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Maternal and Infant Nutrition Reviews



CAMEROON

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MATERNAL AND INFANT NUTRITION REVIEWS

CAMEROON

A Guide to the Literature

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INTRODUCTION

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

The MATERNAL AND INFANT NUTRITION REVIEWS (MINRs) 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 (PVOs). 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 are 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 due to Dr. Albert Henn for reviewing a draft of this report and to Susan Colgate for sharing with us her expertise and resources.

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

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INTRODUCTION (Continued)

MINR Country Reports:

<u>AFRICA</u>	<u>NEAR EAST</u>	<u>ASIA</u>	<u>LATIN AMERICAN AND CARIBBEAN</u>
Cameroon	Egypt	Bangladesh	Bolivia
Congo	Jordan	Burma	Costa Rica
Gambia and Senegal	Morocco	India	Dominica
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, Vanatu, and Western Samoa

MATERNAL AND INFANT NUTRITION REVIEWS

CLASSIFICATION SYSTEM

1. Nutrition and Health Status
 - 1.1 General
 - 1.2 Maternal
 - 1.3 Infants 0-6 Months
 - 1.4 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
 - 2.6 About Illness and Cure

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 Breastfeeding
 - 3.3.2 Weaning
 - 3.3.3 After Weaning
 - 3.4 Health and Medicine

