main sources of protein are flour, rice, and bread.

Jamaican households spend, on the average, 70 to 80% of disposable income on food. Jamaican mothers tend to prefer expensive packaged infant foods which are often used well beyond the normal weaning period. Because of the strain on the family budget, it leads to over-dilution of available quantities and subsequently to malnutrition of the children. Jamaican infants are introduced to corn meal as early as 6 weeks, and it is the principal food consumed by infants up to 3 years of age. Corn meal and condensed milk porridge, a traditional weaning food, has a protein content that compares well with WHO/FAO estimates of necessary needs for young children. However, children often become malnourished after eating this porridge because mothers tend to dilute the mixture quite heavily.

Children may not be introduced to food from the family pot until they are 9 to 15 months of age. Seldom are protein-rich items chosen from the pot for the child's use; rather, the starchy vegetables and soup selected are often such a dilute mixture that energy and nutrient requirements cannot be met.

4. NUTRITION STATUS CORRELATIONS: In Jamaica an association between large families and malnutrition does not always hold. Families of between one and three children have accounted for 56% of malnutrition cases. Bottle feeding appears to be correlated to infant nutritional and health problems; the average age of admission to the hospital for children who had never been breast fed or who had been breast fed for less than a month was 6 months. Infants who were predominantly bottle fed in the first three months of life tended to have more frequent episodes of gastroenteritis than children who had been predominantly breast fed.

When mothers are young and/or unmarried, there appears to be a higher risk of infant malnutrition. The percentage of mothers under 20 years of age who had never breast fed their babies or who had breast fed them for less than six months ranged from 100% in St. Andrew, to about 43% in Kingston West.

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS: Within the Ministry of Health, nutrition programs are the responsibility of the Division of Nutrition and Dietetic Services (Nutrition Unit). The Nutrition Unit is active in four areas: supplementary feedings, nutrition surveillance, nutrition education and communications, and training. The aims of the supplementary feeding program were to provide prenatal service for 90% of pregnant women, one post-natal visit for 70% of the mothers, and nutritional surveillance for 90% of all malnourished children 0-4 years of age. The national nutrition campaign tried to increase public awareness of nutritional problems and to alleviate them through changes in dietary habits. The campaign had a sensitization phase for community leaders, a mass-media phase, and a final phase involving the distribution of educational materials.

The Nutrition and Dietetic Division is developing a pilot project to monitor the prevalence of anemia in pregnant women, as well as to fortify certain foods with iron. Procedures for diabetic surveillance have been established in Kingston and, to a more limited degree, in the parishes. The Division is also developing standardized curricula for basic and in-service training for different specialty members of the health teams.

The U.S. AID Health Management Improvement Project provides technical assistance in improving the supplementary feeding program, training materials and in-service training for nutrition staff, additional vehicles for delivery of PL-480 goods, and scales for primary health care clinics. Each of Jamaica's 14 parishes is divided into Health Districts. There are three types of Health Centers in each Health District. In 1980, a total of 373 Health Centers were functioning in Jamaica.

1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

NATIONAL

NUTRITIONAL DEFICIENCIES: PEM in infants is the major nutritional problem, which usually manifests itself as the mixed form of marasmic kwashiorkor in severe cases, or as marasmus; 20% of children under 4 years are significantly malnourished. Iron and folic acid deficiencies cause anemia in about 50% of pregnant and lactating women and in young children. (Licross, 1979)

ANEMIA: A national survey of hemoglobin status of children 3 to 59 months old and of pregnant and lactating women found the highest prevalence of deficiency (below WHO standards) in St. James parish for all three groups, and the lowest rates in St. Elizabeth. (Simmons et al., 1982)

ANEMIA PREVALENCE: Hemoglobin levels, as measured by the 1978 national nutrition survey, were generally low. Forty-seven percent of the children under five surveyed had levels below 10g/dl; 61% of pregnant women had levels below 11g/dl; and many lactating women (no specific percentage given) had concentrations below 12g/dl. (Nutrition Advisory Council, 1978)

ANEMIA: The commonest cause of nutritional anemia seen in Jamaica is probably iron deficiency; a deficiency of folate may also contribute to the anemia. It affects mostly infants from 0 to 18 months of age and pregnant and lactating women. This nutritional anemia is probably a problem of inadequate iron intake with a decreased absorption. (Simmons, 1979)

ANEMIA PREVALENCE: A 1967 survey of 1510 individuals from 35 to 64 years of age from a rural district (Lawrence Tavern) and a suburban area (August Town) found that 9.5% of rural females were anemic (hemoglobin less than 11 g/dl), 9.6% of urban females were anemic, 11.9% of rural males were anemic (hemoglobin less than 12 g/dl for men), and 4.1% of urban males were anemic. Most of the cases of anemia found were attributed to iron deficiency. Hookworm was found in 30.7% of the rural men and 12.7% of the rural women, and hemoglobin levels were slightly lower (0.4 g/dl mean difference) in subjects infected with hookworm. (Simmons, 1979)

ANEMIA AND VITAMIN B-12: A 1965 study of normal adults, hospital patients, pregnant women, infants, and patients with anemia found normal vitamin B_{12} levels in all groups except the patients with anemia. (Simmons, 1979)

FOLIC ACID DEFICIENCY: It has been difficult to ascertain whether there is a deficiency of folic acid in Jamaican diets. In one study the R.B.C. folate level fell to 151 mg/ml during the first six months of lactation, but this is not considered deficient by the authors. Folic acid deficiency is seen at the university hospital, but exact numbers have not been published. (Simmons, 1979)

DIABETES: Diabetes has been recognized as a priority public health problem. Adequate care is difficult because there is only one Nutrition Assistant per parish. (Ministry of Health, 1984)

RICKETS: Vitamin D deficiency is not as rare in Jamaica as previously believed. Nine children with vitamin D deficiency rickets have been seen at the University Hospital of the West Indies during the past 5 years. All were over 3 years of age at time of presentation. Both dietary deficiency of vitamin D and lack of exposure to sunlight seem to be important causes. Children living in rural Jamaica seem to be more susceptible to the disease than those living in a city, due perhaps to more prolonged breast feeding and lack of fortified milk feeds during weaning. (Miller and Chutkan, 1976)

NO GOITER OR VITAMIN A DEFICIENCY: Vitamin A deficiency and goiter are not significant health problems in Jamaica. (Antrobus, 1978)

DEATH RATE: The overall death rate decreased from 6.2 per thousand to an estimated 5.8 per thousand in 1980. (JNPA, 1980)

INFECTIOUS DISEASES: In 1980, the most commonly reported infectious diseases were: gastroenteritis (14,842 cases reported), tuberculosis (166 cases), typhoid fever (165), measles and dengue (36 cases each), leptospirosis (84), diphtheria (13), and tetanus (11). There were no reported cases of malaria; in the years 1977 through 1979, a total of 12 cases had been reported. (JNPA, 1980)

MAJOR DISEASES: Diarrhea and acute respiratory diseases are still a problem in children. Tuberculosis is a significant cause of death. Venereal disease is a problem. Brucellosis is significant, but control measures are underway. The epidemiological pattern in adults is becoming similar to developed countries; accidents are a major problem. There is an active immunization program, and epidemiological surveillance of communicable diseases is operating. Malaria is under control; the only cases are imported. There have been outbreaks of dengue; Aedes aegypti has not been eradicated. (Licross, 1979)

GASTROENTERITIS DEATHS: Deaths from gastroenteritis, as a percentage of total deaths, decreased from 4.9% in 1973 to 3.2% in 1976. (Nutrition Advisory Council, 1978)

JAMAICAN VOMITING SICKNESS: Unique to Jamaica, this ailment most commonly strikes young children in rural areas during the winter months. Characterized by severe vomiting, convulsions, and hypoglycemia, it is often accompanied by worm infestations, malnutrition, malaria, and other disorders. Death frequently occurs within 24 hours. The cause is not known: possibilities include toxins from local foods such as ackee, cassava, and bush teas; poisons ingested by unsupervised children; increased susceptibility to toxins as a result of liver damage from malnutrition or other causes; or psychogenic causes, including witchcraft. (Thomas and Krieger, 1976)

RURAL

ANEMIA PREVALENCE: A 1969 study of 1,350 rural Jamaican children from 3 months to 15 years of age found mean hemoglobin levels ranging from 10.6 g/dl at 3 to 5 months old to 12.3 g/dl at 7 to 15 years of age. A prevalence of anemia of 2.6% to 37% was found using 10 g/dl as a standard. (Simmons, 1979)

1.2 NUTRITION AND HEALTH STAUS, WOMEN, PREGNANT

NATIONAL

MALNUTRITION: The exact prevalence rate of malnutrition in pregnant women is not known, but it is clearly a problem. (Antrobus, 1978)

ANEMIA IN PREGNANT AND LACTATING WOMEN: A 1972 island-wide survey of 167 pregnant or lactating women considered to be a representative sample, including women from rural and urban areas, indicated that 45% of those women who were pregnant or in the first six months of lactation were anemic (hemoglobin less than 11 g/dl in pregnancy and 12 g/dl during lactation). Half of the anemia cases had hemoglobin levels of less than 10 g/dl. Of the women who were pregnant or in the first six months of lactation, half were identified as iron deficient on the basis of their serum iron level and total iron-binding capacity. Red blood cell folate was measured. The authors concluded that although red cell folate levels declined throughout pregnancy and the six months of lactation, folate deficiency did not contribute to anemia in these women. (Simmons, 1979)

ANEMIA: 45% of pregnant and lactating women were anemic according to a study of 167 women conducted in 1970. None of the women were receiving iron supplements. Intestinal parasites, especially hookworm, were common. (Ashworth and Picou, 1976)

ARM CIRCUMFERENCE: According to the 1978 National Nutrition Survey, approximately 21% of pregnant and lactating women had arm circumference measurements considered to be below the lower limit of normality. (Nutrition Advisory Council, 1978)

RURAL

ANEMIA: The mean hemoglobin level of 134 pregnant rural women was 10.4 g/dl; the WHO standard is 11.0 g/dl. Hemoglobin levels were below 11.0, 10.0, and 8.0 g/dl for 60.5, 39.6, and 4.5%, respectively. (Simmons et al., 1982)

URBAN

ANEMIA: The mean hemoglobin level of 95 pregnant urban women was 10.4 g/dl; the WHO standard is 11.0 g/dl. Hemoglobin levels were below 11.0, 10.0, and 8.0 g/dl for 63.2, 45.3, and 7.4%, respectively. (Simmons et al., 1982)

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

RURAL

ANEMIA: The mean hemoglobin level of 262 lactating rural women was 11.9 g/dl; the WHO standard is 12.0 g/dl. Hemoglobin levels were below 12.0, 10.0, and 8.0 g.dl for 44.7, 13.4, and 1.9%, respectively. (Simmons et al., 1982)

URBAN

ANEMIA: The mean hemoglobin level of 161 lactating urban women was 11.7 g/dl; the WHO standard is 12.0 g/dl. Hemoglobin levels were below 12.0, 10.0, and 8.0 g/dl for 55.2, 14.3, and 1.9%, respectively. (Simmons et al., 1982)

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

NATIONAL

ANEMIA: The national survey of hemoglobin status found the lowest levels among children 3 to 23 months old. Among 66 children 3 to 5 months old, the mean was 9.9 g/dl; the WHO standard is 11.0 g/dl. (Simmons et al., 1982)

INFANT MORTALITY RATE: The infant mortality rate decreased from 12.4 per thousand in 1979 to 11.3 per thousand live births in 1980. (JNPA, 1980)

MORTALITY RATES: There was considerable variation in infant mortality among parishes in 1974, ranging from 16-17 per 1,000 live births in St. Thomas to 34 per 1,000 in St. James. Malnutrition was a determinant in only 10-16% of all deaths, compared to 34% from perinatal causes. (World Bank, 1976)

RURAL

DIARRHEA AND FEEDING METHOD: The proportion of infants (age 0-12 months) who had ever had diarrhea, according to method of feeding, was as follows: only bottle, 80%; mostly bottle, 60%; mostly breast, 42%; breast only, 27%; and population overall, 54%. (Almroth and Latham, 1982)

BIRTH WEIGHT AND RISK--ELDERSLIE: Analysis of anthropometric data showed that children weighing less than six pounds at birth were at greater risk of malnutrition than others. (Alderman et al., 1973)

PERINATAL MORTALITY--TRELAWNY: The reported death rate of children 0 to 7 days old in Trelawny parish from 1971 through 1975 was as follows: 11.78; 8.74; 5.37; 5.94; and 5.64, respectively, per thousand population. (Kielman et al., 1980)

NEONATAL MORTALITY--TRELAWNY: The reported death rate of children 0 to 28 days old in Trelawny parish from 1971 through 1975 was as follows: 14.21; 10.28; 8.59; 11,88; and 9.03, respectively, per thousand population. (Kielman et al., 1980)

INFANT MORTALITY--TRELAWNY: The reported death rate of children 0-1 year of age in Trelawny parish from 1971 through 1975 was as follows: 38.71; 28.8; 19.86; 26.14; and 19.75, respectively, per thousand population. (Kielman et al., 1980)

PERINATAL MORTALITY--HANOVER: The reported death rate of children 0-7 days old in Hanover parish from 1971 through 1975 was as follows: 2.80; 1.08; 1.25; 2.59; and 7.79, respectively, per thousand population. Researchers were of the opinion that 0-28 day deaths are underreported in the parish. (Kielman et al., 1980)

NEONATAL MORTALITY--HANOVER: The reported death rate of children 0-28 days old in Hanover parish from 1971 through 1975 was as follows: 5.04; 4.86; 6.24; 5.17; and 9.21, respectively, per thousand population. Researchers were of the opinion that 0-28 day deaths are underreported in the parish. (Kielman et al., 1980)

INFANT MORTALITY--HANOVER: The reported death rate of children 0-1 year of age in Hanover parish from 1971 through 1975 was as follows: 25.78; 37.26; 25.58; 20.70; and 24.07, respectively, per thousand population. (Kielman et al., 1980)

URBAN

LOW BIRTH WEIGHT--KINGSTON: 11% of children born in University Hospital in Kingston had birth weights below 2.5 kilograms. (Grantham-McGregor et al., 1977)

BIRTH WEIGHT: Mean birth weight among urban infants born in the hospital was 3.1 kilograms. (Landman and Shaw-Lyon, 1976)

WEIGHT: Mean weight at birth was less than the Boston standard. Between 2 to 8 months Kingston and Boston values were similar. Thereafter, Kingston babies were on average smaller than American means. (Landman and Shaw-Lyon, 1976)

BIRTH WEIGHTS--KINGSTON: A review of two studies of birth weights found that weights were low in Kingston. Poor maternal nutrition was a factor contributing to low birth weight babies. (Ashworth and Picou, 1976)

HEMOGLOBIN LEVELS: Mean hemoglobin level among males at birth was 19.5 grams/100 ml., at 3 months the mean was 10.7, at six months the mean was 10.5, and at one year the mean was 10.6. Among girls mean hemoglobin levels were 19.5, 10.9, 10.7, and 10.7 in each respective age category. (Grantham-McGregor et al., 1974)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

NATIONAL

MORTALITY: In 1979, the mortality rate among children age 1 to 4 years was 3 deaths per 1000; in 1960, the rate had been 7 per 1000. (World Bank, 1981)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS (Cont.)

MORTALITY: Mortality among children 1 to 4 years of age was 4.5 per thousand in 1974, twice the rate of Barbados, Puerto Rico, and Trinidad and Tobago. (Nutrition Advisory Council, 1974)

MORTALITY: In 1974 the infant mortality rate was 25.9 per thousand, and the overall mortality rate was 7.2 per thousand. The mortality rate of children aged 1-4 years was 4.5 per thousand, and the leading cause was protein calorie malnutrition. (Antrobus, 1978)

MALNUTRITION AND MORTALITY: It is estimated that malnutrition contributes directly or indirectly to 60-85% of all deaths among children between six months and two years of age. (World Bank, 1976)

MALNUTRITION AND MORTALITY: Malnutrition is the single largest cause of death in the one-year age group. About one-fifth of all children under five are significantly underweight for their age. About 3% are so severely malnourished in the second year of life as to require urgent treatment. (Nutrition Advisory Council, 1974)

CAUSES OF DEATH: The principal causes of death of children under 5 in 1977 in order of frequency were: infectious intestinal disease, conditions originating in perinatal period, pneumonia and influenza, nutritional deficiencies, and congenital anomalies. (JNPA, 1980)

MALNUTRITION AND MORTALITY: Malnutrition was a contributing factor in 84% of all deaths from gastroenteritis, and 43% of deaths from pneumonia in 1963. It contributed directly or indirectly to 78% of the total infant and child deaths. The picture had not improved as of 1976. (World Bank, 1976)

MALNUTRITION AND HOSPITALIZATON: Malnutrition has been a primary or secondary diagnosis for about 50% of hospital admissions of children under two years of age. (World Bank, 1976)

PREVALENCE OF MALNUTRITION: It is thought that almost every Jamaican child goes through a phase of mild or severe protein-energy malnutrition, due to the social and economic problems affecting many families, including high worker/dependent ratios, absent fathers and/or mothers, and extended households. (Nutrition Advisory Council, 1978)

MALNUTRITION PREVALENCE: A national nutrition survey was carried out in 1978 to determine the prevalence of malnutrition in the country. The results were as follows for children under 5 years of age: Gomez Grade III (1%); Gomez Grade II (7%); and Gomez Grade I (31%). The situation is worse in rural areas and especially in the second and third years of life. (Nutrition Advisory Council, 1978)

MALNUTRITION PREVALENCE: The prevalence of malnutrition in children under 5 is about 35%, with a peak of severe malnutrition in the second year of life. (Antrobus, 1978)

MALNUTRITION: An estimated 25-30% of all children under the age of three are moderately malnourished, and 1% are severely malnourished, requiring hospitalization. (Nutrition Advisory Council, 1978)

NUTRITION STATUS: Of the children seen at health centers in 1980, whose nutritional status was assessed, 74% were classified as normal or above; 22% were mildly malnourished; 3.5% were moderately malnourished; and 0.5% were severely malnourished. (JNPA, 1980)

NUTRITION STATUS TRENDS: Data collected on the nutritional status of children comparing the periods January-March 1980 and 1981 showed little difference between these two time periods. There were, however, significant differences between these and the data from the 1978 National Nutrition Survey, showing an increase in the number of children classified as normal, and a decrease in the numbers of Grade I and Grade II malnourished children. (JNPA, 1980)

MALNUTRITION-RELATED DEATHS: Malnutrition, with or without infection, has been ascribed as the cause of death, or as a contributing factor in the deaths, of two-thirds of all deaths of children aged 0-4 years. Until recently child deaths constituted about 50% of all Jamaican deaths, in spite of the fact that preschool children made up only 20% of the population. (Kielman et al., 1980)

MALNUTRITION AND MORTALITY: Malnutrition was a contributing cause in 64.7% of childhood deaths between 6 months and 3 years of age. (Gratham-McGregor and Back, 1970)

MALNUTRITION AND HOSPITALIZATION: Malnutrition and gastroenteritis are among the main causes of illness and death in children aged 0-23 months and 24-59 months. Hospital admissions are highest in the 0-23 month age group and are approximately three times the number of admissions in the 24-59 months age group. Malnutrition accounted for about 5% of admissions of children under two in urban areas, and up to 22% of admissions in rural areas. (Nutrition Advisory Council, 1978)

CHARACTERISTICS OF MALNOURISHED CHILDREN: A study of 248 children treated for malnutrition found: 8.4% had never been breast fed, 6.7% had been breast fed for less than one month, and 26.7% were breast fed for over 7 months. 50% had been ill for 3 months or less. Gastrointestinal symptoms were the most common, and 58% of the children had both vomiting and diarrhea. 69% had hair changes, 40% had skin changes, and 31% had both. 39% had significant edema and 37% had livers enlarged more than 2 cm below the costal margin. Half the children were moderately anemic. Sixteen children died, a mortality rate of 6.5% There has been no significant change in the pattern of infantile malnutrition over the past 14 years. (Alleyne, 1970)

WEIGHT FOR AGE: A review of 6 anthropometric studies conducted between 1968 and 1973 found that about half of children under five years of age were underweight. According to the Gomez classification, 0.5 to 2% were severely malnourished; 8 to 17% were moderately malnourished; and about 30 to 40% had mild PCM. (Ashworth and Picou, 1976)

ANEMIA: Among a national sample, the mean hemoglobin level was 9.7 g/dl for 116 infants 6 to 11 months old and the same for 213 age 12 to 33 months. The WHO standard is 11.0 g/dl. (Simmons et al., 1982)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS (Cont.)

