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MATERNAL AND INFANT NUTRITION REVIEWS

HAITI

A Guide to the Literature

Compiled by

Ron Israel - Senior Editor
Joanne Nestor - Editor and Reviewer
Ellen (Blumenstiel) Taylor - Principal Reviewer
Steve Wirtz - Reviewer

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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-six MINRs in all, profiling forty-five different countries. (See table 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. Special thanks are extended to Drs. Jon Rhode and Gretchen Berggren for their assistance in reviewing this report and supplying information.

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:

Ron Israel, Director
International Nutrition Communication Service
Education Development Center
55 Chapel Street
Newton, Massachusetts 02160, USA

MINR Country Reports:

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

*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

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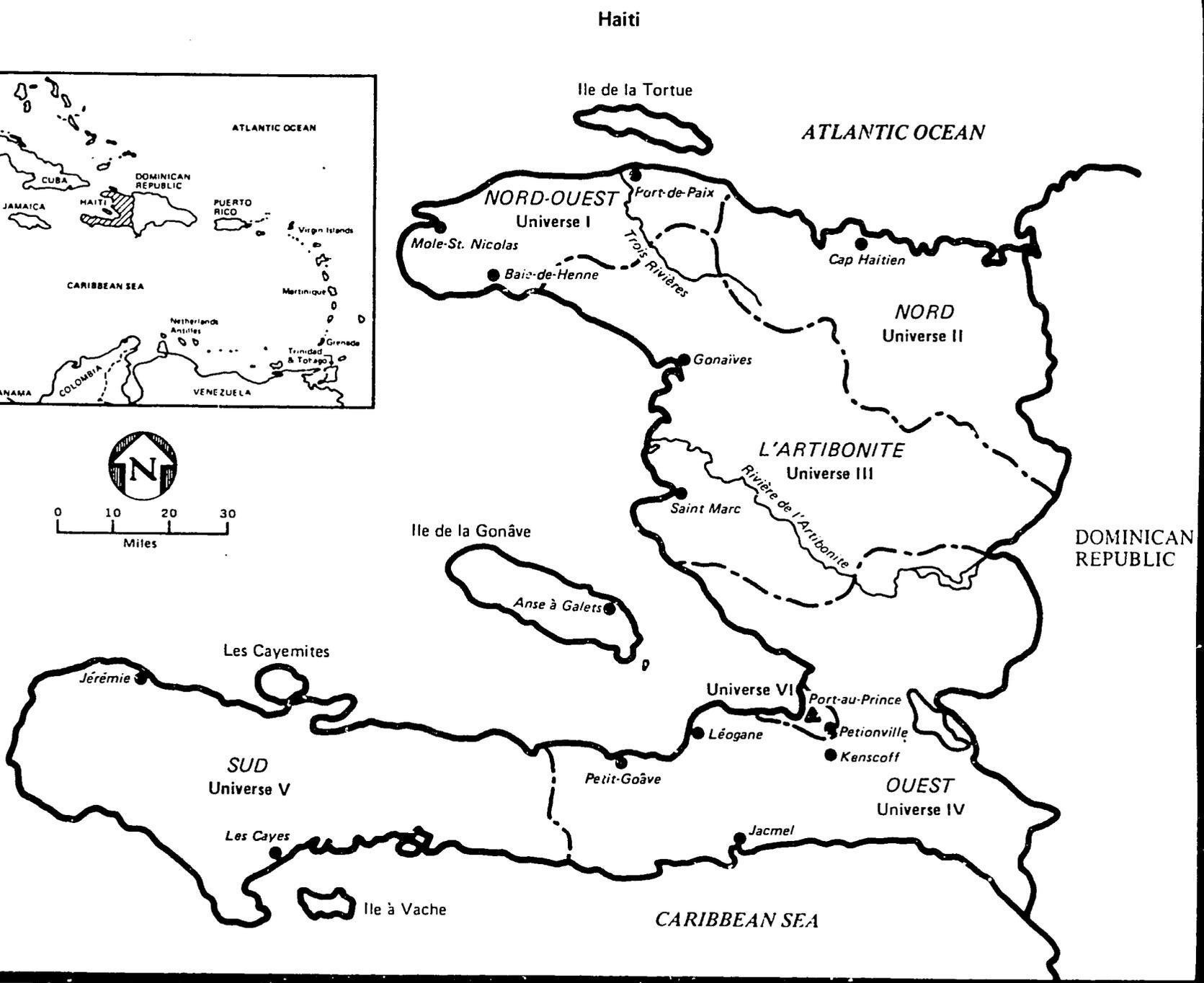
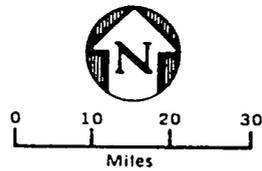


TABLE 1
LOCATIONS STUDIED

	Alvarez and Murray, 1981	Baer et al., 1981	Baer and Rohde, 1981	Ballweg, 1972	Beaudry-Darisme & Latham, 1973	Berggren et al., 1981a	Berggren et al., 1981b	Berggren et al., 1979	Berggren & Berggren, 1971	Berggren & Berggren, n.d.	Berggren et al., n.d.	Brown et al., 1978	Bureau of Nutrition, 1979	Dieudonne, 1981	Genece & Rohde, 1982	Hollant, E., 1975	Jelliffe & Jelliffe, 1961	King et al., 1968	Murray & Alvarez, 1973	Thacker et al., 1980	Toureau, 1979	Webb, 1975	Webb, 1972	Weise, 1976
National													X				X							
Port-au-Prince																				X				
Ste. Marie in Port-au-Prince					X																			
Cité Simone adjoining Port-au-Prince							X																	
29 rural villages North Region	X	X																						
Mathieu, Guerin, Ballanton, Labordes, Plaisance and Thomassain					X																			
Artibonite, North and Northwest Haiti																					X			
Artibonite Valley area of Deschapelles and Albert Schweitzer Hospital						X	X	X	X	X														
Grande Rivière in Northern Haiti												X												
Cul de Sac Plain (one village)	X																		X					
Croix de Bouquets, Thomazeau, Fonds Parisien, La Hatte Cadette and Descloches in the Cul de Sac Plain																X								
Fonds Parisien				X																				
Trou Chouchou, Grande Goâve and Milleur													X											
Port Margot, Ganthier, Fonds Parisien and Les Cayes																		X						
Ten rural villages near Jeremie in the southern part of the country																								X
Thirty localities in the Southern Region															X									
Not Specified																					X	X		

HIGHLIGHTS

1. NUTRITION AND HEALTH STATUS: Most Haitians suffer from multiple nutritional deficiencies. The most important is protein energy malnutrition in children under five. Riboflavin deficiency is probably the second most widespread deficiency disease. 35% of non-pregnant, non-lactating women are anemic.

The maternal mortality rate was 432 deaths per 100,000 live births in 1978. About 38% of pregnant women and 37% of lactating women are anemic.

The infant mortality rate was 150 deaths per 1000 live births in 1980. The high rate of infant mortality is due in large part to frequent death in the first 24 hours of life. Most women are not delivered by a trained attendant. The mortality rate of children 1 to 4 years of age is 23 deaths per 1000. Although the direct cause of most child deaths is diarrhea and respiratory infection, the underlying cause is probably malnutrition. 46% of all children aged 3 to 59 months have first degree malnutrition; 24.1% have second degree malnutrition; and 3.2% have third degree malnutrition. The percent of preschoolers with third degree malnutrition increases markedly with age, up to age six. Six months has been identified as the age when growth retardation begins. 11.3% of children examined showed signs of conjunctival xerosis. 63% of all cases of unilateral blindness among preschoolers are related to vitamin A deficiency. 44.4% of mothers reported that their child had diarrhea in the preceding seven days.

2. DIETARY BELIEFS: Belief in humoral medicine is widely and consistently held in rural areas. A common manifestation of humoral medicine is a hot/cold classification of foods and diseases. The classification depends on an innate quality in each food to generate either cold or hot within the body. Neonatal tetanus is considered a cold disease. It is believed to be the result of a chill caught by an imprudent mother and passed through her milk. Foods are grouped into three categories: viv which includes cereals and tubers, vyan which includes high protein foods such as meat, milk, and beans, and legim or vegetables.

A pregnant woman is believed to have no right to let herself go hungry. If she does not eat enough, the child inside her will not grow. Special drinks are recommended for pregnant women at different times before delivery. For example, a purgative based on castor oil is taken three times in order to purge the child in the womb. Many of these are believed to protect the growing fetus against spiritual or magical harm, especially by the nocturnal lougarou, vampires who thirst for children's blood.

Local custom imposes a three month period of sexual abstinence as the proper protection for women. Colostrum is often discarded because it is believed that the mother's milk will not be good for the baby until it is white. However, village women are unanimous in their view of the superiority of breast milk over powdered milk or cow's milk. The baby's first stools, consisting of meconium, are considered to be unhealthy and must be "cleaned out." Therefore, large doses of castor oil may be given to the newborn to expedite this. When a baby is being weaned, its mother may hang a piece of bois mesquite (stalk of the castor oil bush) around her neck. As the wood shrivels, so the breast milk is meant to dry up. Most mothers feel that eggs are too indigestible for young children.

HIGHLIGHTS (CONTINUED)

Most Haitians are influenced by Voodoo, a polytheistic cult of African origin. According to voodoo beliefs, illness was caused by supernatural forces. The graver the illness, the more important it was thought for the patient to eat carefully, and the more stringently enforced were traditional behavior demands.

3. DIETARY PRACTICES: Corn, sorghum, beans, rice, manioc, sweet potatoes, and plantains make up the bulk of cultivated foods. Corn occupies the largest acreage, and is grown in all the agricultural areas which have sufficient rainfall. Sorghum is the second most important food crop, measured by the numbers of acres planted. Rice is the major cereal in the urban areas. The main cash crop is coffee. Sugar cane grows everywhere. The mango is the most important fruit in the diet. During mango season, mangoes are the principal food in terms of bulk and calories among the rural population. The average food intake is 452 kg per person per year, 24.7% below the FAO recommended level of 600 kg of food per person per year. The average consumption of calories meets 3/4 of the needed amount, while protein intake provides 2/3 of the recommended quantity. Dietary intake has been observed to change radically from day to day in relation to prices in the marketplace.

Post harvest losses of local foods due to rodents, moisture, etc. are estimated by Haitian agronomists at a minimum of 30%. 95.2% of rural families have gardens that produce food consumed by the family. The months of July and August are considered the hardest months, the hungry season. Cooking in a rural village is time consuming. Major meals can take from 3 to 4 hours. As firewood becomes more scarce, rural women are forced to purchase charcoal for cooking. Adult males (fathers and sons) receive the largest share of available family food.

Within the first two or three days after birth, many rural mothers feed their children labouyi lamidon, "starch porridge," a gruel made by mixing water, "Argo" commercially purchased laundry starch, white sugar, and cinnamon. Powdered milk has assumed great importance in the diet of babies in recent years as weaning occurs earlier. Every baby now has its own bottle, and children with enough money will have two or more. It has been suggested that extensive participation of women in economic activity may cause a decline in breast feeding. Among rural mothers 60.1% have fed milk to their baby from a bottle. 20% of all mothers wean their children at six months of age to herb teas, starchy gruels, and bananas soaked in sugar cane water. 18.1% of urban children are weaned between 0 and 5 months. 96% of urban mothers report using a bottle for feeding milk to their infants.

4. NUTRITION STATUS CORRELATIONS: The prevalence of children suffering third degree malnutrition increases with increasing age. There is a correlation between chronic undernutrition and mothers with no formal education, fathers in lower skilled occupations, non-radio owner/listeners, and the prevalence of illness, fever, and diarrhea symptoms. Children from poor families have inferior nutritional status. Vitamin A deficiency is most prevalent in the northern part of the country. Riboflavin deficiency is seen more frequently in winter than in summer. In urban areas younger mothers tend to wean their children sooner than older ones.

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS: The Bureau of Nutrition in the Ministry of Health is in charge of nutrition programs in the country. The Bureau of Nutrition is composed of two Bureaus, one dependent on the Department of Public Health, the other on the Department of Agriculture. The principal functions of the Bureau of Nutrition include defining the nutritional problems

HIGHLIGHTS (CONTINUED)

of Haiti, formulating solutions to these problems, choosing norms and standards, providing technical assistance, training personnel, and coordinating nutrition programs and activities. Only 15% of the health budget was devoted to preventive health programs in 1977.

Legislation enables a nursing woman to take two half-hour daily nursing breaks or fifteen minutes every three hours if the woman prefers. In 1972 an agreement was made between the Government of Haiti, PAHO/WHO, and UNFPA to create an infrastructure for the conduct of integrated maternal and child health and family planning activities.

The Bureau of Nutrition operates Nutrition Rehabilitation Centers, also called Mothercraft Centers, throughout the country. Although these centers have been very effective in curing cases of severe malnutrition, a recent evaluation casts doubt on their cost-effectiveness. An alternative to the mothercraft center is the community based, less expensive "foyer de demonstration nutritionnelle." "Radio docteur" is a mass media health education radio program that broadcasts nutrition education messages. Helen Keiler International, in cooperation with the Government, operates a vitamin A distribution program. 54,724,000 pounds of PL 480 Title II foods are planned for distribution in FY 1982. The foods will be distributed by CARE, Catholic Relief Services, and Church World Service. Recent attempts have been made to develop a local high lysine variety of corn.

1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

NATIONAL

MALNUTRITION: The Haitian peasant suffers from multiple nutritional deficiencies. Most important are insufficient calories and protein resulting in underweight, poor muscular development, short stature, and a high total serum protein with relatively low serum albumin. (Barkhuus and Daly, 1976).

MALNUTRITION: Most Haitians suffer from multiple nutritional deficiencies. The most important nutritional disease is protein energy malnutrition in children under 5 years of age. (A.I.D., 1978)

MALNUTRITION: Nutritional deficiency and malnutrition are clearly among the most serious health problems in Haiti. (Barkhuus and Daly, 1976)

ANEMIA: Over 35% of non-pregnant, non-lactating women were anemic (hemoglobin value of less than 12 gms/100cc). (Bureau of Nutrition, 1979)

ANEMIA: Moderate anemia is frequent whether from deficiency of iron, protein, or vitamins, or from malaria. (Barkhuus and Daly, 1976)

GOITER: 3.8% of 3,806 mothers and guardians responsible for the survey children aged 3 to 59 months had clinical signs of goiter. (Bureau of Nutrition, 1979)

GOITER: Presence of goiter varied by region. A study carried out by Sebrell and his colleagues in 1958 found the frequency of palpable goiter ranged from 17.5% to 39% among women and from 1.4% to 16% among men. Visible goiter was rare. Fougere observed a number of visible goiters in the region of Nouvelle-Touraine. (Beghin et al., 1970)

XEROPHTHALMIA: Xerophthalmia is the eye manifestation of vitamin A deficiency and malnutrition. Children under age 7 are at highest risk. In the past, health data from Haiti have given mixed reports on the extent to which xerophthalmia is a problem in the country. (Toureau et al., 1979)

NUTRIENT DEFICIENCIES IN 1958: In 1958, Sebrell found clinical or biochemical signs of the following nutrient deficiencies: iron deficiency anemia, 13% prevalence; thiamine, 29.3% of subjects low or insufficient; niacin, 18.6% low or insufficient; riboflavin, 51.1% at least one deficiency sign; and dental caries, from 22.8% to 71% of persons, depending on location. (Beghin et al., 1970)

CAUSES OF MORTALITY: The ten most important causes of mortality (compiled from a variety of sources) were avitaminosis and nutritional diseases, pneumonia, tetanus, enteritis and diarrhea, tuberculosis, cerebrovascular diseases, malignant tumors, chronic rheumatic disease, hypertension, and perinatal deaths. (Barkhuus and Daly, 1976)

1.1 NUTRITION AND HEALTH STATUS, GENERAL (CONTINUED)

HEALTH PROBLEMS: The most pressing general health problems were protein calorie nutrition, tetanus, and gastrointestinal disease. (A.I.D., 1978)

MORBIDITY: The rate of morbidity from intestinal helminthiasis was 221.95 per thousand, malaria 219, syphilis 47.46, gonorrhea 46.22, tuberculosis 40.39, measles 24.42, whooping cough 16, amoebiasis 15.4, tetanus 13.68, typhoid 9.06, infectious hepatitis 4.25, chicken pox 3.36, and diphtheria 0.8. (Barkhuus and Daly, 1976)

COMMUNICABLE DISEASES: The most frequently reported communicable diseases in 1973 were influenza (22%), worms (21%), malaria (18%), diarrheas (14%), respiratory diseases (8%), and tuberculosis (7%). Communicable diseases caused about 26% of all deaths from known causes. (A.I.D., 1978)

FOOD AND WATER RELATED ILLNESS: Food and water related illnesses including gastroenteritis, infant diarrheas, intestinal parasites, and typhoid accounted for 15% of recorded hospital admissions. Enteric diseases accounted for 3.5% of recorded hospital deaths; 86% of the deaths were among children under five years old. Typhoid fever accounted for 1% of all hospital deaths. (A.I.D., 1978)

MALARIA: The number of positive malaria cases and the slide positivity rate increased dramatically from 0.2% in 1968, to 8.2% in 1972, and to 15% in 1978. (A.I.D., 1978)

REGIONAL

FAMINE: The northwest is subject to frequent droughts which have caused serious famine. (Barkhuus and Daly, 1976)

GOITER: Clinical signs of goiter were found in 8% of mothers and guardians of young children in the Departement de l'Ouest. This is almost twice the national rate of 4.2% (Bureau of Nutrition, 1979)

ILLNESS--NORTH: In a survey of 611 rural households in the North region, 35% of households reported that no one had been ill during the previous two weeks. There were 541 episodes of illness among 3750 people (14.4%) during the same period. The most common illnesses reported were fever (24%), cold (17%), diarrhea (11%), stomach illness (5%), boils (5%), cough (4%), headache (3%), worms (3%), whooping cough (3%), and eye disease (2%). (Baer and Rohde, 1981)

RURAL

COMMON ILLNESSES--DESCHAPELLES: Examination of hospital records revealed that cases of malnutrition were the greatest consumer of days of hospital care, accounting for 23% of total annual number of hospital days. Tetanus was the most common cause of hospital admission, accounting for 13% of hospital admissions. Tuberculosis and diarrhea were the greatest consumers of ambulatory-clinic services, accounting for 25% and 18% of outpatient consultations respectively. (Berggren et al., 1980)

GOITER: 4.2% of the mothers and guardians of young children surveyed in rural areas had clinical signs of goiter. (Bureau of Nutrition, 1979)

ANEMIA: About 35% of non-pregnant, non-lactating rural women were anemic (hemoglobin value of less than 12 gms/100cc). (Bureau of Nutrition, 1979)

TETANUS VACCINATION: 43% of rural mothers reported that they had at some time received a tetanus vaccination. (Baer et al., 1981)

WATER: Lack of sewage disposal and water purification are serious health problems in rural areas. (A.I.D., 1978)

GASTROINTESTINAL DISEASE: The frequency of gastrointestinal disorders reflected deficiencies in environmental sanitation to a considerable degree. Very few rural residents had access to potable water, and modern sewage services were practically nonexistent. Most rural inhabitants lacked the most rudimentary sanitary facilities. (A.I.D., 1978)

NUMBER OF CHILDREN: Reproductive histories of 425 women in the Artibonite Valley indicated that the average woman 45 years or older had 7 liveborn children. (King et al., 1974)

URBAN

ANEMIA: Almost 45% of non-pregnant, non-lactating women in urban Port-au-Prince were anemic (hemoglobin value of less than 12 gms/100cc). (Bureau of Nutrition, 1979)

GOITER: 1.2% of mothers and guardians of young children surveyed in Port-au-Prince had clinical signs of goiter. (Bureau of Nutrition, 1979)

HEIGHT AND WEIGHT: Among a sample of poor urban women, mean height was 5 feet 2 inches and mean weight was 112 lbs. (Berggren et al., 1981b)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

NATIONAL

MATERNAL MORTALITY RATE: The maternal mortality rate was 4.32 deaths per 1,000 live births in 1978. (Berggren et al., 1980)

MATERNAL MORTALITY RATE: The maternal mortality rate was 13.7 per 1,000 live births. (Barkhuus, 1974)

ANEMIA: About 38% of pregnant women were anemic (hemoglobin value below 11 gms/100cc). (Bureau of Nutrition, 1979)

ANEMIA: Sebrell found in 1958 that 33% of pregnant women were anemic. (Beghin et al., 1970)

1.2 NUTRITION AND HEALTH STATUS, WOMEN PREGNANT (CONTINUED)

RURAL

MATERNAL MORTALITY: The maternal mortality rate was about one death per 300 deliveries in the Trou Chouchou area. (Berggren et al., 1980)

ANEMIA: About 37% of pregnant rural women were anemic (hemoglobin value below 11 gms/100cc). (Bureau of Nutrition, 1979)

URBAN

ANEMIA: Almost 39% of pregnant women in Port-au-Prince were anemic (hemoglobin below 11 gms/100cc). (Bureau of Nutrition, 1979)

ANEMIA: 63.7% of pregnant women in Port-au-Prince were found by Cesar to be anemic. (Beghin et al., 1970)

RIBOFLAVIN DEFICIENCY: 3 out of 200 pregnant women (1.5%) in Port-au-Prince were found by Cesar to have a clinical sign of riboflavin deficiency. (Beghin et al., 1970)

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

NATIONAL

ANEMIA: About 37% of lactating women were anemic (hemoglobin below 12 gms/100cc). (Bureau of Nutrition, 1979)

RURAL

ANEMIA: About 37% of lactating rural women were anemic (hemoglobin below 12 gms/100cc). (Bureau of Nutrition, 1979)

URBAN

ANEMIA: About 33% of lactating women in Port-au-Prince were anemic (hemoglobin value below 12 gms/100cc). (Bureau of Nutrition, 1979)

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

NATIONAL

MALNUTRITION: Among children aged 3 to 5 months, 0.3% were both wasted and stunted (below both 80% of reference median weight for height and 90% of reference median height for age), 2.7% were wasted (weight for height only), and 1.7% were stunted (height for age only). (Bureau of Nutrition, 1979)

INFANT MORTALITY RATE: The infant mortality rate in 1972 was 150 deaths per 1000 live births. (Berggren et al., 1980)

INFANT MORTALITY: Infant mortality was estimated at 138.8 per 1000 live births. The figure in the late sixties was generally accepted as being around 180-190 per 1000. The data for infant mortality were, except for certain specific areas, largely speculative. (Barkhuus and Daly, 1976)

INFANT MORTALITY: The infant mortality rate was 146.5 per 1000 births. (Toureau et al., 1976)

INFANT MORTALITY: The high rate of infant mortality was due in large part to frequent death in the first 24 hours of life. Most women were not delivered by a trained attendant. (A.I.D., 1978)

HIGH PERINATAL MORTALITY--CAUSES: The high perinatal mortality rate was largely due to prematurity and birth injuries rather than genetic defects. (A.I.D., 1978)

NEONATAL TETANUS: Tetanus neonatorum, the infection of the umbilical stump, was the most important cause of infant mortality. Births in rural areas were attended by 'matrones,' women without any formal training. Certain local customs, such as the application of soil to the cord, were extremely dangerous. (Barkhuus and Daly, 1976)

NEONATAL TETANUS: 14 to 20% of live born babies died from tetanus neonatorum. (Barkhuus and Daly, 1976)

NEONATAL TETANUS: Tetanus neonatorum caused about 11,000 infant deaths per year. (A.I.D., 1978)

REGIONAL

WEIGHT FOR HEIGHT--SOUTHERN REGION: Among 59 children in the Southern Region between 3 and 5 months of age, 4% were below 80% of the reference median weight for height; 2% were between 80 and 84.9% of standard; and the remainder were at or above 85% of standard. (Genece and Rohde, 1982)

RURAL

INFANT MORTALITY RATE: The estimated infant mortality rate was 119 per 1000 live births in rural areas. Other estimates of infant mortality ranged from 98 to 147 per 1000. (Bureau of Nutrition, 1979)

INFANT MORTALITY: The infant mortality rate in 1975-76 was 146.5 deaths per 1000 live births. (Berggren et al., 1980)

INFANT MORTALITY RATE--DESCHAPELLES: The infant mortality rate in the Deschappelles area in 1970 was estimated at 50 deaths per 1000 live births using retrospective data and 47 deaths per 1000 live births using prospective data. (Berggren, n.d.)

DECLINE IN THE INFANT MORTALITY RATE: The decline in infant mortality in the rural area of Deschappelles between 1950 and 1970 was due mainly to the elimination of tetanus of the newborn. This began with training of traditional midwives, immunization of pregnant women, and umbilical cord care of infants brought to the hospital after birth. But this cause of death became zero when tetanus immunization was made accessible, free of charge, at the village level and all women in the census tract were immunized. (Berggren, n.d.)

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS (CONTINUED)

WEIGHT--DESCHAPELLES: Deschapelles children grew in weight as rapidly as Boston children during the ages 0 to 4 months. Following that age, they grew more slowly than Boston children. (Berggren and Berggren, n.d.)

LENGTH--DESCHAPELLES: Deschapelles children were shorter than Boston children at birth. (Berggren and Berggren, n.d.)

TETANUS OF THE NEWBORN: Among 1,629 mothers, 36% had lost at least one child due to tetanus of the newborn. There were 7,248 live births reported, and 1,143 children (16%) were reported to have died of tetanus of the newborn. (Berggren and Berggren, 1971)

NEONATAL TETANUS: Neonatal tetanus derived from umbilical cord contamination continues to affect 10 to 20% of newborns in rural areas lacking health programs. (Berggren et al., 1980)

NEONATAL TETANUS PREVENTION--TROU CHOUCYOU: Among 20 deaths in infants 0 to 28 days of age in the Trou Chouchou area in 1975, 15 (75%) were caused by tetanus. A year later, after a community health program was established in the area, there was only one death caused by tetanus among 8 neonatal deaths. (Berggren et al., 1980)

NEONATAL TETANUS PREVENTION--PETIT GOAVE: 22.4% of infant deaths were due to tetanus in the first year of the integrated project at Petit-Goave. By the third year of the project, only 5.2% of infant deaths were due to tetanus. (Republique d'Haiti, 1979)

UMBILICAL CORD: The umbilical cord was called "the doorway" to the body. Poultices were applied after birth using water from a nearby irrigation canal. There was a belief that the dried portion of the umbilical cord must fall off or be manipulated so that it can be removed by the end of the third day of life. Spider webs, candle wax, and most commonly, charcoal were applied to the umbilical cord stump, the palms, and the feet of the newborn on the third day of life. (Berggren et al., 1980)

URBAN

INFANT MORTALITY RATES: The estimated infant mortality rate in Port-au-Prince is 147 deaths per 1000 live births. (Bureau of Nutrition, 1979)

INFANT MORTALITY RATE AND HEALTH PROGRAMS: The infant mortality rate in Cite Simone, a depressed area of Port-au-Prince, was 185 per 1000. After intervention through population-based community health out-reach programs, the mortality rate was 116 per 1000. (Berggren and Berggren, 1982)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 5-24 MONTHS

NATIONAL

CHILD MORTALITY RATE: The mortality rate of children 1 to 4 years of age was 23 deaths per 1000 in 1972. (Berggren, n.d.)