4. Nutrition Status Correlations

5. Nutrition and Health Policies and Programs
 - 5.1 Policies
 - 5.2 Programs

6. Commentaries

Bibliography

MAP OF
CAMEROON

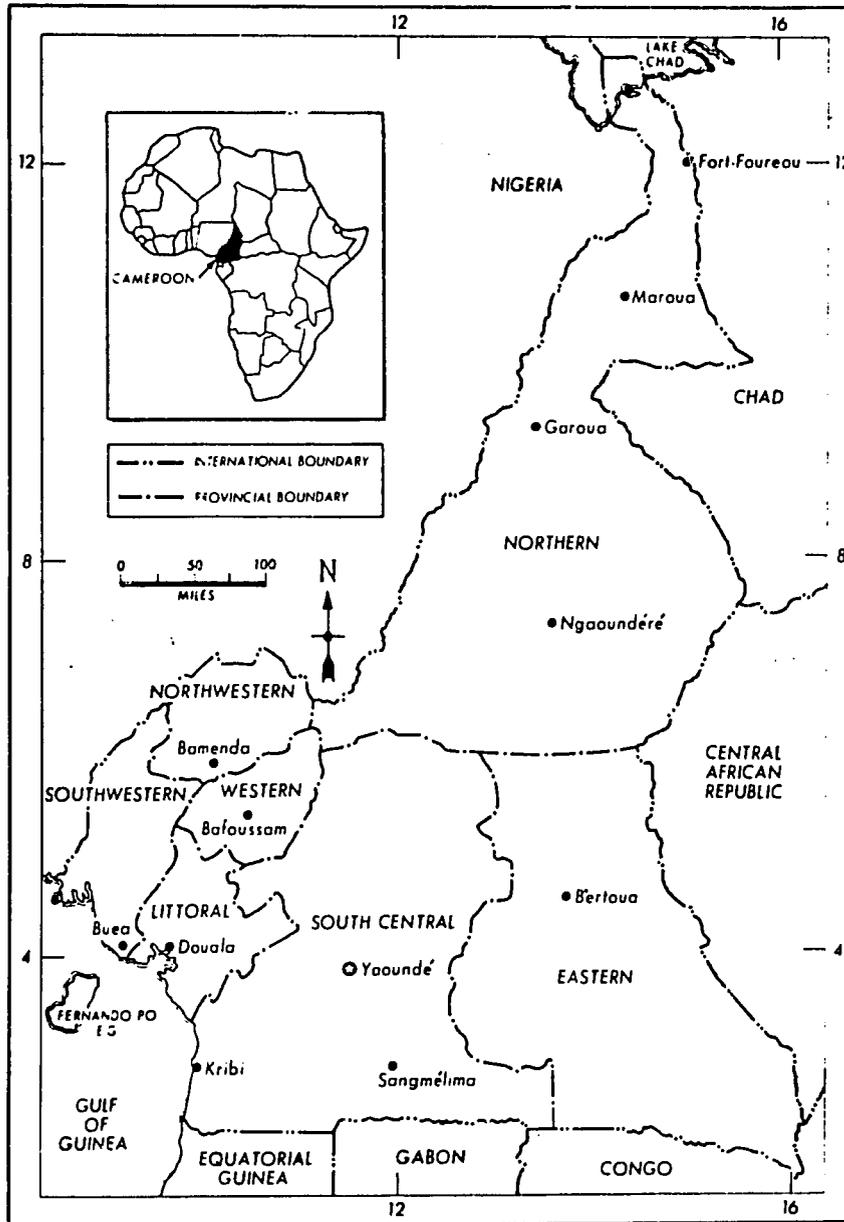


Table I

Locations Studied

	Berggren and Murray 1981	Colgate 1981	de Garine 1978	Drejer 1980	Eckerson 1977a	Eckerson 1977b	Eckerson n.d.	Fakambi et al., 1980	Garrett 1981	Government of Cameroon 1978	Guyer 1977	Lantum 1978	Lantum and Atangana 1980	Martin 1974, 76, 77	Nasah et al., 1976	Ngong 1979	Warrack-Goldman 1980
NATIONAL SAMPLE										X			X				
<u>Province</u> <u>Division</u> <u>Town</u>																	
Central South Nvolye Nsimalen		X												X			
Lekie Nkometon Yaounde		X						X	X		X	X			X		
Upper Senaga Jukiri Mbandjock												X	X				
East Lom-et-Djerem Bertoua					X		X										
Boumba-et-Ngoko Yokadouma					X												
Littoral Moungo Douala				X				X									
North Margui-Wandala Mokolo Rhoumzo	X		X														X X
North West Bui Kimbo																X	
South West						X											

HIGHLIGHTS

1. **NUTRITION AND HEALTH STATUS:** Prevalent nutrition problems include protein-calorie malnutrition, iron and folic acid deficiency anemias and goiter. The infant mortality rate ranges from 100/1000 live births in the Adamaoua Plateau region to 180/1000 in the north. The 1979 child mortality rate among children 1 to 4 years was 25 deaths per 1000 children. Growth appears adequate up to six months of age, but after this there is a rapid flattening of the growth curve which continues to at least age five. The North Province has 54% of all children in Cameroon with acute undernutrition; 28% of all chronically undernourished children; and the highest percentage of low arm circumference for age and height. Children age 6 to 23 months have a high anemia prevalence (34.5% in rural areas, 41.1% in Yaounde/Douala). Anemia is also one of the most commonly reported prenatal health problems.

2. **DIETARY BELIEFS:** During pregnancy, women are usually forbidden to eat eggs and meat because of the common fear that certain characteristics will be transmitted to the child. If a mother in the Eton area does not produce sufficient milk, traditional healers will give her leaves mixed with "egusi." 51% of rural women favor limiting births, believing that this would help insure that their children were properly nourished and well-educated.

3. **DIETARY PRACTICES:** In the North sorghum and millet are the staples, supplemented by groundnuts, root crops and vegetables. In the South maize, yam, cassava, taro, groundnuts and palm oil are among the basic foods produced. 35% of all calories consumed were obtained from grains, 23% from tubers. 39% of all protein consumed also is derived from grains. Calorie intake is inadequate from March to July, the period of heaviest agricultural work. In the North, the pre-harvest "hungry" season occurs between June and August. 2800 calories per person per day were available in 1975-76, but this fell to 2640 calories in 1977-78. Bread consumption increased 5% each year. Almost 60% of Cameroon mothers are both farmers and housewives. Mothers often must spend long days in the field producing food crops, which often prevents them from preparing weaning foods for their children. In some areas trees are scarce, and animal dung may be burned for fuel. About 40% of the corn in the southwest region spoils and is unfit for consumption. During labor a mother is given honey, soft drinks and other high sugar foods, and stimulants such as kola nuts to prevent her from becoming exhausted during labor. Women usually abstain from intercourse while breast feeding a child. Almost all infants are breast fed up to 9 months of age. The North has the highest breast feeding rates for children 18-23 months old: 71%. Bottle feeding is used for 30% infants in Yaounde/Douala; for 24% of children age 3-5 months in Central South Province and 10% in the Western Provinces. Less than 50% of the children age 3 to 5 months receive any food apart from milk, ranging from 29% in the North to 77% in the Northwest and West. Many infants receive prelactal feeds, such as water, sugar water and orange juice. Special foods prepared for children include gruel, bouillie, and commercial foods such as Cerelac.

4. **NUTRITION STATUS CORRELATIONS:** Children age 6 to 23 months are much more likely to have acute mild undernutrition if they were ill or had fever or diarrhea during the previous week. Infant and young child undernutrition is also correlated with households headed by farmers; those that cook with wood; and those where the family pot is not shared with children. Rural birth weights are significantly lower during the rainy months of July, August and

HIGHLIGHTS (Continued)

September. A clear, positive correlation exists between measles mortality and nutrition status. In Yaounde incidence of malnutrition is in inverse proportion to income. Increased incidence of bottle feeding in urban areas is associated with higher educational levels of mothers, mothers over 25 years of age, fathers with "more rewarding jobs" and higher socioeconomic status households.