ANEMIA: Anemia is one of the major national health problems. Forty-seven percent of the children surveyed in 1978 had hemoglobin levels below 11g/dl. (Israel, 1981)

NUTRITION AND ANEMIA: Food Balance Sheets for Jamaica indicate a high level of phytates, which are inhibitors of iron absorption. One quarter of the iron intake of children aged 1-3 years was from corn. A study of anemia showed that the mean absorption of iron from corn was only 4.3% in children 5 months to 2 years of age. Nutritional anemia is therefore probably a problem of inadequate iron intake with a decreased absorption. (Simmons, 1979)

LACTOSE MALABSORPTION: The results of a 1974 study indicate that a high percentage of Jamaican children under 4 years of age cannot absorb lactose, and this percentage increases significantly after the first year of life. Lactose malabsorption occurred in 56% of a random sample of 94 rural children and in 70% of a sample of 20 urban children. The results of this study do not justify cessation of a supplemental milk feeding program. (Stoopler et al., 1974)

MORBIDITY: The major reported cause of morbidity in children under five years of age in 1930 was gastroenteritis, followed by tuberculosis and typhoid fever. However, diseases were not consistently reported in all parishes for the whole year. There were no reported cases of cholera, yellow fever, scarlet fever, plague, poliomyelitis, small pox, or malaria. (JNPA, 1980)

GASTROENTERITIS—PREVALENCE: The prevalence of gastroenteritis was 37.2% for the Kingston and St. Andrew Corporation areas, and 22.2% for the 14 parishes, for the under one year age group. (Nutrition Advisory Council, 1978)

GASTROENTERITIS: In an attempt to provide reliable information on the prevalence of gastroenteritis nationwide, the Ministry of Health and Environmental Control carried out an anthropometric survey, together with the Caribbean Food and Nutrition Institute. Among a sample of 2935 children, 263 (9%) had had gastroenteritis in the two weeks prior to the survey. Broken down by age group, the rates were: 0-5 months, 6%; 6-11 months, 16.2%; 12-23 months, 11.3%; 24-35 months, 10.0%; 36-47 months, 5.5%; and 48-49 months, 7.5%. (Nutrition Advisory Council, 1978)

GASTROENTERITIS—SEASONAL: The incidence of gastroenteritis shows a distinct seasonal pattern. There is a gradual rise from June through September, which levels off until December. The peak months are January and February. In March the incidence drops off sharply and continues to decrease until June. The pattern for respiratory diseases appears to follow a similar trend, which seems to indicate some kind of relationship between the two ailments. (Nutrition Advisory Council, 1978)

GASTROENTERITIS: Data on morbidity are not readily available due to incomplete reporting by hospitals and other sources. Some data from Bustamente Hospital for Children for the period 1973-1977 show that out of 30,364 cases admitted, 12.9% were attributed to gastroenteritis. (Nutrition Advisory Council, 1978)

GASTROENTERITIS: The age distribution of 8,039 cases of gastroenteritis examined by the Casualty Department of the Bustamente Hospital for Children between January and April 1978, as a percentage of the total, were as follows: under 1 year (37.2%) 1 year (32.6%); and 2-4 years (30.2%). When the group of cases under one year of age was broken down, it was clear that the 6 month to one year age group was more seriously affected than the 0-6 month age group. (Nutrition Advisory Council, 1978)

RURAL

ANEMIA: The mean hemoglobin level of 530 rural children 3 to 59 months old was 10.1 g/dl; the WHO standard is 11.0 g/dl. Hemoglobin levels were below 11.0, 10.0, and 8.0 g/dl for 68.0, 46.1, and 11.7%, respectively. (Simmons et al., 1982)

HOOKWORM: A study of rural children found hookworm eggs in about 10% of children over 2 years old. The authors stated that helminthiasis, although common, does not appear to be a major cause of ill health or failure to thrive among Jamaican children. (Simmons, 1979)

MALNUTRITION RATE--ELDERSLIE: The prevalence of malnutrition, based on an anthropometric survey conducted in Elderslie in November 1970, was as follows: Gomez Grade I (33%); Gomez Grade II (8%); and Gomez grade III (1%). (Alderman et al., 1973)

MALNUTRITION MEASURES--ELDERSLIE: Analysis of data from an anthropometric survey in Elderslie showed that using a left arm circumference measurement one obtained a similar size, but slightly different population of malnourished children than the one obtained using weight-for-age standards. (Alderman et al., 1973)

PARASITE INFECTION--ELDERSLIE: A survey revealed that 75% of children under 5 years of age at Elderslie (a mountainous, rural area in west-central Jamaica) harbored parasites. Trichuris was most common, Ascaris frequent, hookworm extremely rare, and Giardia was not found. (Stoopler et al., 1974)

PREVALENCE OF MALNUTRITION--HANOVER: The prevalence of malnutrition in East Hanover at the onset of the Young Child Nutrition Program (1973) was as follows: normal--at least 90% of the weight-for-age standard (57.7%); Grade I--75-90% of the standard (31.5%); Grade II--60-75% of the standard (9.8%); and Grade III--below 60% of the standard (1.1%). The corresponding figures for West Hanover are as follows: normal (50.1%); Grade I (36.8%); Grade II (11.5%); and Grade III (1.5%). (Alderman, 1978)

MALNUTRITION AND MORTALITY RATES AND INTERVENTIONS--HANOVER: Malnutrition rates (Gomez Grade II and III) were 10.9% and 13.0% respectively in the east and west halves of Hanover Parish before the Young Child Nutrition Program; one year later, after initiation of the program, rates had decreased to 5.9% and 6.6% respectively. These results are statistically significant at the level of $p<.00005$. Mortality among children aged 1 to 48 months declined from 14.5 per 1000 to 6.0 per 1000. (Alderman et al., 1978)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS (Cont.)

MORTALITY RATES--HANOVER: The reported death rates of children 1-2 years of age in Hanover parish from 1971 through 1975 were as follows: 15.24; 17.52; 9.57; 12.35; and 4.05, respectively, per thousand population. (Kielman et al., 1980)

CAUSES OF DEATH--HANOVER AND TRELAWNY: The majority of deaths in the parishes of Hanover and Trelawny during the period 1971-1975 were among children 28 days to 2 years of age, and were mostly accounted for by broncho-pneumonia, malnutrition, gastroenteritis, and pneumonia. Similar reductions occurred in the death rates for all age groups in both parishes, except for the 1-2 year age group. About 50% of the reduction took place prior to the onset of the Hanover Young Child Nutrition Program. (Kielman et al., 1980)

MORTALITY RATES--TRELAWNY: The reported death rates of children 1-2 years of age in Trelawny parish from 1971 through 1975 were follows: 6.50; 9.19; 5.89; 5.03; and 3.72, respectively, per thousand population. (Kielman et al., 1980)

MALNUTRITION--PORTLAND: About one-third of the infants aged 0-12 months in the sample suffered from mild to moderate PEM (61-90% of standard weight for age). The majority of the children (24%) fell between 81% and 90% of the standard. (Almroth and Latham, 1982)

WEIGHT FOR HEIGHT--PORTLAND: 68% of the infants aged 0 to 12 months in the sample were above 90% of the standard weight for height. 28% were between 81% and 90% of the standard, and the remaining 4% were between 71% and 80% of the standard. (Almroth and Latham, 1982)

HEIGHT FOR AGE--PORTLAND: 97% of the infants aged 0 to 12 months in the sample were above 90% of the standard length for age. (Almroth and Latham, 1982)

MALNUTRITION--WEIGHT FOR AGE--ST. JAMES: Serious forms of malnutrition (Gomez II and III classifications) in children under three years of age decreased from 9.5% to 4.5% in St. James between 1973 and 1975, in spite of the food crisis. (Marchione, 1977)

MALNUTRITION TRENDS--ST. JAMES: Among children birth to 36 months of age in St. James Parish, 7.4% were in Gomez Classes II and III in 1973 and 4.5% were in this category in 1975. (This was not a statistically significant difference.) In the rural areas, 9.5% were Gomez Class II and III in 1973 and 4.5% in 1975, significant at the $p<.05$ level. Taking one year olds as a separate sample, 10.9% were malnourished in 1973 and 9.2% in 1975. (Marchione and Prior, 1931)

MALNUTRITION--ST. JAMES: The proportion of normal and mildly malnourished children under three years of age increased from 90.5% in 1973 to 95.5% in 1975. The proportion of severely malnourished children (75% of the standard or less) decreased from 9.5% in 1973 to 4.5% in 1975. (Marchione, 1977)

HEIGHT FOR AGE--ST. JAMES: The proportion of rural children under three years of age attaining 90% of the standard length for age was 94.2% in

1973 and 94.3% in 1975. The proportion of children under 90% of the standard was 5.8% in 1973 and 5.7% in 1975. These differences were not statistically significant. (Marchione, 1977)

MALNUTRITION--SEMI-SUBSISTENCE FARMING--ST. JAMES: The proportion of normal and mildly malnourished children (at least 75% of the standard) from semi-subsistence farming families increased from 85.6% in 1973 to 95.7% in 1975. The proportion of severely malnourished children decreased from 14.4% to 4.3% over the same time period ($t=1.37$; $p<.1$). (Marchione, 1977)

MALNUTRITION--NON-SUBSISTENCE FARMING--ST. JAMES: The proportion of normal and mildly malnourished children (at least 75% of the standard) from non-subsistence farming families was 94.6% in 1973 and 95.9% in 1975. The proportion of severely malnourished children was 5.4% in 1973 and 4.1% in 1975. These changes were not statistically significant. (Marchione, 1977)

MALNUTRITION RATES--ST. JAMES: Both height and weight measures confirmed the presence of persistent growth problems in the 12 to 24 month age group. 52.3% of one year old children were normal weight for age, 36.7% were Gomex class I; 10.9%, class II; and 0%, class III in 1973; in 1975 figures were 46.2%, 44.5%, 6.7%, and 2.5% in each respective category. 12.8% of children 12 to 24 months were between 90 and 94% of expected height for age, 3.7% were between 85 and 89%, and .9% were below 86% of expected height for age in 1973. Figures for 1975 were 13.3%, 7.1%, and 4.1% in each category. (Marchione and Prior, 1981)

URBAN

MALNUTRITION: The proportion of normal and mildly malnourished children under three years of age decreased between 1973 and 1975 from 96.1% to 95.5%. The proportion of children attaining 75% of the standard or less, on the contrary, increased from 3.9% to 4.5% over the same time period. (Marchione, 1977)

WEIGHT FOR AGE: One hundred fifty-one children aged 6 to 23 months from three well baby clinics in Kingston, representing a range of socioeconomic groups, were weighed and assessed using weight for age criteria. The mean percentage of the ideal weight for age for all the infants was 94.31 ± 13.75. There was no difference between the sexes. Fourteen percent of the infants were below 80% of the ideal weight for age. (Hibbert et al., 1980)

WEIGHT FOR AGE: Among children under three years of age using the Pediatric Wards of University Hospital on an out-patient basis, 9.3% were moderately malnourished and 1.7% were severely malnourished. Among those admitted to the hospital, rates were 29.1% and 17.1% respectively. (Ashworth and Picou, 1976)

HEIGHT FOR AGE: The proportion of malnourished urban children under three years of age attaining 90% of the standard length for age decreased from 98.2 in 1973 to 96.8 in 1975. The proportion of children under

three under 90% of the standard length for age increased from 1.8% in 1973 to 4.2% in 1975. (Marchione, 1977)

MALNUTRITION AND HYPOTHERMIA: Hypothermia (rectal temperature below 35 degrees centigrade) occurred in 19.7% of children being treated for PEM. Hypothermia was not found to be an unfavorable prognostic sign in malnourished Jamaican children. Hypothermia was more common among children with marasmus than with kwashiorkor. (Brooke, 1972)

ANEMIA: The mean hemoglobin level of 357 urban children 3 to 59 months old was 10.1 g/dl; the WHO standard is 11.0 g/dl. Hemoglobin levels were below 11.0, 10.0, and 8.0 g/dl for 70.9, 46.8, and 9.8%, respectively. (Simmons et al., 1982)

ANEMIA: A longitudinal investigation of 300 infants from birth to one year of age in Kingston found that mean hemoglobin levels varied with age. After the expected fall in hemoglobin levels from birth to 3 months of age, the lowest level was reached in both male and female infants at 8 months of age. In 88% of the stools examined, no parasites were found. Hookworm was found in none of the stools. At 8 months, 76% of the children had hemoglobin levels less than 11 g/dl, 41% less than 10 g/dl. At 12 months 24% had less than 10 g/dl. By 18 months 46% had less than 10 g/dl. Since low levels of hemoglobin were found as early as 3 months, it appears that the iron stores at birth of these infants were poor. The low mean birth weights found in this study could have contributed to the low iron stores at birth. The authors felt that the high incidence of anemia in other infants was almost certainly due to poor iron intake and absorption, the result of poor diets in which cornmeal is the staple food. It has been shown that iron from this source is very poorly absorbed by Jamaican children. (Simmons, 1979)

ANEMIA: 37% of Kingston children 10 months of age were found to be anemic, according to their mean corpuscular hemoglobin concentration; 43% were anemic as measured by serum iron; and 49% were anemic as measured by percent saturation of transferrin. (Grantham-McGregor et al., 1974)

CAUSES OF LOW LEVELS OF HEMOGLOBIN: Low levels of hemoglobin found in children 3 to 12 months of age in Kingston were due to poor iron stores at birth and later due to poor iron intake and absorption. (Grantham-McGregor et al., 1974)

PARASITES: The stools of 148 children were examined for parasitic cysts and ova at 10 to 12 months of age. In 88% of the stools no parasites were found. 8% had Giardia lamblia, 3% had Ascarsis lumbricoides, 1% had Trichuris trichiura, and 1% had both Ascaris and Trichuris. No hookworm was found. (Grantham-McGregor et al., 1974)

CAUSES OF DEATH IN HOSPITAL: Among children one month to two years of age in the Pediatric Department of University Hospital, from 13% to 21% of deaths were due to malnutrition; 19 to 21% of deaths were due to gastroenteritis; and 16 to 31% of all deaths were due to respiratory infections during the years 1972 to 1974. These three illnesses accounted for 50% of all deaths in this age group. (Ashworth and Picou, 1976)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

NATIONAL

CHILDREN'S FOODS: When asked what foods were especially good for cildren, mothers replied biscuit, bread, ripe banana, milk, orange juice, syrup and sugar water, carbonated beverages, custard, and soup. (Reddy, 1971b)

2.2 DIETARY BELIEFS, ABOUT PREGNANCY

URBAN

FOODS' EFFECTS ON BABY: 75% of the women interviewed reported superstitions concerning pregnancy. Magnesia, bitters, milk, or orange were thought to affect the infant's skin (20%). 13% thought that drinking from a bottle or a coconut would cause cast eye in the child. 10% believed that eating chili peppers would cause red, raw, watery, or cast eyes, or blindness in the baby. 10% thought that eating too much food, milk, or tea would produce too large an infant. (Landman and Hall, 1983)

FOODS TO FACILITATE DELIVERY: Foods thought to facilitate delivery were: okra, 14%; thyme tea, 7%; cobweb tea, .8%; ginger tea, .8%; and raw egg, .8%. (Landman and Hall, 1983)

WATER AND ICE: 11% of pregnant women interviewed thought that drinking water or eating a lot of ice was associated with too much "head water" and might stifle or drown the fetus. Some (11%) also thought it might cause "lingering" pain. (Landman and Hall, 1983)

SUGAR CANE AND LABOR: 8% of the pregnant women interviewed thought that eating sugar cane during pregnancy would cause "lingering," "long," "niggling," "negril," or "ningering" labor pains, ague, or premature delivery. (Landman and Hall, 1983)

2.3 DIETARY BELIEFS, ABOUT LACTATION

NATIONAL

BELIEF OF INADEQUACY: 18% of mothers commenced bottle feeding because they believed their breast milk was insufficient. 41% of these mothers said the baby cried after breast feeding. Mothers appeared to be only too ready to attribute child's crying to inadequate breast milk. 27% said their breasts were not as full as they should be; 18% had no specific indication of inadequacy; 4.5% believed their diets were not adequate to enable them to have adequate breast milk, generally because they lacked much meat, fish, eggs, cheese, and milk, foods they believed necessary for breast feeding. (Reddy, 1971a)

2.3 DIETARY BELIEFS, ABOUT LACTATION (Cont.)

URBAN

KNOWLEDGE OF BREAST FEEDING: At nine weeks postpartum, 69% of mothers who had received education about breast feeding recalled being told that breast feeding was best for babies. 44% gave correct responses when asked why breast feeding was best. 35% recalled receiving supervision while breast feeding at the hospital, and 68% recalled aspects of breast care. (Landman and Shaw-Lyon, 1976)

FEEDING METHOD PREFERENCE: 74% of newly delivered mothers said that breast was best, 20% said both breast and bottle were best, and 5% said bottle was best. (Landman and Shaw-Lyon, 1976)

2.4 DIETARY BELIEFS, ABOUT BREAST MILK SUBSTITUTES (INCLUDING BOTTLE FEEDING)

NATIONAL

DRIED SKIM MILK: 55% of mothers say dried skim milk is good for children, while 25% say it is not good. (Reddy, 1971b)

RURAL

SUPPLEMENTATION: Mothers asked what kind of feeding they thought was best for infants responded: combination of breast and bottle, 60%; breast only, 36%; bottle only, 3%. Of those who thought that the combination of breast and bottle was best, one third said that breast milk alone is not enough. (Almroth and Latham, 1982)

2.5 DIETARY BELIEFS, ABOUT WEANING

NATIONAL

PEAS AND BEANS: Peas and beans are not generally accepted as suitable items in infant and young child feeding. 35.4% of mothers never feed their young children peas, and 36.4% say it is not good. Reasons given are: children cannot chew them, indigestible, child may choke on peas, cause diarrhea, and cause gas. (Reddy, 1971b)

SPINACH: 14% of mothers surveyed did not think spinach was good to feed to young children. (Reddy, 1971b)