CHILD DEATH: Of the total number of children ever born to survey mothers, over 20% were reported to have died. (Bureau of Nutrition, 1979)

CHILD MORTALITY RATE AND HEALTH PROJECT AREAS: The mortality rate for children one to four years of age was 26 per 1000. In areas served by primary health care projects the rate ranged from 14 to 23 per 1000, and in areas served by a nutrition rehabilitation center the rate was 7 per 1000. (Berggren et al., 1982)

CAUSES OF DEATH: Reported deaths among children 1 to 4 years old were attributed to diarrhea and respiratory infections. It seemed highly probable that the underlying cause of death was malnutrition. Had these children been adequately nourished they would probably not have died from diarrhea or respiratory infections. (A.I.D., 1978)

WATER SUPPLY AND CHILD MORTALITY: Unsafe water, absence of sewage systems, and overcrowded housing conditions led to a high incidence of water-borne communicable diseases which accounted for a large proportion of all deaths. In particular, infectious diarrheas were an important cause of child mortality. (World Bank, 1976)

WATER SUPPLY AND CHILD MORTALITY: Lack of potable water was cited as one of the main causes of the high death rate, particularly affecting children. In late 1975 only 12% of the total population was supplied with potable water. (World Bank, 1976)

INFANT MORTALITY AND WOMEN'S WORK: A contributing cause to high infant mortality may be the extensive participation of women in economic activity at the sacrifice of breast feeding. This was especially true in rural areas where the tradition of having women assume commercialization of agricultural production was longstanding. It was estimated that 45% of jobs in Haiti were held by women. (World Bank, 1976)

DETERIORATING NUTRITIONAL STATUS: Haiti is one of the least developed countries in the Latin American region. Famine and drought in recent years have aggravated the situation of children already suffering from diets severely deficient in protein and calories. (Toureau et al., 1976)

MALNUTRITION: About 80% of the 800,000 children under five years of age suffered mild to severe malnutrition. About 10% were severely malnourished (Gomez Class III malnutrition with clinical signs of kwashiorkor or marasmus); about 30% were moderately malnourished (Gomez Class II), and about 40% were mildly malnourished (Gomez Class I). (A.I.D., 1978)

MALNUTRITION: 3.2% of children aged 3 to 59 months had third degree malnutrition (below 60% of the reference median weight for age), 24.1% had second degree malnutrition (between 60 and 74.9% of the reference median), 46% had first degree malnutrition (between 75 and 89.9% of the reference standard), and 26.8% were normal (90% or above the reference standard). (Bureau of Nutrition, 1979)

MALNUTRITION: 1.2% of preschoolers surveyed had kwashiorkor, 0.5% had marasmus, 15.7% had third degree malnutrition, 35.6% second degree malnutrition, 28.9% first degree malnutrition, and 17.8% had normal nutritional status. (Toureau et al., 1976)

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

MALNUTRITION: 11% of children birth to 1 year of age and 24% of children 1 to 3 years old were in Gomez categories II and III. 6.5% of children 1 to 3 years old had kwashiorkor. (Barkhuus and Daly, 1976)

PREVALENCE OF MALNUTRITION: 7% of children 1 to 3 years of age were diagnosed as having kwashiorkor. Some degree of protein calorie malnutrition affected about two thirds of this age group in lower socioeconomic status families. (Jelliffe and Jelliffe, 1961)

MALNUTRITION AND AGE: The percent of preschoolers with third degree malnutrition (below 60% standard weight for age) increased markedly with age up until age six. Only about 2% of five year olds fell in the normal category (90% or more of standard weight for age), and 38% in the third degree category (below 60% of standard weight for age). In northern Haiti malnutrition is not only a problem of the weaned child but becomes even more severe in the late preschool child. (Brown et al., 1978)

DECLINE IN GROWTH: Six months has been identified as the age when retardation in growth begins. (Barkhuus and Daly, 1976)

KWASHIORKOR: 7% of children 1 to 5 years of age were estimated to have third degree Gomez malnutrition with edema, i.e. kwashiorkor. (Jelliffe and Jelliffe, 1961)

MARASMUS AND KWASHIORKOR: 0.72% of children between birth and six years of age were found to have kwashiorkor; 0.89% had marasmus. (Brown et al., 1978)

KWASHIORKOR AND AGE: In a national sample of 100 children with kwashiorkor, 86% were between 1 and 3 years of age, 6% were under one year, 6% were between 3 and 6 years, and 2% were over 6 years of age. (Jelliffe and Jelliffe, 1961)

CAUSES OF KWASHIORKOR: The etiology of kwashiorkor is complex; however, in Haiti the most important cause is probably poverty or lack of available protein foods. (Jelliffe and Jelliffe, 1961)

DYSPIGMENTATION: 30% of children under six years of age had evidence of dyspigmentation (reddish hair color); 5% had total dyspigmentation. This sign exceeded the incidence of kwashiorkor (0.72%) but approximated the percent of children falling into the second and third degree of malnutrition (45.1%). (Brown et al., 1978)

EDEMA: Nearly 3 out of every 100 preschool children had clinical evidence of kwashiorkor during the summer of 1978. (Bureau of Nutrition, 1979)

EDEMA: In a national survey 144 children exhibited bilateral pedal edema upon clinical examination. Pedal edema of nutritional origin is diagnostic of kwashiorkor. This was an overall rate of 26.9 per 1000 children surveyed. (Bureau of Nutrition, 1979)

GOMEZ CLASSIFICATION AND AGE: The prevalence of children suffering third degree malnutrition increased with increasing age. Among children 3 to 5

months, 0.6% had third degree malnutrition (below 60% of reference median weight for age); 1.8% at 6 to 11 months; 2.8% at 12 to 23 months; and 3.9% at 24 to 35 months had third degree malnutrition. Percentages of children with second degree malnutrition (60 to 75% of reference median weight for age) also increased: 4.5%, 13.4%, 26%, and 27.8% in each respective age group. (Bureau of Nutrition, 1979)

WATERLOW CLASSIFICATION: 2.9% of children aged 3 to 59 months were wasted (less than 80% of the reference median weight for height and above 90% of the median height for age). 23.6% were stunted (below 90% of reference median height for age but above 80% of median weight for height). 3.1% were both wasted and stunted. 70.4% were normal. (Bureau of Nutrition, 1979)

WATERLOW CLASSIFICATION: Among children age 6 to 11 months, 0.5% were both wasted and stunted (below both 80% of the reference median weight for age and 90% of reference median height for age), as were 3.4% of those age 12 to 23 months. Wasting alone (weight for age) occurred among 4.6% and 6.4% of each group, respectively; and stunting, among 5.2% and 15.8%. (Bureau of Nutrition, 1979)

WASTING AND AGE: The highest prevalence of wasting is seen in the 12 to 23 months age group. Almost 10% fall below 80% of the reference median weight for age and about 15% are between 80 and 84% of the reference median weight for age. (Bureau of Nutrition, 1979)

HEIGHT FOR AGE: 8% of children age 3 to 59 months were severely stunted (below 85% of the reference median height for age), 18.6% were moderately stunted (between 85 and 89.9% of the reference median), 62.9% were normal (between 90 and 99.9% of the reference median), 10.5% were tall (100% or above the reference median). (Bureau of Nutrition, 1979)

STUNTING AND AGE: Large increases in the prevalence of chronic under-nutrition (stunting) occur during the second year of life. Among children 6 to 11 months about 1% are below 85% of the reference median height for age; at 12 to 23 months over 4% are in this category. At 6 to 11 months, about 5% of children are between 85 and 89% of the reference median height for age, and at 12-23 months 15% are in this category. (Bureau of Nutrition, 1979)

NUTRITIONAL DWARFING: 13.6% of children below six years of age were found to weigh below 60% of the standard weight for age (Gomez Class III). Most of these children did not appear to be clinically ill. They appear to fall in the category of nutritional dwarfs. Few children were clinically ill with malnutrition (1.61% had marasmus or kwashiorkor). (Brown et al., 1978)

WEIGHT FOR HEIGHT: 6% of children aged 3 to 59 months were severely wasted (less than 80% of the reference median weight for height), 9.9% were moderately wasted (between 80 and 84.9% of the reference median), 83.1% were normal (between 85 and 119.9% of the reference median), and 1% were overweight (120% or more of the reference median). (Bureau of Nutrition, 1979)

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

EDEMA AND STUNTING AND WASTING: The pedal edema rate for the 314 children found to be wasted (below 80% of the reference median weight for height) was 86/1000. Among 1,329 stunted children (below 90% of reference median height for age) 67 had edema, a rate of 50.4/1000. Among children concurrently stunted and wasted 10.4% of the 144 children had pedal edema, a rate of 104/1000. (Bureau of Nutrition, 1979)

ANEMIA: About 33% of children age 3 to 59 months were found to be anemic (defined as a hemoglobin value of less than 10 gms/100cc for children less than 24 months of age and less than 11 gms/100cc for children 24 months or older). (Bureau of Nutrition, 1979)

ANEMIA AND AGE: About 33% of children aged 6 to 11 months were anemic (hemoglobin value of less than 10 gms/100cc) and about 30% of children aged 12 to 23 months were anemic. (Bureau of Nutrition, 1979)

CAUSES OF ANEMIA: Malaria could be a contributive cause of anemia. A malaria control program has been conducted since 1961, but there are now reports that malaria is in resurgence in the country. Other causes could be hookworm, roundworm, microbial infections, and nutritional deficiency of iron. (Bureau of Nutrition, 1979)

VITAMIN A DEFICIENCY: Vitamin A deficiency was the major cause of binocular blindness among Haitian children. Prevalence rates of corneal scars with avitaminosis A history indicated a public health problem as defined by WHO standards. The rate of corneal destruction for the country as a whole was 2.5 cases per 1000 children under the age of seven. Bilateral involvement was seen in 65% of patients with corneal lesions. (Toureau et al., 1976)

CORNEAL SCAR: 58 of 5000 preschool children had a corneal scar of one or both eyes; 45% were presumed secondary to vitamin A deficiency, 9% as probably vitamin A deficiency. Overall prevalence was 2.5 per 1000 preschoolers. (Toureau et al., 1976)

VITAMIN A DEFICIENCY: 63% of all cases of unilateral blindness among preschoolers were due to presumed vitamin A deficiency. All cases of binocular blindness were due to presumed vitamin A deficiency. (Toureau et al., 1976)

VITAMIN A DEFICIENCY: 345 new surviving cases of corneal destruction, including 94 cases of bilateral blindness per year in the total Haitian child population were predicted as a result of vitamin A deficiency. (Toureau et al., 1976)

VITAMIN A DEFICIENCY: There was considerable seasonal vitamin A deficiency and keratomalacia in third degree malnutrition cases between the ages of one and four (demonstrated by Escapini in 1963). (Barkhuus and Daly, 1976)

VITAMIN A DEFICIENCY: 11.3% of children examined showed evidence of conjunctival xerosis; 1 out of 40 had unilateral corneal scarring. Two older children were seen with the unilateral blindness characteristic of severe xerophthalmia. No Bitot's spots were found. 3% of the children

had follicular keratosis. The percent of children affected increased with increasing severity of malnutrition, from 5% of normal children to 15% of children with third degree malnutrition. This study was carried out in the early spring before the mango harvest. Since mangos are the main source of vitamin A in the northern area, the findings may be more striking than they would be later in the year. (Brown et al., 1978)

BITOT'S SPOTS: No Bitot's spots were observed in a survey of preschool children. (Toureau et al., 1976)

PEM AND RIBOFLAVIN DEFICIENCY: 9.5% of children with a weight below 60% of standard weight to age showed signs of riboflavin deficiency; 5.2% of children between 60 and 74% of expected weight for age showed signs, 2.9% of children between 75 and 89% of standard; and 2.7% of children with a weight of 90% of standard or more showed clinical signs of riboflavin deficiency. (Beghin et al., 1970)

AGE AND RIBOFLAVIN DEFICIENCY: Riboflavin deficiency was uncommon in children below one year of age. In a review of seven studies conducted between 1961 and 1965, 0 to 8.7% of children under one year of age were found to have riboflavin deficiency. Among children 1 to 3 years of age this range was 0 to 22.5%. (Beghin et al., 1970)

CHEILOSISS: 1.7% of children below six years of age were found to have active cheilosis or noticeable scars, suggesting riboflavin or mixed B vitamin deficiency. Deficiency of the B vitamins was found primarily among children with severe protein calorie malnutrition. (Brown et al., 1978)

RICKETS: As a rule, young children were generously exposed to sunlight. Their limbs were exposed, as they wear little clothing and they were never confined to their homes. Rickets is not a public health problem. (Beghin et al., 1970)

DENTAL CARIES: 3% of children 1 to 3 years of age had dental caries, 14% of children 3 to 6 years, and no child under one year had caries. (Jelliffe and Jelliffe, 1961)

COMMUNICABLE DISEASES AND MALNUTRITION: 63% of deaths due to communicable diseases occurred in children under five years of age. The Ministry of Health estimated that because of poor diets, approximately 80% of children this age suffered malnutrition. The mutual reinforcement of nutritional deficiency and communicable diseases accounted for the high mortality and morbidity rates. (A.I.D., 1978)

DIARRHEA: 44.4% of mothers reported that their child had had diarrhea in the preceding seven days. 38.6% of children aged 3 to 5 months, 52.2% of children 6 to 11 months, and 51.1% of children 12 to 23 months had had diarrhea. (Bureau of Nutrition, 1979)

FEVER: 32.2% of children aged 3 to 59 months had fever upon clinical examination. 35.7% of children aged 3 to 5 months, 43.2% of children aged 6 to 11 months, and 45% of children aged 12 to 23 months had fever (Bureau of Nutrition, 1979)

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

ILLNESS AND SOURCE OF WATER: The prevalence of recent fever and illness in children whose families had a source of piped water (either in the home or at a public tap) was significantly lower than in families without a source of piped water. The prevalence of recent diarrhea in children was not significantly different in homes with or without a source of piped water. (Bureau of Nutrition, 1979)

PREVALENCE OF NON-SPECIFIC ILLNESS: 54.6% of mothers reported that their children had been ill in the 7 days preceding the survey. 49.3% of children aged 3 to 5 months, 63.4% of children 6 to 11 months, and 63.6% of children 12 to 23 months had been ill. (Bureau of Nutrition, 1979)

MEASLES: 18.5% of children 3 to 5 months of age had sera positive for measles antibodies, 11% of children 6 to 11 months, and 19.3% of children 12 to 23 months had positive sera. (Bureau of Nutrition, 1979)

REGIONAL

MALNUTRITION--NORTHERN REGION: 13.6% of children 0 to 6 years of age living in the Northern Region were severely malnourished (Gomez Class III, below 60% of standard weight for age), 31.5% were moderately malnourished (Gomez Class II, or between 60 and 75% of standard weight for age), 35.9% were mildly malnourished (Gomez Class I, between 75 and 90% of standard weight for age), and 19.3% had a normal nutritional status (90% or greater than the standard weight for age). (Brown et al., 1978)

VITAMIN A DEFICIENCY: A survey of 5680 young children in the Artibonite, North and Northwest areas was undertaken after a program of vitamin A distribution was established. The survey found five cases of corneal involvement with xerophthalmia and three with conjunctival xerosis. No active keratomalacia or Bitot's spots were found. Mean prevalence rate for keratomalacia was .88 per 1000, the prevalence of conjunctival xerosis was .52 per 1000, and one case of total blindness as a result of keratomalacia was found. (Toureau et al., 1979)

VITAMIN A RELATED CORNEAL DESTRUCTION: An ocular survey undertaken after establishment of a vitamin A distribution program found a ten-fold decrease in the prevalence rate of vitamin A-related corneal destruction in Artibonite, North and Northwest. The disease, however, remained a significant health problem with nearly one case per 1000 children and is potentially blinding. (Toureau et al., 1976)

CORNEAL DESTRUCTION--SOUTH: A significant regional discrepancy existed in rates of corneal destruction. The South had 1.2 cases per 1000, and the North reported 8.1 per 1000. (Toureau et al., 1976)

MEGADOSES OF VITAMIN A: 9.4% of households reported children receiving large doses of vitamin A in the vitamin A deficiency program. (Toureau et al., 1976)

NIGHT BLINDNESS: 1% of all households reported a child with night blindness. (Toureau et al., 1976)

WEIGHT FOR AGE: SOUTHERN REGION: 6% of children 3 to 59 months of age were severely malnourished (below 60% of standard weight for age); 27% were moderately malnourished (between 60 and 74.9% of standard); the remainder (67%) were normal (at or above 75% of standard). (Genece and Rohde, 1982)

WEIGHT FOR HEIGHT--SOUTHERN REGION: Among 144 children 6 to 11 months of age living in the Southern Region, 6% were below 80% of the reference median weight for height; 8% were between 80 and 84.9% of standard; and the remainder were at or above 85% of standard. Among 258 children 12 to 23 months of age there were 17%, 13%, and 70% in each respective category. (Genece and Rohde, 1982)

EDEMA--SOUTHERN REGION: 72 children had edema among 871 preschool children examined in the Southern Region. (Genece and Rohde, 1982)

SEVERE MALNUTRITION--SOUTHERN REGION: 5% of children 3 to 59 months of age examined in the Southern Region were wasted, 22% were stunted, and 6% were both stunted and wasted. 67% were normal. (Genece and Rohde, 1982)

DIARRHEA--SOUTHERN REGION: 52% of mothers interviewed in the Southern Region reported that their preschool children had had diarrhea during the previous seven days. (Genece and Rohde, 1982)

RURAL

CHILD MORTALITY RATE--DESCHAPELLES: The mortality rate of children 1 to 4 years of age living in the Deschapelles area in 1970 was 9 deaths per 1000. (Berggren, n.d.)

CHILD MORTALITY--DESCHAPELLES: Among 2570 mothers in the area of the Albert Schweitzer Hospital, 2144 deaths were reported among their 7743 live-born children (27.7%). (Berggren et al., 1981a)

CHILD MORTALITY: Rural mothers had, on average, given birth to 4.34 children of whom 3.49 (80%) were still living at the time of the interview. (Baer et al., 1981)

MORTALITY AND NUTRITION: Community based control of malnutrition through systematic monitoring of growth of all children, nutrition education of parents, and rehabilitation of malnourished children was introduced in 1969 and was immediately followed by persistent decline in the 3 to 9 year mortality rates in the area of Albert Schweitzer Hospital. Death rates of 1 to 2 year olds fell for a while but rose again due to conditions not related to malnutrition. (Berggren et al., n.d.)

WATER SUPPLY AND CHILD MORTALITY: Lack of potable water has been cited as one of the main causes of the high death rate, particularly affecting children. In rural areas only 3% of the population had access to potable water. (World Bank, 1976)

MORTALITY AND ITS CAUSES--TROU CHOUCYOU: Among 13 deaths occurring in infants 1 to 11 months of age in the Trou Choucou area, 6 were caused by gastroenteritis, 4 by malnutrition, and 3 were due to other causes.

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

After a community health program was established in the area, among 12 deaths occurring in children in this age group, 9 were caused by gastroenteritis, 1 by malnutrition, and 2 were due to other causes. (Berggren et al., 1980)

GASTROENTERITIS--TROU CHOUCYOU, GRAND-GOAVE, MEILLEUR: 44% of deaths among children 1 to 11 months of age were due to gastroenteritis in the Trou Chouchou area; 51.5% of deaths in this age group were due to gastroenteritis in the Grand-Goave area and 52% in Meilleur. After three years of an integrated health project in the areas, gastroenteritis as a cause of death in the 1 to 11 month age group was 29%, 45%, and 42% in each respective location. (Republique d'Haiti, 1979)

MALNUTRITION--PETIT GOAVE: 4.5 to 7.2% of young children were found to have third degree malnutrition (percentages varied according to village), 20.4 to 25.8% had second degree malnutrition, and 33 to 40.2% had first degree malnutrition. 34 to 36.8% of young children were not malnourished in villages served by Petit Goave Integrated Health and Family Planning Project. (Departement de la Sante Publique, n.d.)

AT RISK OF PEM: Children were found to be at high risk of PEM when their mothers did not understand the nutritional needs of young children, when their mothers were separated from their spouses, if pregnancies occurred very close together, when weaned early, and if mother could not take time to breast feed because of jobs she had to do outside the home. (Departement de la Sante Publique, n.d.)

PEM AND NUTRITION REHABILITATION CENTERS: Hospital admissions for protein energy malnutrition from 1968 to 1975 fell to less than half their initial level in the areas served by nutrition rehabilitation centers. Admissions from similar areas not having centers remained relatively constant or tended to rise. (King et al., 1978)

EDEMA: 0.8% of children in 29 rural villages had pedal edema (swelling indicative of malnutrition) upon clinical examination. (Baer et al., 1981)

GOMEZ--DESCHAPELLES: 30% of preschool children were in Gomez Class II or III malnutrition (below 75% of standard weight for age) in 1971-72 in the communities served by the Albert Schweitzer Hospital. (King et al., 1974)

GOMEZ CLASSIFICATION: 3.5% of rural children aged 3 to 59 months were found to have third degree malnutrition (below 60% of the reference median weight for age), 26% had second degree malnutrition (between 60 and 74.9% of the reference median weight for age), 46.4% had first degree malnutrition (75 to 89.9% of the reference standard), and 24.1% were normal (90% or above the reference standard). (Bureau of Nutrition, 1979)

WATERLOW CLASSIFICATION: 3% of rural children aged 3 to 59 months were wasted (less than 80% of the reference median weight for height and above 90% of the median height for age), 25.2% were stunted (below 90% height for age but above 80% of median weight for height), 3.4% were both wasted and stunted, and 68.4% were normal. (Bureau of Nutrition, 1979)

WEIGHT FOR AGE: After 4 months of age children in Deschapelles grew more slowly than Boston children until the age of 14 to 18 months, at which time they began to grow at the same rate as Boston children but at a lower initial weight level. The difference from the Boston standard in absolute weight for age was maintained at least until age 6 years. (Berggren and Berggren, n.d.)

WEIGHT CHARTS: 51% of 635 children less than 5 years old were reported by their mothers to have at some time been weighed, 45% reported that the weight had been recorded on a weight chart, and 16% said they were in possession of the weight chart. (Baer et al., 1981)

WEIGHT FOR HEIGHT: In a national survey 6.4% of rural children aged 3 to 59 months were severely wasted (less than 80% of the reference median weight for height), 10.4% were moderately wasted (80 to 84.9% of the reference median), 82.5% were normal (between 85 and 119.9% of the reference median), and .7% were overweight (120% and greater than the reference median). (Bureau of Nutrition, 1979)

HEIGHT FOR AGE: 8.7% of rural children aged 3 to 59 months were severely stunted (less than 85% of the reference median height for age), 19.9% were moderately stunted (between 85 and 89.9% of the reference median), 62.2% were normal (between 90 and 99.9% of the reference median), and 9.2% were tall (100% or greater than the reference median). (Bureau of Nutrition, 1979)

HEIGHT: Preschool children in rural areas were 12% shorter than the Harvard Standard. (Toureau et al., 1976)

LENGTH--DESCHAPELLES: The growth rate of children slowed at 7 to 9 months of age and remained slow through the age of 24 to 36 months. The difference from the Boston standards in absolute length for age was maintained at least until age 6 years. (Berggren and Berggren, n.d.)

ARM CIRCUMFERENCE: 69.4% of rural children had normal nutritional status (an arm circumference measure in excess of 13.5 centimeters), 21.2% were borderline malnourished (arm circumference between 12.5 and 13.5 centimeters), and 9.4% were severely malnourished (arm circumference less than 12.5 centimeters). (Baer et al., 1981)

ANEMIA: About 28% of rural children aged 3 to 59 months had anemia (defined as a hemoglobin value of less than 10 grams per 100cc for ages below 24 months and less than 11 grams per 100cc for ages 24 months or more). (Bureau of Nutrition, 1979)

ANEMIA: 37% of rural children examined were found to have conjunctival signs of anemia. (Baer et al., 1981)

VITAMIN A: 33% of rural children below the age of five years have received a vitamin A capsule at some time. (Baer et al., 1981)

RICKETS: Among 471 preschool children in Fond Parisien, there was only one case of rickets. (Beghin et al., 1970)

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

ILLNESSES OBSERVED AT EXAMINATION: Upon clinical examination, 57% of rural children had runny noses, 22% had skin infections, and 15% had eye infections. (Baer et al., 1981)

ILLNESS REPORTED BY MOTHER: 43% of mothers of children less than 5 years of age reported that the child had had fever in the past two weeks, 8% had had chills, 80% had had a runny nose, 67% had had coughs, and 34% had had diarrhea. (Baer et al., 1981)

MORBIDITY: 16% of rural children below age 5 years had had measles, 60% had had whooping cough, and 55% had at some time expelled worms (Ascaris). (Baer et al., 1981)

MEASLES: 21.9% of rural children 3 to 5 months of age had sera positive for measles antibodies, 7.9% of children 6 to 11 months and 14% of children 12 to 23 months had positive sera. (Bureau of Nutrition, 1979)

WORMS: Ascariasis (roundworm infection) was prevalent in rural areas, particularly during the mango season when the heavy infestation in already malnourished infants and children was a serious problem. Hookworm was widespread in the rural areas and was an important contributing cause of anemia. (Barkhuus and Daly, 1976)

VACCINATION: 53% of 635 children below the age of 5 years had received one or more vaccinations; 44% had a vaccination card; and 24% had BCG vaccination scars. (Baer et al., 1981)

MIGRATION OF CHILDREN: Among children 0 to 2 years who migrated, 76% lived with their mother after migration; among those aged 3 to 6 years only 45% did so. Another 10% of children 0 to 2 years and 17% of children 3 to 6 years lived with their father or other relative. The remaining children, 14% of those 0 to 2 years, and 38% of children 3 to 6 years, lived with another family. (Berggren et al., 1979)

URBAN

MORTALITY: A preliminary report from Haiti's National Fertility Survey estimated infant mortality in peri-urban areas at 200 deaths per 1000 live births. (Berggren et al., 1981b)

CHILD MORTALITY AND WATER SUPPLY: Lack of potable water has been cited as one of the main causes of the high death rate, particularly affecting children. In 1975, 51% of the urban sector was supplied with potable water. (World Bank, 1976)

MALNUTRITION: 1.5% of urban children aged 3 to 59 months had third degree malnutrition (below 60% of the reference median weight for age), 13.1% had second degree malnutrition (between 60 and 74.9% of the reference median), 43.8% had first degree malnutrition (between 75 and 89.9% of the reference median), 41.7% were normal (90% or above the reference standard). Among a special group of socially and economically advantaged urban children, none had third degree malnutrition, 0.5% had second degree, 15.1% had first degree, and 84.4% were normal. (Bureau of Nutrition, 1979)

SEVERE MALNUTRITION--CITE SIMONE: 4% of 200 children 2 to 23 months of age living in Cite Simone were severely malnourished, both wasted and stunted. (Berggren et al., 1981b)

EARLY MALNUTRITION: Malnutrition appeared earlier in Cite Simone than in rural areas. Malnutrition was becoming apparent in children by the third month of life. Weight for length was lower in Cite Simone than for the rest of the country. Rapid decline in weight for length occurred after the third month of life, following insufficient weight gains in the first two months. 33% of children suffered second or third degree malnutrition by Gomez standards by the end of the second year of life. (Berggren et al., 1981b)

WATERLOW CLASSIFICATION: 2.4% of 893 urban children aged 3 to 59 months were wasted (less than 80% of the reference median weight for height and above 90% of the median height for age), 14.2% were stunted (below 90% of median reference height for age but above 80% of median weight for height), 1.5% were both wasted and stunted, and 82% were normal. (Bureau of Nutrition, 1979)