5. **POLICIES AND PROGRAMS:** The Development Plan of 1976-81 treated nutrition in the context of economic, social and cultural development, aiming to make Cameroon self-sufficient in food production within the next decade. The 1978 National Nutrition Survey recommended actions that include the creation of a national structure with responsibility for studying food and nutrition problems; the preparation of a nutrition education program; the creation of dietetic experimentation and rehabilitation centers; the eradication of goiter; and the intensification of vaccination campaigns against measles. In 1977 the central government expenditure for health was US \$3.00 per person. 14% of the total budget of the Fourth Plan supported efforts to promote food self-sufficiency. Mothers are granted maternity leave with pay, and are allowed to take nursing breaks during working hours. The Nutrition Service in the Ministry of Health carries out a wide range of activities, including epidemiological nutrition and dietary research, nutrition surveillance, nutrition education, and nutrition training for all health service personnel in the Ministry. The MOH broadcasts weekly 15 minute programs on health and nutrition in English and French. In the Southwest, the government operates thirty-nine clinics which conduct nutrition surveillance and education, including weighing and food demonstrations. Catholic Relief Services (CRS) and the World Food Program run food distribution projects in the Southwest. CRS also operates a preschool feeding program in the Northwest Province. The Government trains female rural community development agents ("animatrices rurales") to conduct health education classes and demonstrations at a village level.

1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

NATIONAL

NUTRITION PROBLEMS: Prevalent nutrition-related health problems include protein-calorie malnutrition, iron and folic acid deficiency anemias, and goiter. (Fakambi et al., 1980)

GOITER: Goiter is endemic, and is one of the few nutrition problems which the National Nutrition Survey showed to be common and pervasive. (Eckerson, 1979)

GOITER IN MOTHERS: 4.4% of all mothers examined had obvious goiter of Grade II or III by WHO criteria. 16.8% in East Province and 5.6% in the North had obvious goiter. (Government of Cameroon, 1978)

WASTING IN MOTHERS: 7.3% of mothers had evidence of arm wasting (less than 23 cm. arm circumference) and 13.6% had evidence of fat wasting (less than 7.5 mm. fatfold). Rates were highest among northern mothers (11.6% and 23.7% respectively). (Government of Cameroon, 1978)

MATERNAL STATURE: "Short" stature (under 152 cm) was found in 13.3% of mothers, and tall stature (over 165 cm) in 15.6%. The average height for all mothers was 158.7 cm (5'1"). The East and North-West Provinces had the greatest rates of short mothers (24.8% and 22.5%); 10% of the sample in the East were of pygmy origin. (Government of Cameroon, 1978)

NO VITAMIN A DEFICIENCY: During preparation of the National Nutrition Survey, a USAID expert was assigned to do a preliminary survey to determine whether there was enough evidence of vitamin A deficiency to warrant investigation by the survey. Since the expert's final opinion was that inclusion was not warranted, the problem of avitaminosis A was dismissed from the survey design. (Eckerson, 1978)

ENDEMIC DISEASES: In 1973, endemic diseases included malaria, tuberculosis, parasitic infections including schistosomiasis (also known as bilharziasis or snail fever), onchocerciasis (river blindness), and kwashiorkor. About 75% of the population suffered from one or more forms of these debilitating diseases. The tsetse fly has nearly been eradicated, and sleeping sickness has become rare. Also problematic are leprosy, yaws, venereal diseases, measles, typhoid and rickets. (Nelson et al., 1974)

COMMON DISEASES: The four most common diseases seen at the dispensary at Mvolye were upper respiratory tract infections, malaria, intestinal parasites, and diarrhea in children (including malnutrition). (Martin, 1974)

SICKLE-CELL DISEASE: The prevalence rate for sickle cell disease as determined by hemoglobin genotype was 0.9%; for sickle cell trait, 15.6%. Sickle cell disease is an important cause of severe anemia in young children. (Government of Cameroon, 1978)

1.1 NUTRITION AND HEALTH STATUS, GENERAL (Cont.)

RURAL

GOITER: Goiter was the fifth most common disorder treated at Banso Baptist Hospital in Bui Division in 1975. (Lantum, 1979)

NUTRITION STATUS AND CATARACTS: Among cataract patients of all ages and both sexes, the type of cataract was not diagnosed in 35%; 0.68% were diagnosed as metabolic, including causes such as vitamin A deficiency, diabetes, galactosemia, and hypocalcemia. The remainder had cataracts which were not nutritionally related. (Ngong, 1979)

SCHOOL CHILDREN AND MALNUTRITION: Children age 2 1/2 to 5 years were measured in the Private School in the CUSS project area. Height for weight ratios were acceptable, but no assessment was made of height for age--so children might be stunted but not underweight. (Martin, 1974)

SCHOOL CHILDREN HEALTH PROBLEMS: 50 children age 2 1/2 to 5 years examined at Mvolye had a high rate of infections, particularly skin problems, intestinal infestations, and upper respiratory tract infections. A study following up on a 1973 deworming program found that all the children were re-infested, usually with ascaris and trichocephalus. (Martin, 1974)

ILLNESS IN WOMEN: In two rural villages, women who usually worked in the fields were at home, sick, an average of three days each month. (Guyer, 1977)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

NATIONAL

NO PRENATAL MALNUTRITION: Among the 28,179 pregnant women examined over a 3 year period at the Central Maternity at Yaounde, no cases of "adult malnutrition" were found. (Schuftan et al., 1980)