HEALTH WORKERS AND WEANING FOODS: Many health workers felt that the mixture of corn meal and condensed milk was an unsuitable weaning food. The sugar in the condensed milk was said to "dilute the protein" to dangerously low levels; corn meal was seen as a low protein "starchy" food, and it was noted that a number of malnourished children had a history of having been fed on this mixture. Mothers were advised to use skimmed milk powder instead of condensed milk and to add legumes and other high protein foods to corn meal porridge. (Wheeler, 1974)

SUPERSTITIONS: According to the results of the baseline survey for the National Nutrition Education Campaign, over 60% of all Jamaican women have some superstitious beliefs and misconceptions about feeding young children. (Nutrition Advisory Council, 1978)

2.6 DIETARY BELIEFS, ABOUT ILLNESS AND CURE

NATIONAL

SYMPTOMS OF PCM: Diagnostic symptoms recognized by modern medicine as indicating marasmus were identified by non-clinic mothers and indigenous practitioners as worms or swallowing of teething water (diarrhea). These were perceived as threats to the child but at the same time were viewed as ordinary occurrences of childhood and not considered especially harmful. It was only when they were prolonged and complicated with cold symptoms that the child's condition was rediagnosed as serious. (Fonaroff, 1975)

CAUSES OF MARASMUS--MOTHERS: All mothers believed that improper feeding was a cause of marasmus. Food was not the prime cause of marasmus according to nanas, indigenous health workers, and mothers who did not use clinics. For these groups diet was a contributory factor, and other causes of marasmus were: a child having a cold due to exposure to drafts or wetness, a child having "bad blood" caused by the mother's improper prenatal behavior; or a child being invaded by a ghost because of the mother's improper sexual behavior, the improper burial of a close relative, or the recent death of the mother. (Fonaroff, 1975)

CAUSES OF MARASMUS--MIDWIVES: According to nanas, traditional midwives, marasmus was associated with having a cold rather than nutritional state. They agreed that proper feeding kept the baby strong but that marasmus could be avoided by the use of herbs, purgatives at times, cough syrups, and keeping the child from getting wet. (Fonaroff, 1975)

CAUSES OF MARASMUS--MOTHER'S WORK: Both mothers and traditional midwives believed that children were more susceptible to marasmus when the mother was working and especially when she was forced to migrate to find work, leaving relatives and friends. This observation was substantiated by the relatively higher incidences of PEM found in areas of heavy migration. (Fonaroff, 1975)

CURES FOR PEM: Mothers believed that for a healthy prognosis in treatment of PCM it was necessary to have "proper care," which meant a combination of affection, adequate diet, and doctoring. (Fonaroff, 1975)

FOOD FOR THE MARASMIC CHILD: Traditional practitioners and mothers who used indigenous medical care said that the child who did not get "right feed" might get marasmus. "Right feed" was defined as including cereals and vegetables, enhanced by bush or herb teas and body-building tonics. (Fonaroff, 1975)

CAUSES OF DIARRHEA: The local name for loose bowels was "swallowing of teething water." Diarrhea associated with teething was believed to be caused by swallowing saliva. (Fonaroff, 1975)

FOODS AND INDIGENOUS COLD THERAPIES: Indigenous cold therapies often required the removal of important foods at certain stages, such as avoidance of milk because it tends to "curdle the milk." (Fonaroff, 1975)

2.6 DIETARY BELIEFS, ABOUT ILLNESS AND CURE (Cont.)

COMMON ILLNESSES: Mothers and traditional practitioners were asked to list the common ailments or sicknesses expected for every child. The most common responses were worms, "swallowing of teething water" (a local name for loose bowels associated with teething, thought to be caused by swallowing saliva), colds, fevers, and measles. (Fonaroff, 1975)

RURAL

EDUCATION CONCERNING CHILD CARE: In rural areas education in child care was obtained mainly through direct observation and through instruction received informally from older, more experienced women, usually relatives, belonging to the mother's same socioeconomic class. (Fonaroff, 1975)

3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

FOOD CROPS: Jamaica's major domestic food crops are: Irish potatoes sweet potatoes, horse plantains, other plantains, beetroot, cabbage, calaloo, carrot, peanuts, cucumber, pumpkin, tomato, scallion, onion, hybrid corn, ordinary corn, rice, bitter cassava, sweet cassava, yams, and dasheen. Overall production increased by 4.9% between 1980 and 1981. (JNPA, 1981)

MAJOR CROPS: Crops grown in Jamaica include cassava, vegetables, pineapples, sorghum, millet, sunflowers, and soya. (Development Assistance Corporation, 1981)

STAPLES: The major staple is wheat, which is wholly imported and usually consumed as bread. Small amounts of maize-meal and rice (some of which is imported) are also eaten. Yams, plantains, breadfruit, potatoes, and sweet potatoes are important minor staples. Small amounts of cassava are also used. Local starchy foods have been increasing in importance. (Lieross, 1979)

FOODS EATEN: In addition to staples, coconut products, including oil, and legumes such as pigeon peas, cow-peas, lima beans, and dried peas are important secondary foods. Eaten less regularly are vegetables including tomatoes, cabbage, pumpkin, tropical fruits, and bananas. Overall milk consumption is low, although canned milk is bought for infants. Onions, garlic, chilies, and ginger are the main condiments. Sugar cane is consumed as sugar or as rum. In the poorer sections, fish is the most common animal protein consumed; beef, mutton, goat, pork, and chicken are occasionally consumed. (Lieross, 1979)

RETURN TO TRADITIONAL FOODS: Prior to 1976, there was a tendency on the part of higher income groups to purchase expensive imported foods. There was a tendency on part of lower income groups to imitate this pattern, to the detriment of their nutritional status. This trend has been partially overcome by more stringent foreign exchange regulations, which have brought about a shift back toward indigenous crops such as yams, sweet potatoes, and dasheen. (Nutrition Advisory Council, 1978)

CALORIE SUPPLY: The supply of available calories in 1977, 2,660 calories per person per day, was 119% of the amount estimated by FAO as necessary to meet requirements. (World Bank, 1981)

CALORIE AND PROTEIN SUPPLIES: The food supply in Jamaica is characterized by serious imbalances in distribution between high and low income groups. Daily average dietary energy supplies were 114 calories above recommended allowances; protein supplies were 20 gm above. These figures indicate that on the average Jamaica has sufficient food available. (Nutrition Advisory Council, 1978)

CALORIE AND PROTEIN INTAKE--LOW INCOME: In low income groups, dietary energy intakes fall short of requirements by about 27%, and protein by about 14%. The low income group constitutes about 70% of the population. (Nutrition Advisory Council, 1978)

CALORIE AND PROTEIN SOURCES--LOW INCOME: The most important sources of energy for low income groups are sugar, flour, and rice. The main sources of protein are flour, rice, and bread. Cereals (flour, rice, and corn) provide approximately one-third of both the protein and energy supplies of the nation; 95% of these foods are imported. (Nutrition Advisory Council, 1978)

SOURCES OF ENERGY--LOW INCOME: Sources of energy in the lowest income groups, ranked in order of importance, measured by expenditure, are as follows: dark sugar, flour, rice, oil, green bananas, bread, yams, condensed milk, corn meal, coconut, margarine, sweet potatoes, and beef. (Antrobus, 1978)

SOURCES OF ENERGY--MIDDLE INCOME: Sources of energy in lower middle income groups, ranked in order of importance, measured by expenditure, are as follows: flour, oil, dark sugar, rice, bread, condensed milk, green bananas, yams, coconut, corn meal, beef, granulated sugar, sweet potatoes, margarine, and butter. (Antrobus, 1978)

SOURCES OF ENERGY--MIDDLE INCOME: Sources of energy in upper middle income groups, ranked in order of importance, measured by expenditure, are as follows: rice, oil, flour, condensed milk, bread, dark sugar, green bananas, yams, corn meal, granulated sugar, beef, butter, margarine, coconut, and sweet potatoes. (Antrobus, 1978)

SOURCES OF ENERGY--HIGH INCOME: Sources of energy in the highest income group, ranked in order of importance, measured by expenditure, are as follows: rice, oil, condensed milk, bread, flour, green banana, beef, yams, dark sugar, butter, corn meal, coconut, and margarine. (Antrobus, 1978)

SOURCES OF PROTEIN--LOW INCOME: Sources of protein important to families in the lowest income group, ranked in order of importance, measured by expenditure are as follows: flour, rice, bread, salted cod, yams, condensed milk, green bananas, corn meal, canned mackerel, chicken, red peas, congo peas, beef, chicken neck and back, salted beef, and pork. (Antrobus, 1978)

SOURCES OF PROTEIN--MIDDLE INCOME: Sources of protein important to families in the lower middle income group, ranked in order of importance, measured by expenditure are as follows: flour, bread, condensed milk, chicken, rice, salted cod, salted beef, beef, red peas, yams, green bananas, cornmeal, pork, congo peas, canned mackerel, lamb, and eggs. (Antrobus, 1978)

SOURCES OF PROTEIN--MIDDLE INCOME: Sources of protein important to families in the upper middle income group, ranked in order of importance, measured by expenditure are as follows: chicken, rice, flour, bread, condensed milk, beef, salted cod, pork, salted beef, yams, red peas,

corn meal, eggs, green bananas, canned mackerel, and lamb. (Antrobus, 1978)

SOURCES OF PROTEIN--HIGH INCOME: Sources of protein important to families in the highest income group, ranked in order of importance, measured by expenditure are as follows: beef, chicken, bread, rice, condensed milk, salted cod, flour, salted beef, lamb, yams, pork, red peas, eggs, green banans, canned mackerel, and corn meal. (Antrobus, 1978)

SUGAR: In Jamaica the average per capita consumption of sugar per day is 56.6 grams and this item may be consumed from the first day of life through adulthood. In Jamaica there are 11 sugar factories which could possibly be equipped for fortification since the technology is relatively uncomplicated. (Simmons, 1980)

CORNMEAL: There are three types of corn meal sold in Jamaica for human consumption, all of which go through a central processing plant. (Simmons, 1980)

SALT FISH: Low income families have shifted from dependence on imported "saltfish" as a major source of protein to greater reliance on poultry and eggs. Supplies of saltfish have been steadily decreasing due to the scarcity of foreign exchange. Due to the inability of the local food industry to satisfy the demand for it, the price per pound of saltfish is more than twice that of chicken. (Nutrition Advisory Council, 1978)

MEAT PRODUCTION: Poultry, cattle, calves, pigs, and goats are raised for food. The overall increase in weight of meat produced was 3.2% between 1980 and 1981. (JNPA, 1980)

MEAT PROCESSING: Efforts are being made to regularize the slaughtering of cattle, processing, and marketing of meat and meat products, facilities for which are presently inadequately developed, and in some cases grossly insanitary. (Nutrition Advisory Council, 1978)

EGG PRODUCTION: Egg production showed a marginal increase between 1980 and 1981. (JNPA, 1980)

ACKEE: The ackee is an evergreen tree (Blighia sapida) which produces a fruit used in the national dish, ackee and salt fish. The fruit, 7 to 10 cm long, has three sections, each containing a seed. Only after the fruit ripens and splits open by itself is the cream-colored arillus of the seed safe to eat. The poisonous qualities are well known and therefore present little danger. (Thomas and Krieger, 1976)

BUSH TEAS: Bush teas, made from herbs gathered in the wild, are used not only as medicines but also as the first meal of the day. Toxic bush teas are considered as possible sources of the cirrhosis following veno-occlusive diseases in Jamaica. (Thomas and Krieger, 1976)

COST OF FOOD: Jamaican households spend, on the average, 70% to 80% of disposable income on food. Several groups in the population, particularly children, pregnant and lactating women, heavy labourers, and the

indigent, often do not get enough food because there is not enough income to purchase it. (Nutrition Advisory Council, 1978)

FOOD DISTRIBUTION SYSTEM: The Agricultural Marketing Corporation plays an important role in the internal distribution of over 396,240 tons of domestic crops annually, although its role is secondary to that of over 140,000 "higglers." It is thought that this system of distribution facilitates a high rate of spoilage and creates artificial surpluses and shortages which could be remedied through adequately financed and better developed marketing procedures and facilities. (Nutrition Advisory Council, 1978)

POSTHARVEST LOSSES: Lack of adequate storage facilities is one of the big problems with agriculture, causing a wastage estimated to be about 15% of the total production of cereals and legumes, due to insects and rodents. Storage losses of starchy fruits, roots, and tubers are conservatively estimated to be 20% to 30% of the amount harvested. (Nutrition Advisory Council, 1978)

AGRICULTURE: In 1979, 22% of the labor force was engaged in agriculture, as was 39% in 1960. Meanwhile, the proportion employed in industry had remained at 25%, and the proportion in services had risen from 36% to 53%. (World Bank, 1981)

RICE IMPORTS: Rice is imported in large quantities because it can be imported from Guyana at a cost lower than what it would take to produce it in Jamaica. (Development Assistance Corporation, 1981)

AGRICULTURAL EXPORTS: Jamaica's major agricultural exports are: sugarcane, bananas, citrus, pimento, copra, ginger, cocoa, and coffee. (JNPA, 1980)

CASH CROPS: Historically, emphasis in food production has been placed on cash crops such as sugar and bananas, because commercial banks in Jamaica have been unwilling to take risks associated with domestic crops. (Nutrition Advisory Council, 1978)

WATER SUPPLY: Toward the end of 1977, about 4% of the houses on the island had water piped into them, while 5% had stand pipe facilities. (Nutrition Advisory Council, 1978)

WATER SUPPLY: In 1977, only 68.6% of the rural population received treated water, compared with 100% for the Kingston and St. Andrew Corporation areas. (Nutrition Advisory Council, 1978)

RURAL

USE OF HOMEGROWN FOODS--ST. JAMES: The number of households in St. James Parish using home grown food items in their diets increased from 37% in 1973 to 44% in 1975. (Marchione and Prior, 1981)

FOOD EXPENDITURE--ST. JAMES: In rural households in St. James, 70% of average household income was spent on food. In over one third of these

households more than 90% of the income was spent on food in 1973. (Marchione and Prior, 1981)

URBAN

FOOD EXPENDITURE: The average mother with a child under 12 months of age spent 88% of her income on food. Mothers with lower incomes spent 90% on food, while mothers with a more favorable socioeconomic position spent 79%. (Landman and Shaw-Lyon, 1976)

3.2 DIETARY PRACTICES, WOMEN

3.2.1 DIETARY PRACTICES, WOMEN DURING PREGNANCY

URBAN

FOODS AVOIDED: Pregnant women interviewed reported avoiding the following: water/ice, 6%; milk and milk drinks, 11%; fruit and fruit juices, 10%; vegetables, 8%; sweet drinks, 10%; meat, 38%; fish, 10%; condiments, especially salt, 4%; starchy foods, 23%; soup/porridge, 2%; eggs, 4%; beverages (including alcoholic), 6%; desserts, 5%; and miscellaneous other, 11%. (Landman and Hall, 1983)

CHANGES IN FOOD PREFERENCES: Pregnant women interviewed reported increased preference for the following: water or ice, 30%; milk and milk drinks, 29% fruits and fruit juices, particularly citrus 22%; green leaves, okra, or other vegetables, 18%; sweet drinks, sodas, etc., 16%; meats, 14%; fish, 12%; condiments, especially salt, 5%; starchy foods, 5%; soup/porridge, 8%; eggs, 2%; beverages, including alcoholic, 3%; desserts, 2%; miscellaneous other, 2%. Dietary changes reported by pregnant women were not affected by parity, socioeconomic status, or place of origin. (Landman and Hall, 1983)

PICA: Pregnant women were questioned indirectly about unusual food cravings during pregnancy. 41% reported hearing about other women eating, sand, or clay. 34% reported having seen it, and 6% reported having done it themselves. Other cravings that women reported having heard about (28%) or seen (20%) included included cigarette, wood, or charcoal ashes. 3% of the women reported having eaten ashes themselves. (Landman and Hall, 1983)

PICA AND SOCIAL CLASS: There was a negative association between educational level and the indulgence of unusual cravings during pregnancy, but it was not statistically significant. However, more poor women than middle class women reported eating unusual items. Middle class women did not report pica. (Landman and Hall, 1983)

PICA: Women who reported eating dirt during pregnancy thought that country dirt was suitable for eating, whereas town dirt was considered to be unclean. (Landman and Hall, 1983)

BUSH TEAS: 82% of pregnant women interviewed reported drinking "bush" teas. Fourteen different bushes were mentioned, usually some kind of mint (64%) or cerussee (42%). 43% reported drinking these teas because

3.2.1 DIETARY PRACTICES, WOMEN DURING PREGNANCY (Cont.)

they liked the taste, and 34% cited medicinal or health reasons, including the alleviation of gastrointestinal problems (17%), colds (3%), and to allay hunger, feeling "low," or faintness (10%). Others (5%) reported simply that teas were good for them or their babies in a general way, and 7% reported drinking them because other beverages or foods upset them. The drinking of bush teas tended to be more common among women of lower socioeconomic status ($p<0.01$). (Landman and Hall, 1983)

3.2.2 DIETARY PRACTICES, WOMEN DURING LACTATION

3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS

3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREASTFEEDING

NATIONAL

DURATION: A baseline survey conducted in 1976 and 1977 by the Mass Communications Centre, University of the West Indies, on behalf of the Ministry of Health, showed that approximately 13% of mothers interviewed stopped breast feeding babies when they were under four months of age; 12%, between 5-6 months; 46%, between 7-12 months; and 24%, after 12 months. (Nutrition Advisory Council, 1978)

PREVALENCE: Of the 14,491 babies receiving postnatal care through health centers, 7,371 (52%) were being fully breast fed. (JNPA, 1980)

PREVALENCE: Prolonged breast feeding is not practiced in the urban community. Breast feeding is still commonly practiced in rural communities with weaning taking between 6 and 12 months. (Miller and Chutkan, 1976)

BREAST FEEDING DECLINE: The extent of breast feeding among mothers under 20 declined between 1967 and 1976. Between 1967 and 1971, 8.7% of these mothers had never breast fed their babies; the percentage increased to 14.1% for the period 1972 to 1976. The percentages for the sample of mothers as a whole were 6.6% and 11.5%, respectively. (Bailey, 1981)

BREAST FEEDING AND SOCIOECONOMIC STATUS: Lower socioeconomic groups tend to breast feed their children for relatively long periods while in higher socioeconomic groups cessation of breast feeding occurs at an early age. In a study of a low income group by the Sugar Welfare Board, the percentage of children completely weaned at a given age was: 1 month, 1.4%; 3 months, 3.6%; 6 months, 13.7%; 9 months, 33.3%; 12 months, 69.8%; and 18 months, 95.6%. In another low income area the rates were: 1 month, 5.7%; 3 months, 17.0%; 6 months, 36.9%; 9 months, 78%; and 12 months, 92.2%. In a higher income area the rates were: 1 month, 29%; 3 months, 52%; 6 months, 84%; and 9 months, 100%. (Reddy, 1971a)

URBAN

PLANS FOR INFANT FEEDING: Although 74% of mothers said breast feeding was best, 38% planned to breast feed, 52% planned to give both breast and bottle, and 7% planned to bottle feed. By three weeks postpartum, 66% of

mothers were giving complementary bottle feeding. (Landman and Shaw-Lyon, 1976)

EXCLUSIVE BREAST FEEDING: 65% of mothers exclusively breast fed their infants while still in the hospital, 25% breast fed exclusively at 3 weeks, 10% at 6 weeks, 7% at 9 weeks, 6% at 12 weeks, and 4% or fewer exclusively breast fed from 4 months of age. (Landman and Shaw-Lyon, 1976)

BREAST AND BOTTLE: 27% of infants received both breast and bottle during the hospital stayl 66% received both methods of feeding at 3 weeks; 80% at 6 weeks; 75% at 9 weeks; 73% at 12 weeks; 51% at 4 months; 35% at 5 months; 31% at 6 months; 15% at 8 months; and 11% at 12 months. (Landman and Shaw-Lyon, 1976)

DECLINE IN BREAST FEEDING: There was a more rapid decline in frequency of complete breast feeding in a 1976 sample than reported in 1970. (Landman and Shaw-Lyon, 1976)

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING

NATIONAL

INADEQUATE SUPPLEMENTATION: Jamaican mothers tend to prefer expensive packaged infant foods and milk-based preparations which are often used well beyond the normal weaning period, when the child passes from an all-liquid diet to one of semi-solids and solids. Because of the strain that this places on the family budget, it leads to over-dilution of available quantities and subsequently to malnutrition in the children. A similar pattern exists in the use of processed infant foods. (Nutrition Advisory Council, 1978)

LATE SUPPLEMENTATION: Children are sometimes not introduced to foods from the family food pot until they are 9 to 15 months of age. Sometimes single foods are given or mixtures that are so dilute that energy and nutrient requirements cannot be met. (Nutrition Advisory Council, 1978)

FORMULA PREPARATION: Jamaican public health nurses reported that mothers often made mistakes in formula preparation. Mothers tended to dilute milk excessively, failing to realize that the resulting formula had little food value. (Fonaroff, 1975)

MILK DILUTION: About 15% of the mothers in the Mandeville area used correct proportions when mixing powdered milk for bottle feeding, and 85% used excessively diluted milk. (Reddy, 1971a)

WEANING FOODS: Children fed traditional banana porridge and commercially prepared Cerex porridge under experimental conditions gained weight at equal rates, comparable to that achieved on "high calorie milk." (Alleyne et al., n.d.)