WEIGHT FOR HEIGHT: 3.8% of children aged 3 to 59 months living in metropolitan Port-au-Prince were severely wasted (less than 80% of the reference median weight for height), 7.1% were moderately wasted (between 80 and 84.9% of the reference median), 87% were normal (between 85 and 119.9% of the reference median), and 2.1% were overweight (120% or greater than the reference median). Only 0.1% of a special socially and economically advantaged group of children were severely wasted, 1.2% were moderately wasted, 93.6% were normal, and 5.1% were overweight. (Bureau of Nutrition, 1979)

WASTING: 15% of children 12 to 23 months of age were wasted (below 80% of reference standard weight for height); this was much higher than the 9.8% reported in the Haiti National Nutrition Survey for the whole country. (Berggren et al., 1981b)

HEIGHT FOR AGE: 4.3% of urban children aged 3 to 59 months were severely stunted (below 85% of the reference median height for age), 11.4% were moderately stunted (between 85 and 89.9% of the reference median), 66.4% were normal (between 90 and 94.9% of the reference median), and 17.9% were tall (95% or above the reference median). 0.1% of a special socially and economically advantaged group were severely stunted, 0.3% were moderately stunted, 37.5% were normal, and 62.1% were tall. (Bureau of Nutrition, 1979)

ANEMIA: Anemia was not as serious a problem in Cite Simone as in the rest of Haiti; however, there was some problem among the children of mothers under age 25 years or over age 35. (Berggren et al., 1981b)

ANEMIA: Over 45% of urban children aged 3 to 59 months had anemia (defined as a hemoglobin value of under 10 gms/100cc for ages less than 24 months, and under 11 gms/100cc for ages greater than or equal to 24 months. (Bureau of Nutrition, 1979)

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

ILLNESS: 46% of urban mothers reported that their child had been ill in the seven days preceding the survey. 50% of children aged 3 to 5 months, 57.1% of children aged 6 to 11 months, and 63.9% of children aged 12 to 23 months had been ill. (Bureau of Nutrition, 1979)

INFANT DIARRHEA: A review of consultation records indicated that infant diarrheas were among the most serious health hazards facing the country. During 1963-64, 47.9% of all admissions to pediatric services of the University Hospital in Port-au-Prince were for gastroenteritis, as were 40.5% of the deaths registered in the services. In 1969 18% of all discharges from the hospital and 54.4% of the discharges from the pediatric services had had a diagnosis of gastroenteritis. (Barkhuus and Daly, 1976)

DIARRHEA: 33.5% of urban mothers reported that their child had had diarrhea in the preceding seven days. 31.7% of children aged 3 to 5 months, 44.4% of children aged 6 to 11 months, and 47.5% of children age 12 to 23 months had had diarrhea. (Bureau of Nutrition, 1979)

FEVER: 28.4% of children aged 3 to 59 months in Port-au-Prince had fever upon clinical examination. 34.9% of children aged 3 to 5 months, and 44.3% of children aged 12 to 23 months had fever. (Bureau of Nutrition, 1979)

MEASLES: No urban children under 5 months of age had sera positive for measles antibodies, 31.3% of children 6 to 11 months and 47.2% of children 12 to 23 months had positive sera. (Bureau of Nutrition, 1979)

DISEASE AND WATER: Diarrhea, scabies, conjunctivitis, febrile illness, and malnutrition were more common in children from homes using less than one 5-gallon can of water per person per day than in homes where larger amounts of water were available. (Thacker et al., 1980)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

NATIONAL

FOOD GROUPS: There were three basic categories of foods. Viv included plantain, yams, tubers, cereals, grains, and other carbohydrates. Vyan included meats, fish, milk, eggs, dairy products, poultry, and beans. Legumes included green leaves, vegetables, and fruits. (Berggren et al., 1982)

FOOD GROUPS: A concept of three food groups was present in the local belief system. A well balanced meal was to be composed of viv including roots and tubers, vyan a meat group, and legume a vegetable group. (Berggren and Berggren, 1982)

HOT AND COLD: Foods believed to be cold included melon, pineapple, coconut water, soursop, and some types of mango. Hot foods included milk, eggs, maize, and certain mangos. (Jelliffe and Jelliffe, 1961)

GOATS MILK: Goat's milk was not eaten and was considered repugnant. The flavor and taste were not liked. It was occasionally given to people suffering from tuberculosis. (Jelliffe and Jelliffe, 1961)

REGIONAL

MOTHERS EVALUATE NUTRITIONAL STATUS CORRECTLY--SOUTHERN REGION: Only 1.2% of mothers of malnourished children (below 80% of reference median for weight for height) believed that their children were growing and developing well. 7.5% of mothers of well nourished children (90% or greater than the reference median weight for height) believed their children were not growing well. (Genece and Rohde, 1982)

RURAL

TRADITIONAL FOOD GROUPS: One group, called viv included major cereals, corn, rice, and millet, as well as major root crops, sweet potato, manioc, and yam. The vyan group included high protein foods, meat, eggs, milk, and bean sauce. The third group, legume, was composed of vegetables. (Alvarez and Murray, 1981)

CATEGORIES OF FOOD: Food beliefs affected behavior and health among rural people. Foods were classified according to (1) their innate hot or cold properties, (2) the magic intrinsic to the food (for example, "white foods" included fish, potatoes, pigeon peas, and breadfruit which were thought to cause pus), and (3) their fortifying properties (pork is thought the least fortifying; plaintains, kidney beans, and pigeon meat are believed the most fortifying). (A.I.D., 1978)

HOT/COLD: Belief in humoral medicine was widely and consistently held in rural areas. Practices stemming from this belief system had a serious limiting impact on rural dietary behavior. (Weise, 1976)

2.1 DIETARY BELIEFS, GENERAL (CONTINUED)

HOT/COLD: A common manifestation of humoral medicine is a hot/cold classification of foods. This classification does not depend on any physical property of heat or cold, but on an innate quality of that food to generate heat or cold within the body. (Weise, 1976)

HOT/COLD: The belief in the hot/cold food belief system is both widely and consistently held. (Weise, 1976)

IDEAL MEAL SCHEDULE: The ideal meal pattern emphasized eating five times a day: three meals plus early morning and late afternoon snacks. In addition there would be casual snacking on sugar cane, roasted corn, or sweet potatoes. This ideal was rarely achieved because of poverty and associated lack of food and fuel. (Alvarez and Murray, 1981)

LIME JUICE: Lime juice is traditionally esteemed for its flavor and supposed medicinal value. Lime juice has been used successfully in programs which suggest the addition of lime juice in home preparation of oral rehydration fluid. (Berggren et al., 1981a)

2.2 DIETARY BELIEFS, ABOUT PREGNANCY

RURAL

IMPORTANCE OF EATING: A pregnant woman was believed to have no right to let herself go hungry. If she did not eat enough, the child inside her would not grow. The hunger pangs she felt were no longer her own, but her child's. The mother, her family, and neighbors recognized the right of that unborn child to receive the food it was clamoring for. Any cravings or aversions were also attributed to the unborn child. These cravings were satisfied. Not to do so could damage the child. (Alvarez and Murray, 1981)

HIGH QUALITY DIET: It was strongly believed that proper growth and development of the child in the womb was intimately linked to the food directly consumed from its mother. Explicit emphasis was given to the biological need for a high quality diet for the pregnant woman. Pregnant women should eat well and frequently; informants specifically mentioned that carbohydrate staples, meat, eggs, milk, and beans were good for the mother. (Alvarez and Murray, 1981)

SPECIAL DRINKS: Special drinks were recommended for the pregnant woman. Many of these beverages were believed to protect the growing fetus against spiritual or magical harm, especially by the nocturnal lougarou, vampires who thirst for children's blood. These drinks were generally very bitter; one of the major potions was made from extracted cow's liver. Their very bitterness was believed to make the blood bitter and repulse any lougarou that approached. (Alvarez and Murray, 1981)

SPECIAL DRINKS: Special drinks were consumed by the mother during pregnancy. A purgative based on castor oil was taken three times in order to purge the child in the womb. Special teas made from the leaves of asousi (*Momordica charantia*) were believed to make the child more beautiful. Mixtures of water and laundry starch were used to "refresh" the child and were also believed to have considerable nutritional value. (Alvarez and Murray, 1981)

FOOD CRAVINGS: If a woman explicitly told a food craving to her husband, he was expected to provide the money to satisfy this whim. He was vulnerable to accusations of irresponsibility and stinginess if the child was born with some defect and he had not satisfied his wife's food craving. (Alvarez and Murray, 1981)

GIFTS OF FOOD: In the days before delivery, women received gifts of food from friends and relatives. The foods could be whatever was available at the time--rice, sweet potatoes, plantains, etc. The emphasis at this time was on food. (Alvarez and Murray, 1981)

NO FOOD RESTRICTIONS: A pregnant woman was encouraged to eat anything she wished. There were no standard food restrictions during pregnancy. (Murray and Alvarez, 1973)

AVOIDING TEAS: Women were reluctant to drink teas during pregnancy for fear of unwittingly inducing an abortion. Many teas were believed to be abortifacients, but there was uncertainty as to which teas were truly effective. There was also anxiety concerning leaves which might have unknown abortive powers. (Murray and Alvarez, 1973)

AVOIDED DURING PREGNANCY: There was a general belief that certain medications and very bitter items should be avoided during pregnancy. (Alvarez and Murray, 1981)

PRENATAL CARE: For several reasons, traditional midwives do not give prenatal care. There is a taboo against the midwife entering the yard where the mother cooks while she is pregnant. The indigenous midwife fears being blamed if the baby should be malformed or if the delivery should be difficult. Advice she gave during the pregnancy might be considered the cause of the mishap. (Berggren et al., 1980)

2.3 DIETARY BELIEFS, ABOUT LACTATION

NATIONAL

NEONATAL TETANUS: Neonatal tetanus is considered a cold disease. It is believed to be the result of a chill caught by an imprudent mother and passed through her milk. (A.I.D., 1978)

LOUGAROU: The loularou (werewolf), usually a woman, was supposed to victimize children by "eating" or secretly sucking their blood, thus causing them to become ill and die. Much behavior associated with pregnancy or immediately after childbirth is aimed at protecting against loularou attack. (A.I.D., 1978)

RURAL

CONFINEMENT: The ideal is to have the newly delivered woman freed from all tasks during the five day confinement period immediately following child birth. In its strictest interpretation this custom may even confine the woman to certain rooms of the house. Other family members cook her food, wash her clothes, etc. The woman is supposed to spend these days lying still, caring for the newborn, and taking the prescribed

2.3 DIETARY BELIEFS ABOUT LACTATION (CONTINUED)

baths which traditionally follow delivery. In practice the economic or domestic situation of many families does not permit adherence to this custom. (Alvarez and Murray, 1981)

FOODS AFTER CHILD BIRTH: During the five days a woman spends in confinement in the bedroom of her house after giving birth, she is counselled to consume substantial amounts of chicken, to be followed by large quantities of goat's meat once confinement is over. The husband should purchase a goat or two. Child birth is the one occasion on which a family will regularly slaughter animals for home use. Plantains are also given to women during this period. (Alvarez and Murray, 1981)

POSTPARTUM FOODS: Abundant food was given to the postpartum mother to fill up the hollow space created by the exit of the child. Postpartum feeding was viewed as obligatory, a serious responsibility, which the mother must meet for her own good and for that of the baby. The most important foods at this time are goat's meat and plantains. (Alvarez and Murray, 1981)

FOODS AVOIDED: Village discussion of the postpartum period was overwhelmingly positive when it came to food. The emphasis was on providing rather than prohibiting foods for the mother. However, there were some foods which were prohibited, including white beans and two other local varieties of beans. The most common, red beans and black beans, were permitted and encouraged for the postpartum mother. Attitudes toward milk and eggs varied, some saying they may be eaten, others saying they may not. (Alvarez and Murray, 1981)

FOOD RESTRICTIONS: 72.9% of locally available, cheap staple foods were denied to lactating women because of hot/cold food beliefs. (Weise, 1976)

COLD: In the early postpartum period it is believed to be very dangerous for the mother or newborn to be exposed to cold or moving air. Windows and doors of houses are carefully kept closed day and night, creating a dark stuffy environment. The mother can have no contact with cold water, either for drinking or bathing. Exposure to cold will harm the mother and the new child. It is believed that if the mother irresponsibly exposes herself to cold, harm may be transmitted to the child through breast milk. (Alvarez and Murray, 1981)

VAGINAL BLEEDING: The vaginal bleeding which occurs during confinement is seen as a healthy process and steps are taken to induce and increase this bleeding. Every morning the woman will be given a tizann (tea) prepared from the leaves of boua kanpech (*Haematoxylon campechianum*) and the bark of avocado tree. Both of these are believed to stimulate more rapid bleeding. (Alvarez and Murray, 1981)

SEXUAL ABSTINENCE: Local custom imposes a general three month postpartum period of sexual abstinence as the proper protection for the woman. Premature sexual relations are believed to impede full recuperation from childbirth. Furthermore, a child conceived before the woman's uterine blood has been fully purged is believed to be likely to be born underweight and emaciated. Such a child is thought to have been "tricked" by its parents. (Alvarez and Murray, 1981)

PROTECTION FROM PREGNANCY: Rural women attached great importance to breast feeding because they believed it protected against a new pregnancy. (Dieudonne, 1981)

COLOSTRUM: Eight years ago village opinion was unanimous in believing that colostrum was something very nutritious for the child and something to which the neonate had a "right." Recent conversations with younger women indicate a growing ambiguity on the matter. Some say the colostrum is good; others say it is bad and should be disposed of and not given to the child. Village women report that maternity hospital nurses advise them not to use colostrum. (Alvarez and Murray, 1981)

COLOSTRUM DISCARDED: Colostrum is discarded because it is believed that the mother's milk will not be good for the baby until it is white. Similarly, the mother must eat only "white" foods, and she may be found eating only rice during the neonatal period. (Berggren et al., 1980)

EXCELLENCE OF BREAST MILK: Village women of all age groups were unanimous in their view of the superiority of breast milk over powdered milk or cow's milk. (Alvarez and Murray, 1981)

INDUCING LACTATION: Lactation is viewed as a process that will occur automatically after delivery and no special practices are applied to all women. If the milk is slow to arrive, special measures are taken such as drinking herbal teas. (Alvarez and Murray, 1981)

CASTOR OIL: The baby's first stools, consisting of meconium, are considered to be "unhealthy" and must be "cleaned out." Large doses of castor oil may be given to the newborn to expedite this. (Berggren et al., 1980)

PURGING: Local theory conceptualizes the child's meconium as harmful. A purgative, lok, is the first food given to the neonate. (Alvarez and Murray, 1981)

2.4 DIETARY BELIEFS, ABOUT BREAST MILK SUBSTITUTES

RURAL

EXCELLENCE OF BREAST MILK: Village women of all age groups were unanimous in their view of the superiority of breast milk over powdered milk or cow's milk. (Alvarez and Murray, 1981)

2.5 DIETARY BELIEFS, ABOUT WEANING

NATIONAL

EGGS: Mothers felt that eggs were too indigestible for young children. Eggs were almost never used to feed infants or young children. They were one of the few sources of spending money and were usually sold in the market. (Jelliffe and Jelliffe, 1961)

CORN MEAL: Corn meal is considered indigestible for young children, perhaps because it is a "hot" food. (Jelliffe and Jelliffe, 1961)

2.5 DIETARY BELIEFS, ABOUT WEANING (CONTINUED)

TERMINATING LACTATION: When a baby is being weaned from the breast, the mother may hang a piece of bois mesquite (stalk of the castor oil bush) around her neck. As the wood shrivels, so the breast milk is meant to dry up. (Jelliffe and Jelliffe, 1961)

2.6 DIETARY BELIEFS, ABOUT ILLNESS AND CURES

NATIONAL

HOT/COLD: Traditional beliefs viewed life as a state of delicate equilibrium between forces of nature, fellow humans, and the spirits. The forces of nature included natural calamities and extremes of hot and cold and wet and drought. The factors of heat and cold were the essence of natural causes of illness. (A.I.D., 1978)

HOT/COLD BELIEFS: Sicknesses were categorized as hot or cold depending on their symptoms. Diseases with major symptoms of fever and sweating were classified as hot diseases (malaria and other fevers are considered hot). Diseases with major symptoms of coughing, chills, or palsy were classified as cold, with tuberculosis considered the coldest. (A.I.D., 1978)

TRADITIONAL HEALING: Traditional healing consisted of efforts to neutralize the body temperature states through food preparations and prohibitions, timing of certain drinks or teas, and wrapping or uncovering the body, depending on the symptom. (A.I.D., 1978)

FOOD AND ILLNESS: The graver the illness, the more important it was thought for the patient to eat carefully, and the more stringently enforced were traditional behavior demands. Contradictory advice from medical personnel was likely to create an intolerable conflict/stress situation for the patient which would prevent acceptance of modern medicines and dietary instruction. (A.I.D., 1978)

WITHHOLDING MILK: Foods and illnesses are classified as hot or cold. Diarrhea is believed to be a hot disease, and milk, which is also hot, may be stopped if the child develops loose stools. (Jelliffe and Jelliffe, 1961)

TREATMENT FOR ILLNESS: Herbal teas and magical charms are often used for treatment and prevention of illness. The folk religion, voodoo, holds sway over most of the peasants. This religion emphasizes direct communication with spirits and dead ancestors which leads to a strong belief in magical causes for most illness. (Brown et al., 1978)

SUPERNATURAL CAUSES OF ILLNESS: Voodoo and the belief in the supernatural influenced beliefs about disease etiology. Spirits caused persons to become ill when they failed to meet their spiritual obligations, particularly obligations to dead ancestors to whom funeral rites were owed. (A.I.D., 1978)

VOODOO AND ILLNESS BELIEFS: According to Voodoo beliefs, illness was caused by supernatural forces. For example, filariasis was believed to result from stepping on strong magic powder; yaws, from the anger of a loa (spirit). (Barkhuus and Daly, 1976)

VOODOO: Most Haitians were influenced by Voodoo, a polytheistic cult of African origin. When assistance was needed in determining which deities had been offended and what measures should be taken, especially during sickness, a houngan or mambo (priest or priestess) was called in. Often the houngan or bocor (diviner) gave sound advice to allay anxiety or effective medicine to cure illness. In other cases, a counterspell was put on the enemy and many practitioners tended to emphasize conflict rather than reduce animosities and fears. (Barkhuus and Daly, 1976)

AGGRESSIVENESS: A Haitian psychiatrist has argued that possession states of Voodoo were outlets for otherwise inexpressible aggressiveness. (Barkhuus and Daly, 1976)

RURAL

HOT/COLD: Equilibrium between hot and cold was believed to be very important in the maintenance of health. Meticulous care of this balance was reflected in every day activities, especially in choice of foods which were classified as either hot or cold. (Weise, 1976)

MODERN MEDICINE: The rural population does not fear modern medicine as it once did and considers it a form of magic. (Barkhuus and Daly, 1976)

DELIVERY: In homes where Voodoo is practiced, there is a superstition about having much "light" during the delivery, and midwives tell of performing the entire delivery, even cutting the umbilical cord, under a sheet. (Berggren et al., 1980)

3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

STAPLE FOODS: Corn, sorghum, beans, rice, manioc, sweet potatoes, and plantains made up the bulk of cultivated foods. Fruit was available in considerable quantities. Fruits used included mangos, avocados, oranges, and pineapples. (Brown et al., 1978)

ROOT CROPS: Root crops, especially sweet potatoes and manioc, were commonly eaten and provided a large percentage of caloric intake. (Barkhuus and Daly, 1976)

AGRICULTURAL PRODUCTION: The principal food crops were rice and corn, which accounted for 40% of agricultural production. The main export products, coffee and sugar cane, accounted for another 30% of production. Agricultural yields were very low. The soil has been very eroded because trees were cut down to be used for charcoal. Agricultural methods have not changed in the last century. Farms were fragmented and averaged only 1.4 hectares. 88% of the farmers are illiterate. All these factors have inhibited the modernization of agriculture. (World Bank, 1976)

LAND AVAILABLE FOR CULTIVATION: The total territory of Haiti is 27,700 square km. 31.5% of this area cannot be cultivated. Of the 68.5% suitable for cultivation, 7% is forest, 19% is used for pasture, 11% is not being used, and 31.5% is being cultivated. (DIFPAN, 1978)

FOOD CONSUMPTION: Average annual intake included 63.0 kg. of cereal, 69.4 kg. of tubers, 66.8 kg. of sugar and syrup, 25.6 kg. of legumes, 43 kg. of vegetables, 145.6 kg. of fruits, 8 kg. of meat, 0.9 kg. of eggs, 1.8 kg. of fish, 11.2 kg. of milk and milk products, and 6.6 kg. of fats and oils. (DIFPAN, 1978)

FOOD DEFICIT: The average food intake is 452 kg per person per year, a food deficit of 148 kg (24.7% below the FAO recommended level of 600 kg of food per person per year). Calorie intake is 13.7% below the recommended level, and protein intake is 25.5% below the recommended level. (DIFPAN, 1978)

ANNUAL INTAKES: Six studies carried out in the 1950s and 1960s found that intake of cereals per person per year ranged from 63 to 103.8 kilograms; tubers, 54.4 to 128.8 kilograms; sugar and syrups, 11.7 to 66.8 kilograms; legumes, oil, and nuts 11.6 to 38.3 kilograms; vegetables, 0.7 to 45.6 kilograms; fruit, 22.7 to 152.2 kilograms; meat, 4.7 to 9.1 kilograms; fish and eggs, 1.8 to 4.6 kilograms; and milk, 3.1 to 15.3 kilograms. (Barkhuus and Daly, 1976)

CALORIE DEFICIT: There is a general calorie deficit of 500 to 600 calories per person per day in most of the country. (King et al., 1974)

3.1 DIETARY PRACTICES, GENERAL (CONTINUED)

FRUIT: Many fruits were available, including mangos, avocados, papayas, and pineapples. Fruits were an important source of vitamins A, B, and C. (Barkhuus and Daly, 1976)

FRUIT: Citrus fruits, avocados, breadfruit, and mangos were eaten extensively. Mangos were particularly important because of their high vitamin A content. They were generally available for five months of the year, but no serious attempt has been made to conserve the plentiful supply for the rest of the year. (Barkhuus and Daly, 1976)

BANANAS: Bananas and plantains were an important source of calories and were widely grown for consumption. Since the withdrawal of the United Fruit Company, there has been little export of bananas. (Barkhuus and Daly, 1976)

MANGO: The mango was the most important fruit in the diet. During mango season, this fruit was the principal food in terms of bulk and calories among the rural population. (Jelliffe and Jelliffe, 1961)

EGGS: Eggs were rarely eaten by the Haitian peasant and were regarded as a cash crop to be sold on the local market. (Jelliffe and Jelliffe, 1961)

MEAT: Chickens, goats, and pigs were raised rather haphazardly, and the quality was quite poor. Meat was not an important part of the diet. (Brown et al., 1978)

LIVESTOCK: Livestock was valued as a repository of savings rather than a source of food. (Barkhuus and Daly, 1976)

SUGAR: Over 90% of all families surveyed served predominantly suk rouge, a partially refined sugar. Since few families used white refined sugar, it is not a suitable vehicle for a fortification program. (Bureau of Nutrition, 1979)

FATS: The diet was very low in both animal and vegetable fats. Seasonal use of avocados and a small amount of pork lard in cooking were the only sources of fats. (Jelliffe and Jelliffe, 1961)

BEVERAGES: The three principal drinks of adults were coffee, white rum, and herb tea. (Jelliffe and Jelliffe, 1961)

DRINKING WATER: 29% of the population had access to potable drinking water. (Secrétairerie d'Etat du Plan, 1980)

DAILY INTAKE: Average daily intake per person in 1980 included 172 grams of cereal; 290 grams of roots, tubers and bananas; 89 grams of sugar; 52 grams of legumes; 117 grams of vegetables; 198 grams of fruit; 21 grams of meat; 4.9 grams of fish; 2.5 grams of egg; 30 grams of milk and milk products; 18 grams of oils and fats; and 8.2 grams of coffee and cocoa. (Secrétairerie d'Etat du Plan, 1980)

CALORIE AND PROTEIN CONSUMPTION: Calorie intake nationwide averaged 1900 calories per day, 14% below the FAO/WHO recommended level of 2200

calories per day. Protein intake averaged 41 grams per day nationwide, 31.5% below the recommended level of 60 grams. (A.I.D., 1978)

INADEQUATE INTAKE: The average daily nutritional intake was estimated at 39 grams of protein and 1,700 calories. Daily requirements in Central America have been estimated at 50-70 grams of protein and 2,000 to 2,500 calories. This suggests that minimum requirements were not met for a large proportion of the population. 70% of children under 5 years of age were suffering from malnutrition. (World Bank, 1976)

CALORIES AND PROTEIN: A review of ten studies conducted between 1951 and 1965 found that intake ranged from 1105 to 2450 calories, and intake of protein from 31.7 to 82 grams. (Berggren et al., 1982)

CALORIES AND PROTEIN: Ten studies carried out between 1951 and 1965 found that the average intake was 1,728 calories and 39.2 grams of protein per person per day. (Barkhuus and Daly, 1976)

CALORIES AND PROTEIN: The average consumption of calories met about 3/4 of the needed amount, and protein intake provided about 2/3 of the recommended quantity. These figures are averages, which means that some people do meet their needs for calories and protein, but for many others there is an even greater deficit than average. (Beghin et al., 1970)

CALORIES AND PROTEIN: Numerous dietary studies and food balance studies in Haiti have consistently shown a deficiency in both calories and protein. In a nationwide study, average daily intake was 1,580 calories and 37.4 grams of protein (Sebrell, 1958). Minimum acceptable levels have been estimated at 2000 calories and 43 grams of protein per day (King 1968). Actual intake has been estimated at 1700 calories and 41 grams of protein (Beghin 1970). (Brown et al., 1978)

NUTRIENT DEFICITS: It was estimated that the daily per capita food consumption falls between 300 to 400 calories short of recommended levels. Hospital records and data from nutrition clinics indicated that serious protein deficiency existed in the adult population. In addition, vitamin A, iodine, riboflavin, and folic acid deficiency were specific problems in certain regions and among certain population subgroups. At very high risk were children under 5, pregnant and lactating women, and the newly arrived rural poor in urban areas. (A.I.D., 1978)

IRON: A review of nine dietary studies concluded that average consumption of iron was 12 mg per person per day, a value which is just below the recommendation of the NAS/NRC for adults in the United States. Clinical observation indicated that, on the whole, the need for iron is not met in Haiti. This contradiction may be explained by poor absorption of iron, the presence of intestinal parasites and malaria, and living in a tropical milieu which is relatively unhealthy. (Beghin et al., 1970)

CALCIUM: Average consumption of calcium was 280 mg per person per day. (Beghin et al., 1970)

3.1 DIETARY PRACTICES, GENERAL (CONTINUED)

INTAKE OF RIBOFLAVIN: Intake of riboflavin averaged about 1.1 mg per person per day, about 70% of the recommended allowance of 1.5 mg. A review of eight studies conducted between 1951 and 1965 found that intake of riboflavin ranged from .49 to 1.74 mg per person per day. (Beghin et al., 1970)

RIBOFLAVIN DEFICIENCY: There was seasonal riboflavin deficiency characterized by cheilosis. (Barkhuus and Daly, 1976)

SOURCES OF RIBOFLAVIN: Avocados and mangoes are the principal sources of riboflavin in the diet, but these fruits are available only in summer. Other sources are, in order of importance: milk, red beans, sorghum, maize, meat, and plantain. (Beghin et al., 1970)

THIAMINE: Average intake of thiamine was 1.6 mg per person per day, at least two times the minimum need of 0.4 mg per 1000 calories consumed which is recommended by the NAS/NRC. Lack of vitamin B₁ is not a public health problem in Haiti. (Beghin et al., 1970)