HEALTH PROBLEMS: The most commonly reported prenatal health problems were malaria, anemia, intestinal parasites, and abdominal pain with or without bleeding. In general, mothers using the private ward (higher socioeconomic status) suffered these problems less often. (Colgate, 1981)

RURAL

PRENATAL WEIGHT GAIN: Mothers in Nsimalen gained an average of 12 kg (26.4 lbs.) during pregnancy, which is close to the recommended optimum gain. (Schuftan et al., 1980)

MATERNAL MORTALITY RATES: The maternal mortality rates were 1.25 deaths per 1000 live births at Banso Baptist Hospital and 1.83 per 1000 at Shisong Hospital in 1973-77 in Bui Division. (Lantum, 1979)

ANEMIA, PARASITES, AND MALARIA: Among 98 women delivering healthy infants at a mission dispensary, 26.5% were anemic (not defined), 13.3% had intestinal parasites, and 24.5% had malaria. (Colgate, 1981)

URBAN

NO MATERNAL MALNUTRITION: Among 28,000 consecutive births at Central Hospital in Yaounde, not one case of clinically evident adult malnutrition was seen. (Nasah et al., 1976)

ANEMIA, PARASITES, AND MALARIA: Among 100 women delivering healthy infants at a public hospital ward, 7% were anemic (not defined), 5% had intestinal parasites, and 29% had malaria. Among 101 private (higher socioeconomic status) mothers, the rates were 6.9%, 1%, and 10.9%, respectively. (Colgate, 1981)

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

NATIONAL

NUMBER OF LACTATING WOMEN: Between 400,000 and 500,000 women are breast feeding at any one time, representing 30% of all women age 15 to 44 years. (Bryson, 1979)

URBAN

POSTPARTUM AMENORRHEA: In a study of postpartum amenorrhea in Yaounde, duration was 42 days among women not breast feeding, 4.23 months for partial breast feeders, and 5.8 months for complete breast feeding. (Nasah et al., 1976)

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

NATIONAL

REGIONAL INFANT MORTALITY: Infant mortality rates vary among regions. The national rate is 100 deaths per 1000 live births, but the rate is 180/1000 in the north, 138 in the west (mostly northwestern and southwestern provinces), 100 in the Adamaoua Plateau region, and 76 in the south central and eastern regions. (Nelson et al., 1974)

INFANT MORTALITY RATE: In 1976, the infant mortality rate was 137 deaths per 1000 live births. (Sivard, 1979)

INFANT MORTALITY RATE: The infant mortality rate is 75 to 200 per thousand live births. (Guillozet, 1976a)

BIRTH WEIGHTS: Nasah (1975) found that mean birth weights of infants of women of lower economic classes averaged 3,167 grams for males and 3,061 grams for females. These means approximate the standard Boston birth weights as well as those of babies of prosperous women in Accra, Ghana, and Kenya, and they exceed those of Senegal (2,007 gm.). (Garrett, 1981)

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

BIRTH WEIGHTS: A study conducted in 1971-1973 found that among 8071 births, average birth weight was 3119 grams. (WHO, 1980)

RURAL

INFANT MORTALITY RATE: The infant mortality rate in rural areas is 200 deaths per 1000 live births. (Bryson, 1979)

INFANT MORTALITY RATE: Among all deaths in Jakiri in 1977/78, 15% occurred among infants--a rate of 135.5 deaths per 1000 live births. (Lantum, 1979)

MEASLES AND INFANT MORTALITY RATE: Measles epidemics were largely responsible for the infant mortality rate of 416/1000 in 1976 in Mbandjock district. (Lantum, 1979)

BIRTH WEIGHT: Mean birth weight of 98 healthy infants born at a mission dispensary was 3154 grams. (Colgate, 1981)

BIRTH WEIGHTS: The mean birth weight of infants born in the institutions studied was 3112 grams (6.87 lbs.) in 1971-73, suggesting the protein intake and overall nutrition status of the mothers was satisfactory. (Lewis, 1974)

BIRTH WEIGHTS: Mean birth weights of infants delivered at different institutions did not vary significantly in 1971-73, ranging from 2944 grams to 3195 grams. (Lewis, 1974)

URBAN

INFANT MORTALITY RATE: Infant mortality is 100 deaths per 1000 live births for the urban population. (Bryson, 1979)

PERINATAL MORTALITY: In a Yaounde clinic population, the perinatal mortality rate was 43.3 deaths per 1000 live births. After initiation of a High Risk Pregnancy Clinic at Central Maternity at UCHS, the rate dropped to 31.2 in 1975. (Guillozet, 1976b)

PREMATURITY: Among infants born to an indigent patient group in Yaounde in 1974, the rate of prematurity, based on birth weight, was 10.8%; among infants born to the prosperous patient group, the rate was 5.9%. (Guillozet, 1976b)