SEMI-SOLID FOODS: Infants progressed from milk feeds supplemented with vitamins, tonic foods, and bush teas to the next stage of feeding--namely

milk and/or porridge, paps, and semi-solid foods--at around the third month. (Reddy, 1971b)

SUPPLEMENTS IN MIDDLE-INCOME GROUPS: Mothers in middle-income groups generally tended to introduce milk supplements, semi-solids, and solid foods at earlier ages than low income mothers. (Reddy, 1971b)

CORN MEAL: Jamaican infants are introduced to corn meal as early as 6 weeks, and it is the principal food consumed by infants up to 3 years of age. (Simmons, 1980)

SUPPLEMENTARY FOOD MIXTURE: A supplementary food mixture commonly used by Jamaican mothers, especially in poor areas, was corn meal porridge mixed with sweetened condensed milk. This mixture was often made watery enough to be fed from a bottle with a large hole in the teat. (Wheeler, 1974)

CORN MEAL AND CONDENSED MILK: Corn meal and condensed milk porridge, a traditional weaning food, had a protein content which compared well with WHO/FAO estimates of necessary needs for young children. When a child becomes malnourished after using this porridge, it is probably the small amount of food which is at fault because mothers tend to dilute this porridge quite heavily. (Wheeler, 1974)

FEEDING CORNMEAL AND CONDENSED MILK: Previously malnourished children who had been rehabilitated continued to gain weight when fed a porridge of condensed milk and corn meal. The mixture was given five times each day and made thicker than is customary. (Wheeler, 1974)

WATER: Infants in Jamaica are customarily introduced to water at an early age, although apparently they do not need it. Infants receiving unboiled water have more diarrhea than infants receiving boiled water. (Almroth, 1978)

RURAL

MIXED FEEDING: Most infants aged 1-8 months (60 to 70%) received mixed breast and bottle feeding. (Almroth and Latham, 1982)

SUPPLEMENTARY FOODS: By the age of one month, 80% of the infants in the sample had received extra water, 70% had received bush tea, and 35% had received orange juice. By the age of 4 months, over 90% had received bush tea and orange juice, and almost all had received extra water. (Almroth and Latham, 1982)

SUPPLEMENTARY MILK: By the age of one month, 50% of the infants in the sample had received supplementary milk. By the age of 4 months, almost all of them had received supplementary milk. By the age of 3 months, none of the infants in the sample was exclusively breast fed. (Almroth and Latham, 1982)

REASONS FOR BOTTLE FEEDING: Mothers asked why they had started bottle feeding (n=155) cited the following reasons: to get baby used to the bottle, 28%; breast milk alone is not enough, 20%; breast feeding is

unpleasant, 14%; not enough breast milk, 11%; baby did not want the breast, 6%; illness of the mother, 5%; nothing special, 5%; had to work, 4%; and other, 11%. (Almroth and Latham, 1982)

AGE AT WEANING: The median age at weaning (cessation of breast feeding) was just under nine months. (Almroth and Latham, 1982)

REASONS FOR WEANING: Mothers asked why they had weaned their children (n=52) cited the following reasons: baby weaned him/herself, 35%; no milk, 17%; illness of the mother, 15%; breast feeding is unpleasant, 12%; had to work, 5%; other, 19%. (Almroth and Latham, 1982)

FIRST FOODS: Among infants aged 0-12 months, supplementation with solid foods was not started until the infant was at least 6 months of age. (Almroth and Latham, 1982)

URBAN

DIET AT WEANING: The diets of children were poor during the weaning period. Maize meal was the staple food of most weaning diets. (Grantham-McGregor et al., 1974)

WEANING FOODS: Among Kingston mothers, corn meal was the most common cereal given to infants and was usually given in a bottle with a large hole in the nipple. Unfortunately, corn meal often replaced rather than supplemented milk. Irish potatoes, chocho, and pumpkin are commonly given vegetables. Peas and beans are rarely given. Meat is given more often than fish, and when fish is given it is usually fresh. Soup is commonly introduced at about 6 months, but the meat is often discarded. (Gratham-McGregor and Back, 1970)

SUPPLEMENTARY FOODS: 72% of infants received orange juice by 9 weeks of age; later, tomato and carrot juice were added. Soup without the fish, meat, and vegetables was added by 6 or 8 months for 30 to 40% of infants. 96% of children received cereal as the first semi-solid food. Proprietary infant cereal products were gradually replaced by corn meal. At 12 months, 67% of infants were receiving corn meal 3 or more times daily. 48% had received cereal by 12 weeks. (Landman and Shaw-Lyon, 1976)

BUSH TEAS: 24% of infants received bush teas by six weeks of age. These teas were infusions made of leaves of herbs and shrubs. Mint was the most popular herb. Bush tea was given as the first feed of the day or at night. Sometimes herb teas were given when a mother could not afford to buy formula. (Landman and Shaw-Lyon, 1976)

SUBSIDIZED MILK: Milk is the main source of protein in the first year of life in Jamaica. The present subsidized milk scheme is not reaching many children. Mothers did not know how to get the milk or could not get a regular supply. (Gratham-McGregor and Back, 1970)

SOURCES OF BABY FOOD: Only 37% of Kingston mothers surveyed said they had purchased the government-subsidized half-cream milk while 66% said they had purchased at least one jar of proprietary baby food. (Gratham-McGregor and Back, 1970)

INSUFFICIENT MILK: A study of 300 Kingston infants checked at 6 weeks and at 3, 4, 5, 6, 8, 10, and 12 months found that 37 received insufficient milk (breast or bottle) on at least one visit, and 19 were repeatedly found to have received insufficient milk. A higher proportion of this group were in the 10th percentile for weight at one year ($p<.01$). The number repeatedly found to have received insufficient milk is probably a low estimate of the actual population occurence since these mothers were advised to give more milk. (Gratham-McGregor and Back, 1970)

REASONS FOR INTRODUCING THE BOTTLE: 51% of mothers introduced the bottle because they felt they had insufficient milk to satisfy their babies; 26% because they were given free samples and advice by milk nurses who visited them at home; 12% to accustom the baby in case they went out to work; 6% due to breast troubles; 6% due to mothers' illness; 2% due to work; and 40% for miscellaneous reasons. (More than one response was recorded for 30 mothers.) (Landman and Shaw-Lyon, 1976)

BOTTLE-FEEDING PATTERN: Kingston mothers began the bottle early. 77% began by the time the infant is six weeks old and continued combined breast and bottle feeding for about six months. (Gratham-McGregor and Back, 1970)

BOTTLE ONLY: 8% of infants received only the bottle during the hospital stay; 9% were exclusively breast fed at 3 weeks; 10% at o weeks; 18% at 9 weeks; 18% at 12 weeks; 45% at 4 months; 61% at 5 months; 64% at 8 months; 81% at 8 months; and 87% at 12 months of age. (Landman and Shaw-Lyon, 1976)

MIXED FEEDING: Thirty of ninety mothers of well-nourished children gave their children some breast milk in addition to bottle feeds, although this did not amount to more than two short sucklings per day, except in four cases. There was no difference in the level of bacterial contamination of their feeds. However, all of these children experienced fewer episodes of gastroenteritis than expected. (Hibbert and Golden, 1981)

BOTTLE FEEDS: There was a tendency for younger mothers to introduce bottle feeds early. At 3 months 75% of mothers under 27 years of age were complementing with the bottle. None of the infants were weaned from the bottle by 12 months of age. After 5 or 6 months of age most bottle feeds included cereal as well as milk formula. (Landman and Shaw-Lyon, 1976)

BOTTLE FEEDS: Samples from bottle feeds of 90 well-nourished and 11 under-nourished children aged 6 to 23 months were examined . Twenty-seven of them consisted of porridges based on maize (20) or oats (7) that had been made thin enough to pass through the widened hole of a rubber feeding nipple. Sixty-three of the feeds were milk preparations: 2 condensed milk, 5 dried milks marketed for adults, and 56 formulae sold specifically for infants. (Hibbert and Golden, 1981)

BOTTLE FEEDING PRACTICES: In a study of 90 well-nourished children aged 6 to 23 months in Kingston, researchers found that two thirds of the mothers left unfinished milk standing in the bottle and refed it later.

The remainder reported that they either finished it themselves, gave it to siblings, discarded it, or reported that their child never left any feed. There was no difference between groups that did or did not retain leftover feed for later use in terms of the incidence of gastroenteritis. (Hibbert and Golden, 1981)

COST OF BOTTLE FEEDING: The cost-of-living index for Kingston rose 19.6% between January and June 1973. During this period the cost of infant milks alone increased 37%. As mothers already spent 88% of their incomes on food, they had very little margin to withstand further increases. (Landman and Shaw-Lyon, 1976)

BOTTLE HYGIENE: 65% of the homes of Kingston infants have poor kitchen facilities. There is little idea of hygiene and kitchens are often dirty and infested with flies. Consequently, few bottles are correctly sterilized although most mothers make some attempt to clean bottles at least once a day. (Gratham-McGregor and Back, 1970)

BOTTLE CONTAMINATION: The bottle feeds of 90 children aged 6 to 23 months were analyzed. Over four fifths had more than ten thousand viable faecal bacteria per ml. and about two thirds had over one hundred thousand per ml. (Hibbert and Golden, 1981)

BOTTLE CONTAMINATION: In a study of bottle-feed samples of 90 well-nourished and 11 undernourished children aged 6 to 23 months in Kingston, heavy loads of viable faecal bacteria were found. However, there was no correlation between the length of time from preparation of the feed by the mother to the time of sampling. (Hibbert and Golden, 1981)

3.3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS, AFTER WEANING

NATIONAL

DIET AT ONE YEAR: At one year of age, 60 infants were reported to eat "every little thing." Only 14 infants received a meal each day. 62% were not offered legumes and only 20 infants were given the dark green leafy vegetable, callaloo. (Landman and Shaw-Lyon, 1976)

CHILDREN'S DIETS: The semi-solid and solid foods given to the child are often taken from the family pot, but seldom are the protein rich items chosen. Usually some starchy vegetables such as potato, or green banana and either cho-cho or pumpkin along with some of the gravy or soup are the ingredients considered appropriate for infants and young children. These are deliberately selected from an otherwise reasonably nutritious mixture prepared for the family. (Reddy, 1971b)

ANIMAL PROTEIN: The animal protein foods, milk, egg, fish, and meat, are readily given to young children. However, certain patterns have evolved in the use of these foods. Usually only soups, teas, and gravies of meat and fish are given. Often whole egg will not be given to children but only the yolk (23% of mothers) or only the white (15% of mothers) will be given to children. This is despite the fact that most mothers (72%) say they believe whole egg is better for children. (Reddy, 1971b)

3.3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS, AFTER WEANING (Cont.)

RURAL

FORAGING: Young children are often left to forage for their own foods and may even have their own cooking pots for food given to them or gathered in the wild. (Thomas and Krieger, 1976)

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE

NATIONAL

INDIGENOUS THERAPY FOR PCM: Indigenous therapy for PCM included visits to the balmyard or the Obeah-man, when the child reached an extreme stage of emaciation and lethargy. Indigenous practitioners prescribed one or more of the following: herb baths; wearing of special amulets, red clothing or strings; rubbing asafetida (a fetid gum resin of the carrot family) into the hair; placing a bible at the head of the bed; herb teas and a semi-liquid diet; tightly closed windows for the avoidance of all drafts; and numerous patent medicines. (Fonaroff, 1975)

ORAL REHYDRATION FLUID: Mothers were advised by health personnel as well as on radio and television programs to prepare various home-made sugar-salt solutions for treatment of children with diarrhea. (Harland et al., 1981)

AVAILABILITY OF MEDICAL ADVICE: In a study of 248 children treated for malnutrition at the Medical Research Council's Tropical Metabolism Research Unit, it was found that 6% had been to a hospital, clinic, or general practitioner, indicating that lack of availability of medical advice is not a major factor in causation of malnutrition. For reasons not ascertained by the study, mothers were probably not able to carry out the advice given. (Alleyne, 1970)

THE BALMYARD: The balmyard was an indigenous source of medical care, where a revivalist male or female healer, considered to possess prophetic powers, cured by removing spells, ghosts, and other forms of black magic inflicted on an individual. (Fonaroff, 1975)

OBEAH-MAN OR WOMAN: The Obeah-man cures by putting spells on people, animals, or objects. (Fonaroff, 1975)

THE NANA: The "nana" is a practical midwife who perpetuates magical customs relating to childbirth and who serves as an influential lay adviser on traditional child care. (Fonaroff, 1975)

SOURCES OF HEALTH CARE: Ministry of Health employees estimated that about 30% of the target population regularly attended prenatal and child health care clinics; the remainder, only for emergencies, sporadically or not at all. This latter group, the bulk of the population, generally received and accepted most of its child health information from indigenous practitioners and from influential lay persons--despite the fact that use of indigenous practitioners was discouraged by the government. (Fonaroff, 1975)

ILLNESSES TREATED: The principal illnesses for which children received treatment at health centers in 1980 were: respiratory tract infection, skin infection, gastro-enteritis, and measles. (JNPA, 1980)

ANTENATAL SERVICES: According to the records of the Statistical Division of the Ministry of Health, 31,374 women received antenatal health care services at health centers for the first time in 1980. Nineteen percent were under 16 weeks pregnant at the time of the first visit; 56% were between 16 and 28 weeks pregnant; and 17% were over 28 weeks pregnant. (JNPA, 1980)

HOSPITAL BIRTHS: Only 40% of all births took place in government hospitals in 1974. (Antrobus, 1978)

MATERNITY CARE: The World Bank financed the construction of 10 rural maternity health centers. Available data indicate that there has been marked under-utilization of both prenatal and postnatal capacities. The occurrence of deliveries in the centers has been low. It has been proposed that they be converted into multi-purpose health centers. (World Bank, 1976)

POSTPARTUM CARE: A postpartum program began in 1970 to provide advice to women giving birth at the Victoria Jubilee Hospital. The program was expanded to provide advice on maternal and child care, in addition to family planning. In 1973 it was extended to the Spanish Town and Linstead Hospitals in St. Catherine Parish, Mandeville and Spauldings Hospitals in Manchester Parish, and the Cornwall Regional Hospital in St. James Parish. (World Bank, 1976)

POSTPARTUM CARE: Postnatal sessions (including family planning clinics) averaged 1.1 and 1.4 per center-month in 1974 and 1975, respectively. Attendance at postnatal sessions was 80% lower than at prenatal sessions in 1975. Only 48% of the women who gave birth in rural maternity centers returned for postnatal sessions. (World Bank, 1976)

POSTNATAL SERVICES: During 1980, 13,894 mothers and 14,491 babies received postnatal services at health centers throughout the island. Of these, 3.8% of the mothers and 4.1% of the babies were referred to a doctor, hospital, or nurse practitioner because of complications. Of the women receiving postnatal services, 76% reportedly gave birth in a hospital, 15% at home and 4% in rural maternity centers. Fifty-two percent of the babies were being fully breast fed. (JNPA, 1980)

HOSPITALIZATION AND MALNUTRITION: The average length of stay in hospital in 1974 was 32 days for malnutrition, compared to 24 for tuberculosis and 20 days for diabetes. (Antrobus, 1978)

SANITATION: In 1978, about 30% of the total population on the island was served by a sewage treatment system and another 25% by septic tanks and absorption pits. The sewage systems in Kingston serve about 100,000 people. (Nutrition Advisory Council, 1978)

RURAL

HEALTH CARE: Approximately 90% of the mothers interviewed had visited an antenatal clinic; about 45% had attended a postnatal clinic with their infants. (Almroth and Latham, 1982)

USE OF CLINICS--ST. JAMES: About 30% of one year old children were regularly brought to local clinics in St. James Parish. (Marchione and Prior, 1981)

URBAN

HOSPITAL BREAST FEEDING SUPPORT: Following the study by Grantham-McGregor and Back in 1970, changes were instituted at the University Hospital of the West Indies. "Milk nurses," employed by commercial firms to promote infant milk products, were no longer allowed in the hospital, and complementary bottle feeds were not routinely prepared. Positive measures were instituted at the hospital to encourage mothers to breast feed. (Landman and Shaw-Lyon, 1976)

DIARRHEA: Nearly one third of 90 well-nourished children aged 6 to 23 months had had episodes of gastroenteritis severe enough for their mother. to seek medical help. Another third had had episodes of "running belly" treated at home. Between these groups there was no significant difference in method of food preparation or amount of contamination. The episodes did not give rise to chronic diarrhea, nor did diarrhea significantly impair the children's nutritional status. (Hibbert and Golden, 981)

ORAL REHYDRATION FLUID--ADVICE: Among 44 mothers using home-made oral rehydration fluid, 7 got information on composition of the fluid from the radio, 20 from relatives, 11 from doctors, and 6 from nurses. (Harland et al., 1981)

ORAL REHYDRATION FLUID--DOSAGES: Mothers' estimates of the volume of fluid given in a 24-hour period varied from 176 ml. to 2280 ml. The low volume was the result of a mother giving the fluid as a medicine, a teaspoonful three times a day. (Harland et al., 1981)

ORAL REHYDRATION FLUID--COMPOSITION: Analysis of 22 samples of sucrose and glucose water solutions prepared by mothers demonstrated that the mean osmolality of the glucose solutions was very high. Mothers often prepared the solution according to taste and Jamaicans prefer very sweet and very salty food. Feeding infants with gastroenteritis with solutions of high osmolality may prolong diarrhea and exacerbate water depletion. (Harland et al., 1981)