NIACIN: Average intake of niacin was 9.2 mg per person per day, a figure well below the recommendations of the NAS/NRC. However, pellagra is rarely seen. An isolated case of pellagra may be found occasionally among alcoholics, persons suffering from tuberculosis, the extremely poor, or prisoners. (Beghin et al., 1970)

INTAKE OF VITAMIN A: A review of ten studies conducted between 1951 and 1965 found that average intake of vitamin A ranged from 342 to 14,855 international units per person per day (9.6% to 417% of the recommended amount). (Secrétairerie d'Etat du Plan, 1980)

VITAMIN C: The average intake of vitamin C was 100 mg per person per day, indicating adequate intake of this vitamin. (Beghin et al., 1970)

DIETARY INTAKE AND PRICES: Dietary intake has been observed to change radically from day to day in relation to prices in the marketplace. (Barkhuus and Daly, 1976)

COST OF FOOD AND FUEL: The average mother spent U.S. 7.8¢ each day for food and fuel for each member of the family in 1964. This figure rose to U.S. 12 to 14¢ per person per day in 1973. Since these figures are averages, many mothers have even less money to buy and cook food. (King et al., 1974)

FOOD EXPENDITURE: The average expenditure on food allows for the purchase of only 1,700 calories each day, 77% of normal requirements in this region of the world. (World Bank, 1976)

FLUCTUATION OF FOOD PRICES: There were marked seasonal variations in food prices. There was almost complete absence of storage facilities on the farm and in rural markets and a lack of transportation facilities which resulted in wide fluctuations in food prices. (Barkhuus and Daly, 1976)

INCREASING FOOD PRICES: There has been a sharp acceleration in domestic food prices due, in part, to the price of imported food, which increased an average of 35% annually from 1972 to 1975. Additional pressure on food prices resulted from the sluggish domestic food supply, with production of four main food products (corn, millet, beans, and bananas) declining or stagnating and with imports having to supplement inadequate production of other products (milk, rice, dried fish, fats, and oils). (World Bank, 1976)

AGRICULTURE: Production of food was not sufficient to meet the basic needs of the population. Natural resources were often poorly exploited or under-utilized. Food availability depended to an increasing extent on imports. (Secrétairerie d'Etat du Plan, 1980)

AGRICULTURE: Agriculture, the most important sector in the economy, declined by 30% in the 1960s. The problems of agriculture were many: soil fertility, irrigation, care of crops and animals, storage, and transportation. Farms were small, averaging 2.5 acres. The system of inheritance continued to further fragment the land, making mechanized farming unfeasible. Once-fertile land was being depleted through generations of use and misuse. (Barkhuus and Daly, 1976)

CORN: Corn occupied the largest acreage and was produced in all the agricultural areas which had sufficient rainfall. The preferred type was "yellow flint," a type poor in lysine and tryptophan. A large proportion of corn was hand pounded into meal and flour for home consumption. (Barkhuus and Daly, 1976)

SORGHUM: Sorghum was the second most important food crop, measured by number of acres planted. It was grown in areas too dry for corn. Sorghum was eaten much as corn. (Barkhuus and Daly, 1976)

SUGAR CANE: Sugar cane was grown everywhere there was sufficient rainfall. Sugar cane for direct consumption, processed into rapadou (a form of sugar) and alcoholic products, accounted for about 75% of production. (Barkhuus and Daly, 1976)

SUGAR AND COFFEE: The main cash crop was coffee, but because of taxes and middle man charges, peasant growers received only 35% of the export price of coffee. Sugar was the second major cash crop, although 75% of the sugar cane grown was processed in small operations for local consumption as crude sugar and rum. (Brown et al., 1978)

FOOD PRODUCTION AND CONSUMPTION: Between 1971 and 1975 the production of food grew at an annual rate of only 1.2%. During this same period private consumption grew at an annual rate of more than 5% and induced a sharp increase in demand for food stuffs. (World Bank, 1976)

POST HARVEST LOSS: Inadequate storage poses a major problem for the small farmer. Post harvest losses of local foods due to rodents, moisture, etc. were estimated by Haitian agronomists at a minimum of 30%. (Jackson, 1979)

3.1 DIETARY PRACTICES, GENERAL (CONTINUED)

INTRA FAMILY FOOD DISTRIBUTION: Adult males (fathers and grown sons) were found to receive the largest share of the available family food, especially foods of animal origin. Daughters and mothers received smaller quantities. In general, women and young children received the smallest amounts of foods distributed within the family. During periods of reduced food availability, the rations of children were reduced even further. (DIFPAN, 1978)

MEAL PATTERN: Most families had one main cooked meal daily, usually in the late afternoon just before sunset. Vegetable stew was the most common dish. Other meals were more in the nature of a snack, usually in the early morning and at mid-day. These snacks commonly consisted of corn on the cob, cold leftovers, mangoes, sugar cane, and herbal teas. (Jelliffe and Jelliffe, 1961)

FOOD PREPARATION--COOKING METHODS: Almost all dishes were boiled. Vegetable stews, containing mixtures of beans, maize, plantain, bread-fruit, rice, etc., were commonly prepared. If possible, a very small piece of meat or fish was added to the stew. Spices used included garlic, cloves, cinnamon, and aniseed. A very few foods were cooked directly on the hot ashes of the fire such as corn on the cob and yams. (Jelliffe and Jelliffe, 1961)

FOOD PREPARATION--KITCHEN FACILITIES: The rural kitchen was usually in a small separate hut with the cooking fire on the ground. Pots were made of metal or dried calabashes. The fuel, which was an expensive item, was either wood or charcoal. (Jelliffe and Jelliffe, 1961)

WASHING DISHES: Cooking pots, plates, and cups were washed in cold, often contaminated water. (A.I.D., 1978)

FOOD HYGIENE: Food hygiene activities consisted solely of supervision. The central laboratory in Port-au-Prince did not have sufficient personnel, material, or equipment to undertake any type of investigation. There was insufficient inspection of the food markets which were crowded and unsanitary. (Barkhuus and Daly, 1976)

WOMEN'S WORK: Women were mainly responsible for marketing food, cooking, and washing clothes. During some seasons, women were the total suppliers of food and other products for the family through their marketing. Girls began at an early age to assist with household tasks including getting food, carrying water, and doing laundry. (A.I.D., 1978)

WOMEN AND FOOD MARKETING: Women were generally the merchants, buying small lots which were accumulated and transported to larger markets, regional centers, or even major cities. Since the internal markets were highly competitive, the normal differential between producer selling price and retail price was low. (Barkhuus and Daly, 1976)

FOOD MARKETING: It was estimated that producers retained about 30% of food items to be used at home. The rest was marketed through a long marketing chain operated in small lots, chiefly by women. (Barkhuus and Daly, 1976)

FOOD STORAGE: Food storage was limited so that mice, insects, and roving animals infested supplies and ate whatever was available. (A.I.D., 1978)

FOOD SPOILAGE: Food spoilage, due to poor transportation and storage facilities, contributed to high costs. (Barkhuus and Daly, 1976)

RURAL

STAPLE FOODS: The foods most important in rural areas were corn, millet, sorghum, bananas, cassava, sweet potatoes, and beans. One or more of these foods were produced on the family plot; the others were acquired in the local market. (Barkhuus and Daly, 1976)

STAPLE FOODS: Staple foods included corn, millet, manioc, and bananas. Rice was generally much too expensive to form part of the rural diet although rice and peas was a creole specialty much enjoyed in Port-au-Prince. (Barkhuus and Daly, 1976)

STAPLES: Corn was the main staple of the rural Haitian diet with rice, yam, and cassava important in the diet of certain communities. (Toureau et al., 1976)

STAPLE FOODS: In the Artibonite Valley irrigation makes rice production feasible, and it is important in the local diet. In the arid crop region of the Northwest, rice is a minor crop, and corn and drought resistant sorghum are the important staples. (King, 1979)

STAPLES: Beans and peas were available in the rural markets and constituted an important supplement to the main food article, corn, which was poor in lysine and tryptophan. (Barkhuus and Daly, 1976)

ANIMAL PRODUCTS: Beef and lamb were far too expensive for rural populations. Some goats and pigs were consumed by the peasants. Farmers might keep a few chickens, but eggs and poultry were usually sold in the urban market. (Barkhuus and Daly, 1976)

BEEF: No beef was regularly slaughtered for sale in the local market. On the whole, cows were the bank which villagers used to amass capital for the ultimate purchase of land. (Alvarez and Murray, 1981)

SUGAR: Sugar was used in large quantities in the rural diet, particularly as a coarse brown sugar called rapadou. (Barkhuus and Daly, 1976)

WATER: Water was obtained from streams and wells in rural areas. (World Bank, 1976)

DRINKING WATER: 5.54% of the rural population had access to potable water. (Secrétairerie d'Etat du Plan, 1980)

CALORIE AND PROTEIN INTAKE: Calorie intake in rural areas averaged 1325 calories per person per day, 40% below the FAO/WHO recommended level. Protein intake averaged 30 grams a day, 50% below the recommended level. (A.I.D., 1981a)

3.1 DIETARY PRACTICES, GENERAL (CONTINUED)

CALORIES AND PROTEIN: Seven studies carried out in rural areas between 1951 and 1965 found that calorie intake ranged from 1,105 to 2,203 calories; and protein intake, from 31.7 to 70 grams. (Barkhuus and Daly, 1976)

PROTEIN: Most rural communities were 10 to 15% below their total protein needs. Protein as a rule contributed 9 to 10% of total calories. (King et al., 1974)

CALCIUM: Calcium consumption fell between 200 and 400 mg. per day, appreciably under the FAO recommended level of 485 mg. (King et al., 1968)

MARKET: Rural people did not live entirely from the products of their gardens and fields. Many products were purchased in the market. Rural markets based their prices on supply and demand, and the considerable fluctuations in prices made the rural families more dependent on a money economy than was the case where subsistence farming prevailed. The social role of the market may be as important as its economic role. (Barkhuus and Daly, 1976)

MARKETS: People bought a large proportion of their food in the markets. This provided a certain opportunity to choose. The menu was not entirely dictated by what could be grown on the family plot but was determined by a number of other factors such as price or availability. (Barkhuus and Daly, 1976)

PURCHASED FOODS: Peasants throughout the country purchased substantial amounts of their food, including not only essential cooking oil, salt, sugar, and seasonings, but also many of the basic staples themselves. Major crops such as sugar cane and shallots were planted almost exclusively with a view to sale. Even locally consumed crops such as rice, beans, or sweet potato were grown with a view to marketing. (Alvarez and Murray, 1981)

STORAGE: At least three factors operated to discourage efforts to store food: absence of adequate storage techniques, the need to pay off debts, and the need for capital to purchase land. (Alvarez and Murray, 1981)

HUNGRY SEASON: The months of July and August were considered the hardest months, the hungry season. November, December, and January were months of plenty, when the largest amounts of food were available. (Alvarez and Murray, 1981)

FOOD EXPENDITURE: The average annual per capita expenditure on food amounted to U.S. \$43.00 in rural areas in 1970. Only \$12.00 was left for other expenditures of which \$9.00 was used for rent and fuel. The situation was worse for low income groups in rural areas where the employed family member was earning, on average, U.S. \$120.00, which yields only \$40.00 per person, below the average consumption level for food alone. (World Bank, 1976)

SUBSISTENCE FARMING: Root vegetables and sugar cane were grown on the peasant's own land and were consumed by the family. Many products were

sold in local markets, including eggs, chicken, and pork. (Barkhuus and Daly, 1976)

MIGRATION: The system of land holdings has led to individuals owning land in widely dispersed plots. Because of this system of scattered plots, individuals and families often moved from one piece of land to another because of a new inheritance or other changes in land ownership. The death of a senior family member was often followed by the sale of land in order to pay for the traditional elaborate funerals which also caused migration. (Berggren et al., 1979)

GARDENS: 95.2% of rural families had gardens that produced food consumed by the family. (Bureau of Nutrition, 1979)

AGRICULTURAL PROBLEMS: The problems of Haitian farmers included coping with the constantly subdivided land resulting in small scattered plots, being forced to denude their land in order to find cooking fuel, lacking resources to buy fertilizer, seeds, or equipment which could build up the land, and the problem of ever increasing soil erosion. (Berggren et al., 1979)

SOIL EROSION: The folk saying, "The hills grow rocks," reflects the problem of once productive land which has been abandoned due to soil erosion. This is so common that nearly every farmer in the hilly areas can point to land owned by himself or his neighbors which has gone out of production during his life time. Terracing the hillsides is practiced in few areas. (Berggren et al., 1979)

RICE-LOSS IN THE FIELD: Rats consume about 10% of the rice crop while it is still standing in the field. (King, 1979)

WOMEN AND AGRICULTURE: Women's role in agriculture is crucial: women do much of the planting, transplanting, weeding, and harvesting and are needed on every plot. (Berggren et al., 1979)

MOTHER COOKS: In 108 out of 114 families the mother was responsible for preparing meals. In five cases the grandmother did the cooking, and in one case a domestic prepared meals. (Ballweg, 1972)

COOKING: Kitchens are generally a separate structure from the house made of one or two rooms. Fires of wood are made directly on the ground and charcoal fires are made in braziers. Metal pots of iron or aluminum are used. Food is placed on separate plates in the kitchen and then distributed to family members. (Alvarez and Murray, 1981)

TIME FOR FOOD PREPARATION: Cooking in a rural village is time consuming. Even a light meal of porridge takes an average of 60 minutes to prepare. Major meals can take from 3 to 4 hours. (Alvarez and Murray, 1981)

FUEL FOR COOKING: As fire wood becomes more and more scarce, rural women are forced to purchase charcoal for cooking. Consequences of this include undercooked meals, less boiling of water, smaller numbers of meals, and more days when only one meal is cooked. (Alvarez and Murray, 1981)

3.1 DIETARY PRACTICES (CONTINUED)

NUMBER OF MEALS: Among 114 families, 86 families reported having two meals each day, 9 had three meals a day, and 19 had one meal each day. (Ballweg, 1972)

INTRA FAMILY FOOD DISTRIBUTION: Young children were apparently not receiving their fair share of the protein available, and kwashiorkor was endemic. Except during March, the protein supply was adequate. Distribution of protein among members of the family might be improved by nutrition education. (King et al., 1968)

INTRA FAMILY FOOD DISTRIBUTION: When a meal was cooked, food was distributed by dishing out individual plates in the kitchen. Adult males received the largest quantities, but always left some for women and children. Meat eating was infrequent, but when eaten each person would be given at least a little. The one exception was the withholding of fish from very young children. (Alvarez and Murray, 1981)

INTRA FAMILY FOOD DISTRIBUTION: Very young children generally were the last to receive their share of the family food. Their precarious situation was alleviated somewhat by the privilege they have of receiving small bits of food placed in their hand during the cooking process or at the beginning of the food distribution. Further, it was exclusively the young children's right to protest when they felt they had been unfairly treated. Their demands often led to concrete increases in their share of the food. (Alvarez and Murray, 1981)

URBAN

RICE: Rice was the preferred cereal in urban areas. (Barkhuus and Daly, 1976)

BREAD: Bread made from imported wheat was largely confined to urban areas. (Barkhuus and Daly, 1976)

GREEN VEGETABLES: Green vegetables grew well in Haiti above a certain minimum elevation but were largely consumed in urban areas. (Barkhuus and Daly, 1976)

WATER: In urban areas many households rely on water vendors. (World Bank, 1976)

POTABLE WATER: 91% of the urban population had access to potable water. (Secrétairerie d'Etat du Plan, 1980)

WOMEN'S WORK: In poor-peri urban areas of Port-au-Prince women work very hard. They gather wood, buy charcoal and provisions, carry water, do some trading of one sort or another, sell clairin, a kind of local home made beer, notions, or farm produce. Many cook and sell food from their own door step. Many trade in nearby markets. Mothers also wash, iron, tend children, and cook as well as work outside the home. Babies are not carried on their mothers' backs, so baby sitters must be found for toddlers. (Berggren et al., 1981b)

CALORIES AND PROTEIN: Five studies carried out between 1951 and 1959 found that calorie intake ranged from 1,383 to 2,450 per person per day; and protein intake, from 37.4 to 82 grams. (Barkhuus and Daly, 1976)

FOOD EXPENDITURE: The average annual per capita expenditure on food amounted to U.S. \$48 in Fort-au-Prince in 1970. (World Bank, 1976)

GARDENS: Only 8.3% of urban families in Port-au-Prince had gardens that produced food consumed by the family. (Bureau of Nutrition, 1979)

3.2 DIETARY PRACTICES, WOMEN

3.2.1 DIETARY PRACTICES, WOMEN DURING PREGNANCY

NATIONAL

NO FOOD RESTRICTIONS: No food restrictions were reported to take place during pregnancy. (Jelliffe and Jelliffe, 1961)

RURAL

SPECIAL DRINKS: Special drinks given during pregnancy include a purgative known in Creole as lok. This is taken after the third month of pregnancy on three occasions and is prepared by mixing castor oil, spices, sour orange, and bicarbonate of soda. It is taken to purge the child, not the mother. A bitter salted tea made from the leaves of asousi (Momordica charantia) is believed to make the child more beautiful. Mixtures of water and commercially purchased laundry starch are also consumed in the belief that they will "refresh" the child and provide nutritional value. (Alvarez and Murray, 1981)

3.2.2 DIETARY PRACTICES, WOMEN DURING LACTATION

NATIONAL

FOOD RESTRICTIONS: In some villages women restricted intake of fresh fish, eggplant, white beans, pork, lard, and all fruit for two to three months after delivery. (Jelliffe and Jelliffe, 1961)

RURAL

RICE ONLY: Some mothers ate only "white" foods during the neonatal period and could be found eating only rice. (Berggren et al., 1980)

COLD FOODS AVOIDED: Cold foods were believed to be harmful to lactating women. Cold foods avoided by the lactating mother included avocado, coconut, mango, pineapple, soursop fruit, star apple, cassava bread, banana, lime, grapefruit, okra, orange, cane syrup, chayote fruit, and tomato. (Weise, 1976)

POSTPARTUM DIET: Women ate large quantities of food in the days after giving birth. The most frequently consumed items were chicken, goats meat, and plantains. (Alvarez and Murray, 1981)

3.2.2. DIETARY PRACTICES, WOMEN DURING LACTATION (CONTINUED)

RESTRICTED DIET: Diet of lactating women included only banana juice, mint candy, cassava, marionade (fried dough balls), goat meat, kidney beans, malanga, plantain, white rice, mushrooms, cinnamon, coffee, nutmeg, and rum. Other foods were restricted because they were too expensive or out of season. Many foods were not eaten because they were believed to be "cold" and, therefore, harmful to postpartum women. (Weise, 1976)

INDUCING LACTATION: Locally available herbs are used to induce lactation. One common remedy is a tizann, a tea prepared with barks of avocado and mango trees boiled in water. Others are prepared with cotton, kenep (Meliocca bijuga), Panzou (Solanum tortipes), and lian koulev (Passiflor rubra), boiled and given to the woman. If these remedies do not work, a wet nurse may be sought. (Alvarez and Murray, 1981)

3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS

NATIONAL

AVERAGE DIET: The average diet of young children was found to be 32% below the recommended level for calories, 24% below the recommended level for protein, and 17% below the recommended level for iron. The diet was found to be rich in vitamin A as the survey was conducted during mango season. (DIFPAN, 1978)

CALORIE INTAKE: Mean ingested calories among preschoolers was 1200 per day (range 800 to 1300). (Toureau et al., 1976)

PROTEIN INTAKE: Mean ingestion of protein was 12 grams per preschooler per day (range 10 to 20 grams). 90% of protein in the diet was of vegetable origin. (Toureau et al., 1976)

VITAMIN A: Only 34% of the recommended amount of vitamin A was included in the average child's diet. (Toureau et al., 1976)

RURAL

STARCH PORRIDGE: Within the first two or three days after birth, most mothers fed their children a food called labouyi lamidon, literally "starch porridge." This gruel was prepared by mixing water, commercially purchased laundry starch, white sugar, and cinnamon. The starch was often referred to by its brand name "Argo." Clearly written on the box is "Not Recommended for Food Use" in English, which is not understood by the villagers. Argo was one of the regular components of the diet of the neonate and young infant. (Alvarez and Murray, 1981)

IMPORTANCE OF POWDERED MILK: Powdered milk has assumed great importance in the diet of babies in recent years as weaning occurs earlier. Every baby now has its own bottle, and children of women with enough money will have two or more. First births are now increasingly taking place in the hospital, and village women report that they are obliged by the hospital to include a bottle as part of the packet which they bring with them to the hospital. The hospital uses the bottle for boiled sugar

water, but village women associate the bottle with powdered milk, and this bottle supports and encourages use of powdered milk. (Alvarez and Murray, 1981)

PURGING: The first food given to neonates is a purgative called lok, given to expel the meconium, which is believed to be harmful. The lok is made of castor oil, nutmeg, unrefined sugar, garlic, the juice of a sour orange, and water. Women who deliver in the hospital will give the child lok immediately upon returning to the village. (Alvarez and Murray, 1981)

URBAN

VITAMIN A: In the slum area of La Faussette mean ingestion of vitamin A by preschoolers was 6% of the recommended daily allowance. Of this, 20% was of animal origin. (Toureau et al., 1976)

3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREAST FEEDING

NATIONAL

CURRENTLY BREAST FED: 34.6% of children aged 3 to 59 months were breast fed at the time of the survey. 97.3% of children aged 3 to 5 months, 91% of children aged 6 to 11 months, and 53.1% of children aged 12 to 23 months were breast fed. (Bureau of Nutrition, 1979)

DURATION OF BREAST FEEDING: 4.5% of children were weaned between 0 and 5 months, 11.7% at 6 to 11 months, 32.9% at 12 to 17 months, 36.5% at 18 to 23 months, and 11.6% were weaned at 24 months or later. (2% were never breast fed, and 19% were unknown.) (Bureau of Nutrition, 1979)

STABLE PATTERNS: During the past five years the age distribution of children into various weaning age groups has remained stable. The percentage of children 12 to 59 months who had been weaned at less than 12 months ranged from 11.6 to 17.8%. The percent of children never breast fed also remained fairly constant during this period. (Bureau of Nutrition, 1979)

BABIES LEFT AT HOME: Mothers do not usually take infants to the fields or the market. Babies and young children in Haiti are often left at home with older sisters or other women when mother has to go out. The result is that many babies receive a very irregular supply of breast milk, and when mother is away from home, the infant often goes hungry or is given unsuitable food as a substitute. (Matheson, 1975)

REGIONAL

DURATION OF BREAST FEEDING--NORTH REGION: 97% of children in the north region had received breast milk. Among those weaned, the mean age of stopping breast feeding was 15.6 months, and the mode was 18 months. (Baer and Rohde, 1981)

DURATION OF BREAST FEEDING--SOUTHERN REGION: 81% of children in the southern region were still breast fed at 1 year of age; 46%, at 2 years; 4.4% at 3 years; and 0.8%, at 5 years of age. (Genece and Rohde, 1982)

3.3.1. DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREAST FEEDING (CONTINUED)

RURAL

DURATION OF BREAST FEEDING: In rural areas almost all children are breast fed through the first year of life. At 12 months only 3 to 9% had been completely weaned. (Bureau of Nutrition, 1979)

DURATION OF BREAST FEEDING: Average duration of breast feeding in the Petit-Goave area was 20 months. (Dieudonne, 1981)

UNIVERSAL BREAST FEEDING: In the rural areas, virtually all children were breast fed for some time. The percentage of rural children never breast fed ranged from 0.0 to 1.1% (depending on district). (Bureau of Nutrition, 1979)

DURATION OF BREAST FEEDING: 0.8 to 2.5% (percent varied by district) of rural children were weaned from the breast between 0 and 5 months, from 3.9 to 12.3% were weaned at 6 to 11 months, 30.2 to 38% were weaned at 12 to 17 months, 33.1 to 45.1% were weaned at 18 to 23 months, 7.8 to 17.5% were weaned at 24 months or older. (Bureau of Nutrition, 1979)

DURATION OF BREAST FEEDING: Most rural children were completely weaned by 23 months of age. (Bureau of Nutrition, 1979)

DURATION: In the Deschappelles area the mean duration of breast feeding was 18 months. (Berggren and Berggren, n.d.)

BREAST FEEDING DURATION: 50% of children were still receiving breast milk at 21 months of age. (Berggren et al., n.d.)

DURATION OF BREAST FEEDING: Mothers usually breast feed for about 18 months. When a second pregnancy immediately followed the birth of a child, breast feeding might be stopped as early as six months. (Ballweg, 1972)

COLOSTRUM: The yellow color of colostrum is looked upon with great suspicion. Traditional midwives report that they instruct mothers that this must be expressed and discarded. (Berggren et al., 1980)

URBAN

DURATION OF BREAST FEEDING: 25.6% of children aged 3 to 59 months living in Port-au-Prince were breast fed at the time of the survey. 90.2% of children aged 3 to 5 months, 71.7% of children 6 to 11 months, and 28.9% of children 12 to 23 months were breast fed. (Bureau of Nutrition, 1979)

DURATION OF BREAST FEEDING: 18.1% of urban children were weaned between 0 and 5 months, 35% between 6 and 11 months, 27.3% at 12 to 17 months, 14.7% at 18 to 23 months, and 3.8% at 24 months or later (9.7% were never breast fed, and 1.4% were unknown). (Bureau of Nutrition, 1979)

DURATION OF BREAST FEEDING: 50% of children were weaned before the age of 20 months. About 10% of children were weaned at 9 months of age, and almost all children began receiving a bottle during the first two months of life. (Berggren et al., 1981b)

NEVER BREAST FED: 9.7% of mothers in Port-au-Prince reported that the survey child had never been breast fed. (Bureau of Nutrition, 1979)

URBAN MIGRATION AND BREAST FEEDING: It has been suggested that accelerated urban migration might cause deterioration of infant health because the rate of breast feeding will continue to decline. Migration from rural to urban areas involves a large proportion of women, whose number in the capital exceeds the male population by 33%. (World Bank, 1976)

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING

NATIONAL

WEANING: 20% of mothers weaned their children at 6 months of age to herb teas, starchy gruels, and bananas soaked in sugarcane water. (Barkhuus and Daly, 1976)

MANUFACTURED WEANING FOODS: A study was conducted concerning local production of a weaning food. The purchase of ingredients, manufacture, packaging, advertising, cost, sales, and identification of buyers were carefully monitored. The study concluded that the buyers were predominantly middle class people, not the low income groups which had been targeted, and that it was unlikely that a profitable market could be established for the product. (Berggren et al., 1982)

HERBAL TEA INFUSIONS: Herbal teas were often introduced in the first few months of life. The most common ones were made from the fresh leaves of various fruit bearing trees, such as orange and soursop, or from garden herbs such as mint. (Jelliffe and Jelliffe, 1961)

COW'S MILK: 71% of mothers questioned stated that their children aged up to two years were receiving cow's milk. Further questioning revealed that in almost all cases the quantity taken was extremely small, sometimes being only a few ounces weekly or even monthly. (Jelliffe and Jelliffe, 1961)

LEGUMES: 20% of mothers reported introducing beans into their children's diet in the second 6 months of life. The majority did not do so until early in the second year. The cost of legumes, especially the preferred red beans, was expensive relative to the very small budget available to the mother. (Jelliffe and Jelliffe, 1961)

MEAT: Meat played no part in infant feeding because of its high cost. (Jelliffe and Jelliffe, 1961)

EGGS: Eggs were not given to young children. They were sold in the market. (Jelliffe and Jelliffe, 1961)

REGIONAL

BOTTLE FEEDING--NORTH REGION: 61% of children 3 to 59 months of age were reported to have ever had a bottle; 26% were receiving the bottle at the time of the interview. The mean age at the start of bottle feeding was within the first month of life, and the mode was age 0 months. The bottle

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING (CONTINUED)

was given 1 to 5 times each day with a mean of 2.5. The mean age of stopping was 7.8 months. Fresh cow's milk and tea were the most common liquids used in bottle feeding. Few mothers reported the use of commercial milk. Most were 8 ounce-glass bottles. 59% of the bottles were reported by the interviewer to be clean. The remainder were in various categories of "dirty." (Baer and Rohde, 1981)

RURAL

USE OF BOTTLE: Among rural mothers 60.1% of the mothers had fed milk to their children from a bottle. (Bureau of Nutrition, 1979)

BOTTLE FEEDING: 25% of rural children below age 5 years and the youngest in their family were currently bottle feeding. 46% had at one time been bottle fed. (Baer et al., 1981)

PREVALENCE OF BOTTLE FEEDING: Approximately 70% of rural children have at some time or other been fed with a bottle. (Baer et al., 1981)

WHAT'S IN THE BOTTLE: When mothers of children under 5 years of age were asked what was given to the child in the bottle, mothers usually answered with two or more products of which the most frequent were tea (85%), fresh milk (82%), sugar water (40%), water (33%), juice (27%), commercial milk (9%), and starch (1%). (Baer et al., 1981)

SUPPLEMENTATION: In the first months of life children were supplemented with "sweet foods," a variety of sugared porridges and paps prepared by dissolving locally prepared flours, often plantain and arrowroot, in a water or milk base. Some mothers began giving these porridges within the first month after birth, and all mothers had begun by the onset of the child's third month. (Alvarez and Murray, 1981)

SUPPLEMENTARY FOODS: Mothers in the Deschappelles area began supplementing breast feeding with a variety of foods of low nutritional value at widely variable ages, but by age 1 year, most children received portions of adult food. (Berggren and Berggren, n.d.)