BIRTH WEIGHT: Mean birth weight of healthy infants born on the public maternity ward was 3229 grams. Mean birth weight of healthy infants born on the private (higher socioeconomic status) service was 3236 grams. (Colgate, 1981)

BIRTH WEIGHTS: At the General Hospital at Yaounde, in 1975, average birth weights were 3130 grams for boys and 2990 grams for girls (mean 3060 grams) born on the wards; boys and girls born in private rooms to

mothers of higher socioeconomic status weighed 3300 and 3190 grams (mean 3200 grams). (Schuftan et al., 1980)

BIRTH WEIGHTS: The difference in birth weights between babies of lower income and middle income mothers was 200 grams in 1975. The difference is now 337 grams, probably because of increasing poverty. (Schuftan et al., 1980)

BIRTH WEIGHT: Average birth weights were 3.13 kg for 4,059 boys, and 2.99 kg for 3,908 girls born at Central Hospital at Yaounde. (Nasah et al., 1976)

BIRTH WEIGHTS: In Yaounde mean birth weights dropped from 3145 grams in 1955 to 3060 grams in 1975. (Schuftan et al., 1980)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

NATIONAL

CHILD MORTALITY RATE: In 1979, the mortality rate among children age 1 to 4 years was 25 deaths per 1000 children; in 1960, the rate had been 41 per 1000. (World Bank, 1981)

CHILD MORTALITY RATE: The mortality rate in 1977 among children age 1 to 4 years was 27 deaths per 1000 children in this age group. (World Bank, 1980)

RATES OF MALNUTRITION: Among children under five years old, 22.1% were chronically undernourished (height for age less than 90% of the reference median); 21.1% were underweight (weight for age less than 80% of the reference median); and 1% were acutely undernourished (weight for height less than 80% of the reference median). (Government of Cameroon, 1978)

MALNUTRITION IN HOSPITALIZED CHILDREN: Among children age 0 to 47 months old admitted to the hospital with primary diagnoses other than malnutrition, 43% had weights below 80% of the expected weight for their age, and 11% were below 60%, the standard for severe malnutrition. (Garrett, 1981)

GROWTH RATES: Growth appears adequate up to six months of age, but after this there is a rapid flattening of the growth curve which continues to at least age five years. This illustrates the onset and progression of growth retardation in the young child population. (Government of Cameroon, 1978)

ANTHROPOMETRIC STATUS: Among preschoolers from low-income families, 36% were less than 80% of "normal weight"; 47% were less than 90% of "normal height"; and 18% had arm circumferences less than 80% of "normal." Among preschoolers from high-income households, rates were 14%, 24%, and 6% respectively. (Schuftan et al., 1980)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

WEIGHT FOR AGE: 21.1% of children aged 3-59 months were underweight (less than 80% of the reference weight for age). Prevalence was lowest among children aged 3-5 months, began to increase after 6 months and reached a peak at 15-20 months, maintained a plateau throughout the second year of life, and dropped slightly after this until 59 months. (Government of Cameroon, 1978)

WEIGHT FOR HEIGHT: Only 1% of the children age 3-59 months were acutely undernourished (below 80% of the reference weight for their height), indicating that famine conditions did not exist at the time of the survey. (Government of Cameroon, 1978)

HEIGHT FOR AGE: 22.1% of children age 3-59 months were chronically undernourished (less than 90% of the reference height for age). Prevalence was lowest in early infancy, began to increase after 12 months of age, and reached a plateau from 18 to 59 months. (Government of Cameroon, 1978)

EDEMA: Among children 3-59 months old, 0.6% had edema, a sign of acute malnutrition; this is in keeping with the low incidence of unsatisfactory weight for height. The rates were 1.5% in the East Province, and 1.8% in the Littoral. (Government of Cameroon, 1978)

ARM WASTING: 3% of children had arm wasting (circumference less than 12.5 cm.) and 4.7% to 11.9% had borderline arm wasting (12.5 cm. to 13.4 cm.), depending on the province, based on the use of the Shakir Strip technique. (Government of Cameroon, 1978)

ARM CIRCUMFERENCE FOR AGE: Among children 3 to 59 months, 13.0% had low arm circumference for age (less than 82.5% of the reference median). Rates by region were: East, 13.4%; North, 16.9%; N. West, 7.0%; West, 9.6%; S. West, 12.0%; Littoral (excluding Yaounde/Douala), 6.4%; Central South (also excluding Yaounde/Douala), 11.8%; and Yaounde/Douala, 6.3%. (Government of Cameroon, 1978)

ARM CIRCUMFERENCE FOR HEIGHT BY REGION: Among children age 3 to 59 months, the prevalence of low arm circumference for height was 3.9% overall. Rates by region were: East, 3.4%; North, 5.4%; N. West, 1.4%; S. West, 3.6%; Littoral, 1.8%; Central South (excluding Yaounde and Douala), 3.9%; and Yaounde/Douala, 1.6%. (Government of Cameroon, 1978)