4. NUTRITION STATUS CORRELATIONS

NATIONAL

BREAST FEEDING AND MOTHER'S AGE: The percentage of mothers under 20 years of age who had never breast fed their babies or breast fed them for less than six months ranged from 100% in St. Andrew, to about 43% in Kingston West. Not even one adolescent mother in St. Andrew north and southeast had even partially breast fed her baby for more than six months. (Bailey, 1981)

BREAST FEEDING AND UNEMPLOYMENT: All of the adolescent mothers in St. Andrew north were unemployed; the percentage unemployed in St. Andrew east central was 66.7%. The average unemployment for the sample was 57% and for the subsample of adolescent mothers, 82%. Of those unemployed, 76% were not breast feeding babies of six months and less at the time of their admission to hospital. The sample average was 81%. (Bailey, 1981)

MALNUTRITION AND MOTHER'S AGE: In 16% of 761 cases, children admitted to two hospitals with severe protein-energy malnutrition were the offspring of unmarried mothers aged 20 years or less. (Bailey, 1981)

MALNUTRITION AND MOTHER'S AGE: Roughly 98% of the children born to adolescent mothers were between 0 and 23 months of age at the time of first admission to the hospital with severe protein calorie malnutrition. These babies tended to be admitted to the hospital at earlier ages than babies from the wider sample, 24.2% as opposed to 17.3%. (Bailey, 1981)

MALNUTRITION AND BREAST FEEDING: The average age at admission to the hospital for children who had never been breast fed or who had been breast fed for less than a month was 6 months. The age at admission increased to 12 months for children who had been breast fed for 3 to 6 months; this group constituted the majority of admissions. The babies who had been breastfed for over a year were admitted to the hospital at an average age of 18 months. (Bailey, 1981)

MALNUTRITION AND FAMILY SIZE: In Jamaica the association between large families and malnutrition that was established for other developing countries does not hold. Families of between one and three children accounted for 56% of the cases. (Bailey, 1981)

MALNUTRITION, AGE, AND FAMILY SIZE: Malnutrition is most common in the 10-12 month age group and in children from families with five or more children. (Alleyne, 1970)

MALNUTRITION AND CHILD SUPPORT: Over 41% of mothers aged twenty or less reported little or no support for the malnourished child. The percentages ranged from 57% in St. Andrew southeast to 17% in St. Andrew east central. In families where young mothers had borne children by more than one father, they were less likely to be receiving support than in single-father situations. However, even where there was only one father involved, only 66% were receiving support, compared to 78% for the sample as a whole. Situations in which more than one father was involved included about 20% of the cases. (Bailey, 1981)

4. NUTRITION STATUS CORRELATIONS (Cont.)

RURAL

MALNUTRITION RISK FACTORS--ELDERSLIE: Analysis of anthropometric data from a survey of 576 children under five conducted in Elderslie showed that those aged 6 to 36 months were most likely to be malnourished; children who lived farther from the clinic were at greatest risk, regardless of history of clinic attendance; girls were three times more likely than boys to be malnourished; and the longer the child was breast fed, the more likely he or she was to be malnourished. (Alderman et al., 1973)

MALNUTRITION CORRELATES--ELDERSLIE: Analysis of data from an anthropometric survey in Elderslie showed than antenatal care, attendant at birth, household size, and intestinal-parasite infestation were all apparently unrelated to the subsequent occurrence of malnutrition. (Alderman et al., 1973)

MALNUTRITION AND MOTHER'S AGE--ELDERSLIE: Analysis of data from an anthropometric survey in Elderslie showed that children of mothers under twenty were more likely to be malnourished than others. (Alderman et al., 1973)

NUTRITION STATUS AND FEEDING METHODS--PORTLAND: The nutritional status of both breast fed and bottle fed infants aged 0 to 12 months was observed to decline with age, although breast fed infants were somewhat better off than predominantly bottle fed infants. (Almroth and Latham, 1982)

BREAST FEEDING AND PRENATAL CARE--PORTLAND: Regression analysis showed that mothers who had attended an antenatal clinic breast fed longer and supplemented later than other mothers. Mothers who attended postnatal clinics expressed the intention to continue breast feeding longer than those who did not attend postnatal clinics. (Almroth and Latham, 1982)

MORTALITY, MALNUTRITION, AND BREAST FEEDING--PORTLAND: Malnutrition played an important role in 44% of Jamaican child deaths. This is thought to be associated with a shorter breast feeding period. (Almroth and Latham, 1982)

NUTRITION STATUS CORRELATES--ST. JAMES: Factor analysis indicated two consistent predictors of weight for age through time were the factors of agricultural subsistence stress and mother/guardian maturity. Two factors, family cohesion and family demographic stress, were significantly associated with nutritional status measures of one year old children in St. James Parish in 1973 but not in 1975. (Marchione and Prior, 1981)

VARIABLES ASSOCIATED WITH HEIGHT AND WEIGHT--ST. JAMES: Variables positively associated with nutrition status of one year old children in studies in 1973 and in 1975 included: household food expenses, household income, dietary variety, presence of child's father in the household, age of the mother, dietary adequacy of the child. Negatively correlated was the number of home grown foods used in the household diet. (Marchione and Prior, 1981)

WEIGHT FOR AGE CORRELATES--ST. JAMES: Weight for age was positively associated with household food expenditures, income, dietary variety, presence of the father, and mother's age. (Marchione and Prior, 1981)

CHILD GROWTH AND DEMOGRAPHICS--ST. JAMES: Malnutrition occurred where family demographic stress was greatest. Child growth tended to fail as the number of preschool siblings increased, dependency ratios increased and family size grew larger. (Marchione and Prior, 1981)

ANTHROPOMETRY AND INCOME--ST. JAMES: Correlations between anthropometric measures (height and weight) of one year old children and income and food expenditures were significant. (Marchione and Prior, 1981)

WEIGHT AND MOTHER'S AGE--ST. JAMES: Child weight for age was higher in households with mature mothers and guardians. Mothers under 20 years tended to have lighter one year old children than mothers in their thirties. (Marchione and Prior, 1981)

NUTRITION STATUS, HOUSEHOLD DIET, AND CLINIC CARE--ST. JAMES: Two expected predictive factors, household diet and clinic care, proved to have no association with nutrition status. (Marchione and Prior, 1981)

UNDERNUTRITION AND DIARRHEA: Undernutrition was associated with a higher incidence of diarrhea but not of respiratory infections among young children in the Lawrence Tavern area. These illnesses had no measureable influence on long-term weight increments. (Miall et al., 1970)

DIARRHEA AND CHILD'S SEX: Diarrhea was more common and, as measured by duration, was more severe in boys than in girls. 11 of 13 children reported to have had more than 30 days of diarrhea during a quarter were boys. (Miall et al., 1970)

DIARRHEA AND SEASON: There was evidence of periodic epidemics of diarrhea which bore no obvious relationship to the seasons. (Miall et al., 1970)

URBAN

FACTORS INFLUENCING ESTABLISHMENT OF LACTATION: Factors which discouraged successful establishment of lactation included abnormal delivery, grandmultiparity and increasing maternal age, low birth weight, and mother's work. (Landman and Shaw-Lyon, 1976)

BREAST FEEDING AND MOTHER'S WORK: Consistently more of the mothers who did not go out to work or school were breast feeding, compared with mothers at work or school. Only at 6 months was this difference statistically significant. (Landman and Shaw-Lyon, 1976)

DURATION OF BREAST FEEDING AND MATERNAL AGE: Among mothers under 27 years of age, 45% breast fed their infants for 6 to 13 weeks, and 42% for 4 months or more. Among mothers 27 years or older, only 21% breastfed for 6 to 13 weeks, and 69% breast fed for 4 months or more. (Landman and Shaw-Lyon, 1976)

4. NUTRITION STATUS CORRELATIONS (Cont.)

BOTTLE FEEDING AND GASTROENTERITIS: Infants who had been predominantly bottle fed in the first 3 months of life tended to have more frequent episodes of gastroenteritis than children who had been predominantly breast fed. (Landman and Shaw-Lyon, 1976)

BOTTLE CONTAMINATION AND CLEANING METHOD: In a study of fecal bacteria found in the bottle feeds of 90 well-nourished and 11 undernourished children aged 6 to 23 months, the method of bottle sterilization did not make any significant difference in the level of contamination found. (Hibbert and Golden, 1981)

MALNUTRITION AND BOTTLE CONTAMINATION: In a study of 101 children aged 6 to 23 months in well-baby clinics in Kingston, no significant difference was found in the amount of bacterial contamination that characterized the bottle-feeds of well-nourished and undernourished children. (Hibbert and Golden, 1981)

PEM AND HYPOTHERMIA: Hypothermia (rectal temperature below 35 degrees centigrade) occurred in 19.7% of children with PCM. It was related to low weight and height but not to serum or whole body potassium, serum sodium, or seasonal variation in ambient temperature. Hypothermia was more common in marasmus than it was in kwashiorkor. (Brooke, 1972)

LOW WEIGHT AT ONE YEAR OF AGE AND ITS CORRELATES: Children who were of low weight at age 12 months (10th percentile for weight) were more likely to be of birth order 6 or greater, to be below 2.5 kilograms at birth, to have below average housing, to have frequent attacks of gastroenteritis, to have few routine clinic visits, and to have small milk intake. There was no association between the marital status of the child's mother and child's weight at 12 months. (Grantham-McGregor et al., 1977)

BIRTH WEIGHT AND WEIGHT AT 12 MONTHS: 8% of children with a birth weight greater than 2.5 kilograms were in the 10th percentile for weight at age 12 months; 32% of children with a birth weight below 2.5 kilograms were into the 10th percentile. (Grantham-McGregor et al., 1977)

WEIGHT AND BIRTH RANK: Children of birth rank six or greater tended to have lower weights than children of lower birth order ($p<.10$). 9% of first-born children were in the 10th percentile for weight at age 12 months, 7% of children in birth rank 2 to 5, and 20% of children in birth rank 6 or greater. (Grantham-McGregor et al., 1977)

CHILD WEIGHT AND MOTHER'S MARITAL STATUS: Mother's marital status was not associated with her child's weight. 35% of mothers were married, 29% were in common-law unions, and 37% were single. (Grantham-McGregor et al., 1977)

MALNUTRITION AND GROWTH: Urban children admitted to the University Hospital of the West Indies for malnutrition remained stunted and had smaller head circumferences than control group children two years after leaving the hospital, even though their weight for height was the same. (Sheffer et al., 1981)

MALNUTRITION AND DEVELOPMENT: Malnourished children admitted to the pediatric ward of the University Hospital of the West Indies had lower mean developmental levels than non-malnourished children, as measured by the Griffiths Mental Development Scales. They also had longer hospital stays, lower birth weights, and mothers with lower verbal IQs. (Grantham-McGregor et al., 1980)

MALNUTRITION AND DEVELOPMENT: Regression analysis of developmental level on birth weight, age at admission to hospital, severity of illness (days), days in hospital, mother's verbal IQ, housing rating, home inventory, and the presence or absence of PEM showed that together these variables accounted for 83% of the variance in DQ (developmental quotient). Nutritional status had the largest statistically significant effect on DQ. (Grantham-McGregor et al., 1980)

MALNUTRITION AND ENVIRONMENT: Malnourished and adequately nourished urban children had similar levels of home stimulation, but malnourished children tended to have a poorer standard of housing and a higher birth order than adequately nourished children. (Sheffer et al., 1981)

MALNUTRITION AND ENVIRONMENT: A study designed to test the hypothesis that malnourished children suffer from poor mother-child relationships found little support for that hypothesis. Researchers concluded that Jamaican mothers of malnourished children are different from North American mothers of children who fail to thrive, and that the ecology of childhood PEM is different in different cultures. Poverty was, however, strongly associated with malnutrition. (Sheffer et al., 1981)

HEMOGLOBIN LEVEL AND BIRTH WEIGHT: Hemoglobin levels were higher among children with birth weights over three kilograms than among children with birthweights of 2.5 to 3.0 kilograms. (Grantham-McGregor et al., 1974)

HEMOGLOBIN AND SEX: Hemoglobin levels of males were consistently lower than those of females during the first years of life, but the difference was significant only at six weeks of age. (Grantham-McGregor et al., 1974)

HEMOGLOBIN AND SOCIOECONOMIC CLASS: Hemoglobin levels did not vary by socioeconomic class during the first six months of life. From 8 months onward, children from the upper socioeconomic group had higher hemoglobin levels than children from the lower socioeconomic group. The difference became statistically significant by 12 months of age. (Grantham-McGregor et al., 1974)

HEMOGLOBIN AND WEIGHT GAIN: A very weak negative correlation between weight gain and hemoglobin level was found among children birth to one year of age. The mean hemoglobin level of the children who were underweight at 12 months of age was not significantly different from those of the group as a whole. (Grantham-McGregor et al., 1974)

HEMOGLOBIN LEVELS AND PARASITES: Hemoglobin levels of children 10 to 12 months of age who had no parasites were not significantly different from hemoglobin levels of children who did have parasites. (Grantham-McGregor et al., 1974)

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

5.1 NUTRITION AND HEALTH POLICIES AND PROGRAMS, POLICIES

NATIONAL

NUTRITION DIVISION: The Nutrition Division of the Ministry of Health has the main responsibility for the implementation of the nutrition programme, and for research and evaluation activities connected with the program, including research on the use of a high-calorie formula to treat children admitted to hospitals. (JNPA, 1980)

NUTRITION ADVISORY COUNCIL: The Ministry of Health and Environmental Control created a Nutrition Advisory Council in October 1973. This body draws its membership from several ministries and other agencies. It has been charged with the responsibility for coordinating the work of agencies working in the fields of food and nutrition; reviewing all nutrition programs; reviewing the nutritional implications of legislative measures; and preparing and later monitoring the national food and nutrition policy. (Antrobus, 1978)

NUTRITION ADVISORY COUNCIL OBJECTIVES: The principal objectives of the Nutrition Advisory Council for the period 1978-1983 are: 1a) eliminate protein-calorie malnutrition and anemia in children under five, 1b) eliminate nutritional deficiencies in pregnant and lactating women, 2) ensure availability of adequate amounts of nutritious foods to all segments of the population, and 3) ensure annual increases in the amounts of protein and energy sources that are produced locally. A commitment to work toward these objectives was also secured from several other Ministries, government and quasi-government agencies, and statutory bodies. (Nutrition Advisory Council, 1978)

POLICY ON BREAST MILK SUBSTITUTES: The national nutrition campaign sponsored by the Ministry of Health has tried to increase awareness of the need for children to be properly fed, while at the same time recognizing that it may not be possible for working mothers to breast feed, and that therefore provision of adequate breast milk substitutes and supplementary foods constitutes an important part of the national food and nutrition policy. (Nutrition Advisory Council, 1978)

FOOD POLICY IMPLEMENTATION: During the period 1973-1978, the Jamaica Nutrition Holdings, a subsidiary of the State Trading Corporation, made significant contributions toward the achievement of the Food and Nutrition Policy aims emphasized in the 1974 policy document. It has assured a constant supply of reasonably priced nutritious foods purchased from cheaper sources and expedited their distribution. It has also created a buffer system, through the establishment of a stabilization fund, to cushion the effects of food price changes abroad which had a pronounced effect on the Jamaican population, because of its heavy reliance on imported foods. (Nutrition Advisory Council, 1978)

AGRICULTURE POLICY: Jamaica's agricultural policy was designed to encourage the expansion of food producton, but with emphasis on export

5.1 NUTRITION AND HEALTH POLICIES AND PROGRAMS, POLICIES (Cont.)

crops rather than domestic food crops. (Development Assistance Corporation, 1981)

AGRICULTURAL POLICY: The Emergency Production Plan was initiated in 1978 to intensify local cultivation of food, so that the country would be less reliant on imported food. This was to be achieved through improvement of the agricultural extension service, exploring the possibility of setting up a network of agricultural research stations, and improving coordination of existing agricultural research education and extension efforts directed at small-scale farmers. A significant increase in production was achieved during that first year, but overall production fell in 1979 and 1980 as a result of the flood rains of 1979 and the effects of hurricane "allen" in 1980. Root crop production fell by about 22.4% between 1979 and 1980, while vegetable production fell about 1.7%. (Government of Jamaica, 1980)

INDIGENOUS PRACTITIONERS: Use of indigenous health practitioners was discouraged by the Government. (Fonaroff, 1975)

HEALTH CARE PRIORITIES: Although the Ministry of health primary health care system does provide maternal and child nutrition services, budgetary constraints demand well over 50% of the primary health care budget to respond to curative services and medical supplies. (U.S.A.I.D., 1982a)

NUTRITION PRIORITY LOW: Nutrition activities are not a high priority with the government of Jamaica, which allocated only $111,000 for maternal and child nutrition activities in fiscal year 1982. (U.S.A.I.D., 1982a)

GOVERNMENT EXPENDITURES: In 1977, central government expenditures per person were: health, U.S.$35 (1975 dollars); education, $83; and defense, $12. (World Bank, 1976)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS

NATIONAL

NUTRITION UNIT ACTIVITIES: Within the Ministry of Health, nutrition programs are the responsability of the Division of Nutrition and Dietetic Services (Nutrition Unit). The Nutrition Unit pursues activities in 4 areas: supplementary feedings, nutrition surveillance, nutrition education and communications, and training. These functions are performed by 34 field staff, including 2 nutritionists for each of the 4 regions, and 1 nutrition assistant for each of the 14 parishes. Nutrition Assistants are responsible for monitoring community nutrition status, providing nutrition information to the public, and for conducting in-service training. They also motivate and organize the nutrition education efforts of the Community Health Aides (CHA), and midwives. The performance of field staff is presently hampered by lack of reliable transporation and educational materials. (U.S.A.I.D., 1982b)

FEEDING PROGRAM: The goal of the present Ministry of Health feeding program is to provide supplements to malnourished and "at risk" children under 5 and undernourished pregnant and lactating women. Tuberculosis

patients, diabetics, and indigents also receive food when surpluses exist. The objective of the present program is to provide 4 pounds of food per month to severely malnourished children (Gomez II and III), and nursing mothers, and 2 pounds per month to marginally malnourished children, and those of normal status who are losing weight. Records are not kept on the numbers and types of beneficiaries. The projected beneficiaries for 1980 were as follows: children under five (Gomez Ii and III) (9,185), children under five (Gomez I and normal) (105,625), pregnant women (38,170), for a total of 152,980 persons. The program presently suffers from serious operational problems, ranging from procurement to record-keeping and distribution. (U.S.A.I.D., 1982b)

FEEDING PROGRAM: Jamaica obtains some food supplies from the U.S. under the PL-480 program and from the EEC. These are distributed to clinics and health centers island-wide through the Nutrition and Dietetics Division of the Ministry of Health and Environmental Control. The aims of the supplementary feeding program are to provide, by 1980: pre-natal service for 90% of pregnant women, one post-natal visit for 70% of mothers, and nutritional surveillance for 90% of all malnourished children 0-4 years of age. (Government of Jamaica, 1980)

NUTRITION ACTIVITIES: During the period 1973-1978 significant contributions to the nation's nutritional well-being were made by the Ministry of Education with its School Feeding Programme, and by the Ministry of Health and Environmental Control, through its National Education Campaign. (Nutrition Advisory Council, 1978)