MEAL PATTERN: At about 4 to 6 months of age, children's daily calorie intake began to follow a schedule dictated by the working hours of the adult members of the family. Food was prepared and consumed one or two times a day. Little or no food was available between times, and young children were probably incapable of receiving their food requirements from only one or two meals. (Berggren and Berggren, n.d.)

ABRUPT WEANING: Weaning was generally done in an abrupt fashion. Most frequently mother removed herself physically from the village to resume trading. Other mothers stayed at home and applied a very bitter substance to the breast to assist in extinguishing the child's attraction to the breast. The child was put to sleep far away from the mother. Special teas were given to the child. A child-caretaker assumed full charge of the child at this time. (Alvarez and Murray, 1981)

TREND TO EARLIER WEANING: Over the last eight years there has been a tendency to wean children much earlier. The traditional time of weaning

was 18 months. The drop in the weaning age was caused by the deteriorating economic situation in the village. Women could not afford to wait 18 months to return to their trading activities. (Alvarez and Murray, 1981)

INADEQUATE CALORIES: Children in three villages in the South East were found to consume inadequate amounts of food. Children in Fond Droit (average age 33 months) consumed 57% of the recommended amount of calories. Children in La Montagne (average age 40 months) consumed 59% of the recommended amount, and children in Orangers (average age 39 months) consumed 87% of the recommended amount of calories. Protein intake was 60%, 53%, and 116% of the recommended amount in each respective village. (Secrétairerie d'Etat du Plan, 1980)

URBAN

USE OF BOTTLE: 96% of urban mothers reported using a bottle for feeding milk to their infants. (Bureau of Nutrition, 1979)

BOTTLE FEEDING: Few mothers in Cite Simone reported never having given a bottle. But in most instances this bottle was a supplement to breast feeding and was not intended to replace it. The general pattern for infant feeding seemed to be one of mixed feeding, using a bottle to supplement breast milk. (Berggren et al., 1981b)

BOTTLE FEEDING: Bottle feeding began as a supplement to breast feeding in over half the children during the first month of life; less than 20% of mothers refrained altogether from bottle feeding. (Berggren et al., 1981b)

BOTTLE FEEDING: Mothers give about three bottles per day, on average, containing either laundry starch mixtures or sugary teas; these mixtures are easily contaminated. (Berggren et al., 1981b)

SUBSTANCES USED IN BOTTLE FEEDING: Bottle contents tend to be a mixture of watery cooked laundry starch ("Argo"), a few spoonfuls of sugar, and "enough milk to give it taste." (Berggren et al., 1981b)

COST OF MILK: In 1980 an adequate supply of cow's milk to feed an infant would have used up nearly half the income of the average poor working-class mother in Port-au-Prince. (Berggren et al., 1982)

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

RURAL

TIME SPENT IN FOOD RELATED ACTIVITY: Meals provided by a family in the majority of cases failed to meet the food needs of children. Children were constantly on the look out for opportunities to supplement their diet. Preschool children were observed to spend up to 40% of their waking hours in food related endeavors including eating and also looking for things to eat, observing what is being cooked, attending to what others are eating, looking for fuel, fetching water, or going to buy food. (Alvarez and Murray, 1981)

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

REFUSAL TO EAT: When a child did not wish to eat, the parents did not generally interfere and allowed the child to do as he wished. Mealtime resistance was uncommon. Sometimes children did not eat all their food at mealtime but saved some of it for later. (Alvarez and Murray, 1981)

3.4 HEALTH AND MEDICINE

NATIONAL

COMMUNICABLE DISEASE: People sleep in tightly closed houses for fear of spirits that roam at night. This facilitates the spread of communicable diseases among occupants. (A.I.D., 1978)

SEEKING MEDICAL HELP: If a disease was believed to be caused by natural, not supernatural causes, the first assumption was the the problem would disappear with time. People waited a long time before seeking medical help. If the problem did not disappear, people turned to the advice of family and friends and/or home remedies, such as herbal teas, salves, baths, and compresses. If these remedies did not work, the herbalist was consulted. If the ill person were a female or young child, the midwife might be consulted. (A.I.D., 1978)

TREATMENT FOR DIARRHEA: Mothers of children under five years of age reported the following treatments for diarrhea: herb tea, a visit to a doctor or health center, and no treatment. (Beaudry-Darisme and Latham, 1973)

CAUSES OF MALNUTRITION: Prolonged starvation was commonly used in the treatment of diarrhea. Other treatments implicated in the development of malnutrition were frequent doses of laxatives and use of toxic anti-helminthics. (Jelliffe and Jelliffe, 1961)

TRADITIONAL MEDICAL PRACTITIONERS--THE CHARLATAN: If treatment by the herbalist had not worked, the patient might turn to the charlatan who gave injections of medicine (often penicillin) which was purchased by the client at a pharmacy. The needle was not sterile, contaminated water was used as a dilutant, and doses were rarely calculated. (A.I.D., 1978)

TRADITIONAL MEDICAL PRACTITIONERS--SUPERNATURAL: When illness was believed to be supernaturally caused, two different types of houngan (voodoo priest) might be sought depending on whether the illness was caused by ancestral or alien spirits. The bokor (sorcerer) was the last person consulted for cures based on magical spells and poisons thought to bring misfortune to someone else or to ward off bad spirits. (A.I.D., 1978)

DISTRIBUTION OF HEALTH RESOURCES: Although an agricultural country with 80% of the population living in rural areas, two thirds of the resources for health care were concentrated in urban areas, particularly in the capital. (Barkhuus and Daly, 1976)

CHILD HEALTH: There were 33 pediatric clinics in 10 sanitary districts: 15 were private, 2 mixed, and 16 run by the government. Care was offered to nursing mothers and children and was usually free. Health education

was given with emphasis on nutrition and surveillance of weight. (Barkhuus and Daly, 1976)

HEALTH SERVICES: Public and private health services are operated in Haiti. Government health stations, which have been established in nearly every village, are frequently augmented by private facilities, many with religious affiliations. Each health district has a hospital with a staff of physicians. The University Hospital in Port-au-Prince is the major referral hospital. (Toureau et al., 1976)

REGIONAL

ILLNESS IN YOUNG CHILDREN--NORTH REGION: Among 943 preschool children 38% were reported to have had fever during the two weeks prior to the day of examination, 7.3% had chills, 72% had running noses, 58% had coughs, and 30% had diarrhea. 66% of mothers reported that the child had difficulty seeing when it started to get dark. On the day of the exam, 2.8% of the children had fever, 8.9% had scalp infection, 49% runny noses, 16% eye infection, 1% dehydration, 17% cough, 2.5% enlarged spleen, 0.3% rapid respiration, 2.1% swollen abdomen, and 0.7% edema of both feet. (Baer and Rohde, 1981)

HEALTH CARE OF YOUNG CHILDREN--NORTH REGION: Among 943 young children examined during a survey 43% were reported to have ever been weighed, 38% said the result was recorded on a weight chart, 13% said they were given the card to keep at home. 41% had a vaccination card. 28% recalled having received a vitamin A capsule. Measles had been recognized in 13.8% of the children, whooping cough in 55%, and 42.2% had ever passed worms. (Baer and Rohde, 1981)

RURAL

TREATMENT OF ILLNESS: 453 households reported 393 illnesses during the previous two weeks (.87 illnesses per household). 65.5% of these illnesses were treated at home, 40% were treated at a dispensary, 21% were treated at a hospital, and 2.3% were treated by traditional healers. Illnesses which were treated at home did not incur payment for treatment. For illnesses which were treated outside the home an average of 13.4 goudes (\$2.70) was paid for treatment. (Baer et al., 1981)

DIARRHEA: 34% of mothers reported that their child had diarrhea in the previous two weeks. In some cases no treatment or several treatments were given to the child. The most frequently used treatments were tea (37%), medication (27%), oral rehydration (16%), and medication plus tea (24%). (Baer et al., 1981)

MODERN HEALTH PRACTITIONERS: Health practitioners with western medical training, especially doctors, alienated rural clients. These doctors advised medical treatment and did not provide the sympathetic feedback and psychotherapeutic consultation which was the key to the traditional practitioner's appeal. Auxiliaries in public dispensaries were also reported to be unsympathetic and denigrating. Nuns were seen as sympathetic but primarily concerned with dispensing of drugs. (A.I.D., 1978)

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE (CONTINUED)

MIDWIVES: In rural areas untrained traditional birth attendants known as "matrones" performed more than 80% of the deliveries. (Berggren et al., 1980)

MIDWIVES: Almost all births in rural areas are attended by untrained village women, "matrones." A recent survey found that there were about 11,000 matrones in rural areas. (Barkhuus and Daly, 1976)

MIDWIVES: 95% of hospital maternity patients called in a local midwife as soon as they returned home for the customary hot leaf baths and advice on traditional dietary restrictions. Supervision of these restrictions was the essence of the traditional midwife's services to postpartum women. (Weise, 1976)

MIDWIVES: Midwife/herbalists provided all prenatal, delivery, and postpartum services to the vast majority of mothers and were relied upon especially during the postpartum period. These women have had years of practical experience in delivery and herbal remedies but little formal training. Supervision of traditional dietary restrictions was an important part of postpartum care. (Weise, 1976)

CHILDBIRTH: 449 mothers were asked where they had delivered their last child. 3% had delivered at home alone, 89% at home with a midwife, and 8% at a maternity. (Baer et al., 1981)

PRENATAL CARE: Traditional midwives have little contact with patients before the beginning of labor. Whatever advice is given by midwives during pregnancy is done through informal contact during a chance encounter. Advice given by the midwife during pregnancy might be seen by the family as the cause of mishaps such as a difficult delivery or a malformed baby. (Berggren et al., 1980)

DELAYED DELIVERY: If there is a delay in the delivery of the placenta, midwives may "sweep" over the abdomen with a broom. This may stimulate the uterus to contract and is similar to a maneuver referred to in modern textbooks. Other practices include blowing on the severed end of the umbilical cord or calling a dog to sit outside the door. Delivery of the placenta has special significance, and traditionally the placenta is buried at the site of the birth. (Berggren et al., 1980)

MIDWIVES AND DIFFICULT DELIVERIES: Through long experience the midwife is often very perceptive about the early signs of obstructed labor and is usually quite willing to transport her patient to a modern medical facility if it appears that the delivery will be difficult. Midwives administer teas and potions which are reputed to relieve the pain of a difficult delivery. (Berggren et al., 1980)

HOME BIRTH: Between 94 and 98% of rural births occur at home in rural areas with no modern medical assistance. Delivery may or may not be attended by a traditional midwife. (Berggren et al., 1980)

HEALTH WORKERS: Local people in Deschappelles were recruited and trained to provide preventive health care. Health workers were first trained to give tetanus immunizations. Later they worked in preventive nutrition

programs, weighing and measuring the village children, learning to graph the children's weights, and explaining the children's growth progress to the mothers. They also provided nutrition education and powdered milk to mothers of malnourished children and made necessary referrals.
(Berggren, n.d.)

URBAN

DIET AND DIARRHEA: Mothers in Cite Simone tend to deny foods or liquids to infants suffering diarrhea both during the episode and in the recovery days, apparently with the idea that it is important to "rest" the stomach. (Berggren et al., 1981b)

4. NUTRITION STATUS CORRELATIONS

NATIONAL

MALNUTRITION: The prevalence of children suffering third degree malnutrition increased with increasing age. Among children 3 to 5 months, 0.6% have third degree malnutrition (below 60% of reference median weight for age); 1.8% at 6 to 11 months; 2.8% at 12 to 23 months; and 3.9% at 24 to 35 months have third degree malnutrition. Percentages of children with second degree malnutrition (60 to 75% of reference median weight for age) also increased: 4.5%, 13.4%, 26%, and 27.8% in each respective age group. (Bureau of Nutrition, 1979)

CHRONIC UNDERNUTRITION AND OCCUPATION OF PARENTS: There was an inverse association between the father's being in the higher skilled occupations and the prevalence of chronic undernutrition (height for age less than 90% of reference median) in the survey child. There was no association between mother's occupation and child's nutritional status. (Bureau of Nutrition, 1979)

CHRONIC UNDERNUTRITION AND MOTHER'S EDUCATION: The prevalence of chronic undernutrition (height for age less than 90% of the reference median) in children of mothers who had attended school was significantly less than in children whose mothers had not attended school. (Bureau of Nutrition, 1979)

ACUTE UNDERNUTRITION AND MOTHER'S EDUCATION: Children whose mothers had attended school had a significantly lower prevalence of acute undernutrition (weight for height less than 80% of the reference median) than children whose mothers did not attend school. (Bureau of Nutrition, 1979)

CHRONIC UNDERNUTRITION AND RADIO USE: The prevalence of chronic undernutrition (height for age less than 90% of the reference median) was significantly lower in children of radio owners/listeners than in non-radio owners/listeners. (Bureau of Nutrition, 1979)

ACUTE UNDERNUTRITION AND RADIO: Children of mothers who either owned or listened to a working radio had a statistically lower prevalence of acute undernutrition (weight for height less than 80% of the reference median) than children whose mothers did not own a radio or listen to one. (Bureau of Nutrition, 1979)

ACUTE UNDERNUTRITION AND ILLNESS: There was a constant relationship between the prevalence of illness, fever, and diarrhea symptoms and acute undernutrition, as indicated by low weight for height relative to the reference median. As weight for height decreases, the prevalence of recent symptoms of fever, diarrhea, and illness increases. This relationship did not hold for chronic undernutrition and the prevalence of symptoms. (Bureau of Nutrition, 1979)

NUTRITIONAL STATUS AND INCOME: Children from poor families had inferior nutritional status. Among 17 children below six years of age whose families had a regular income, 52% had normal nutritional status (90% of better for standard weight for age), 41% had Gomez Class I malnutrition

4. NUTRITION STATUS CORRELATIONS (CONTINUED)

(between 75 and 90% of standard weight for age), and 7% were Gomez Class II (between 60 and 75% of standard weight for age). No child in this group fell below 60% of standard weight for age. Among 76 children living in families without a regular income, 24% were normal, 32% Gomez Class I, 26% Gomez Class II, and 18% had weights below 60% of standard weight for age. (Brown et al., 1978)

MALNUTRITION AND FAMILY SIZE: The percent of preschool children with third degree malnutrition (below 60% of standard weight for age) increased as family size increased. But when the total number of children is over six, there appears to be a slight improvement. Perhaps this is due to having older children in the family who can help work in the fields. (Brown et al., 1978)

NUTRITIONAL STATUS AND FAMILY SIZE: Among families with only one or two children, 26% of preschool children had normal nutritional status (90% or greater than standard weight for age), 40% were Gomez Class I (75 to 90% of standard weight for age), 29% were Gomez Class II (60 to 75% of standard weight for age), and 5% were Gomez Class III (below 60% of standard weight for age). In families with 3 or 4 children, 18% of preschoolers were normal, 36% were Gomez Class I, 35% were Gomez Class II, and 11% were Gomez Class III. In families with 5 or 6 children, 24% were normal, 20% were Gomez Class I, 29% Gomez Class II, and 27% Gomez Class III. In families with 7 or more children 32% of preschoolers had normal nutritional status, 26% were Gomez Class I, 26% Gomez Class II, and 16% Gomez Class III. (Brown et al., 1978)

NUTRITIONAL STATUS AND BOTTLE FEEDING: Children who had received feeding from a baby bottle had a significantly lower prevalence of wasting and stunting than children who had never been fed from a bottle. Some mothers who are unable to provide weaning foods tend to prolong breast feeding without providing food supplementation. The children of these mothers tend to have insufficient nutritional intake. (Bureau of Nutrition, 1979)

NUTRITIONAL STATUS AND PRESENCE OF ADULT MALE: 30.4% of preschool children from families without an adult male had third degree malnutrition (below 60% of expected weight for age); 12% of preschoolers from families with an adult male present had third degree malnutrition. (Brown et al., 1978)

NUTRITIONAL STATUS AND LAND OWNERSHIP: No correlation was found between malnutrition and amount of land owned. Farming is the main livelihood of almost all peasants in Haiti. This lack of correlation is probably due to inaccurate reporting of land tenure and use. (Brown et al., 1978)

MALNUTRITION AND MORTALITY: Nutritional deficiencies were associated with 40 to 70% of deaths due to infectious diseases. (Barkhuus and Daly, 1976)

SEVERE MALNUTRITION AND SOCIO-ECONOMIC FACTORS: Socio-economic factors clearly precipitated clinical malnutrition in five of the nine cases observed. Two of the four children with kwashiorkor were siblings in a family whose father had recently died. Another two year old had lost his

mother. Two of the five marasmic children had retarded mothers; a third was orphaned and living with another family. (Brown et al., 1978)

ILLNESS AND LATRINES: The prevalence of recent illness, fever, and diarrhea was significantly lower in children whose families had useable latrines. (Bureau of Nutrition, 1979)

ILLNESS AND SOURCE OF WATER: The prevalence of recent fever and illness in survey children whose families had a source of piped water was significantly lower than in families without a source of piped water. The prevalence of recent diarrhea in survey children was not significantly different in homes with or without a source of piped water. (Bureau of Nutrition, 1979)

VITAMIN A DEFICIENCY AND REGION: Prevalence of corneal scars presumed secondary to vitamin A deficiency was 1.2 per 1000 preschoolers in the South but 8.1 per 1000 in the North of the country. Variation within regions was minimal, and differences in rates in urban and rural areas were not significant. (Toureau et al., 1976)

RIBOFLAVIN DEFICIENCY AND SEASON: Riboflavin deficiency was seen more frequently in winter than in summer. Mangoes and avocados (the main sources of vitamin B₂) were out of season in winter. (Beghin et al., 1970)

FOOD PRODUCTION AND POPULATION GROWTH: The rate of population growth was slightly more than 2%. Food production had essentially kept pace with demand. This did not mean that the needs of the rural population were being satisfied. The average protein intake was about 30% below requirements. Reaching the desired calorie level of food intake would require about 30% increase in basic food crop production. (Barkhuus and Daly, 1976)

RURAL

MORTALITY AND PLACE OF BIRTH: No significant differences in mortality rates were found between the group of children born in the village and those delivered in Port-au-Prince. To be born in Port-au-Prince hospital did not appear to increase a child's chance of surviving until age 17 years. (Murray and Alvarez, 1973)

MORTALITY RATE AND NUTRITION PROGRAMS: While death rates among 1 to 4 year old children in Haiti were 26 per thousand per year, death rates among malnourished children who had been rehabilitated in either a foyer or a nutrition rehabilitation center dropped to 15 per 1000 per year. Non-rehabilitated children whose mother received only counseling sustained a 1 to 4 year death rate of 22 per thousand per year. (Republique d'Haiti, 1979)

MALNUTRITION AND BIRTH INTERVAL: An interval of 18 months or less between births was associated with severe nutritional problems as measured by a weight for age below 75% of standard. (Webb et al., 1972)

4. NUTRITION STATUS CORRELATIONS (CONTINUED)

MALNUTRITION, BIRTH INTERVAL, AND NUMBER OF SIBLINGS: Birth interval (number of months between the two youngest living siblings) rather than the total number of siblings had a more direct correlation with nutrition problems as measured by weight for age. (Webb et al., 1972)

MALNUTRITION AND FAMILY SIZE: Children with 4 to 7 siblings were more likely to suffer severe malnutrition. Among 74 families which had fewer than five children, there were 13 cases of severe malnutrition (Gomez Class III, below 60% of expected weight for age). Among the 37 families with 5 to 8 children, there were 14 cases of severe malnutrition. But among 3 families with 9 children, no severe malnutrition was found. (Ballweg, 1972)

MALNUTRITION AND FAMILY SIZE: No significant differences in the percentage of children with severe malnutrition were found in families of small and large size. (Webb et al., 1972)

MALNUTRITION AND MOTHER'S MARITAL STATUS: Nutritional problems were more common among preschool children whose mothers were not married. 17 out of 46 (36.9%) children whose mothers were married had normal weights for age, and 7 (15.2%) were severely malnourished. 13 out of 68 (19%) children with mothers who were not married had normal weights for their age, and 20 (29.4%) were severely malnourished. (Ballweg, 1972)

MALNUTRITION AND MOTHER'S OCCUPATION: 12 out of 48 (25%) mothers whose occupation was farmer had a severely malnourished child; 7 out of 9 (77.7%) of charcoal sellers had a severely malnourished child; 8 out of 51 (15.6%) street merchants had a severely malnourished child. Four seamstresses, a cook, and a butcher had no severely malnourished children. (Ballweg, 1972)

MALNUTRITION AND SOCIOECONOMIC STATUS: Families living in one or two rooms were more likely to have a malnourished preschool child than families living in houses with three, four, or five rooms. Families who owned land were more likely to have a malnourished child than families who did not own land, which was not an expected finding. (Ballweg, 1972)

MALNUTRITION AND PRESENCE OF FATHER: 14 out of 81 children (17.2%) in homes where the father was present had severe malnutrition (below 60% of standard weight for age). 13 out of 33 children (39.3%) who lived only with their mother had severe malnutrition. (Ballweg, 1972)

MALNUTRITION AND NUMBER OF MEALS: Families which had only one meal each day were more likely to have a malnourished preschool child. Families which prepared only one meal represented 16.7% of the sample but had 33.3% of the severely malnourished children (below 60% of standard weight for age). (Ballweg, 1972)

MALNUTRITION AND SEX: Preschool girls were more likely to suffer third degree malnutrition than boys. 12 out of 60 preschool boys had severe malnutrition (Gomez Class III, below 60% of standard weight for age), but 15 out of 54 girls had severe malnutrition. 19 out of 60 boys had normal weight for age, but only 11 out of 54 girls had a normal weight. (Ballweg, 1972)

PEM RISK FACTORS: Children were found to be at high risk of PEM when their mothers did not understand the nutritional needs of young children, when their mothers were separated from their spouse, if pregnancies occurred very close together, when weaned early, and if mother could not take time to breast feed because of jobs she had to do outside the home. (Departement de la Sante Publique, n.d.)