ANEMIA: 38.1% of children 6-59 months old were anemic by WHO standards. In the West Plateau, the rate was only 23.1%, but otherwise rates were similar for all geographic and socioeconomic categories. (Government of Cameroon, 1978)

OBESITY: 3.5% of children under five years old were obese (weight for height greater than 120% of reference median). (Government of Cameroon, 1978)

DEHYDRATION AND BOTTLE FEEDING: Hospitalized children receiving bottle feedings (alone or as supplements to breast feeding) represented 35% of

the hospitalized children but accounted for half of the cases of dehydration. (Garrett, 1981)

DEHYDRATION AND FEEDING METHOD: Among hospitalized children age 0 to 47 months, almost half had been admitted with a primary diagnosis of dehydration. The rate of this diagnosis was 75% among bottle fed children; 61% among those receiving both breast and bottle feedings; 46% among those breast fed; and 30% in the group receiving neither, 94% of whom were over 12 months old. (Garrett, 1981)

HOSPITAL DIAGNOSES: Among hospitalized children age 0 to 47 months, the primary diagnosis on admission was dehydration for 49%; respiratory infections, 14.8%; anemia, 14.0%; malnutrition, 13.7%; meningitis, 3.3%; and other, 5.2%. (Garrett, 1981)

HOSPITALIZATION: Most children age 0 to 47 months admitted to the hospital were ill with gastrointestinal problems. Increasing numbers arrived at the hospital with unsanitary ("putrid") feeding bottles of milk or pap of doubtful dilution. (Garrett, 1981)

RATES OF ILLNESS: Between 22.5% and 36.2% of the children (depending on the province) had sickness, diarrhea, fever, or a combination of these, at the time of the survey. (Government of Cameroon, 1978)

MEASLES: Measles contributed to approximately 25% of all deaths in young children. (Government of Cameroon, 1978)

PYGMY STATUS: Among pygmy children studied by Arnhold in 1977, 39% had arm wasting (circumference less than 13.5 cm.). The prevalence rate of underweight for age among pygmy children was 60% (for the East Province as a whole, 21%). National Academy of Sciences reference values, used for the study, may not be appropriate for this group. (Government of Cameroon, 1978)

NORTH PROVINCE SEVERELY AFFECTED: The North Province alone had 54% of all children in Cameroon with acute (mild) undernutrition; 28% of all chronically undernourished children; and the highest rate of arm wasting (16.9% for low arm circumference for age and 5.4% for low arm circumference for height). (Government of Cameroon, 1978)

RURAL

DEATHS OF CHILDREN: Among all deaths in Jakiri in 1977/78, 25% occurred among children under five years old. (Lantum, 1979)

PEM: In Jakiri and Mbandjock, clinical cases of PEM were found among children of apparently normal height and weight. "Height and weight criteria do not detect all cases of kwashiorkor." (Lantum, 1978)

SEX DIFFERENCES IN PEM: Malnutrition rates were not significantly different between boys and girls. (Lantum, 1978)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

MALNUTRITION RATES: "Florid" kwashiorkor, marasmus, and marasmic kwashiorkor were seen in less than 1% of Jakiri children 12 to 60 months old. (Lantum, 1979)

ANEMIA: Among children age 6 to 23 months, the prevalence of anemia (by WHO standard, below 10 gm%) was 34.5 overall. Regional rates were: East, 62.1%; North, 38.3%; N. West/West, 19.7%; S. West/Littoral, 34.7%; and Central South (excluding Yaounde/Douala), 43.3%. (Government of Cameroon, 1978)

WEIGHT FOR AGE - JAKIRI AND MBANDJOCK: 7.5% of children studied in Jakiri and 20% in Mbandjock fell below 80% of the Harvard standards for weight for age; 0.02% and 3.16% respectively fell below 60% of standard (severe PEM; Gomez Third Degree). (Lantum, 1978)

HEIGHT FOR AGE - JAKIRI AND MBANDJOCK: Growth curves of children in Jakiri and Mbandjock fell below standard growth curves, including Harvard standards based on growth of children in Zambia, and growth curves of high-income children in Yaounde. 75% of children in Jakiri and 68.4% of children in Mbandjock were below the 25th percentile. (Lantum, 1978)

HEIGHT FOR AGE - JAKIRI: In Jakiri, mean heights corresponded to 90% of the Harvard standard; 0.5% of the children were between 60-30% of standard (moderate PEM); and none were below 60% (severe PEM). (Children who were "obviously ill" were excluded from this study.) (Lantum, 1978)

SEX DIFFERENCES IN WEIGHT: Boys were significantly heavier than girls of the same age, although mean heights for age and mid-arm circumferences showed no sex-based difference. (Lantum, 1978)

ARM CIRCUMFERENCE FOR AGE: Among children age 3 to 59 months, 14.4% had low arm circumference for age (less than 82.% of reference median). (Government of Cameroon, 1978)

ARM CIRCUMFERENCE FOR HEIGHT: Among children age 3 to 59 months, 4.4% had low arm circumference for height (under 82.5% of reference median). (Government of Cameroon, 1978)