CARIBBEAN FOOD AND NUTRITION INSTITUTE: The CFNI has accomplished the following: developed guidelines for a breast feeding/weaning practices strategy for the Caribbean; assisted member countries with institutional development of food and nutrition councils and programs or these councils in subject areas; assisted with the production of 9 action plans for breast feeding, resulting in implementation of these plans in 6 Caribbean countries; participated in research activities at Jamaica's College of Arts, Science, and Technology (CAST) in weaning, obstetrical management to promote mother-infant bonding and breast feeding, and management of iron-deficiency anemia; produced breast feeding and weaning education materials for both the general public and health professionals; and provides follow-up support to member countries for activities mentioned above; and has hosted national workshops for trainers of community health workers involved in subject areas. (U.S.A.I.D., 1982a)

CFNI--GENERAL ACTIVITIES: The Caribbean Food and Nutrition Institute is a development resource network that serves seventeen Caribbean countries. It is involved on a regional basis in finalizing and distributing the Food and Nutrition Manual for community health aides; promoting the use of "A Guide to Feeding the Weaning Age Group in the Caribbean; producing a teaching package on weaning; commencing implementation of the Anaemia Strategy; producing, printing, and distributing materials on the control of anemia; collaborating in the collection, analysis, and interpretation of hemoglobin data to monitor anemia status; promoting the production and use of the CFNI Haemoglobin Screening Apparatus; assessing the functional significance of the levels of anemia commonly found in the member countries; promoting the use of "Guides to Conducting Workshops and

follow-up Activities on Diabetes Mellitus"; following up the STC report on systems for diabetes control through cooperation with PAHO, CARICOM, and UWI in setting up a sub-regional expert committee for control of hypertension and diabetes; producing educational materials for the control of diabetes mellitus, including a teaching package on diabetes; distributing the "Diet Manual for the Caribbean" (2d edition) and the "Physicians Guide to Diet Ordering"; cooperating with diet manual committees in developing training programs for health personnel in the use of the manual; collaborating with U.W.I. Faculty in Food and Nutrition Courses for Agriculture students; collaborating with governments in promoting home food production; cooperating with relevant institutions in fellowship awards through country programs to insure that personnel are trained to carry out nutrition-related activities; and publishing nutrition materials for the direct use of the public, to increase public awareness, understanding, and knowledge of food and nutrition. (CFNI, 1983)

CFNI--JAMAICAN PROJECTS: The Caribbean Food and Nutrition Institute is cooperating with the government of Jamaica in the National Nutrition Education Programme. It is also involved in the production of educational materials for the Diarrhoeal Disease Programme, in screening hemoglobin concentrations in the Primary Health Care System, in providing service to the government in implementing National Food and Nutrition Policies, and in stimulating the establishment and restructuring the National Food and Nutrition Council. (CFNI, 1983)

NUTRITION EDUCATION CAMPAIGN: A three-year nutrition education/ communication campaign was started in 1978, under the supervision of the Ministry of Health and Environmental Control, and representatives from other agencies and institutions. Its major goals were to increase public awareness of nutritional problems and to alleviate them through changes in dietary habits. Special emphasis was on pregnant and lactating women, and children birth to 4 years of age, but attention was also given to the need to involve fathers in the care and welfare of their families. The campaign was divided into three phases: a sensitization phase, to enlist the support of community leaders; a mass-media phase to convey direct messages through radio, television, and other media; and a final phase involving the distribution of educational materials. (PAHO, 1978)

NUTRITION EDUCATION CAMPAIGN: The campaign, launched in November 1977, had 3 major components: (1) seminars for doctors, paramedical staff, and community workers; (2) an intensive mass media program for the general public; and (3) interpersonal communication to reinforce and supplement the mass media messages. (Hosang, 1981)

NUTRITION EDUCATION CAMPAIGN--MESSAGES: Based on information gathered in the baseline survey, 5 messages were developed: (1) pregnant women should eat the right kinds of food; (2) babies should be breast fed for the first 4 months; (3) babies should be weaned onto nutritious foods; (4) family planning is a means to achieve a healthier family life; and (5) the use of the Maternal and Child Health Services will promote family health. (Hosang, 1981)

NUTRITION EDUCATION CAMPAIGN--MASS MEDIA: The mass media component was varied. Radio elements included 45-second announcements, 5-minute talks, and 15-minute dramas; time was donated by radio stations. Use of television was limited to short advertisements and discussion programs. Newspapers carried articles and advertisements on each topic. Billboards and bus stop shelters promoted basic slogans, "Breast is Best" and "Good Health Begins with Eating Right." The campaign ran for a year, was evaluated and revised, and resumed in 1981. (Hosang, 1981)

NUTRITION EDUCATION CAMPAIGN--TOPICS: After evaluation, the campaign was re-launched in 1981. The focus was on breast feeding, promoted through 5-minute radio broadcasts and community activities including clinic groups. A videocassette for television broadcast focused on diarrhea and oral rehydration. (Cajanus, 1981a)

NUTRITION EDUCATION CAMPAIGN--OUTREACH: Evaluation of the campaign found that the messages were well-conceived and the materials well-designed, but that implementation was hindered by inadequate dissemination. Therefore, the project has expanded to include many types of community groups in addition to health care, such as church groups, farmers' organizations, youth clubs, and parent-teacher councils. Nutrition messages are taped to use with community groups to supplement radio broadcasting. Games, a coloring book, and a book cover are distributed by the Ministry of Education. (Hosang, 1981)

NUTRITION EDUCATION CAMPAIGN--COMMUNITY-BASED ACTIVITIES: The revised campaign increased community outreach, to reach "clinic non-attenders." Nutrition staff from clinics meet with existing community groups or form new ones. Specialized classes are conducted for mothers of malnourished children. Extension officers from the Ministry of Agriculture help support backyard gardening, and Home Economics Officers instruct in food preparation. (Cajanus, 1981b)

YOUNG CHILD SURVEILLANCE: The Nutrition and Dietetic Division will investigate the etiology of malnutrition by following up cases of malnourished children treated at hospitals and clinics. The study will identify: high risk areas and their characteristics, characteristics of the malnourished children and their households, and characteristics of malnourished children who are admitted to hospitals but do not pass through the primary health care system. (Ministry of Health, 1984)

ANEMIA SURVEILLANCE: The Nutrition and Dietetic Division is developing a pilot project to monitor the prevalence of anemia in pregnant women. In particular, the pilot project will investigate the levels at which patients should be screened, and the "streamlining" of procedures for procuring supplies. (Ministry of Health, 1984)

ANEMIA CONTROL: Government programs to reduce the prevalence of anemia include fortification of foods with iron, distribution of iron and folate at health clinics, and sanitation and nutrition education programs. (Simmons et al., 1982)

DIABETES: Procedures for diabetic surveillance have been established in Kingston and, to a more limited degree, in the parishes. Diabetes has

been identified as a priority for primary health care. At present, there is only one Nutrition Assistant per parish, so it is "virtually impossible to provide adequate dietary care for diabetics attending clinics." The Nutrition and Dietetics Division is investigating the role of high-fiber diets in treating diabetes at selected hospitals. (Ministry of Health, 1984)

TRAINING: The Nutrition and Dietetics Division is developing standardized curricula for basic and inservice training of different categories of the health team. This project includes: pretesting and evaluating manuals already prepared, preparation of standardized training materials, and regular inservice training for nutrition and dietary staff. (Ministry of Health, 1984)

REHABILITATION CLINICS: There are presently sixteen clinics for the rehabilitation of malnourished children. The Nutrition and Dietetic Division expects to have 8 more in operation by the end of 1984. (Ministry of Health, 1984)

USAID PROJECTS: The Health Management Improvement Project provides: technical assistance for improvement of the supplementary feeding program, which uses P1-480 foods for malnourished infants and children and all pregnant and nursing women; training materials for Ministry of Health nutrition division staff; additional vehicles for delivery of PL-480 commodities; scales for primary health care clinics; manuals for community health aides; and in-service training to update skills of Nutrition Division staff. (U.S.A.I.D., 1982a)

HEALTH MANAGEMENT: Under the proposed Health Management Improvement Services project, emphasis will be placed on developing a new supplementary feeding program through staff training in nutrition program planning and management, food logistics, and record-keeping. Instructional manuals on breast feeding, weaning, and nutrition for pregnant women, mothers, and children under five will also be produced. Staff will also be trained to perform nutritional diagnostic procedures, remedial follow-up, and standardized reporting. Information gathered from nutrition surveillance will be incorporated into the Monthly Clinic Reporting System, and the Sample Surveys of In-Clinic Records, so that an information system will be continuously compiling data on the following: birth weights; weight for age; morbidity; mortality; breast feeding; participation in supplementary feeding; nutrition and education, weight for height; immunization status; dietary child care; HB levels of pregnant and lactating women; weight gain in pregnancy; participation in supplementary feeding programs and nutrition education; and the incidence of diabetes, hypertension, and obesity in the general population. (U.S.A.I.D., 1982b)

HEALTH MANAGEMENT--GOALS: The goals of the Health Management Improvement Systems project are to provide a manpower development and training system to provide health manpower information, planning and training for the 14 parishes; develop a detailed health information system to provide data on the health and nutrition status of the population; insure effective equipment maintenance and supply management systems for local health centers, hospitals, and medical stores; ensure that all health centers

and dental clinics are fully equipped and operational; improve nutrition guidance and practice among Jamaican mothers with children under 5 years of age; increase primary health coverage for children under 3,and increase the number of patients receiving primary health care in health centers. (U.S.A.I.D., 1982b)

HEALTH MANAGEMENT--OBJECTIVES: Attainment of the goals of the Health Management Improvement Services project will be measured by the following criteria: maintenance of an infant mortality rate not in excess of 18.5 per 1,000; a reduction of the malnutrition rate from 7% to 4% (Gomez II scale) and from 1% to .6% (Gomez III scale); a reduction of anemia in pregnant and lactating women from 9/100 (in 1978) to 4.5/100; a 10% decrease in the incidence of gastroenteritis by 1985; and a 10% reduction in the prevalence of common diseases which can be prevented or treated by the Primary Health Care system. In addition, there are two subgoals: to increase coverage of primary health care services delivery for children under three from 65% (in 1979) to 86% and to increase the number of patients receiving primary health care in health centers rather than hospitals by 20%. (U.S.A.I.D., 1982b)

HEALTH MANAGEMENT--NUTRITION: A public nutrition education program will be developed as part of the Health Management Improvement Services project which will make use of radio, pamphlets, posters, slide shows, audio and visual aids, and photo-novels, with community presentations and individual instruction at health centers. (U.S.A.I.D., 1982b)

HEALTH MANAGEMENT--OUTREACH: The majority of Jamaicans live in rural areas, whereas existing health care delivery systems are typically located in urban areas. One of the goals of the Health Management Improvement Services project is to expand and upgrade primary health care and nutrition improvement services in order to reach the rural population. (U.S.A.I.D., 1982b)

MEDICAL SERVICES: There are 21 general hospitals, a network of over 150 health centers with doctors but no beds, clinics with visiting personnel, six specialized hospitals in the Kingston area, and a new regional hospital to serve the western part of the island. In 1975, there were 3 physicians per 10,000 people and 4 hospital beds per 10,000, but half the beds were allocated to mental patients. (Licross, 1979)

HEALTH CENTERS: Each of the 14 parishes is divided into Health Districts which form the smallest administrative units. There are 3 types of Health Centers in each Health District. Type I Health Centers serve approximately 4,000 people and are closely integrated into the community. They are responsible for delivering basic maternal and child health care, family planning, and nutrition and immunization services. Type II Health Centers perform the same functions as Type I Health Centers, but in addition there are public health nurses and public health inspectors who are responsible for the Type I Health Centers in the area. This type of center serves a population of approximately 12,000 through a number of Type I centers. The Type III Health Center incorporates the Type I and Type II Health Centers, and has in addition an assigned doctor, a supervisory nurse, a nurse-practitioner, and a public health inspector. It is also the headquarters of the Health District and serves a

population of about 20,000 persons through a number of Type I and Type II centers. The County of Cornwall also has a Type IV center with laboratory, x-ray, and other facilities. Type V, or Comprehensive Health Centers, are located in the urban areas of Kingston, St. Andrew, Spanish Town, and Portmore (St. Catherine). In January 1980, there were a total of 373 functioning Health Centers on the island. Many health projects are administered at the parish level. (U.S.A.I.D., 1982b)

6. COMMENTARIES

NATIONAL

NUTRITION SURVEILLANCE: The present system of nutrition surveillance carried out by the Nutrition Division field staff suffers from administrative problems. Data collection procedures and methods of tabulation vary from parish to parish. The information is also incomplete, making aggregation or interpretation of the data unreliable. (U.S.A.I.D., 1982b)

MALNUTRITION: Protein energy malnutrition is frequently an associated cause of death among 6 to 36 month old children. Most typically the malnourished child comes from a large family in a low socioeconomic class and is between 8 and 15 months of age. The weaning period is a time of great nutritional hazard. (Wheeler, 1974)

MALNUTRITION: Jamaica's nutrition profile is more positive than that of most other nations in the western hemisphere. However, there are significant nutrition and health problems caused by maldistribution of food, and there are indications that the nutritional status of the poor has deteriorated since the last nutrition survey was undertaken in 1978. Making more food available to the poor would help to alleviate these problems. (Development Assistance Corporation, 1981)

CAUSES OF MALNUTRITION: The period from 6 to 12 months of age is a critical one for the occurrence of malnutrition because it is the period of transition from baby food to family food. Malnutrition is due in part to poverty, lack of knowledge, and inappropriate or delayed treatment of disease. (World Bank, 1976)

PROBLEM WITH TRADITIONAL PORRIDGE: A problem with traditional corn meal porridge which is used for weaning is the tendency to make it thin and watery. Mothers should be urged to feed their children from a bowl or mug with a spoon and to make the porridge thick enough to do this. (Wheeler, 1974)

WEANING FOODS: Mothers should be encouraged to wean their children early on to a full mixed diet and to give generous amounts of less expensive cereal foods such as corn meal, bread, dumplings, rice, and Irish potatoes. Lower protein staples such as breadfruit, yam, and sweet potatoes should be supplemented with small amounts of peas, beans, fish, and milk. Dependence on specially formulated infant foods should be discouraged as these are expensive and often fed only in meager amounts. Frequent feeds are essential for the smaller child. Mothers should be encouraged to give some foods at least four or five times each day. (Wheeler, 1974)

BOTTLE HYGIENE: The sterilization of bottles and water is inadequate in Jamaica, in spite of the relatively high level of adult education, literacy, government publicity campaigns, almost universal delivery of a clean water supply from taps and stand pipes, and a significant effort on part of mothers to carry out practices taught. (Hibbert and Golden, 1981)

6. COMMENTARIES (Cont.)

ANEMIA AND GARDENING: The highest rates of anemia are found in St. James parish; the lowest, in St. Elizabeth's. Clinic coverage and parasitism rates are comparable. In St. Elizabeth's, families with gardens grow vegetables, peas, and red kidney beans, and raise some goats; in St. James, there are more large farms, which grow fruit and sugar cane. Thus, dietary differences may account for status differences; further studies are needed to substantiate this theory. (Simmons et al., 1982)

RESPIRATORY AND DIARRHEAL DISEASES: The diseases of most concern in relation to food and nutriton are respiratory and diarrheal diseases including gastroenteritis and malnutrition, particularly in young children. The two often occur together, and are thought to arise largely as a result of poor sanitation and inadequate housing. (Nutrition Advisory Council, 1978)

HEALTH PERSONNEL PROBLEMS: One of the difficulties that the Ministry of Health faces is a shortage of personnel, an unbalanced distribution, and inefficient utilization of staff. The Ministry has difficulty recruiting and retaining adequate numbers of trained personnel. A limited amount of in-service training is conducted by the Ministry of Health. At present, the major function of the Ministry of Health Training Branch is to process applications for overseas training. (U.S.A.I.D., 1982b)

BIBLIOGRAPHY

Alderman, M. H., Wise, P. H., Ferguson, R. P., Laverde, H. T., and D'Sonza, A. J.

1978 Reduction of young child malnutrition and mortality in rural Jamaica. Tropical Pediatrics and Environmental Child Health 24(1):7-11.

Original data
Method: Census; weights and ages taken; monitoring of children's weights monthly or bi-monthly. Children were placed in one of four categories, according to nutritional status. Intervention included food supplements, medical care, and home visits to provide nutrition counseling. Non-specific viral syndrome nostrums, antihelminthics, dermatological preparations, and antibiotics were also provided on a limited basis, through supervised field clinics.
Sample: 86% of the 3,357 children age 1 to 48 months in East Hanover in 1973, and 97% of the 3,294 children in West Hanover in 1974.
Location: Hanover Parish, a rural area of 177 square miles in the northwest end of the country, with a population of 59,799.

This study was designed to extend the pilot program carried out in the district of Elderslie (1970) to a larger setting, chosen because of its poor health conditions. Regular anthropometric surveillance ensured early identification of malnourished children in whose homes intensive practical nutritional advice was then provided. Community health workers recruited from each electoral district received eight weeks of training and were supervised by trained medical personnel. The program was first introduced in the Eastern half, and in the West one year later. As a result, it was possible to observe, in a controlled way, sequential decline in the prevalence of malnutrition (40%) and mortality rate (60%). However, the incidence of new cases of malnutrition continued unabated, and the mortality rate in the first month of life remained constant. The results of the study were statistically significant at $p<.00005$.

Alderman, M. H., Husted, J., Levy, B., and Searle, R.

1973 A young child nutrition programme in rural Jamaica. Lancet 1(813): 1166-69.

Original data
Method: Locally trained and recruited health auxiliaries surveyed all children under five, using anthropometric indices to diagnose malnutrition. They treated malnourished children by education and demonstration at home, by relying entirely on local resources. Each child was monitored through a monthly reexamination.
Sample: 1150 children were weighed, and all children under 75% of the standard (576) were assigned to treatment groups.
Location: Elderslie

The program did not affect the prevalence of malnutrition, but it did reduce young child mortality by half. At the end of the first and second years of the young-child nutrition program, the course of 61

children who had been treated was analyzed. At the end of the second year 45 had improved, 8 were unchanged (growth continued to parallel Gomez curves), 2 had declined, and 1 had died. Of the 45 who had improved, 34 had maintained Gomez status I for at least 3 months and were no longer being visited; 2 had improved by one grade each but for less than 3 months; 1 had imporved but remained within his initial grade; and 8 had reached their fifth birthdays.

Alleyne, C., Landman, J., and Jackson, A.

n.d. The Nutritional Value of Two Weaning Foods. Tropical Metabolism Unit, University of the West Indies, Jamaica.

Original data
Method: Two weaning foods were compared for nutritional value: traditional banana porridge and commercially prepared Cerex porridge. The porridges were made isocaloric and fed ad libitum to children recovering from malnutrition for 10 days on each porridge in a cross-over design.
Sample: 5 girls and 3 boys, aged 6-16 months, all about 80% of the standard weight for height at the start of the study.
Location: University of the West Indies

The children gained weight at the same rate on both porridges. The rate was 13.1±6.3(SD) g/kg/d for Cerex and 12.5±5.2(SD) g/kg/d for banana porridge, comparable to that achieved on "high calorie milk." The mean intakes were 147±19(SD) g/kg/d and 156±16(SD) g/kg/d, respectively. The differences were not statistically significant. The traditional po ridge makes use of indigenous foodstuffs.

Alleyne, G. A. O.