NUTRITIONAL STATUS AND MOTHERS' LITERACY: No correlation was found between mothers' literacy and the nutritional status of their children. (Ballweg, 1972)

NUTRITIONAL STATUS AND MOTHERS' AGE: 34.2% of preschool children whose mothers were 20 to 29 years of age had a normal weight for age; among children whose mothers were 30 to 39 years of age, 19% had normal weights; among those with mothers 40 to 49 years of age, 20.8% had normal weights; and among children with mothers 50 to 59 years of age, 100% of children had normal weights. (Ballweg, 1972)

NUTRITIONAL STATUS AND PRESENCE OF PARENTS: A child who was not living with both its father and its mother might be subjected to increased risks of malnutrition because the household might be less economically secure. (Berggren et al., 1979)

GROWTH AND SEPARATION FROM PARENTS: Among 46 children between the ages of 2 and 6 years, 24 were living with both biologic parents. Of the 22 children not living with both parents, 70% were in second or third degree malnutrition by Gomez standards, but only 25% of the 24 children living with both parents were in second or third degree malnutrition. This difference is significant at $p < 0.001$. (Berggren, 1971)

MIGRATION AND ABSENCE OF PARENTS: Only 60% of young children were living with both parents. The low proportion of children living with both parents is generally the result of migrations accompanied by the break up of the conjugal union. The proportion living with both parents decreased over the time of the study. (Berggren et al., 1979)

BREAST FEEDING AND ABSENCE OF MOTHER: 86% of infants in the census tract studied were living with their mothers. This means about one child in seven was deprived of breast milk because it was not living with its mother. (Berggren et al., 1979)

DURATION OF BREAST FEEDING AND AGE OF MOTHER: Older mothers breast fed their infants for a longer time than younger mothers. (Dieudonne, 1981)

WEANING AND AGE OF MOTHER: Younger mothers tend to wean their children sooner than older ones. Among rural mothers under 25 years, 19.5% weaned before the child was 12 months, 42.8% at 12 to 17 months, and 36.9% at 18 months or later. Among mothers 25 to 34 years, 10.4%, 36.8%, and 52.3% weaned at each respective age. Among mothers over 35 years, 8.2%, 26.9%, and 64.8% weaned at each respective age. (Bureau of Nutrition, 1979)

NUTRITIONAL EDUCATION MATERIALS AND LEVEL OF LITERACY: There was no significant difference in conceptual understanding of graphic health and

4. NUTRITION STATUS CORRELATIONS (CONTINUED)

nutrition education materials among illiterate and semiliterate subjects. (Hollant, 1975)

URBAN

MORTALITY AND FEEDING METHOD: Mothers in Cite Simone tend to give both the breast and bottle during the first year of life; however, the data on mortality show that children who get bottles in the first month of life have a risk of dying at age 1 to 18 months that is four times higher than for other children. (Berggren et al., 1981b)

MORTALITY AND BIRTH ORDER: First born children, who are more apt to be bottle fed, have an infant mortality rate twice as high as children of pregnancy orders two through seven. (Berggren et al., 1981b)

MORTALITY AND MOTHER'S IRON STATUS: 87% of children survived to 23 months of age among mothers whose hemoglobin was 11g/dl or greater at the time of the survey; among mothers with hemoglobins of 10 to 10.99 g/dl the survival rate was 79%; and among mothers whose hemoglobin was less than 10 g/dl, the survival rate was 68%. (Berggren et al., 1981b)

MORTALITY AND MOTHER'S AGE: Children of mothers under 25 years of age have a three times higher risk of dying between 6 and 18 months of age than children of mothers aged 25 to 34 years. (Berggren et al., 1981b)

ANEMIA AND ECONOMIC STATUS: Hemoglobin levels of young children varied with economic status. Children in upper socioeconomic areas had hemoglobins lower than those of children in poorer areas. It may be that use of iron cooking pots (a practice known to affect hemoglobin levels) is more common in poorer homes. (Berggren et al., 1981b)

CORRELATES OF DISEASE: Four variables were found to be related to morbidity in young children: unemployment of household head, low socioeconomic status of the family, large family size, and quantity of water (less than one 5 gallon can per person per day). (Thacker et al., 1980)

ILLNESS AND WATER USE: In large families (more than 4 persons), illness rates among children below 6 years of age were higher in families which used less than one 5-gallon can of water per person per day than in families which used more than one 5-gallon can of water per day. This relationship was statistically significant ($p < 0.02$). (Thacker et al., 1980)

DISEASE AND WATER: Diarrhea, scabies, conjunctivitis, febrile illness, and malnutrition were more common in children from homes using less than one 5-gallon can of water per person per day than in homes where larger amounts of water were available. (Thacker et al., 1980)

DURATION OF BREAST FEEDING AND AGE OF MOTHER: Younger mothers tend to wean their children sooner than older ones. Among urban mothers under 25 years of age, 51.9% weaned before 12 months, 20.7% at 12 to 17 months, and 12.6% at 18 months or later. Among mothers 25 to 34 years, 44.2%, 28.2%, and 17.6% weaned at each respective age. Among mothers 35 years

and older, 32.7%, 34.5%, and 29.2% weaned at each respective age. (Bureau of Nutrition, 1979)

MOTHER'S AGE AND FEEDING METHOD: Younger mothers, under 25 years of age, with low parities tend to bottle feed more and therefore probably breast feed less. Their children are more apt to be malnourished. (Berggren et al., 1981b)

TIME SPENT AT WORK AND NUMBER OF CHILDREN: The women most likely to spend time outside their homes are those with no surviving children and those with 6 or more surviving children. Presumably, those with no children have no responsibilities which require them to stay at home each day. Women with 6 or more children probably have older children to take care of young ones, and women with so many children feel a greater need to work to support them. (Berggren et al., 1981b)

MOTHER'S LITERACY AND AGE: The mother's ability to read is an important consideration for health educators. Few poor women in Port-au-Prince ever finish grade school. About 1/4 of the women could read. However, the ability to read is greater among women 15 to 19 years of age than older women, indicating an improvement. (Berggren et al., 1981b)

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

5.1 NUTRITION AND HEALTH POLICIES AND PROGRAMS, POLICIES

NATIONAL

MINISTRY OF HEALTH: The goals of the Ministry of Health under the current five year plan included a campaign against malnutrition to diminish the malnutrition mortality rate among preschool children, improvement of maternal child health services, a campaign against endemic diseases, strengthening and regionalization of health services, and providing the best medicines and medical supplies possible to the people. (A.I.D., 1978)

BUREAU OF NUTRITION: The Bureau of Nutrition of the Ministry of Health was in overall charge of nutrition programs in the country. The Bureau worked in close collaboration with the Ministry of Agriculture, which furnished agricultural extension services in connection with nutrition rehabilitation centers. (Barkhuus and Daly, 1976)

BUREAU OF NUTRITION: The Bureau of Nutrition was established in 1962 to deal with problems of nutrition. The office consisted of two divisions, one from the Ministry of Agriculture and the other from the Ministry of Health. These two divisions have worked well together. (Barkhuus and Daly, 1976)

BUREAU OF NUTRITION: The Bureau of Nutrition is composed of two Bureaus, one dependent on the Department of Public Health, the other on the Department of Agriculture. Both ministries furnish personnel, and each ministry controls the activities of its own people. A climate of cooperation exists, and agricultural and health personnel share the work of the Bureau of Nutrition. (Beghin et al., 1970)

DIFPAN: Division de la Formation de la Politique Alimentaire et Nutritionnelle was established in 1976 by the Department of Plan to develop a national nutrition policy statement. It has received funding and technical assistance from UNICEF. (A.I.D., 1981a)

UPAN: Unite de Programmation Alimentaire et Nutritionnelle, formerly known as DIFPAN, has been incorporated into the Department of Plan to do intersectoral planning, coordinate ministry activities in food and nutrition, assess the nutritional impact of proposed projects, recommend policy changes to improve nutrition in Haiti, and distribute and interpret information on food and nutrition. (A.I.D., 1981a)

DIVISION OF FAMILY HYGIENE: In 1971 a Division of Family Hygiene was organized within the General Directorate for Public Health Activities in the Ministry of Health and Population. This Division established policies concerning maternal and child health and family planning services in the 11 sanitary districts. (Barkhuus and Daly, 1976)

FAMILY HYGIENE DIVISION: The Family Hygiene Division plans to establish 40 integrated maternal and child health/family planning governmental clinics. (Barkhuus and Daly, 1976)

5.1 NUTRITION AND HEALTH POLICIES AND PROGRAMS, POLICIES (CONTINUED)

NURSING BREAKS LEGISLATION: Provision is made for 2 half-hour nursing breaks or 15 minutes every three hours if the woman prefers, until the child is two years old. These breaks are over and above rest breaks and are remunerated. Every employer with more than 50 women workers in his service is required to provide a nursing room and a nursery; employers may pool their resources to provide this facility. (Richardson, 1975)

HEALTH BUDGET: About 70% of the health budget in 1977 was devoted to personnel who delivered largely curative health services; about 15% was spent on administration; and the remainder, about 15% of the budget, was used for preventive health programs such as nutrition and prevention of epidemic diseases. (A.I.D., 1978)

HEALTH EXPENDITURES: Expressed in real terms, current budgetary expenditures of the Ministry of Health decreased annually by 4.3% during 1971-75. Operating expenditures which included medicines, medical supplies, and food for hospitalized persons were U.S. \$0.74 per person in 1974. (World Bank, 1976)

MIDWIVES: The Ministry of Health through the Division of Family Hygiene (DFH) recommended the integration of a training program for matrones (traditional birth attendants) with the DFH's maternal and child health and family planning program. A manual for training was published by DFH in 1976. (Berggren et al., 1980)

PROPOSED PROJECTS: Projects have been proposed for vitamin A fortification of sugar, salt iodization, wheat fortification, and fish ponds. However, all these projects were rejected on the basis of feasibility studies which found them impractical because of lack of central processing or high cost. Projects which have been reviewed favorably include nutrition surveillance, nutrition education, and various research projects. (A.I.D., 1981a)

RURAL

RURAL DEVELOPMENT: In 1959 the Haitian government, under the Duvalier family, instituted a policy of rural development. One result of this effort was the establishment of nutrition rehabilitation centers in rural villages. (Weise, 1976)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS

NATIONAL

BUREAU OF NUTRITION: The Bureau of Nutrition provided nutrition education and assistance to families for prevention of malnutrition in children. The Bureau directly supported 30 Nutrition Rehabilitation Centers and supervised an additional 60 or 70 centers run by private voluntary organizations. The Bureau of Nutrition was also responsible for retraining all health personnel to improve nutrition related health services. The Bureau also had an Agriculture Section which provided extension activities including use of improved seeds, land preparation, pest control, rabbit production, bee keeping, and other activities. (A.I.D., 1978)

ACTIVITIES OF THE BUREAU OF NUTRITION: The functions of the Office of Nutrition included: definition of the nutritional problems of the country, setting norms and standards (the Gomez classification was used in Nutrition Centers), technical services, training of personnel, and coordination of public and private activities in the field of nutrition. The Office has set up nutrition rehabilitation centers and developed AK-1000, a mixture of cereals and beans for small children. (Barkhuus and Daly, 1976)

BUREAU OF NUTRITION--FUNCTIONS: The principal functions of the Bureau of Nutrition are defining the nutritional problems of Haiti, formulating solutions to these problems, choosing norms and standards, providing technical assistance, training personnel, and coordinating nutrition programs and activities. The Bureau has also been involved in Nutrition Rehabilitation Centers and development of AK-1000, a nutritious weaning food. (Beghin et al., 1970)

GOVERNMENT MATERNAL CHILD HEALTH CENTERS: In 1972 an agreement between the Government of Haiti, PAHO/WHO, and UNFPA was undertaken to create an infrastructure for the conduct of integrated maternal and child health and family planning activities. Provision was made for the operation of two MCH centers in order to study the feasibility of the service and to train personnel. It was planned to extend this program gradually to other districts until national coverage was achieved. (Barkhuus and Daly, 1975)

MINISTRY OF HEALTH MATERNAL CHILD HEALTH AND FAMILY PLANNING: The MOH Division of Family Hygiene, AID, and the United Nations Fund for Population Activities have begun a project of maternal and child health and family planning. The program has begun with construction of training centers, training, operation of clinics, and supervision. It was planned to provide service to about one third of the population. (Barkhuus and Daly, 1976)

DIVISION OF FAMILY HEALTH - CHILD HEALTH CLINICS: The Division of Family Hygiene of the government of Haiti has developed a program of maternal child health clinics emphasizing vaccinations and health education. (Brown et al., 1978)

RURAL HEALTH DELIVERY SYSTEM--INSTITUTION BUILDING: Under the Regionalization Program, the Rural Health Delivery System will decentralize administration of health services to Regions and Districts. Through decentralization, the role of the Department de Sante Publique et Population should change from direct provider of services to long range planner and allocator of resources to intermediate levels. (A.I.D., 1978)

TRAINING AUXILIARY NUTRITIONISTS: Throughout 1975 a group of medical auxiliaries were given special training by the Bureau of Nutrition in order to become auxiliary nutritionists; one or two were then assigned to each district with responsibility for nutrition activities. In March 1977, specific instruction in vitamin A was given to these auxiliary nutritionists, and responsibility was allocated to them for distribution of vitamin A capsules and its reporting. (Toureau et al., 1976)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

MINISTRY OF HEALTH MALARIA PROGRAM: An anti-malaria program began in 1964. The program was successful in the years 1966 through 1968 when the slide positivity rate of malaria fell to 0.2%. The slide positivity rate since then has climbed dramatically to 15.5% in 1978. A joint Ministry of Health/U.S. A.I.D. evaluation of the program was planned to determine what actions were needed to reverse this trend. (A.I.D., 1978)

HIGH LYSINE CORN: Recently attempts to provide a high lysine corn have met with some resistance as the peasants prefer a yellow flint type. A new high lysine corn has now been produced which is similar to the preferred Haitian type. (Barkhuus and Daly, 1976)

MULTILATERAL ASSISTANCE: Operating under a basic agreement with the government of Haiti, WHO/PAHO has been providing a wide range of technical services in the areas of strengthening of health services, family health, health manpower development, communicable disease prevention and control, and health statistics. (Barkhuus and Daly, 1976)

PL-480 TITLE II FOODS: 54,724,000 pounds of food (corn-soy milk, non-fat dried milk, soy fortified bulgur, soy fortified cornmeal, and vegetable oil) worth about \$8,558,900.00 is planned for distribution in FY 1982. These foods will be distributed by CARE, Catholic Relief Services, and Church World Service for programs of maternal child feeding, school feeding, food for work, and general relief. (A.I.D., 1981b)

U.S. PL-480 FOOD: In fiscal year 1977 the World Food Program, together with CARE, Catholic Relief Services, and Church World Service, distributed 27,000 tons of food sent to Haiti under Title II of the US PL 480 program. (Jackson, 1979)

FOOD WAREHOUSES FOR TITLE II FOODS: Fourteen food warehouses are presently under construction throughout Haiti. They are all to be used to store Title II foods. (Jackson, 1979)

U.S. PRIVATE VOLUNTARY AGENCIES--NUTRITION PROGRAMS: Six U.S. private voluntary agencies provided assistance in the areas of nutrition. These agencies were CARE, Catholic Relief Services, Church World Service, Churches of God in North America, Foster Parents Plan, and World Relief Commission of the N.A.E. (TAICH, 1976)

PROGRAMS OF U.S. VOLUNTARY AGENCIES: 39 U.S. voluntary agencies provided assistance in the areas of medicine and public health. Programs included support for hospitals, clinics, equipment, medicine, and volunteer personnel. 13 agencies provided assistance in the area of food production and agriculture and 6 in the area of nutrition. (TAICH, 1976)

CRS: CRS with Secours Catholique d'Haiti and the government Bureau of Nutrition conducted a nutrition education program designed to educate mothers and rehabilitate children suffering from malnutrition. (Barkhuus and Daly, 1976)

CARE: CARE's activities included a nutrition education project for severely malnourished preschoolers and their families--eight new centers were built and furnished, 21 directors were trained, 11,886 children were

enrolled, and 20 school gardens were established. Supplementary foods were distributed to 235,200 people. (CARE, 1981)

UNICEF HEALTH PROJECTS: UNICEF had two projects related to health improvement. The Regional Health Services and Environmental Sanitation project gave priority to maternal child health, communicable diseases, nutrition, dental care, sanitation, and health education. A second project was aimed at development of potable water systems. (A.I.D., 1978)

WILLIAMS-WATERMAN FUND: This private American foundation has contributed to many Haitian nutrition programs, including financing the development of AK-1000 and assisting the Bureau of Nutrition in numerous activities. (Beghin et al., 1970)

AMERICAN BAPTIST CHURCHES: This organization ran a food distribution and feeding program, conducted through hospitals and schools. (Barkhuus and Daly, 1976)

AMERICAN WOMEN'S HOSPITALS SERVICES: American Women's Hospitals Services supported the Limbe dispensary and a rural mobile clinic which provided nutrition, hygiene, and health education. (Barkhuus and Daly, 1976)

CHURCHES OF GOD IN NORTH AMERICA, INC.: This organization ran two nutrition centers where children received protein rich foods and their mothers were given instruction in its preparation. (Barkhuus and Daly, 1976)

MENNONITE CENTRAL COMMITTEE: The Mennonite Central Committee provided nutrition education and supplemental food in the Grande Riviere area. (Brown et al., 1978)

UNITED METHODIST COMMITTEE ON RELIEF: This organization operated a food for work program which included building roads and improving the water supply. (Barkhuus and Daly, 1976)

HELEN KELLER INTERNATIONAL: In 1974-75 a survey was conducted to determine the prevalence of xerophthalmia in Haiti which revealed a significant deficiency of vitamin A, a major cause of blindness among children. Based on survey results, a program was designed in collaboration with the Government of Haiti. The program administers vitamin A capsules to the population at greatest risk through the existing health system. In cooperation with the Ministry of Health, the Bureau of Nutrition, and local private voluntary health agencies, indigenous health personnel will be trained to assist with the project. (TAICH, 1976)

VITAMIN A DEFICIENCY PREVENTION: A program of intervention initiated in 1976 consisted of a targeted distribution of massive dose (200,000 IU) vitamin A capsules to ill or malnourished preschool age children and lactating mothers. The program included nutrition education and training of medical, health, and nutrition personnel in detection and treatment of the disease. The program was designed to be eventually fully integrated into the government's health and nutrition infrastructure. (Toureau et al., 1979)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

VITAMIN A DISTRIBUTION: An evaluation of vitamin A distribution found that 82% of health establishments were known to distribute vitamin A capsules. (Toureau et al., 1979)

VITAMIN A NUTRITION EDUCATION--SEANCES D'EDUCATION: Nutrition education was a support activity in the vitamin A distribution program. Auxiliary nutritionists were instructed to educate mothers while administering vitamin A capsules. Topics of discussion included the importance of vitamin A, the capsules, vitamin A rich foods, and the relationship of all these to the eyes. Evaluation of the program revealed that among mothers whose children had received capsules, 41% knew that vitamin A had something to do with "eyes," "sight," or "blindness." (Toureau et al., 1979)

RADIO DOCTEUR: The program "Radio Docteur" is aimed at the general public, especially the adult population in the reproductive age group. Ten minute programs are broadcast twice a day on subjects such as vaccination, nutrition, health, and family planning. The format of the program is a dialogue in Creole. (Hollant, 1977)

RADIO DOCTEUR--NUTRITION EDUCATION: The program "Radio Docteur" is built around 20 basic messages: five concern care of the pregnant woman, five for the newly delivered mother, five for the baby's health, and five for family planning. Nutrition related messages stress the importance of breast feeding, good diet during pregnancy and lactation, and feeding infants and young children. (Hollant, 1977)

MASS MEDIA NUTRITION EDUCATION: 105 radio programs were presented between 1976 and 1978. The programs stressed the need for vitamin A, the use and availability of vitamin A capsules through the centers for mothers and children, in addition to general education in nutrition. However, ownership of working radios is low, 10.8% in rural areas and 60.3% in Port-au-Prince. (Toureau et al., 1976)

MASS MEDIA--AVAILABILITY OF TV AND RADIO: There are 16 active broadcasting stations and a 2-channel TV station, but availability of receivers amounted to only 17 radios per 1,000 persons in the early 1970's. (World Bank, 1976)

NUTRITION EDUCATION AT MEDICAL SCHOOLS: A course in clinical nutrition is offered in the medical school. Some material on nutrition is included in the courses on biochemistry and pediatrics. In the school of Agriculture and Veterinary Medicine, nutrition is included in a course on animal production. Nutrition is included in the training of nurses, sanitarians, health agents, auxiliary nutritionists, and responsables who run the nutrition rehabilitation centers. (DIFPAN, 1978)

NUTRITION REHABILITATION CENTERS--RESPONSE: The overall national experience with tens of thousands of children has been that about 85% of them respond well in the nutrition rehabilitation centers. The first evidence is a sharp increase in alertness and physical activity. Then a weight gain begins. By the time they leave the center, a 5 to 7% improvement in percent of standard weight for age has been reached, and in most cases the improvement persists long after discharge. (King, 1979)

COSTS OF NUTRITION INTERVENTIONS: Improvements in the nutritional status of children were as favorable for the education-oriented foyer de demonstration as for the nutrition rehabilitation centers, but at less than one third of the cost. Foyer de demonstration provided Title II foods with food preparation demonstrations. (A.I.D., 1991a)

NUTRITION REHABILITATION CENTERS: The Haitian government has established a Bureau of Nutrition which now has an extensive program of nutrition rehabilitation centers (also known as mothercraft centers) in many communities. (Brown et al., 1978)

NUTRITION REHABILITATION CENTERS--SCREENING: All children in the area were weighed. Priority was given to children having third degree malnutrition (below 60% of standard weight for age). Second priority was given to second degree malnutrition (between 60 and 75% of standard). All children with edema (kwashiorkor) were considered to have third degree malnutrition. These children constituted on an average not less than 7% of the children in the village. When possible, each child was seen by a physician before being admitted to the nutrition rehabilitation center. (Barkhuus and Daly, 1976)

NUTRITION REHABILITATION CENTERS--FACILITIES: In nutrition rehabilitation centers preschool children were put on a well balanced nutritional regime, and their mothers received elementary health education and instruction in the proper preparation of food for their children. The centers were located in a house in the village which had been made available by the community. Furniture, kitchen utensils, washing facilities, etc. were of a type normally in use in the village. The center was run by a girl (the 'responsible') who had a minimum of nine to ten years of schooling and had received practical training in nutrition. She had a cook helper, but the heavy work was all carried out by the attending mothers. (Barkhuus and Daly, 1976)

NUTRITION REHABILITATION CENTERS--PROGRAM: The children arrived at the center about eight in the morning and left about three in the afternoon. They were served a small breakfast about half past ten, dinner towards midday, and a small snack or some milk before they left. All meals were prepared and served by mothers. Simple educational activities were arranged for the children such as playing or singing. Children attended six days a week for a period of four months. (Barkhuus and Daly, 1976)

NUTRITION REHABILITATION CENTERS: Only locally available food was served to the children. Milk was never given in large quantities since most mothers would be unable to provide this for the children once they had finished their attendance at the center. The principal message to get across to the mothers was how best to utilize local food stuffs and how best to combine them to obtain the greatest nutritional value. (Barkhuus and Daly, 1976)

NUTRITION REHABILITATION CENTERS: All meals were prepared and served by the mothers. In this way they received their training. They also had discussions with the 'responsible' on the choice of foods, methods of preparation, and elementary rules of hygiene. (Barkhuus and Daly, 1976)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

NUTRITION REHABILITATION CENTER: At Fond-Parisien where the first nutrition rehabilitation center was opened, the children admitted were compared with a statistically identical control group. Weight, total plasma proteins, plasma albumin, and brachial muscular circumference were found to have risen to a statistically significant degree. (Barkhuus and Daly, 1976)

NUTRITION REHABILITATION CENTERS: The majority of nutrition rehabilitation centers were independent centers set up at low cost and run by staff with minimum education. A smaller group were attached to the few existing health centers, and a few were connected with hospital services. At present 61 centers cover only a small part of the rural areas, and the number of centers may diminish as the voluntary agencies supporting them are experiencing financial troubles. (Barkhuus, 1974)

NUTRITION REHABILITATION CENTERS: Nutrition rehabilitation centers were located in buildings typical of homes in the community served. Furnishings and facilities for cooking were restricted to those completely within the means of village residents. Foods used were those available in the local market and were cooked in traditional ways using wood or charcoal fuel. No special medical care was provided. The young women called 'responsables' who run the centers receive four weeks of class work in child care and center management and have one month of training in an existing center. (King et al., 1978)

NUTRITION REHABILITATION CENTERS--COST: An evaluation of nutrition rehabilitation centers, also called mothercraft centers, reported that they were not being effectively utilized. Although they had been successful in recuperating many severely malnourished children, the cost per child was so high as to make major expansion of the program impossible. The cost per child was \$42.00, not \$24.00 as had been projected. At these cost levels, it would cost about \$20 million per year to achieve national coverage of the target population with this program. (A.I.L., 1981a)

NUTRITION REHABILITATION CENTERS--COST: The cost of lifetime protection from severe malnutrition of one child through the nutrition rehabilitation center was approximately \$10.11 in 1975. This increase in cost in the nutrition rehabilitation center reflected increased food costs due to an inflation rate of 20 to 25% and drought. (King et al., 1978)

COSTS OF NUTRITION REHABILITATION: In cases where a nutrition rehabilitation center was located in a health center, the recurrent expenditures were generally limited to buying food supplies, which on the average came to about U.S. \$0.09 per child per day. It is of some interest that U.S. \$0.09 was exactly what the average rural Haitian has available for food per day, which means that it was at least theoretically possible to ensure an adequate daily diet for Haitian children. (Barkhuus and Daly, 1976)

COST EFFECTIVENESS OF NUTRITION REHABILITATION CENTERS: Previous studies have established that the cost of treating children through a Nutrition Rehabilitation Center is less than that incurred through hospitalization. The present study indicates that the cost effectiveness of the Center

compared to hospitalization is greatly enhanced because subsequent children in the family do not require services of the Center. (Webb et al., 1975)

NUTRITION REHABILITATION CENTERS--COST: The cost of preventing clinical malnutrition during the preschool years through the use of nutrition rehabilitation centers was estimated at U.S. \$6.82 per child. (King et al., 1974)

NUTRITION REHABILITATION CENTER AND WEIGHT GAIN: An improvement in nutritional status of children participating in a Nutrition Rehabilitation Center was demonstrated by weight gain. Children averaged 65.3% of standard weight for age at the time of admission. The average weight was 69.4% of standard at discharge from the Center (an improvement in weight significant at the $p < 0.05$ level). When followed up 21 months later, the average weight was 72.2% of standard (not statistically significantly different from their previous weight). (Webb et al., 1975)

NUTRITION REHABILITATION CENTERS--WEIGHT FOR AGE: 151 children were located 6 to 26 months after their discharge from a nutrition rehabilitation center. At follow-up all the children had a higher percent of standard weight for age than on admission, and 81% had a higher weight for age than at discharge. Another group of 207 children were followed up 2 years after discharge. 44% of these children weighed at least 3/4 of expected weight for age at follow-up, but only 12% had achieved that growth when admitted, and 36% had reached that level at discharge. (King et al., 1974)

NUTRITION REHABILITATION CENTERS--WEIGHT: 75% of children attending a Nutrition Rehabilitation Center improved their percent of standard weight for age, 10% maintained their weight for age, and 15% deteriorated in weight for age between admission to the center and discharge. (Beaudry-Darisme and Latham, 1973)

NUTRITION REHABILITATION CENTERS--CONSUMPTION: Meat, fish, poultry, vegetables, fruits, and total sources of animal protein were consumed significantly more often by families of the children who had attended a Nutrition Rehabilitation Center than by the control group. There were no significant differences in reported frequency of consumption of pulses, cereals, starches, or milk. (Beaudry-Darisme and Latham, 1973)

NUTRITION REHABILITATION CENTERS--NUTRITION EDUCATION: While working with mothers in caring for the children in nutrition rehabilitation centers, the 'responsible' guides the conversation to the improved child care practices being used in the center. This informal education is stressed in contrast to formal lectures and demonstrations though the latter are occasionally used. (King et al., 1978)

NUTRITION EDUCATION AND NUTRITION REHABILITATION CENTERS: The success of the nutrition education component of the nutrition rehabilitation center was indicated by significantly improved weights of younger siblings of center children. The author felt this indicated that the mother absorbed and was able to apply information about nutrition provided by the nutrition rehabilitation center. (Webb et al., 1972)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

NUTRITION REHABILITATION CENTER--PARENT'S OCCUPATION: Children whose parents were involved in farming or fishing benefited more from attending a nutrition rehabilitation center than children whose parents had other occupations. (Beaudry-Darisme and Latham, 1973)

NUTRITION REHABILITATION CENTER--DIARRHEA: Diarrhea tended to be more frequent among families of the control group than among families with children who had attended a nutrition rehabilitation center. (Beaudry-Darisme and Latham, 1973)

NUTRITION REHABILITATION CENTER--MORTALITY: Mortality was higher among children of the control group than among children who had attended a nutrition rehabilitation center. (Beaudry-Darisme and Latham, 1973)

NUTRITION REHABILITATION CENTERS--NO RESPONSE: Among 3698 children in nutrition rehabilitation centers, about 16% failed to respond to better care. 246 non-responders received complete physical examination. 30% had tuberculosis, 10% pneumonia, 50% had other diagnosed infections or metabolic diseases, and 10% had no clinical findings. A similar explanation of another group of 107 non-responders found 30% to have tuberculosis, 37% other respiratory diseases, 5% genetic diseases, 19% non-respiratory infections, and 9% were clinically negative. (King et al., 1974)

NUTRITION REHABILITATION CENTERS--COMMUNITY EFFECT: When nutrition rehabilitation centers were designed, it was hoped that the improved nutrition knowledge of mothers attending the center would be passed on to neighbors, friends, and relatives. Unfortunately, later evaluation of neighbors and relatives of mothers who had attended the centers and improved the nutrition of their own families did not show any indication that the mothers had passed on their new knowledge and behavior. (King, 1979)

SUCCESS OF THE NUTRITION REHABILITATION CENTER: Younger siblings of children who attended a nutrition rehabilitation center averaged 81.6% of standard weight for age which was significantly different from the weight of the center children ($p < 0.01$). 96% of younger siblings had a higher percent of standard weight for age than the older brother or sister. The author feels this is an indirect measure of the education objective and demonstrates the effectiveness of the center. (Webb et al., 1975)

NUTRITION REHABILITATION CENTERS--SUCCESS: About 75% of children discharged from nutrition rehabilitation centers continued to improve as measured by increasing percent of standard weight for age. This indicated that without further intervention these mothers were providing better child care. (King et al., 1974)

NUTRITION REHABILITATION CENTERS AND HOSPITAL ADMISSIONS FOR PEM: Data from the Albert Schweitzer Hospital from 1968 through 1975 showed that admissions for protein energy malnutrition fell to less than half of their initial level in the 100,000 person district served by the nutrition rehabilitation centers but remained relatively constant or tended to rise in those districts without centers. The difference was found to be statistically significant ($p < 0.0235$). Deaths attributable to

uncomplicated protein energy malnutrition in children 0 to 4 years of age fell from 12 per 10,000 to 2 per 10,000 persons during the same period where nutrition rehabilitation centers were in operation. (Anonymous, 1978)

NUTRITION REHABILITATION CENTERS: The nutrition rehabilitation centers started at the Albert Schweitzer Hospital have been closed for about nine months due to problems of food distribution and high cost benefit ratios. (A.I.D., 1978)

AK-1000 IN NUTRITION REHABILITATION CENTERS: AK-1000 is a food developed for use in nutrition rehabilitation centers to feed malnourished young children. It is composed of locally available foods blended to maximize complementary amino acid content and balanced nutrient content. (Anonymous, 1978)

FEASIBILITY OF PROPOSED PROJECTS: Projects have been proposed for vitamin A fortification of sugar, salt iodization, wheat fortification, and fish ponds. However, all these projects were rejected on the basis of feasibility studies which found them impractical because of lack of central processing or high cost. Projects which have been reviewed favorably include nutrition surveillance, nutrition education, and various research projects. (A.I.D., 1981a)

PIGS AND CHICKENS: There has been an epidemic of swine fever among the native pigs of Haiti. The U.S. and Canada are implementing a program to eliminate the pigs and substitute poultry, although there is not enough feed for the poultry, so it will have to be imported; and chickens are more vulnerable to disease. (Berggren, 1982)

RURAL

PETIT GOAVE INTEGRATED HEALTH AND FAMILY PLANNING PROJECT: This preventive health project served the Petit Goave area. Services of the project included weighing children and teaching mothers to use the road to health chart, preventive health services such as vaccination, and nutritional education both in rehabilitation centers and foyer de demonstraiton. The program actively sent health workers out into the community to recruit participants, especially to encourage pregnant and lactating women to participate. (Departement de la Sante Publique, n.d.)