ARM CIRCUMFERENCE - MBANDJOCK: In Mbandjock, 11.6% of the children studied were moderately malnourished (based on Morley's band) and 9.5% were severely malnourished. 70% of these children were 12-24 months old. (Lantum, 1978)

ARM CIRCUMFERENCE - JAKIRI: In Jakiri, 5.3% of the children studied (age 1 to 5 years) had moderate malnutrition (based on arm circumference taken using Morley's band) and 0.7% were severely malnourished. Rates were higher in peripheral villages than in "semi-urbanizing collectivities." 52.2% of the malnourished children were 12 to 23 months old. (Lantum, 1978)

CAUSES OF PCM - JAKIRI AND MBANDJOCK: The majority of malnourished children in Jakiri and Mbandjock were age 12-24 months and were breast

feeding. Possible causes include inadequacy of breast milk at this age; qualitatively inadequate complementary and supplementary food; endemic diseases such as malaria infections; helminthiasis, anemias; measles; whooping cough; gastroenteritis; and socio-cultural taboos and behaviors. (Lantum, 1978)

URBAN

CHILD MORTALITY: The urban child mortality rate in Yaounde and Douala is 265 deaths per 1000 children. (Garrett, 1981)

MALNUTRITION RATES - YAOUNDE: Less than 1% of the children were acutely undernourished (under 80% of the reference weight for height), and 12% were chronically undernourished (under 90% of the reference height for age) in a study of children in and around Yaounde conducted in November 1975 by OCEAC (Organisation de Coordination pour la Lutte contre les Endemies en Afrique Centrale). (Government of Cameroon, 1978)

MALNUTRITION RATES - DOUALA: In Douala in 1973, a survey of children age 0-5 years found that 4.4% had severe PEM and 36.4%, moderate PEM. (FAO, 1977)

NUTRITION AND HEALTH PROBLEMS - YAOUNDE: The clientele of the Pediatrics Section of Central Hospital tended to be seriously ill infants who were underweight and usually suffering from at least one obvious environmental problem. (Guillozet, 1976b)

NUTRITION AND HEALTH PROBLEMS - YAOUNDE: In the Pediatrics Section of Central Hospital in Yaounde, severe dehydration from gastroenteritis and measles, to the point of circulatory collapse, happened "ten times a day." Other common problems included late complications of measles, chronic malnutrition, profound anemias, and life-threatening infectious diseases. (Guillozet, 1976b)

ANEMIA: Among children age 6 to 23 months in Yaounde/Douala, the rate of 41.1% were anemic by WHO standards (hemoglobin under 10 gm%). (Government of Cameroon, 1978)

HEIGHT FOR AGE: 19.4% of children age 3 to 59 months from families of all socioeconomic levels in Douala were chronically undernourished (less than 90% of the reference height for age). Among urban children from higher socioeconomic levels, prevalence was 4.2%. (Government of Cameroon, 1978)

WEIGHT FOR AGE: 13.6% of urban children age 3-59 months were underweight (less than 80% of the reference weight for age). Among urban children of high socioeconomic status, the rate was 3.6%. (Government of Cameroon, 1978)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

ARM CIRCUMFERENCE FOR AGE: Among children age 3 to 59 months, prevalence of low arm circumference for age (under 82.5% of reference median) was 6.2% in Yaounde/Douala, and 5.7% in other urban areas. (Government of Cameroon, 1978)

ARM CIRCUMFERENCE FOR HEIGHT: Among children age 3 to 59 months, the prevalence of low arm circumference for height (under 82.5% of reference median) was 1.6% in Yaounde/Douala, and 1.7% in other urban areas. (Government of Cameroon, 1978)

RATES OF ILLNESS: 24.5% of the children in the Yaounde/Douala sample had a fever; 16.4% had diarrhea; and 22% were "sick." 68% of the children had no symptoms; 9% had all three; and 23% had one or two symptoms at the time of the survey. (Government of Cameroon, 1978)

MEASLES MORTALITY - YAOUNDE: Measles and its complications were responsible for half of all hospitalized child deaths in 1975 in Yaounde. (Guillozet, 1976b)

MEASLES MORTALITY: The case-specific mortality rate for measles in the Yaounde/Douala sample was 2.0%. This rate, much lower than other areas, may reflect better nutritional status or better health services. (Government of Cameroon, 1978)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

RURAL

WOMEN FORBIDDEN POULTRY: In the north, women of several tribal groups are apparently forbidden to eat poultry. (Berggren and Murray, 1981)

MANIOC SUPPLY: Men's jealousy of women's earnings through sales of surplus manioc is believed to decrease manioc yields through magical means. (Guyer, 1977)

FRUIT AVOIDED: In much of the savanna region, people are not supposed to eat fruit because of the belief that planting a fruit tree diminishes one's life force. (Nelson et al., 1974)