1970 Some features of infantile malnutrition in Jamaica. West Indian Medical Journal 19(1):32-36.

Original data
Method: Unspecified clinical, biochemical, and physiological examinations.
Sample: 248 children admitted to the Tropical Metabolism Research Unit between March 1963 and May 1969. Of the 248, 244 were boys; admission apparently depended not only on diagnosis of malnutrition, but also on subject's suitability for research projects (boys were favored for metabolic studies requiring urine collection). Equal numbers from urban and rural areas.
Location: Tropical Metabolism Research Unit of the Jamaica Medical Research Council.

While not describing its methodology in detail, this article presents a detailed account of characteristics of the patients studied, including sociodemographic data, physical and biochemical measures, and correlations between characteristics measured. The authors particularly note that the peak age at admission was 10 to 12 months, and malnourished children tended to come from larger families and to have gastrointestinal symptoms. Peripheral edema was found in 39%,

and hepatomegaly in 37%; children with these characteristics were the least underweight and stunted in height, suggesting that they had been ill a relatively short time.

Almroth, S. and Latham, M. C.

1982 Breast feeding practices in rural Jamaica. Journal of Tropical Pediatrics 28(3):103-09.

Original data
Method: The purpose of the study was to find out what infants were being fed, when supplementation began, when breast feeding was discontinued, and what reasons mothers gave for their actions. Mothers were interviewed in their homes using a set questionnaire, and anthropometric measurements were also recorded.
Sample: 90 women randomly selected from birth registration records in Port Antonio, and approximately 30 women each from the villages of Windsor Castle, Bangor Ridge, and Hectors River, comprising all of the mothers in those villages with infants between 0 and 12 months of age.
Location: The town of Port Antonio, and the villages of Windsor Castle, Bangor Ridge, and Hectors River in the Parish of Portland, northeast Jamaica.

Breast feeding is still widely practiced, but mothers begin supplementing breast milk with bottle milk as early as the first month of life. The reason most frequently cited was insufficient breast milk. Solid food was generally not introduced until the infant was approximately 6 months of age. About one-third of the infants in the sample suffered from mild to moderate PEM, although predominantly breast fed infants tended to be better off than predominantly bottle fed infants.

Antrobus, A. C. K.

1978 Nutrition and Government Policy in Jamaica. In B. Winikoff, ed., Nutrition and National Policy. Cambridge, Mass.: M.I.T. Press, pp. 169-198.

This article discusses the state of nutrition within the national development policy set by Jamaica's government under Prime Minister Michael Manley. Information is provided on such aspects as: the Nutrition Advisory Council and its role in development; steps taken to integrate family planning and nutrition into MCH programs; nutrition improvement programs aimed at the poor--such as the Nutrition Holdings and low-income shops efforts, as well as school funding programs. The author lists obstacles faced by Jamaica in terms of improving its food and nutrition situation and provides several tables clarifying agricultural and nutritional trends.

Ashworth, A. and Picou, D.

1976 Nutritional status in Jamaica (1968-74). West Indian Medical Journal 25(1):23-34.

A review of the literature found that children aged 6 to 24 months were the group most vulnerable to severe PEM. Infection, especially

gastroenteritis, was strongly associated with development and exacerbation of PEM. Marasmus had been increasing and kwashiorkor decreasing as the prevalent form of PEM; this was related to a continuing decline in breast feeding. 0.5% to 2% of children were severely malnourished, and 8 to 17% were moderately malnourished. No improvement in the rate of PEM was apparent during the period 1968 to 1973.

Bailey, W.

1981 Malnutrition among babies born to adolescent mothers. West Indian Medical Journal 30:72-76.

Original data
Method: Hospital records were obtained and analyzed for cases of protein calorie malnutrition admitted to the Bustamente Hospital for Children and the University Hospital of the West Indies for the period 1967 to 1976.
Sample: 761 cases for whom complete records were available (1521 were admitted during the entire period).
Location: Kingston/St. Andres Metropolitan Area.

Using hospital records, the author was able to determine the age at admission of the child, the age and marital status of the child's mother, and particulars about breast feeding patterns and employment status of mothers under twenty years of age. The study shows that young mothers were less likely to breast feed their children and that the children of such mothers were first admitted to the hospital for malnutrition at a younger age than children from the sample at large. Furthermore, mothers under twenty were less likely to be receiving support from the child's father, particularly in families where the mother had borne children to more than one father.

Brooke, O. G.

1972 Hypothermia in malnourished Jamaican children. Archives of Disease in Childhood 47:525-30.

Original data
Method: Temperatures of children with PCM were recorded every four hours and mean temperatures were calculated. Total body potassium was estimated.
Sample: 137 children admitted for treatment for PEM.
Location: Medical Research Council's Tropical Metabolism Research Unit, University of the West Indies, Kingston.

Hypothermia (rectal temperature below 35 degrees Centigrade) occurred in 19.7% of children being treated for PEM. It was related to low weight and height but not to serum or whole body potassium, serum sodium, or seasonal variation in ambient temperature. The incidence of hypothermia in the survivors of this group of children was the same as it was in 42 children who had died from severe malnutrition. It was concluded that hypothermia was not an unfavorable prognostic sign in malnourished Jamaican children.

Cajanus

1981a Nutrition campaign resumes after evaluation. Cajanus 14(2):103-04.

This "news brief" describes new developments in the campaign, including the nature and use of mass media messages.

Cajanus

1981b Focus on community activities in National Nutrition Education Programme. Cajanus 14(3):165-66.

This "news brief" describes the programme's community-based activities, including gardening, food preparation, general nutrition instruction for community groups, and special programs for mothers of malnourished children.

CFNI (Caribbean Food and Nutrition Institute)

1983 Programme of Activities for 1983. Kingston: CFNI.

This document summarizes the Caribbean Food and Nutrition Institute's involvement with the government's educational institutions and other agencies of its seventeen member countries, on a country by country as well as a regional basis. The CFNI is involved in the formulation of national and regional policies, strategies and action programs; education and training activities, for both health personnel and for the general public; and the establishment of information systems in food and nutrition.

Development Assistance Corporation

1981 Synopsis of the Consumption Effects of Agricultural Policies in Jamaica (Draft Report) Study. Washington, D.C.: Development Assistance Corporation, July 31, 1981.

This report constitutes a summary of "Consumption Effects of Agricultural Policies" (CEAP), a study carried out by the Development Assistance Corporation in order to further the understanding of the consumption and nutrition effects of agricultural policies; to explore the important socioeconomic relationship between agricultural production and increases in food consumption and nutrition; to estimate the consumption and nutrition impact of alternative policies, programs, and projects; to explore the impact of agricultural policies and programs on food consumption of designated target groups; to provide a basis for increased coordination between agricultural and nutrition policies; and to develop new techniques for analyzing policy effects. One of its major recommendations is that rice be dropped as a major import substitute crop, due to the high cost of making Jamaica self-sufficient in rice and its questionable effect on the incomes and employment of small farmers The Development Assistance Corporation recommends cultivating close substitutes such as yams, plantains, bananas, potatoes, maize, and other labor-intensive crops suitable for cultivation by small farmers instead. They also recommend

revitalizing the sugar industry, because of the high value of foreign exchange.

Fonaroff, A.

1975 Cultural perceptions and nutritional disorders: A Jamaican case study. Bulletin of the Pan American Health Organization 9(2):112-23.

Original data
Method: Interviews conducted concerning mothers' theories about PEM and comparing them with one another and with theories held by modern medical and indigenous practitioners. Case study method.
Sample: 50 interviews with rural women, not randomly chosen but selected for their willingness to communicate.
Location: national

PEM was regarded differently by women who used modern medical services and those who did not. Women who used modern health clinics could identify techniques for reducing a child's susceptibility to PEM. Women who relied on indigenous medical services and indigenous medical practitioners frequently misdiagnosed PEM as a "marasmic cold" and treated it as such. Treatment often decreased the child's resistance to nutrition-related disorders.

Government of Jamaica

1980 PL 480 Title I Self-Help Report.

The Government of Jamaica prepared and submitted this annual progress report to the U.S. Government in accordance with an agreement regarding the sale of agricultual commodities. Nine Self-Help measures undertaken are reported, including efforts aimed at intensifying local production of food, and financial support and personnel provided to undertake an evaluation of the nutritional impact and manangement efficiency of the supplementary feeding program that is being undertaken by the Ministry of Health and Environmental Control, with food supplies from the U.S. and from the EEC.

Grantham-McGregor, S. M. and Back, E. H.

1970 A note on infant feeding in Kingston. West Indian Medical Journal 19(2):111-15.

Original data
Method: Infants of working-class mothers were examined 8 times during their first year, and mothers interviewed about types of food being given. Quantities were estimated only for milk. At least one home visit was conducted for each child, focusing on standard of housing and food preparation.
Sample: 300 infants.
Location: Paediatric Department of the University Hospital, Kingston.

This article discussed in detail the bottle-feeding practices prevalent in Kingston at this time, especially quantities of milk

given and the relative popularity of specific brands. Refrigeration was unusual, 77% of infants were at least partially bottle-fed by 6 weeks of age, and bottle hygiene was unsatisfactory. Various foods and the ages at which they were given are presented in tabular form. The authors' recommendations focus on improving access to supplemental milks.

Grantham-McGregor, S. M., Stewart, M. E., and Desai, P.

1980 The relationship between hospitalization. social background, severe protein energy malnutrition and mental development in young Jamaican children. Ecology of Food and Nutrition 9:151-56.

Original data
Method: Children admitted to the University Hospital of the West Indies between June 1975 and June 1976 were studied. All were singletons, had birth weights over 5 lbs, and were aged 6 to 24 months on hospital admission. Data collected were: birth date and weight, severity of illness on admission, days in hospital, mother's IQ, house rating, Caldwell Home Inventory scores, and developmental level.
Sample: 18 malnourished and 21 adequately nourished children selected on the basis of hospital admission.
Location: Kingston.

The study looked at the sociocultural and biological backgrounds of Jamaican children hospitalized for severe protein calorie malnutrition and compared them with other hospitalized but adequately nourished children. Malnourished children had mean developmental quotients that were significantly lower than those of the comparison children. They also had longer hospital stays, poorer housing, smaller birth weights, and mothers with lower verbal IQs. The effect of each independent variable was measured by a standardized regression coefficient. Nutritional status had the largest statistically significant effect on the developmental quotients. Less important but still significant variables were: age, length of hospital stay, and home inventory scores.

Grantham-McGregor, S. M., Desai, P., and Buchanan, E.

1977 The identification of infants at risk of malnutrition in Kingston, Jamaica. Trop. Geogr. Med. 29(2):165-71.

Original data
Method: Longitudinal study. Children were followed from birth to one year. Weight records were kept, and care and background of children were studied.
Sample: 300 consecutive births at the University Hospital of the West Indies.
Location: Kingston.

Children with low birth weight tended to remain in the 10th percentile. High birth order, poor standard of housing, repeated attacks of gastroenteritis, poor clinic attendance, and poor milk intake were all significantly associated with being underweight at 12

months of age. These factors were interrelated, and the more factors present in each child the smaller the child tended to be.

Grantham-McGregor, S. M., Desai, P., and Milner, P. F.

1974 Haematological levels in Jamaican infants. Archives of Disease in Childhood 40:525-30.

Original data
Method: Longitudinal study; blood specimens were taken within three days of birth, at six weeks, and at 3, 6, 8, 10, and 12 months.
Sample: 300 infants birth to one year of age selected by taking consecutive births at University Hospital.
Location: Kingston

Low hemoglobin levels were associated with iron deficiency, which was probably due to poor iron stores at birth followed by poor iron intake or absorption. It was not possible to determine whether folic acid deficiency or protein deficiency was also important. Hemoglobin levels varied with age, socioeconomic status, birth weight, sex, and rate of weight gain.

Harland, P. S. E., Cox, D. L., Lyew, M., and Lindo, F.

1981 Composition of oral solutions prepared by Jamaican mothers for treatment of diarrhoea. Lancet 8220(1):600-1.

Original data
Method: Standard questionnaire concerning salt-sugar solutions for treatment of diarrhea. Some subjects brought in samples of homemade solution; others were given materials and asked to prepare the solution as they usually did.
Sample: 44 mothers attending University Hospital casualty department who had used homemade oral rehydration fluid.
Location: University Hospital, Kingston.

The composition of oral rehydration fluids prepared by mothers varied dangerously. The authors suggested that the double-ended spoon be used to improve the precision with which home-made solutions were prepared. Mothers should also be told which kind of sugar to use. All members of the health team and the mass media should present the same method.

Hibbert, J. M. and Golden, M. H. N.

1981 What is the weanling's dilemma? Journal of Tropical Pediatrics 27:255-58.

Original data
Method: Children attending three well-baby clinics were weighed, and histories were compiled, which included information on feeding practices, feed preparation, methods of sterilization, kitchen facilities, and any previous attacks of gastroenteritis for which medical help had been sought. Bottle feeds of both well-nourished and

malnourished children were cultured in McConkey's agar and analyzed to test the hypothesis that feeds given to well-nourished children were less contaminated than those given to malnourished children.
Sample: 90 well-nourished (over 80% of Boston standards) and 11 under-nourished (less than 80% of Boston standards), aged six to 23 months of age. All children present on a given day were included in the study.
Location: urban Kingston.

Researchers found that four-fifths of the feeds were heavily contaminated with fecal organisms, and that the level of contamination did not differ between milks and porridges or with different methods of sterilization. Furthermore, there was no relationship between the level of contamination and the nutritional status of the child. One-third of the well-nourished children were receiving some breast milk in addition to bottle feeds, at the time of the study, and had suffered from fewer attacks of gastroenteritis. Researchers hypothesized that breast fed children could ingest fecal organisms with greater impunity than non-breast fed children.

Hibbert, J. M., Seakins, H. A., and Jackson, A. A.

1980 Nutrient contents of bottle feeds of infants and children brought to clinics in Kingston, Jamaica. West Indian Medical Journal 29(2):134-41.

Original data
Method: Samples of bottle feeds were obtained from mothers attending three child welfare clinics representing a range of socioeconomic groups. Clinics were visited weekly for four weeks. All mothers with infants aged 6 to 23 months were invited to participate, and none refused. Infants were weighed and assessed using weight for age criteria. Mothers responded to questionnaires on the age of the child and methods of feed preparation. Samples were tested for protein, energy, sodium, and solid contents. Standard feeds were also prepared, according to the manufacturers' instructions, and used as controls.
Sample: 151 samples of bottle feeds, from the well baby clinics of the University Hospital of the West Indies, the Comprehensive Health Center, and the Edna Manley Health Center. The samples were divided into milk formulae, milk drinks, and porridges.
Location: Kingston

Nutrients were measured within the normal range in only 14% of the milk formulae; only one of the milk drinks was within the normal range for all nutrients. The majority of the milk drinks were high in energy, solids, and sodium. None of the porridges was within the normal range for all nutrients. Seventeen percent of the milk formulae had protein content as low as 60% of the standard, and 50% of them had energy content in excess of 110% of the standard, as a result of added sugar. Porridges were generally thin, with a low energy content, and a high sodium content, as a result of added salt.

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Hosang, G.

1981 The Nutrition Education/Communication Programme--Jamaica. Paper presented at the Annual Meeting of the Caribbean Association of Nutritionists and Dieticians, July 1981. Kingston. 5p.

This paper summarizes the development of the program, including a description of the preparatory activities conducted prior to launching the campaign in 1977: a baseline survey, staff and community training, and designing and pretesting messages and materials.

Israel, R.

1981 Consultant Report for Jamaica (March 1-7, 1981): Planning assistance for the nutrition activities of the Jamaica Health Management Improvement Program. Newton, MA: International Nutrition Communication Service, Education Development Center.

This report describes the schedule of nutrition technical assistance developed by the International Nutrition Communication Service to help the Nutrition Division of the Ministry of Health Service carry out the activities of the Jamaica Health Management Improvement Project (JHMIP). Information on nutrition planning, surveillance, education, and supplementary feeding activities to be undertaken in the first 18 months of the project is outlined, and a suggested timetable for implementation is also provided.

JNPA (Jamaica National Planning Agency)

1980 Economic and Social Survey, Jamaica, 1980. Kingston: Government Printer.

JNPA (Jamaica National Planning Agency)

1981 Economic and Social Survey, Jamaica, January-June 1981. Kingston: Government Printer.

The 1981 Economic and Social Survey of Jamaica is a government publication giving information on the economy, including investment, trade, banking, and finance aspects, performance of different industries by sector; manpower and industrial relations; and social development and welfare programs. Data for 1981 is compared with 1980 and sometimes earlier data, so that trends can easily be distinguished.

Kielman, A., Ajello, C., and Kielman, N.

1980 Evaluation of Nutrition Intervention Projects. Final Report of the Documentation Coordinator, TA/PPU/EUI. Washington, DC: U.S.A.I.D., Technical Assistance.

The purpose of this study was to provide a critical evaluation of several nutrition interventions in order to provide guidelines for future nutrition programs. The Hanover Young Child Nutrition Program in Jamaica was one of six selected for the study. The researchers

compared the effects of these interventions on health indices and came up with a set of questions to be asked by people designing and evaluating intervention projects. They also developed criteria for determining whether a significant impact on health has occurred, sample sizes required to determine whether the criteria have been met, and guidelines for identifying the social, economic, cultural, and health considerations that must be taken into account in designing a project.

Landman, J. and Hall, J. St.E.

1983 The dietary habits and knowledge of folklore of pregnant Jamaican women. Ecology of Food and Nutrition 12:203-10.

Original data
Method: The study was undertaken to look at the dietary habits of pregnant women in a socioeconomic context. Those with diagnosed hypertension or diabetes were excluded. A questionnaire was administered to collect information on parity, age, stage of gestation, socioeconomic background, and dietary history. The mean age was 25.
Sample: 125 women were interviewed: 84 were public patients from antenatal clinics, 41 were private patients.
Location: Kingston.

Dietary changes during pregnancy were common and probably reflect general physiological changes. Women commonly reported an increased appetite for certain foods and aversion to others. Aversion to meat was commonly mentioned. 41% of the women reported indulging cravings for unusual or inedible substances; 14% reported pica. Traditional customs and superstitions were also commonly reported. Lower socioeconomic status was significantly associated with unusual cravings and traditional beliefs.

Landman, J. P. and Shaw-Lyon, V.

1976 Breast-feeding in decine in Kingston, Jamaica, 1973. West Indian Medical Journal 25(1):43-57, March.

Original data
Method: 12-month longitudinal study. Data were gathered from hospital records and interviews with mothers concerning obstetric history, illness, and feeding patterns. Anthropometry of children.
Sample: 82 consecutive live births in hospital (7% lost at follow up).
Location: University Hospital of the West Indies.

At University Hospital of the West Indies, breast feeding was promoted by education of mothers, limiting complementary feeds and preventing access of commercial milk nurses to the hospital. Although 65% of mothers fully breast fed at the hospital, by 3 weeks only 25% did so. At 5 months, only 38% of infants were still breast fed at all. The decline of breast feeding occurred in a context of poverty in which the average mother spent 88% of her income on food.

Licross (Licross/Voltags Steering Committee for Disasters)

1979 Medico-Nutritional Information on Disaster Prone Countries and Glossary of Common Illnesses. Brussels: International Research Center on Disasters Epidemiology, Unit of Epidemiology, School of Public Health, University of Louvain. September.