HEALTH PROJECT AT PETIT GOAVE: The health project at Petit Goave provided health services to about 10,000 people. Services included health surveillance by a mobile team, health education and registration of vital events. Preschool children were weighed and measured every three months, and their progress was followed on growth charts. Immunization and family planning services were also provided. (Saulniers, 1978)

INTEGRATED HEALTH PROJECT PETIT-GOAVE AND MORTALITY: In areas served by the integrated health project of Petit-Goave, infant and child mortality rates decreased. The infant mortality rate in the first year of the project was 107 per thousand; this rate was 90 per thousand by the third

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

year of the program. The child mortality rate decreased from 17.7 to 15.9 during the same period. (Republique d'Haiti, 1979)

NUTRITION PROGRAM--SIBLING DEATH RATES: Death rates in a follow up study of 0 to 4 year old younger siblings of children rehabilitated in either a nutrition rehabilitation center or foyer was 5 per 1000 versus 39 per 1000 for a matched comparison group. (Republique d'Haiti, 1979)

DISTRIBUTION OF FORTIFIED MILK: Full cream milk fortified with sugar and oil is distributed by the Integrated Health and Family Planning Project at Petit Goave to children suffering third degree malnutrition. The ration is distributed every two weeks and provides 20 grams of protein and 400 calories per day. (Departement de la Sante Publique, n.d.)

ALBERT SCHWEITZER HOSPITAL--MALNUTRITION: The clinical load of the hospital included 300 to 600 inpatients each year with a final diagnosis of malnutrition and 10,000 to 17,000 outpatient consultations per year for children suffering from malnutrition. An outreach program of health and nutrition was undertaken in the area surrounding the hospital. (Berggren and Berggren, n.d.)

TETANUS IMMUNIZATION: A retrospective study among women living near Albert Schweitzer Hospital found that 7% of the youngest mothers in the study reported losing a child because of tetanus. More than half of the mothers who had completed their reproductive life at the time of the study reported losing one or more children due to tetanus of the newborn. This decline was due to an aggressive program of immunization for tetanus on a population-wide basis. Immunization of all adult women in the area succeeded in eliminating tetanus of the newborn. (Berggren and Berggren, 1971)

FOYERS DE DEMONSTRATION EN NUTRITION: Foyers de demonstration en nutrition (FDN) is a nutrition program which moves into a village for two weeks. The teacher and 15 to 20 mothers prepare snacks and a midday meal daily using recipes mothers can duplicate at home. Nutrition education occurs as mothers and teacher shop and cook together. When possible, positive beliefs and practices are reinforced. Some well nourished children are usually included in the group to avoid the stigma of the school being only for failures. (Berggren and Berggren, 1982)

FOYERS DE DEMONSTRATION--OBJECTIVES: The objectives of the foyers program were to provide preventive nutrition education for parents of preschool children, to provide special demonstration education for parents of malnourished children, and to promote community activities for prevention of malnutrition. The program was carried out by itinerant workers who moved from community to community, setting up the foyers in various villages. (Berggren and Berggren, 1982)

FOYERS DE DEMONSTRATION EN NUTRITION: The foyers are temporary health structures which remain in a neighborhood two or three weeks. The purpose of the foyers is to educate mothers in the best possible utilization of locally available foods using appropriate culinary technology to provide the weaning diet. (Berggren and Berggren, 1982)

FOYER DE DEMONSTRATION NUTRITIONNELLE: This is a program of nutrition education and food demonstrations. An area with malnourished children is selected by examining the health records of young children. A local person is asked to donate a room to be used for two weeks. Mothers are recruited to participate for six days each week for two weeks accompanied by their children under five years of age. The nutritionist, assisted by the mothers, purchases and prepares food to demonstrate preparation of a well balanced diet on a budget similar to the mothers'. During this period mothers receive lessons on child development, nutrition, sanitation, and family planning. At the end of the two weeks the children are weighed. After the two weeks of intensive participation, children receive a continuing ration of fortified milk and frequent weighing. (Henry, 1977)

VITAMIN A DISTRIBUTION: A survey undertaken in the mid-1970s indicated that vitamin A related eye disease was a public health problem. An intervention program was begun distributing large doses of vitamin A to ill or malnourished children. An evaluation conducted about two years after the program began found a tenfold decrease in the prevalence of vitamin A related corneal disease. The success was attributed to the vitamin A distribution, good rainfall in the six months prior to the evaluation, and construction of a highway which provided better access to the studied area. (Toureau et al., 1976)

WHEAT DISTRIBUTION: A dispensary in the Cul de Sac Plain encouraged women to come for prenatal care by providing free wheat flour. Women were instructed to eat this flour themselves to supplement intake during pregnancy. Observation in the village found that women gave the food to their children and also served it to visitors. (Alvarez and Murray, 1981)

RADIO: From 10.8 to 24.8% of rural survey mothers reported owning a radio, and from 11.3 to 27% reported listening to educational radio programs for guidance. There was surprisingly little communal use of the radio, and the use of radios for mass education should be reconsidered. The lack of familiarity with AKAMIL, a material purported to be widely promoted, attests to the lack of success government programs had in promoting the benefits of this satisfactory weaning food supplement. (Bureau of Nutrition, 1979)

NUTRITION EDUCATION AND SUPPLEMENTARY FEEDING: A multilateral effort which included PAHO, UNICEF, FAO, and UNESCO was organized in 1961 to improve nutritional status of the population through nutrition education, supplementary feeding programs for vulnerable groups, and other measures. This program was also to develop an integrated food and nutrition program in certain rural areas. The program was scheduled to run through 1976. (Barkhuus and Daly, 1976)

NUTRITION EDUCATION MATERIALS: Graphic nutrition education materials prepared for literate and semi-literate rural people were frequently misunderstood by the target audience. Materials were most successful when they expressed the characteristic features of a person or an object and when proportion of the images was as close to reality as possible without considering the perspective aspects. Vertical images were best

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

understood when held upright, such as the case of a standing man, to avoid misinterpretation of a man lying down. Small details were necessary to successfully convey meaning. Shading on the images and scenery in the background tended to distract the viewers to the extent that they missed the whole meaning of the message. (Hollant, 1975)

NUTRITION EDUCATION MATERIALS: When shown visual health education materials with a text at the bottom, semi-literate rural people had great difficulty in reading words like "diarrhee" and abbreviations like "1er" and "2eme." Semiliterate people also tended to misunderstand the meanings of the plural French words which end in "ent." Text and sentences were better understood when simple and short. Written text was better understood when placed on the page facing the image in a booklet or on the back of the image when using a flipchart. (Hollant, 1975)

NUTRITION EDUCATION MATERIALS When semi-literate rural people were shown visual materials with a text at the bottom, they seemed to be so busy trying to read and understand the text that they missed the content of the image as well as the text. (Hollant, 1975)

NUTRITION EDUCATION MATERIALS--COLOR CHOICES: Health education materials were prepared using primary colors. When interviewed about these materials, respondents never mentioned color. When asked directly about color preferences, 27 out of 50 respondents preferred green and 23 chose orange. Only 2 out of 50 mentioned blue although traditionally they dress in blue. Brown and gray were mentioned as second choices by male respondents. (Hollant, 1975)

NUTRITION EDUCATION--IMAGE PREFERENCE: Illiterate and semiliterate people were shown graphic images promoting family planning and health education messages. The pictures which respondents liked best were not necessarily the graphic images which most successfully conveyed the health education message. (Hollant, 1975)

RURAL COMMUNITY DEVELOPMENT PROGRAM: The Rural Community Development Program was initiated in 1966 and resulted in the development of 10 nutrition centers providing maternal and child health services and installation of water systems. (Barkhuus and Daly, 1976)

NUTRITION REHABILITATION CENTERS: Nutrition Rehabilitation Centers, also called Mothercraft Centers, were first organized in Haiti in 1964 and had expanded to 63 centers in 1973. The centers are operated by the Bureau of Nutrition in the Ministry of Health. (King et al., 1974)

NUTRITION REHABILITATION CENTERS--SUCCESS: The 1978 national nutrition survey showed that 27% of preschool children suffered moderate to severe malnutrition. In the northwest, where the worst malnutrition was expected, there was less marasmus and kwashiorkor. Nutrition rehabilitation centers had been operating in the area for some time before the survey was conducted and may be responsible for the decreased rates of malnutrition. (Berggren and Berggren, 1982)

NUTRITION REHABILITATION CENTERS--SUCCESS: 75% of rural mothers who were educated in a nutrition rehabilitation center and who participated in a

nutrition monitoring program could prevent malnutrition in the younger siblings of the child who had been rehabilitated. (Berggren and Berggren, 1982)

NUTRITION REHABILITATION CENTERS--CONSUMPTION: In 1970 after five years of center operation and four years of agricultural work, nutritionally significant increases were seen in the consumption of meat products, milk, dry beans, cereals, avocados, melons, and papayas. During this period, food expenditures increased 28% and increases in nutrients were as follows: 66% for calories, 100% for protein, 300% for animal protein, 140% for calcium, 19% for iron, 59% for vitamin A, 44% for thiamine, 117% for riboflavin, 67% for niacin, and 52% for ascorbic acid. The increase in animal protein came largely from goat's milk and fish consumption encouraged by the nutrition rehabilitation center program. (King et al., 1978)

NUTRITION REHABILITATION CENTERS--MORTALITY RATES: Among women who received mothercraft education, mortality rates for one to four year old children was 7 per 1000, and the mortality rate for infants up to one year was 15 per 1000. Among mothers who did not receive this education, the rates were 91 per 1000 for infants and 16 per 1000 for children one to four years of age. (Berggren et al., 1982)

NUTRITION REHABILITATION CENTERS--PEM: Admissions to the Albert Schweitzer Hospital for protein energy malnutrition from 1968 to 1975 fell to less than half their initial level in the areas served by nutrition rehabilitation centers. Admissions from similar areas not having centers remained relatively constant or tended to rise. (King et al., 1978)

NUTRITION REHABILITATION CENTERS--DROUGHT: In 1975 drought damaged food crops in the area of the Albert Schweitzer Hospital, and annual inflation was estimated at 20 to 25%. These conditions were reflected in the cost of food in the centers and, of course, in homes. From 1972 to 1975 the daily cost of food per child in the centers was 9, 11, 14, and 20¢ in each respective year. Follow-up data on children discharged from the center was less favorable than it had been in normal times. (King et al., 1978)

NUTRITION REHABILITATION CENTERS--NUTRITION EDUCATION: Child feeding is taught in terms of foods rather than nutrients. Much of the teaching is done completely informally as women go about the daily care of the children in the nutrition rehabilitation center. The program was designed to teach women by methods they are accustomed to--working with someone and talking about it. (King, 1979)

NUTRITION REHABILITATION CENTER: Some children left the nutrition rehabilitation center and relapsed into malnutrition when they returned home. In some cases it was found that the cooking was done by a grandmother, aunt, or older daughter. Thus, the nutrition education received by the mother did not benefit the child upon return home. The author suggests that the child be admitted to the center with the person who does the cooking at home. (King, 1979)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS (CONTINUED)

NUTRITION REHABILITATION CENTER: If a mother had completed the course of instruction in the nutrition rehabilitation center dealing with food selection, preparation, and use, it was expected that she would incorporate this information into meal preparation practices for her family. For some reason, this has not been completely successful. (Ballweg, 1972)

NUTRITION REHABILITATION AND HEALTH CARE: While it was advantageous to have nutrition rehabilitation centers functioning as part of the general health service, this was only possible in comparatively few cases due to the scarcity of health centers in rural areas. (Barkhuus and Daly, 1976)

MORTALITY AND NUTRITION: Community based control of malnutrition through systematic monitoring of growth of all children, nutrition education of parents, and rehabilitation of malnourished children, was introduced in 1969 and was immediately followed by persistent decline in the 3 to 9 year mortality rates in the area of Albert Schweitzer Hospital. Death rates of 1 to 2 year olds fell for a while but rose again due to conditions not related to malnutrition. (Berggren et al., n.d.)

MORTALITY AND A COMMUNITY HEALTH PROGRAM: Among 13 deaths occurring in infants 1 to 11 months of age in the Trou Chouchou area, 6 were caused by gastroenteritis, 4 by malnutrition, and 3 were due to other causes. After a community health program was established in the area, among 12 deaths occurring in children in this age group, 9 were caused by gastroenteritis, 1 by malnutrition, and 2 were due to other causes. (Berggren et al., 1980)

DISPENSARIES: There were about 190 dispensaries, most of them in rural areas. They provided the main health services for the rural population. Most were run by nurses or auxiliaries. (Barkhuus and Daly, 1976)

URBAN

HEALTH CENTERS: Health centers were available in urban areas. They offered many services including maternal and child health, control of acute communicable diseases, tuberculosis, and venereal disease, as well as environmental hygiene. (Barkhuus and Daly, 1976)

NUTRITION REHABILITATION CENTERS: Operation of nutrition rehabilitation centers in major urban areas has been difficult. Attendance by children was erratic, and as a result rehabilitation progressed slowly. Attendance by mothers was poor, and their drop-out rate was high. Not infrequently mothers would abandon their children in the center and never appear again. (King, 1979)

COMPLEX MEDICO-SOCIAL: The health programs of the Complex Medico-Social in Cite Simone are based on a medical staff and facilities plus a group of community collaborators who serve as a link between the clinic staff and the community. The community collaborators insure complete coverage of the population served by the clinic, encourage participation in programs to monitor the growth and development of each child in the area, and serve as a source of information on the health care needs of the population. (Berggren et al., 1981b)

6. COMMENTARIES

NATIONAL

EFFECTS OF POVERTY: It was the poverty of Haiti, expressed in inadequate nutrition and unsanitary living conditions, which was at the root of the health problems of its population. Malnutrition and lack of hygiene affected particularly infants and explained the large proportion of child mortality in total deaths (70%). (World Bank, 1976)

REASONS FOR MALNUTRITION: The main cause of malnutrition is the inability to spend enough money for food each day. The lack of economic development, particularly at the level of the peasant, prevents buying necessary foods or buying fertilizer or insecticides to increase food production. Further, the wealthy elite are able to buy the fertile, cultivable land in the plains to grow sugar and tobacco for export. Peasants are forced to cultivate increasingly precipitous mountain slopes which should be left forested. Another serious problem is the rapid population growth. The rate of growth is said to be 2% per year. Cultural factors appear to limit the rapid acceptance of family planning. A third problem is the lack of education. 90 to 93% of the population are illiterate. There is also a cultural isolation that makes it difficult to communicate concepts of nutrition and health to the population which thinks in terms of magic and spirits causing illness. (Brown et al., 1978)

CAUSES OF MALNUTRITION: Causes of malnutrition are multiple. They include scarcity of fuel which constrains the number of times per day a fire is made, low food consumption, emphasis on one meal a day which may be served so late at night that toddlers are already asleep, infrequent feedings for young children, lack of time for very busy mothers to prepare meals for children, and use of spices which make the family pot too spicy for young children. (Berggren et al., 1982)

BREAST FEEDING AND MOTHER'S WORK: It has been suggested that the extensive participation of women in economic activity may cause a decline in breast feeding. It is estimated that 45% of jobs in Haiti are held by women. There is a long standing tradition of women marketing agricultural products. (World Bank, 1976)

PNEUMONIA: Hospital records indicated that the death rate for patients admitted with pneumonia was about 45-50%. This may reflect reluctance to seek care until an advanced stage of the disease has been reached or lack of appropriate care when they reached the hospital. (A.I.D., 1978)

NUTRITION EDUCATION IN NUTRITION REHABILITATION CENTERS: The centers should be emphasizing low cost local foods which can be used to promote child health, such as a combination of pulses and cereals. It appears much more prestigious to teach about the importance of meat, fish, poultry, eggs, and milk which are relatively expensive, often not easily available, and which the mother would buy in any case if she could afford it. Discussions of low cost, locally available protective foods are often relatively neglected. (Beaudry-Darisme and Latham, 1973)

6. COMMENTARIES (CONTINUED)

NUTRITION EDUCATION: A nationwide program of nutrition education should be directed at all mothers to improve weaning and breast feeding. The use of AKAMIL, a weaning food, should be promoted in this education project. (Bureau of Nutrition, 1979)

RADIO: Use of radio in mass media health education programs should be reexamined. This survey indicated that radios are not effective in reaching the mothers of undernourished children. (Bureau of Nutrition, 1979)

EVALUATION OF THE VITAMIN A PROGRAM: After evaluating the vitamin A program, researchers concluded that the program should continue. They also recommended that its supervisory component be improved. The time of interaction between patient and health worker was found to be the optimal time for transmitting nutrition messages. The program should take advantage of any mass immunization campaign. (Toureau et al., 1976)

NUTRITION EDUCATION CONCERNING VITAMIN A: On the basis of an evaluation of the vitamin A program in Haiti, it was concluded that more emphasis should be given to nutrition education (about vitamin A). A very effective method of nutrition education noted by the evaluation was informal education at the time of interaction between the patient and health worker. (Toureau et al., 1976)

NUTRITION EDUCATION: Decreased prevalence of kwashiorkor in the village of Fond-Parisien has been attributed to nutrition education in the nutrition rehabilitation centers. Mothers applied what they learned at the centers if they had money to buy food. (Barkhuus and Daly, 1976)

FOYERS DE DEMONSTRATION: Itinerant monitrices who stay only two weeks in a village foyer can have an impact on nutrition if they concentrate on participatory teaching. Mothers who participate in the improved child feeding demonstrations for only two weeks can learn to prevent malnutrition in the future. (Berggren et al., 1982)

SURVEILLANCE: A nationwide surveillance system should be established as soon as possible. (Bureau of Nutrition, 1979)

PREVENTIVE NUTRITION: Preventive nutritional activities should be directed nationally to all children under 35 months of age. Data from this survey show that many Haitian children begin to develop severe nutritional deficiencies before reaching 6 months of age. (Bureau of Nutrition, 1979)

REHABILITATION: Immediate nutritional rehabilitation should be provided to those children who are severely undernourished (less than 80% of reference weight for height). This amounted to about 48,000 children at the time of the survey, 1978. Priority should be given to the 25,000 children who exhibit wasting and stunting. (Bureau of Nutrition, 1979)

INCREASED MALNUTRITION: Rates of malnutrition increased between 1958 and 1970. Jelliffe's figures collected in 1958 for malnutrition in young children are likely to be too low for the present situation. (Barkhuus and Daly, 1976)

IMPROVEMENT IN NUTRITIONAL STATUS: The percentage of children with clinical malnutrition, i.e. kwashiorkor, had decreased since 1962 when the Jelliffes found a 7% incidence of severe malnutrition with edema. They surveyed one community included in the present survey. The Jelliffes found an incidence of kwashiorkor of 13%; the present study did not identify a single case of kwashiorkor. It is possible that this improvement is due to efforts of the government to provide nutrition rehabilitation centers throughout the country and the efforts of the Meannonite Central Committee to provide nutrition education and supplemental food in the Grande Riviere area. (Brown et al., 1978)

TRAINING VILLAGE HEALTH AND NUTRITION WORKERS: An approach to training village health and nutrition workers which was found successful was summed up as "I see. I do. Now I know." The authors recommend this approach to teaching all the population of Haiti. (Berggren et al., 1982)

HEALTH PLANNING: In the Ministry of Health there was an absence of leadership, indicated by an almost total lack of policy formulations and directions. Although a national health plan has been discussed and a 'planning committee' officially set up, there was no machinery for the formulation of a plan and no planning secretariat at all. The country is in need of a well thought out and constructed national health plan. At present government health services are poorly coordinated. (Barkhuus, 1974)

PROBLEMS IN AGRICULTURAL PRODUCTION: The amount of arable land was scant. Because of rugged topography, only 30% of the total land area was cultivated. Productivity of the land was low since technology and credit were unavailable. Increasing demand for food had to be met by over-cultivating land at the cost of rapid soil exhaustion and by bringing mountainous and wooded areas under cultivation. Valuable trees such as mahogany were turned into charcoal, and the destruction of forest began a process of soil erosion which could prove irreversible. Production technology was primitive; hoes and machetes were the main tools. Irrigation was rare and, when present, often ineffective. (World Bank, 1976)

AGRICULTURAL PRODUCTIVITY: 95% of the agricultural area is now in holdings of less than 13 hectares, and 1/3 is in holdings of less than 1.3 hectares. These conditions make irrigation and water management unwieldy. Illiteracy is predominant, and agricultural extension services are very inadequate. Farm management and technology are antiquated. Productivity could be doubled or even tripled if more progressive methods of cultivation were spread and adopted. (World Bank, 1976)

CONTROLLING FOOD IMPORTS: Food imports rose rapidly from 1970 to 1974. Imports grew from U.S. \$11 million to U.S. \$26 million, from 21 to 24% of total imports. Production of basic foods which could be produced in country should be given highest priority. The rapid growth of "non-essential" food imports could be halted or even reversed without creating great hardship. (World Bank, 1976)

TRANSPORT AND STORAGE OF DONATED FOODS: Over \$1,000,000 is allocated for building food warehouses; over \$300,000 is being spent to transport

6. COMMENTARIES (CONTINUED)

donated foods. Meanwhile, local farmers have no such resources to improve storage and transport. This might serve as a disincentive to local production. (Jackson, 1979)

FOOD AID AND LOCAL MARKETS: Food from food aid programs is often available for sale in local markets. They are often sold at prices far below the cost of locally produced food. (Jackson, 1979)

RURAL

INSUFFICIENT FOOD: Despite detailed nutrition knowledge and a high level of concern and social value placed by rural Haitian culture on the proper feeding of children, the economic situation in rural Haiti has deteriorated to a point where traditional food supply circuits have been jeopardized. People find themselves unable to feed their children as they were fed as children, which local norms still regard as proper. (Alvarez and Murray, 1981)

REASONS FOR POOR GROWTH: Growth of children in Deschapelles was comparable to international standards until 4 to 6 months of age and then slowed. At 4 to 6 months of age the child's need for calories has outgrown the maternal milk supply. The number of infections was increasing in children at this age. Care of children 4 to 6 months of age was turned over to older siblings or other young relatives who could not care for the child as well as his mother. It was also the age when children begin to eat with the family. This could limit the child to one or two meals a day with little or no food available between meals. Children 4 to 6 months of age cannot consume the food they need in only one or two meals. (Berggren and Berggren, n.d.)

NUTRITION EDUCATION AND POVERTY: The effects of an ambitious nutrition education program are limited by the fact that even the cheapest, most efficient menu is beyond the reach of much of the rural poor. (Toureau et al., 1976)

NUTRITION EDUCATION: Nutrition education programs will have to vary regionally because local food supplies are quite different. For example, in Port Margot rice and tubers provide the bulk of calories, and in Fond Parisien corn and sorghum are the main calorie sources. Nutrient intakes in the two communities were similar, but the foods were distinctly different. As a result, education in the two areas must differ. (King et al., 1968)

DIETARY RESTRICTIONS: For the Haitian peasant, environmental, technological, and economic factors alone account for a substantial amount of poor nutrition. If one also considers the additional restrictions of the humoral medical system, under which foods are classified as either hot or cold, rural Haiti's problem of malnutrition becomes alarming. (Weise, 1976)

HOT/COLD: Humoral medical beliefs as manifested in hot/cold life-state and food classifications were widely and consistently held. These beliefs must be considered in any nutrition program. (Weise, 1976)

GROWTH STANDARDS: Rural Haitian children were much lighter and shorter than American standards, but the children of elite Haitian families were similar in height and weight to American standards, according to a study done by King, et al., in 1968. The anthropometric differences between the rural children in Deschapelles and the Boston standard children are, therefore, unlikely to have been genetically determined and probably represent the adverse effects of the environmental and economic situation of the children's families. (Berggren and Berggren, n.d.)

TIMING OF INTERVENTIONS: The authors suggest that children in the Deschapelles area are at very high risk of malnutrition when 67 to 87 cm. in length, because weight for height deficits were greatest when children were 67 to 87 cm. They suggested that community health programs intervene as early as possible after the birth of the child to prevent or mitigate the period of slow growth. Mothers should receive nutrition and health education before the child is 6 months old in order to avoid infection and insure adequate food intake. (Berggren and Berggren, n.d.)

MIGRATION AND PROGRAM PLANNING: Given the high rate of mobility of this population and the great instability of families, it is vitally important that all health programs, agriculture programs, and development programs in general be designed to deal with the problems caused by this instability. (Berggren et al., 1979)

ESTIMATES OF BLINDNESS: From the prevalence data, the authors estimated 345 new surviving cases of vitamin A related corneal destruction each year, roughly 1/4 of which (94) would be bilaterally blind. Almost 3/4 of these will occur in the North. (Toureau et al., 1976)

TRAINING MEDWIVES: A number of proposals were under study for the short term training of 'matrones,' traditional midwives. Without reorganization of the rural infrastructure to permit continuous supervision of this type of auxiliary personnel, short-term training was unlikely to accomplish much. (Barkhuus and Daly, 1976)

URBAN

NUTRITION MESSAGES: Nutrition messages recommended by the authors for use with mothers in poor areas of Port-au-Prince include avoiding the use of bottle feeding or supplementary gruels during the first three months of life. Messages should also stress the importance of continuing breast feeding during diarrhea. (Berggren et al., 1981b)

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This document calls for a project integrating nutrition into rural health delivery. Previous work in health and nutrition carried out in Haiti by A.I.D. is reviewed.

A.I.D.

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- 1981b Fiscal Year 1982 Public Law 480 Title II ISC Approved Quantities. Voluntary Agencies/WFP. Food for Peace, U.S.A.I.D., Washington D.C. Unpublished computer printout.

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- 1981 Socialization for Scarcity: Child Feeding Beliefs and Practices in a Haitian Village. Submitted to USAID/Haiti Port-au-Prince, August 28, 1981.

Original data

Method: Participant observation.

Sample: All inhabitants of a rural village.

Location: A lowland agricultural community in the Cul de Sac Plain identified by the pseudonym Kinanbwa.

A detailed description and analysis of food related beliefs and practices of a community of peasant farmers is presented. Community behavior in the preparation and distribution of food is described. Results indicated that rural Haitian peasants had a good understanding of human nutritional needs but the economic conditions had deteriorated to such a degree that they were unable to provide sufficient food for themselves and their children due to extreme poverty.

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Original data

Method: Baseline data, cross sectional. Interviews with mothers or guardians of children less than five years of age; anthropometric measures and physical exams of the children themselves. Information collected included morbidity data, socio-economic information, maternal and child history, and child feeding practices.

Sample: 29 rural villages were randomly selected. These results come from 22 villages including 450 households and 635 children 3 months to 5 years of age.

Geography: 29 rural villages (the same 29 villages surveyed during the National Nutrition Survey of 1978) randomly selected.

A household survey was carried out to collect baseline data concerning prevalence and incidence of common diseases which are treatable or preventable. Information was also collected concerning utilization of health care services, socioeconomic information, and feeding practices in the Northern Region of Haiti. Results indicate that many of the children had been sick during the previous two weeks. 70% had at some time been bottle fed, tea being the substance most commonly given in feeding bottles. 9.4% were severely malnourished as measured by arm circumference.

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Original data

Method: Interviews with households and observations.

Sample: 943 children aged 3 to 59 months from 614 households randomly chosen.

Location: North Region. Same 29 villages chosen by the CDC in the 1978 national nutrition survey.

97% of children in the survey had received breast milk; mean age of weaning was 15.6 months among children already weaned. 61% had received a bottle. Mean age of beginning bottle feeding was the first months of life and mean age of stopping was 7.8 months. Fresh cow's milk and tea were the most common liquids used. Few mothers reported using commercial milk. 38% of the children had had fever in the two weeks prior to the examination, and 30% had had diarrhea.

Ballweg, J.A.

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Original data

Method: Interviews with mothers of children 6 months to 5 years of age who had been weighed as part of a previous survey.

Sample: 114 families selected by stratified sampling techniques so that there were 30 families with a normal weight preschooler, 30 with a child with first degree malnutrition, 27 with second degree, and 27 with third degree Gomez malnutrition.

Location: Fond Parisien.

A study was carried out to investigate the use of nutrition rehabilitation centers, the effectiveness of the centers, and socio-economic factors related to child malnutrition. Although the center had succeeded in eliminating edema and fatal malnutrition, 8.3% of children were still found to have third degree malnutrition. The centers emphasized education of mothers, yet many mothers who had attended 3 and 4 sessions continued to have malnourished children. A greater likelihood of having a severely malnourished child was associated with a family having five or more children, the child being female, the child being under two years of age, mother being older, mother being unmarried, father not being present in the home, preparation of only one meal per day, the home having only one or two rooms, the family owning land (an unexpected finding), and mother or father having the occupation of charcoal seller.

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Beaudry-Darisme, M. and Latham, M.C.

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Original data

Method: Data were collected from a pretested standardized interview administered to the mother or guardian; anthropometric measures were collected from center records and at follow up; centers were observed. Sample: Study children had attended a nutrition rehabilitation center for at least two months and were followed up a year later (136 children) and control children had visited the center but had stayed a very short time and were also located a year later (59 children). Location: Six rural and one urban center in Haiti. The rural villages were Mathieu, Guerin, Bellanton, Labordes, Plaisance, Thomassain, and the urban site was Ste-Marie in the capital.

An evaluation of children attending Nutrition Rehabilitation Centers was carried out in Haiti and Guatemala. There was a mean rise in weight for age between admission and discharge of 4.2% in Haiti. Younger siblings of children who had attended the centers showed a smaller deficit in growth than siblings of control children, but the difference was not statistically significant. The authors conclude that too much emphasis is placed on caring for the children and not enough on educating the mother. Education should focus on locally available foods such as legumes and less on expensive animal foods.

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Original data

Method: Mortality and morbidity information was collected by health surveillance, surveys, examination of hospital records, and from maternity histories.

Sample: 8820 residents of 23 villages were followed in the program of nutritional surveillance. 2570 mothers were contacted for maternity histories, and hospital records were taken from the Albert Schweitzer Hospital.

Location: Area around Albert Schweitzer Hospital.

Deaths and their causes were studied. The results were used to select eight diseases for delivery of health services by village level health workers. The impact of the services was measured by monitoring annual age-specific and disease-specific mortality rates and comparing them with national estimates. Mortality rates fell over five years to only 1/2 of the national average. this fall was associated with services that prevented deaths due to tetanus, malnutrition, diarrhea, and tuberculosis.

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Original data

Method: Questionnaire administered to all women in sample. Subsample of women and children were measured for weight, height, blood pressure, hemoglobin, and hematocrit.

Sample: 534 women 15 to 49 years of age were selected from the family register system. A subsample of 200 children and 304 women received biological exams.

Location: The Boston and Brooklyn areas of Cite Simone adjoining Port-au-Prince.

An investigation of low socioeconomic mothers and young children in a very disadvantaged area of Port-au-Prince found that few mothers had never bottle fed their young children. Mothers usually gave both the breast and the bottle during the first year of life; however, the data on mortality show that children who get the bottle in the first month of life have a risk of dying at age 1 to 18 months that is four times higher than for other children. Bottles often contain "Argo," a commercial laundry starch which is flavored with a small amount of canned milk. Rates of malnutrition in this area were found to be higher than rates for the country as a whole as determined by the national nutrition survey.

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Original data

Method: The data consisted of annual censuses of the entire population and complete registration of births and deaths. The material included information on migrations which occurred between 1968 and 1972.

Sample: 10,000 people living in the area (the entire population of the area).

Location: 23 rural villages surrounding and including the town of Deschappelles in the Artibonite Valley.

This paper discusses the high migration rates in the Albert Schweitzer hospital Census Tract and the instability of conjugal unions and families in general. A large proportion of the migrations are related to the break up of families. Migrations of children are often related to the shortage of assets which require a family to send youngsters to live with relatives. Break up of families may be responsible for health and other social problems, especially in cases where infants and young children are separated from their mother and/or father.

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This paper reviews the Haitian experience with rehabilitation centers. Information from the evaluation of the education component of the centers indicates that they have been a successful program.

Berggren, W.L. and Berggren, G.

- 1971 Changing incidence of fatal tetanus of the newborn. American Journal of Tropical Medicine and Hygiene 20(3):491-94, May 1971.

Original data

Method: Interviews with mothers concerning the birth of each child and, in the case of death, its cause.

Sample: 1,629 mothers, 15 to 60 years of age.

Location: The census tract around the Albert Schweitzer Hospital in Deschapelles.

A retrospective study of death due to tetanus of the newborn found that losing a child due to tetanus was relatively infrequent among younger mothers; over half of the older mothers had endured this experience. Further analysis revealed that frequency of death due to tetanus of the newborn had diminished over a 30-year period from 25% of live births to 0% of live births. Declines in frequency could be directly related to a succession of preventive programs. A program that immunized all women with tetanus toxoid, whether or not they were pregnant, provided the means of eliminating tetanus of the newborn as a public health program.

Berggren, W.L.

- n.d. The utilization of medical auxiliaries in a rural health program. Industry and Tropical Health: VIII, published by the Industrial Council for Tropical Health. Boston: Harvard School of Public Health, n.d.

This article describes the training of local people to work in a rural preventive health program in Deschapelles. People were recruited and trained to give tetanus immunizations, screen for malnutrition and tuberculosis, and provide simple treatment or referral for those with health problems.

BIBLIOGRAPHY (CONINTUED)

Berggren, W.L. and Berggren, G.G.

- n.d. Growth Patterns of Preschool Children as Instruments for the Management of Child Health in an Undernourished Haitian Population. Unpublished.

Original data

Method: Weights and lengths of children were recorded at monthly intervals as part of a program for educating mothers and detecting children in need of nutrition rehabilitation services. Observations were made over 2 1/2 years.

Sample: 2,700 children 0 to 6 years of age. All the children in a population of 9,400 rural Haitians. All children received health care regularly; 650 received nutrition rehabilitation.

Location: The area around the Albert Schweitzer Hospital.

Nearly all age groups of Deschapelles children were lighter and shorter than Boston children of the same age, sex, and centile. Anthropometric differences were apparent at age 5 months and increased during the next 12 to 18 months. Children needing special attention were characterized anthropometrically as groups who were 5 to 24 months old and 67 to 87 cm. in length. Preventive programs should intervene before children enter this period of high risk.

Berggren, W.L., Ewbank, D.C., and Berggren, G.G.

- n.d. Impact of health Programs on Trends in Child Mortality Rates. unpublished, n.d.

Original data

Method: Maternity histories were gathered from women 15 to 60 years of age by interview. Information included name, sex, and birthdate of each child and dates of any deaths.

Sample: 2,570 mothers were interviewed.

Location: A census tract near Deschapelles. The area included 23 small villages in an area of 10 square miles.

Among children born to mothers living in the census tract near Albert Schweitzer Hospital, mortality rates fell during the period 1950 to 1970. The decline was frequently interrupted by years of increased mortality rates during food shortages, epidemics of polio and measles, and interruptions in the malaria control program. Infant mortality rates had been reduced by the clinical services of the hospital and by programs to prevent neonatal tetanus and malaria. Child mortality rates were reduced by hospital services, malaria control, health surveillance, and nutrition education, immunization, and the improvement of food resources.

Brown, B., Herdgerken, J., and Jacobsen, M.

- 1978 Malnutrition in the Mountains of Northern Haiti. *Journal of Tropical Pediatrics and Environmental Child Care* 24(4):176-181.

Original data

Method: House to house survey of all children under six years in each community. Information was obtained on family size, births, and deaths. Children were weighed; arm circumference was measured. Physical exam was conducted for each child. Economic data was also collected.

Sample: 857 children under 6 years of age were weighed; 406 received a physical exam.

Location: The mountainous area of Northern Haiti near the town of Grande Riviere. The study included the town of Grand Riviere, three communities in the valley, and four communities in the mountains.

An epidemiologic survey of the nutritional status of preschool children in the mountains of Northern Haiti was undertaken. A house to house survey was carried out. 13% of the children were found to be severely malnourished by the Gomez classification. 0.72% were found to have kwashiorkor, and 0.89% to have marasmus. 11.3% were found to have vitamin A deficiency; 1.7% to have angular cheilosis. The incidence of malnutrition increased with age up to the age of 6 years. Malnutrition was correlated positively with lack of steady income, absence of a father in the home, and increasing family size.

Bureau of Nutrition

- 1979 Haiti Nutrition Status Survey: 1978. Republic of Haiti: Bureau of Nutrition, Department of Health and Population. Washington, DC: U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, and the Agency for International Development, Department of State. June 1979.

Original data

Method: Direct measurements of weight, height, hemoglobin, and estimates of age were collected from children. Interviews were conducted with mothers or guardians on demographic, health, dietary, and socioeconomic factors.

Sample: A random sample of rural children. All urban children came from Port-au-Prince, plus a special group of socially advantaged families was selected. 5353 children 3 to 59 months were examined. 1046 mothers or guardians had hemoglobins taken.

Location: national.

A nutrition status survey carried out on a national sample of children found 15.9% of the children were severely or moderately wasted. A higher prevalence of children in the rural areas were acutely malnourished than in urban areas. Children were not born with a height/length deficit, and there was little stunting during the first year. In the second year, the weaning period, deficit in height for age was marked. Most children were breast fed between 12 and 24 months. Bottle feeding was wide spread and was almost universal in Port-au-Prince.

BIBLIOGRAPHY (CONTINUED)

CARE

1981 Annual Report

This report reviews the activities of CARE around the world.

Dieudonne, W.

1981 Allaitement Maternel (mortalite infantile) in Departement de la Sante Publique, Division d'Hygiene Familiale, Population et Developpement, Section d'Information, d'Education et de Communication. July 1981.

Original data

Method: Longitudinal study. Women were followed over a three year period. Questionnaire.

Sample: 2056 women with young children. 63% of the sample were lactating during the study, and 37% had already weaned their child.

Location: Trou Chouchou, Grand-Goave, and Meilleur. (These areas were served by the Integrated Project of Health Population at Petit-Goave.)

This study confirmed the belief of rural women that lactation could help avoid a new pregnancy. Most of these rural women did breast feed their children. Among women whose child had died, conception occurred much sooner than among women who were nursing a child.

DIFPAN

1978 Diagnostic Preliminaire de la Situation Alimentaire et Nutritionnelle de la Population Haitienne, Aout 1978.

Only 25 pages were available for review from this document. They reviewed the nutrition, health, and agriculture situation from tables of statistics.

Departement de la Sante Publique

n.d. Bulletin d'Information du projet integre de sante et de population No. 1. Type de services delivres dans les 3 aires du projet, n.d. Departement de la Sante Publique et de la Population. Division d'Hygiene Familiale. Projet Integre de Sante et de Population.

This bulletin describes the Integrated Project of Health and Family Planning in the Health District of Petit Goave. This program began in February 1975 as part of the Division of Family Hygiene. The program is a preventive health, community based program which emphasizes maternal and child health care. Community health workers actively recruit people for public health rallies where over a thousand people may receive treatment.

Genece, E. and Rohde, J.

1982 Resultats Preliminaires de l'Enquete sur l'Etat Nutritionnel dans la Region Sanitaire du Sud (Haiti-1981). Regional Health Bureau, South Region, and the Central Bureau of Nutrition, unpublished.

Original data

Method: Measurements taken of weight, height, arm circumference; clinical examination. Interview with mother or guardian. All measurements taken during the crisis period following a hurricane.

Sample: 872 preschool children, 3 to 59 months of age.

Location: 30 localities in the Southern Region. These were the same localities sampled in the national nutrition survey of 1978.

A nutrition survey was carried out in the aftermath of Hurricane Allen. 22% of preschool children had low weight for height; 18% had fallen in this category in 1978. The rate of edema was 85 per 1000 in 1981 compared to 37 per 1000 in 1978. The prevalence of severe malnutrition had increased from 7 to 11% in the three year period. 52% of the children had had diarrhea in the seven days preceding the survey. 81% of the children were breast fed at one year of age, and 46% were breast fed at two years. In 1978 the rates had been 94% and 53.6% at each respective age.

Henry, M.

- 1977 Annexe au rapport semestriel du projet integre de sante et de population: Foyer de demonstration nutritionnelle. Departement de la Sante Publique et de la Population. Division d'Hygiene Familiale. Projet Integre de Sante et de Population.

This report describes the goals and methods of the program of foyer de demonstration nutritionnelle.

Hollant, E.

- 1977 Family Health Education on "Radio Docteur" in Haiti. Unpublished. December 1977.

This document describes the program "Radio Docteur," a health education program broadcast on the radio. The main audience of the program were adults in the reproductive age group. Ten minute programs are broadcast twice daily on subjects such as vaccination, nutrition, health advice, and family planning. The format is a dialogue conducted in Creole.

Hollant, E.

- 1975 Pictorial Illiteracy in Rural Haiti. Centre d'Hygiene Familiale, June 1975.

Original data

Method: Thirteen graphic images were shown to respondents. Images were shown with and without a written text in the bottom. Images were displayed with musical background and narration to groups of respondents. Understanding was measured by a questionnaire administered after seeing the image.

Sample: 100 illiterate and semi-literate adults 20 to 45 years of age. Location: Plaine du Cul de Sac, northeast of Port-au-Prince. Rural villages included in this study were Croix de Bouquets, Thomazeau, Fonds Parisien, La Hatte Cadette, and Descloches.

BIBLIOGRAPHY (CONTINUED)

This study was carried out to investigate the response of literate and semi-literate rural people to visual aids used in family planning and community medicine. Materials were best understood when use of visual aids did not exceed 15 to 20 minutes and conveyed only 1 or 2 messages at a time. Preferred colors were orange and green. Images used with synchronized background music and narration were understood when tested in one village but not in another. On the whole, rural populations perceived two dimensional graphic representations differently from the artist producing them. Pretesting of images is very important.

Jackson, T.

- 1979 Food Aid versus the Peasant Farmer: The Case of Haiti. Unpublished, February 1979.

PL 480 food is distributed as a supplement to locally grown foods. The author spent a month in Haiti where he frequently saw PL 480 foods sold in local markets at prices far below costs of locally grown foods. He concludes that these foods discourage food production and are a disincentive to local farmers.

Jelliffe, D.B. and Jelliffe, E.F.P.

- 1961 The nutritional status of Haitian Children. Acta Tropica 18:1-45.

Original data

Method: A nutrition status survey was conducted. Anthropometric measurements were taken, a physical exam was carried out, and mothers were interviewed concerning infant feeding and child rearing.

Sample: 2,313 children were included. 1,322 children were between 1 and 3 years of age.

Location: 21 representative villages scattered throughout the five Departements of Haiti and 2 slum dwelling groups in the capital, Port-au-Prince.

Information is presented on the prevalence of malnutrition among young Haitian children as well as a description of the ecology of malnutrition, including possible etiological factors, methods of infant feeding, customs in child rearing, and the presence of conditions such as malaria, yaws, and skin disease. The authors conclude that poverty is probably the single most important factor in malnutrition on the island and recommendations are made to improve nutritional status of young children.

King, K.W.

- 1979 Toward Better Coping by Third World Mothers--Role of Mothercraft Centers. New York: Research Corporation, draft of a book, 1979.

This document traces the history of the nutrition rehabilitation center in Haiti from its earliest days. The author discusses the nutritional problems which existed that spurred development of these centers, the state of nutrition knowledge, the politics of the

country, and the personalities involved to explain the conception and growth of the nutrition rehabilitation center.

King, K.W., Fougere, W., Webb, R.E., Berggren, G., Berggren, W.L., and Hilaire, A.

- 1978 Preventive and therapeutic benefits in relation to cost: performance over 10 years of Mothercraft Centers in Haiti. American Journal of Clinical Nutrition 31:679-690, April 1978.

Evaluation of the effectiveness of nutrition rehabilitation centers over the period 1964 to 1975 is reported. It was estimated that the cost of providing lifetime protection from severe malnutrition is about \$10 per child.

King, K.W., Fougere, W., Hilaire, A., Webb, R.E., Berggren, G., and Berggren, W.L.

- 1974 Cost in Relation to Benefits for Mothercraft Centers in Haiti, 1964-1974. Paper presented at Western Hemisphere Nutrition Congress IV, Bal Harbour, Florida, August 19-22, 1974.

This document evaluates the effectiveness of nutrition rehabilitation centers in Haiti. The cost of preventing clinical malnutrition through the use of the nutrition rehabilitation centers was calculated to be U.S. \$6.82 per child. A review of several studies indicated that mothers learned better child care in the Centers and were able to apply what they learned to subsequent children.

King, K.W., Dominique, G., Uriodain, G., Fougere, W., and Beghin, I.D.

- 1968 Food patterns from dietary surveys in rural Haiti. Journal of the American Dietetic Association 53:114-18.

Original data

Method: Meals were observed in individual homes. All foods were weighed before cooking and leftovers were also weighed. Food eaten outside the home was determined by recall.

Sample: 5% of homes in each survey area were randomly selected. In Les Cayes, only literate families who owned their own homes were selected.

Location: Port Margot, Ganthier, Fond Parisien, Guerin, and Les Cayes, representing rural areas in different ecological zones.

A food survey conducted in rural areas revealed that intake of calories, protein, calcium, and riboflavin were inadequate during many months of the year. Protein was inadequate only in the month of March. Kwashiorkor was common in young children indicating that they do not receive their fair share of the available protein.

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Matheson, A.

- 1975 "The grim facts of life on Haiti." UNICEF News 85:21-26, 1975.

This article describes life in Haiti. Health statistics are presented as well as a brief history of the island. The problems of insufficient food intake, drought, and inadequate water supplies are described as well as programs designed to combat these problems.

Murray, G.F. and Alvarez, M.D.

- 1973 Childbearing, Sickness and Healing in a Haitian Village. Unpublished document. New York: Columbia University. Port-au-Prince: Departement de la Sante Publique et de la Population et Centre d'Hygiene Familiale. August, 1973.

Original data

Method: Participant observation by two anthropologists who lived in the village, observing life there and participating in local activities.

Sample: All inhabitants of a rural village.

Location: An unspecified rural village in the Cul de Sac Plain.

This document reports on the folk medicine system in rural areas of Haiti, including descriptions of beliefs about natural and supernatural illness and local, traditional health practitioners. Many of the beliefs spring from the religion of voodoo. Local beliefs and practices concerning childbirth, lactation, and care of the very young child are described in detail.

Republique d'Haiti

- 1979 Rapport Final du Projet Integre de Sante et de Population de Petit-Goave. Republique d'Haiti, Departement de la Sante Publique et de la Population, Division d'Hygiene Familiale. July 1979.

This document reports on the integrated project of health and population undertaken by the division of family hygiene. The efforts of this project focused on maternal child health, family planning, nutrition and immunization, carried out in the context of community support and participation.

Richardson, J.L.

- 1975 Review of International Legislation Establishing Nursing Breaks. Journal of Tropical Pediatrics 21(5):249-58.

The purpose of this paper is to ascertain what legislation exists in various countries to protect the nursing relationship. Information was gathered mainly from the International Labour Office publication "Legislative Series."

Saulniers, S.S.

- 1978 Rural health delivery system project in Haiti: Evaluation of previous rural health projects in Haiti. Report No. 4. A.I.D. #521-78-32, July 1978.

This document describes health worker selection and training in rural areas. Several rural health programs are described Secretairerie d'Etat du Plan

- 1980 Unite de Planification Alimentaire et Nutritionnelle (UPAN) Diagnostic de la Situation Alimentaire et Nutritionnelle de la Population Haitienne 1980. Secretairerie d'Etat du Plan, Projet Interagence de Promotion de Politiques Nationales d'Alimentation et Nutrition.

This document describes the nutritional status of the people of Haiti. It includes information on the ecology, demography, economics, health, education, and culture of the country as well as a review of nutrition studies. It also reviews information on food production, consumption, and demand.

TAICH

- 1976 TAICH Country Report: Development Assistance Programs of U.S. Non--Profit Organizations Haiti. New York: American Council of Voluntary Agencies for Foreign Services, Inc., Technical Assistance Information Clearing House. September 1976.

This report describes the programs of 56 private, non-profit U.S. organizations which provide the people of Haiti with development assistance and material aid.

Thacker, S.B., Music, S.I., Pollard, R.A., Berggren, G., Boulos, C., Nagy, T., Brutus, M., Pamphile, M., Ferdinand, R.O., and Volvick, R.J.

- 1980 Acute Water Shortage and Health Problems in Haiti. The Lancet March 1, 1980, pp. 471-73.

Original data

Method: Morbidity and mortality information concerning children born since 1971 was obtained by interviewers in a door-to-door survey conducted during a drought.

Sample: A random sample of 400 households in each area: one area was affected by the drought, the other was not.

Location: Port-au-Prince.

During a severe drought Port-au-Prince lost hydroelectric power for 10 weeks. This led to water shortages in areas of the city supplied by electrically driven pumps. A study was carried out to determine the impact of water restriction on disease. Disease in children was found to be related to quantity of water used, socie-economic status, employment of household head, and family size.

BIBLIOGRAPHY (CONTINUED)

Toureau, S., Pizzarello, L., and Leane, S.E.

- 1979 Evaluation of a Program to Prevent Xerophthalmia in Haiti. New York: Helen Keller International.

Original data

Method: Ocular survey. Children received eye examinations and mothers were interviewed concerning night blindness, whether or not child had received vitamin A capsules, and distance to nearest health center.

Sample: 5680 children under the age of seven.

Location: Artobonite, North, and Northwest Haiti.

This document reports on an evaluation of a program to prevent xerophthalmia. Results indicated a tenfold decrease in the prevalence rate of vitamin A related corneal destruction in the areas studied since the 1974 survey. The decrease was probably influenced by a number of factors, among which was certainly the active and extensive vitamin A supplementation program. The prevalence of nearly one case per 1000 children indicated that xerophthalmia continued to be a problem of public health magnitude.

Toureau, S., Summer, A., Doty, M.M., and Pettiss, S.T.

- 1976 Assessment of Xerophthalmia in Haiti. New York: American Foundation for Overseas Blind, Inc.

Original data

Method: Cross sectional survey. Clinical examination of eye, measurement of height and weight plus dietary history taken. Carried out December 30, 1974 to February 28, 1975.

Sample: 5000 preschool children from 3,201 households. 25 sites chosen by multistage stratified sampling. Urban sites limited to slum areas; rural sites apportioned between coast, valley, and mountain. 1542 for nutritional assessment.

Location: National

A survey of preschoolers found that vitamin A deficiency and resulting blindness and corneal scarring were a serious problem, particularly in the North. Intakes of vitamin A were very low, and only 17.8% of children had normal nutritional status.

Webb, R.E., Fougere, W., and Papillon, Y.

- 1975 "An evaluation of the educational benefits of nutritional rehabilitation centres as measured by the nutritional status of siblings." Journal of Tropical Pediatrics and Environmental Child Health 21:7-10, February 1975.

Original data

Method: Children using a Nutrition Rehabilitation Center and their siblings were weighed and ages were recorded. Children were weighed again 21 months after discharge from the Center. Control children were weighed during a community nutrition status survey. Their siblings were also weighed.

Sample: 25 children using the Center and their paired younger sibling, 23 non-Center children and their paired younger sibling.
Location: not specified.

The purpose of this study was to evaluate the impact of the education effect of a Nutrition Rehabilitation Center. Malnourished children attending a Center for four months showed a 4.1% significant increase in standard weight for age at discharge. Follow up 21 months later showed a further increase of 2.8%. Paired siblings of Center children showed a 16.3% improvement in standard weight for age over their older brother or sister at the time the latter was admitted to the Center. Comparison with a control group of non-Center children showed no significant differences.

Webb, R.E., Bellweg, J.A., and Fougere, W.

1972 Journal of Nutrition Education 4(97):97-99.

Original data

Method: Children were weighed and examined for edema or other evidence of nutritional problems. Mothers were interviewed concerning family size and birthdates of their children.

Sample: 231 families with one or more children under 12 years of age.

Location: unspecified rural village

A short birth interval was found to be a better predictor of severe malnutrition than an increasing number of siblings.

Weise, H.J.C.

1976 Maternal Nutrition and Traditional Food Behavior in Haiti. Human Organization 35(2):193-200.

Original data

Method: Data were collected over a 12-month period from herbalist/midwives who rated foods as hot or cold on a seven point scale and indicated whether foods were dangerous or nondangerous for lactating women.

Sample: Ten indigenous herbalists from ten widely separated areas in the southern mountainous area of the country.

Location: Ten rural communities within a 35 mile radius of Jeremie in the southern part of the country.

Economic, technologic, and environmental factors seriously limit food availability in rural areas of Haiti. The hot/cold classification of foods is another serious restricting influence on diet, especially among lactating women. The hot/cold classification of foods should be considered in any intervention aimed at changing the dietary practices among Haitians.

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World Bank

- 1976 Current Economic Position and Prospects of Haiti (In Two Volumes).
Volume I: Main Report. Latin America and the Caribbean Regional
Office. Report No. 1243-HA, December 7, 1976.

Haiti is among the 30 or so poorest countries in the world. It is overpopulated, has limited arable land, scant resources, and a largely illiterate population. This document examines all these problems in detail. The authors conclude that the key to improving the economic situation of the country lies in the development of agriculture.