This series of over 100 1- or 2-page "country fact sheets" was prepared by the Steering Committee to aid in prompt and appropriate responses to disasters; the accompanying glossary was designed for non-medical administrators. Each section describes a country's diet, nutritional deficiencies, medical supplies, health services, capacity for handling refrigerated drugs, and common illnesses. Regional and rural-urban distinctions are included where possible.

Marchione, T. J.

1977 Food and nutrition in self-reliant national development: The impact on child nutrition of Jamaican government policy. Medical Anthropology 1(1):57-79.

Original data
Method: Social, economic, and anthropometric data were collected in order to assess the impact of the 1974 food crisis and the subsequent shift in governmental policy on the incidence of malnutrition in a rural area.
Sample: 500 children in 300 households, 0 to 36 months of age, were randomly selected.
Location: St. James.

Contrary to expectations, the crisis of 1974 resulted in a decrease rather than an increase in the prevalence of malnutrition in rural St. James. The prevalence rate fell from 14.4% to 4.3%, while urban rates remained roughly constant. The author speculated that this improvement was due in part to the favorable market for local food products created by the shortage of imported foods, assisted by a minor shift in land redistribution patterns, government taxation of idle lands, price supports for local food produce, tacit support of unionism resulting in higher wages for industrial workers, and the creation, in rural St. James, of a Community Health Aide Programme, directed at improving nutritional awareness of pregnant and lactating women and children.

Marchione, T. J. and Prior, F. W.

1981 The Dynamics of Malnutrition in Jamaica. In L. Greene and F. Johnston, eds. Social and Biological Predictors of Nutritional Status, Physical Growth, and Neurological Development. New York: Academic press, pp. 201-222.

Original data
Method: Sociocultural interviews and anthropometric measurements.
Sample: Two samples of 500 children under 36 months of age, one in 1973 and one in 1975, selected by random, cluster, stratified

sampling. A subsample of one year olds and their households was focused on in this paper.
Location: St. James Parish

This analysis has shown that the nutritional status of one year old children, as measured by weight and height, was not consistently associated through time with a set of socioeconomic variables. 15 to 31 variables were associated with either height or weight in 1973, but in 1975, 8 of 31 variables were significantly associated. The inconsistency of the predictive capacity of the variables was explained by the underlying dynamics of changing society in Jamaica.

Miall, W. E., Desai, P., and Standard, K. L.

1970 Malnutrition, infection, and child growth in Jamaica. Journal of Biosocial Sciences 2(1):31-44.

Original data
Method: Longitudinal study. Observations and interviews every two weeks for two years, then once a month. Interview in home with mother or guardian concerning diet, child health, income, etc. Anthropometry of children.
Sample: 420 children, 207 boys and 213 girls, under 4 years of age. All mothers in one area were asked to participate.
Location: Village of Lawrence Tavern, 15 miles from Kingston.

This study of factors influencing child growth explored the relationships between diarrhea, respiratory infections, and body weight. Respiratory infections and diarrhea both reached peak incidences between 6 and 24 months when children were also at highest risk of malnutrition. Respiratory infections had no demonstrable influence on growth. Diarrhea was more common in boys than in girls and more common in underweight children. It had no influence on long-term weight increases but did have the expected negative influence on short-term increments.

Miller, C. G. and Chutkan, W.

1976 Vitamin D deficiency rickets in Jamaican children. Arch Dis Child 51(3):214-18.

Original data
Method: Clinical, biochemical, and radiological examination of malnourished children admitted to University Hospital, 1969-1973.
Sample: 6 boys and 3 girls ranging in age from 3 to 8 years.
Location: University Hospital, Kingston; only 3 of the children had spent the early years of their lives in Kingston.

The authors conclude from their findings that rickets is not as rare in Jamaica as had been believed, although there is no way of telling whether this is due to an actual increase in incidence, or to increased awareness. They present a case study of 3 children from 1 household who all had rickets because of not being allowed out of their high-rise apartment.

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Ministry of Health

1984 Nutrition and Dietetic Division Priorities for 1984. Kingston.

This paper summarizes the planned activities of the Division in 1984, including surveillance, supplementary feeding programs, hospital-based service, research, and training.

Nutrition Advisory Council

1978 A Food and Nutrition Policy for Jamaica with Programmes for Incorporation into the National Development Plan. Ministry of Health and Environmental Control: Revised, August 1978.

A National Food and Nutrition Policy document was formulated in 1974, outlining the state of food supply and nutrition, the determinants of food consumption patterns, nutritional status, and goals to be attained through the adoption of policies and the implementation of projects and programs. Since then, far-reaching changes have taken place in Jamaican society at large, and in the area of food and nutrition in particular. This document represents a review and a reworking of the 1974 document to bring it up to date with the new conditions and the new underlying philosophy of "Self Reliance." it includes an overview of projects and programs begun between 1974 and 1978, information on the structural breakdown of the population and the nutritional status of vulnerable groups, characteristics of the food supply and its availability, food preferences and the influence of trade policies, data on infectious diseases related to food and nutrition, breast feeding practices, and a few observations on environmental sanitation and the water supply.

Nutrition Advisory Council

1974 The Development of a Food and Nutrition Policy for Jamaica. Kingston, April.

The Nutrition Advisory Council, established by cabinet decision in August 1973, came out of the recognition on part of the Governm nutrition for the well-being of the people and the economy. The Council was charged with formulating a National Food and Nutritic Policy for Jamaica, and developing programs to implement such a policy. To that end, a seminar on food and nutrition policy was held at the Sheraton Kingston Hotel, from May 27 to 31, 1974. Topics discussed were: food balance sheets, household budget surveys, food supply and nutrient needs, and food consumption patterns. Tables on food groups, household expenditures on foods, recommended dietary intakes, per capita food availability, and other agronomic data are presented, which permit an assessment of the magnitude of the problem.

PAHO (Pan American Health Organization)

1978 Jamaica Launches Nutrition Education Campaign. PAHO Bulletin 12(2):1978.

This article outlines the major goals, emphases, and phases of a nutrition education communication campaign that was started in 1978, under the supervision of the Ministry of Health and Environmental Control, and other local agencies and institutions.

Reddy, S. K.

1971a Artificial feeding in Jamaica and Barbados. West Indian Medical Journal 20(3):198-207.

This article summarizes data on artificial feeding practices in Jamaica and Barbados drawn from six studies, carried out by the Sugar Welfare Board, Sugar Welfare Jamaica, the Social Development Agency, the United Manchester Association Project, the Jamaica Federation of Women, and the National Nutrition Survey (Barbados), respectively. The samples for each study were chosen from different areas and socioeconomic groups. Data on the age at which bottle feeding is introduced, reasons for introducing the bottle, types of milk used, reasons for its selection, methods of preparation, vitamin and other supplements, and the age at which complete cessation of breast feeding occurs are included.

Reddy, S. K.

1971b Transition to family diet in Jamaica and Barbados. West Indian Medical Journal 20(3):218-26.

This article presents information from the same studies reported in Reddy, 1971a; in this paper, data are presented for weaning foods. Foods are assessed in terms of bottle-fed "semisolids," solid foods, protein content (animal or vegetable), and dark green leafy vegetables. The paper also discusses local foods readily available and suitable for use as weaning foods, customary ages of introduction of various foods, attitudes towards specific foods, and the frequency of meals for young children.

Sheffer, M. L., Grantham-McGregor, S. M., and Ismail, S. J.

1981 The social environment of malnourished children compared with that of other children in Jamaica. Journal of Biosocial Sciences 13:19-30.

Original data
Method: A longitudinal study of mental development of children admitted to hospital with severe protein energy malnutrition was carried out, using the Jamaican Inventory of Home Stimulation. Anthropometric data were also collected. The results were compared with those of adequately nourished children admitted to the hospital for other reasons, and two neighborhood samples.
Sample: 17 urban children hospitalized for malnutrition, and 20 urban children hospitalized for causes other than malnutrition, aged 6 to 24 months at the time of hospitalization.
Location: Hospital of the University of the West Indies, Kingston, and neighborhoods near the University.

The study was designed to test the hypotheses that the ecology of protein energy malnutrition is different in different countries, that malnourished children suffer from poor mother/child relationships, and that levels of home stimulation are a factor in producing the deficit in mental development manifested by malnourished children. The findings contradicted those of other researchers, because of the similarity found in the levels of home stimulation of malnourished and adequately nourished children. Malnourished children, however, tended to have a poorer standard of housing and a higher birth order than the comparison groups. They also remained stunted and had smaller head circumferences than the control children, although their weight-for-height was the same two years after leaving the hospital.

Simmons, W. K.

1980 Programmes for the prevention of anaemia in Jamaica. West Indian Medical Journal 29(1):15-21.

This paper presents descriptions of planned and existing programs to address anemia problems in Jamaica; the problems themselves were presented in Simmons, 1979. Programs are categorized by four approaches, as designated by the WHO: fortification, direct supplementation, education approaches, and public health measures to decrease requirements due to environmental factors that depress absorption or increase metabolic needs.

Simmons, W. K.

1979 Nutritional anaemia in Jamaica. West Indian Medical Journal 28(4):199-208.

This paper presents data from studies of anemia in Jamaica conducted from 1950 through 1974; data are presented and compared in tabular form, including locations, ages studied, number of cases, and findings of hemoglobin and parasite status. The author concludes that anemia is a significant public health problem, particularly among children under 18 months old and pregnant and lactating women. Folic acid deficiencies and complications from parasite infestation were not considered major factors; iron deficiencies were apparently due to low intakes and poor absorption.

Simmons, W. K., Jutsum, P. J., Fox, K., Spence, M., Gueri, M., Paradis, R., and Gurney, J. M.

1982 A survey of the anemia stauts of preschool age children and pregnant and lactating women in Jamaica. American Journal of Clinical Nutrition 35(2):319-26.

Original data
Method: Cluster sampling of 15 children age 3 to 59 months in each of 200 census districts selected at random in proportion to the population of each parish. Finger-prick blood samples were taken from every third child. Women in these households were included if pregnant or breast feeding a child under 6 months old; finger-prick blood samples.

Sample: 1000 children, 229 pregnant women, and 423 lactating women.
Location: National sample as described above.

This article presents the hemoglobin results of the 1978 national survey, which also included anthropometric measures. In addition to presenting results on national, rural, and urban populations, the paper presents tables on the mean hemoglobin levels of each study group in each of the parishes, levels for pregnant women by trimester, and for presechool children by age groups. Iron-deficiency anemia was found to be a significant problem in all groups.

Stoopler, M., Frayer, W., and Alderman, M. H.

1974 Prevalence and persistence of lactose malabsorption among young Jamaican children. American Journal of Clinical Nutrition 27(7):728-32.

Original data
Method: Lactose tolerance tests following fasting. Parents were interviewed about incidence of symptoms of lactose intolerance: abdominal pain, diarrhea, and vomiting following the test dose.
Sample: Randomly selected 94 children (48 boys, 46 girls under 5 years old) in Elderslie and 20 children under 4 years old in Kingston.
Location: Elderslie and Kingston.

Although there was no local dairy industry in Elderslie, dried skim milk was a part of children's diets. This study presents the lactose tolerance for two groups of children whose demographic characteristics and health status were known.

Thomas, A. and Krieger, L.

1976 Jamaican vomiting sickness: A theoretical investigation. Soc. Sci. Med. 10(3-4):177-183.

This report summarizes the literature on Jamaican Vomiting Sickness and summarizes the hypotheses regarding its etiology and the evidence for and against each, ending with recommendations for further research, primarily on food consumption of young children and the epidemiological evidence already on hand, as well as more complete investigation of future outbreaks.

USAID (U.S. Agency for International Development, Kingston Mission)

1982a Telegram Re: Review of Breastfeeding, Weaning, and Maternal Nutrition Programs. Kingston, April 1982.

This telegram was sent to USAID/Washington in response to their request for information on current programs in weaning, breast feeding promotion, and maternal nutrition.

USAID

1982b Jamaica Project Paper: Health Management Improvement Project. Project No. 532-0064. Washington, D.C.

This document requesting a proposal for a Health Management Improvement Services project covers formal instructions for preparation and submission of proposals, contract format and requirements, and selection criteria. In addition it contains background information on goals and programs of the Jamaican Ministry of Health, current difficulties, objectives for the proposed project, guidelines for a nutrition education program, and the organizational structure of the present system.

Wheeler, E. F.

1974 "Cornmeal and condensed milk": Assessment of a Jamaican supplementary food mixture. West Indian Medical Journal 23(2):69-74, June.

Original data
Method: Refeeding of previously malnourished children between one and two years of age with a porridge of corn meal and condensed milk.
Sample: Seven children who had suffered malnutrition and were treated in the Tropical Metabolism Research Unit.
Location: Tropical Metabolism Research Unit.

A thin porridge of cornmeal and sweetened condensed milk is a traditional weaning food. Health workers have discouraged the use of this food, believing that it is too low in protein to support good growth. A trial with seven previously malnourished children indicated that this porridge can support good growth if the porridge is served thick instead of thin and if the food is offered frequently enough, at least four or five times each day.

World Bank

1981 World Development Report, 1981. Washington, D.C.: International Bank for Reconstruction and Development/The World Bank.

This document is the fourth in an annual series assessing key development issues; the focus of this year's work was the international context of development. Chapters are devoted to trade, energy, finance, human development, and countries' experiences in managing adjustment. Annexes provide tables of country-specific development indicators, including factors in population, economics, labor, and government budgets. The per capita supply of calories was computed from the net food supplies available from domestic production, imports less exports, and changes in stock; net supplies exclude animal feed, seeds, quantities used in food processing, and losses in distribution. FAO requirements are based on physiological needs for normal activity and health considering environmental temperature, body weights, age and sex distribution of the population, and allowing 10% for waste at the household level. The World Bank notes that this document should not be quoted as representing the views of the Bank, nor does the Bank accept responsibility for the accuracy or completeness of the report.

World Bank

1976 Appraisal of a Second Population Project: Jamaica. Washington, D.C.: World Bank Report No. 1040b-JM, May 26, 1976, Population Projects Department.

In this appraisal of its first population project in Jamaica, the World Bank concluded that although the project had had an impact in reducing fertility, the demographic objective had not as yet been fully achieved. The government was successful in reducing infant mortality to the target level, but the prevalence of malnutrition among young children and pregnant and lactating women was still high compared to developed countries. A second project was proposed, which would incorporate a stronger nutrition component. Special emphasis would be placed on: training and equipping midwives and community health aides; developing an integrated MCH/FP/nutrition program in Cornwall County, and expanding existing postpartum programs. Objectives for the nutrition education program would include: promotion of breast feeding, helping mothers recognize and use adequate infant weaning foods, reducing anemia in mothers through supplementary foods, and encouraging the utilization of MCH/FP/nutrition services by mothers and children. The project would also undertake a study to determine the need for supplementary foods for mothers and for weaning, explore alternative methods for local procurement of foods, and recommend methods for local processing and packaging of supplementary food.

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1979 Programmes to control or stabilize food prices in Jamaica. Cajanus 12(2):93-110.

Almroth, S. G.

1978 Water requirements of breast-fed infants in a hot climate. American Journal of Clinical Nutrition 31(7):1154-57.

Original data
Method: Three urine samples each were collected from a sample of exclusively breast fed infants, to estimate the water requirements of exclusively breast fed infants in a hot climate. The urine samples collected were tested for specific gravity, and the values for osmolality were calculated. The mean outdoor temperature was 27.3° C and the humidity 76%.
Sample: 16 infants (boys and girls, age unspecified).
Location: The coastal town of Port Antonio and the villages of Hectors River and Bangor Ridge, northeastern Jamaica.

Based on the universally low values obtained for specific gravity, the author concluded that these infants were able to manage very well without additional water, an important point in an area where the practice of giving infants water is widespread, and the water supply frequently contaminated.

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1981 Report of a Training Program for the Mobile Unit Project: An Integrated Nutrition and Family Planning Education and Service Program. Kingston: Ministry of Agriculture, under the auspices of the American Public Health Association, supported by the U.S. Agency for International Development, May 13-30, 1981.

This is a consultant report of a two-week workshop to train Home Economics Officers for the Mobile Unit Integrated Nutrition and Family Planning project, the purpose of which is to reduce the number of pregnancies among teenage and older women, and improve the nutritional status of families. The objectives of the project are as follows: to provide direct family planning information to 12,000 sexually active adults each year; to provide one-to-one family planning counselling to 2,000 different persons each year; to provide contraceptive supplies to 3,000 new acceptors each year; to provide nutrition information and demonstrations to 15,000 youths and adults each year; to provide initial training for Home Economics Officers in the use and development of educational materials, nutrition information, family planning information, counselling techniques, methods for distributing contraceptives, and to assess regularly the living conditions, family planning, and nutrition practices of rural people in response to the project.

Bressler, R.

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CCS (Caribbean Community Secretariat)

1981 Report of Workshop on Primary Health Care, Saint Lucia, June 7-13, 1981.

The workshop was organized by the Caribbean Community Secretariat, with the University of the West Indies, the Pan American Health Organization/World Health Organization, the United Nations Children's Fund, the United States Agency for International Development, and the American Public Health Association. Governments participating were: Antigua, Barabdos, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts/Nevis, St. Lucia, St. Vincent and the Grenadines, Anguilla, the Bahamas, Bermuda, British Virgin Islands, Cayman Islands, Turks and Caicos Islands, and Suriname. Broad areas discussed included primary health care in the Caribbean context; infrastructure of primary health care; managerial components; human resources for primary health care; community involvement; coordination; and mobilization and utilization of resources to meet primary health care needs.

CFNI (Caribbean Food and Nutrition Institute)

1976 Food Balance Sheet for the Caribbean. Kingston: Caribbean Food and Nutrition Institute.

CFNI (Caribbean Food and Nutrition Institute)

1974 Some Aspects of the Sales Promotion of Proprietary Brands of Milk for Feeding Infants. Kingston: CFNI document No. CFNI-J-110-74.

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1975 Cultural perceptions and nutritional disorders: A Jamaican case study. Bull. Pan American Health Organization 9(2):112-23.

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1972 Intellectual levels of school children severely malnourished during the first two years of life. Pediatrics 49:814-24.

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1980 A "Catch up growth" chart. Cajanus 13(1):15-17.

The Tropical Metabolism Research Unit at the University of the West Indies, Mona, developed a growth chart to use in monitoring the weight gains of children hospitalized for malnutrition. Based on the records of 100 children from the TMRU ward and 4 rural Jamaican hospitals, the chart is based on an expected weight gain of 2 kg in 6 to 10 weeks and differs from the usual growth chart by providing for daily weighings for 10 weeks and is based on weight gain alone, rather than age or height standards.

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Miller, G. J., Miller, N. E., and Ashcroft, M. T.

1976 Inverse relationship in Jamaica between plasma high-density lipoprotein in cholesterol concentration and coronary-disease risk as predicted by multiple risk-factor analysis. Clin. Sci. Mol. Med. 51(5):475-82.

Ministry of Health

1978 Primary Health Care: The Jamaican Perspective. Kingston: Ministry of Health.

This reference manual contains background information on primary health care programs and projects; health policies and plans; data on current health status; definitions of primary health care concepts and guidelines for developing primary health care services; a detailed description of the present delivery system; guidelines for community involvement in primary health care; training requirements for health personnel; and constraints in implementation of primary health care services, concluding with profiles of each parish, including population figures; a schedule of health centers, their locations and services offered; location of community health committees; and further building needs.

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