FOOD TABOOS IN MOKOLO AREA: Among 15 families in the Mokolo area, most households had no particular food taboos, but in one, women were not allowed to eat eggs or chicken. In the study of 15 households, no member of any household consumed any eggs or chicken during the study day, so this taboo does not affect intake. (Warrack-Goldman, 1980)

PORK PROHIBITION - FULBE: In the North, the Fulbe respect the Muslim prohibition of pork. (Berggren and Murray, 1981)

MEAT TABOOS: In the north, taboos exist regarding the eating of horse, monkey, and dog meat. For the Dourou and Baya on the Adamaoua Plateau, snake and monkey meat are forbidden. (Nelson et al., 1974)

2.2 DIETARY BELIEFS ABOUT PREGNANCY

NATIONAL

EGGS AND MEAT FORBIDDEN: During pregnancy, women are usually forbidden to eat eggs and meat because of the common fear that certain characteristics will be transmitted to the child. (Nelson et al., 1974)

RURAL

FISH: Among the Beti, pregnant women were not supposed to eat fish because it was thought that this would cause the child to have scaly skin. (Bryson, 1979)

FOODS FORBIDDEN: In one household of the 15 studied, the women reported that during pregnancy, no pimento, honey, or sugar cane should be eaten. None of these foods was consumed in any of the households observed during the study. (Warrack-Goldman, 1980)

2.3 DIETARY BELIEFS ABOUT LACTATION

NATIONAL

REASONS FOR WEANING: Among 130 mothers of hospitalized children who had been weaned from both the breast and bottles, reasons given for weaning included insufficient breast milk (given by 47 mothers); mother works (25), illness or fatigue of mother (19); numerous or multiple pregnancies (17); "bad" breast milk (8); mother a student (8); sex taboo (1); other (1); and not stated (4). (Garrett, 1981)

UNSUITABLE MILK AND SORCERY: In a study of women who believed their milk was "unsuitable" (Martin, 1974), 10 of their 24 offspring had diarrhea, vomiting, cough, and fever. The cause of this condition, believed to be sorcery, is amenable only to prolonged, costly, traditional treatment. Thus, if the child is breast fed he will die, so the mother gives him bottles, believing his chances of survival are better. (Garrett, 1981)

NURSES AND BAD MILK: A "responsible and experienced nurse" stated, "It may not be possible to have bad milk, but if a mother continues to breast feed after her milk turns sour the baby will die--usually within the first 48 hours." (Garrett, 1981)

RURAL

INCREASING BREAST MILK: If a mother in the Eton area does not produce sufficient milk, traditional healers will give her leaves mixed with egusi. Another mixture is heated and put on her head; the "milk starts flowing out immediately." (Lantum, 1977)

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

NATIONAL

CHOICE OF MILK: Among mothers who bottle fed, 41% said that their choice of milk was influenced by health personnel; 22% cited the success of a friend or relative; 16%, promotion or publicity; 16%, other; and 8%, no response. (Garrett, 1981)

BOTTLE PROMOTION: Bottle-feeding mothers described publicity for baby foods and milk including vans with loudspeakers in different sections of the city as well as radio commercials. (Garrett, 1981)

2.5 DIETARY BELIEFS ABOUT WEANING

2.6 DIETARY BELIEFS ABOUT ILLNESS AND CURE

RURAL

INFANT NUTRITION AND BIRTH CONTROL: 51% of women were in favor of limiting births; reasons given were primarily the cost of living and the wish to insure that children were properly nourished and well educated. (Bryson, 1979)

3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

BASIC DIET: Meals are usually in the form of a thick porridge with a spicy sauce made of seeds, leaves, insects, and seasonings. (Nelson et al., 1974)

BASIC FOODS: Tubers were commonly consumed by families in Yaounde/Douala and all provinces except the North. Cereals were consumed most commonly in the North (98% of families), North-West, and West Provinces and Yaounde/Douala. In all areas, at least one type of bean, seed, or nut was eaten by 60% to 80% of families, the lowest rate being in the North and the highest in the East. The proportion of families eating dark green leafy vegetables ranged from 30% in Yaounde/Douala to 52% in the East. The consumption of meat, fish, or eggs was highest in the South-West/Littoral Provinces and in Yaounde/Douala (88%). Fruits and vegetables were consumed most often in Yaounde/Douala (80% of families), and by about 50% of families in other areas. Consumption of oils varied greatly, being highest in Yaounde/Douala and the Western Provinces (90%), and lowest in the East and North (40-50%). (Government of Cameroon, 1978)

CONSUMPTION OF STAPLES: Nationwide, in 1978, average per capita consumption was 104 kg cereals, 235 kg starches, and 32 kg legumes. Although these proportions apply to most areas within Cameroon, in the Littoral and Central-South regions, consumption of cereals was lower (38 and 58 kg) and consumption of starches was higher (422 kg and 338 kg). (Schuftan et al., 1980)

STAPLE FOODS IN THE SOUTH: In Southern Cameroon, basic foods grown include maize, yam, cassava, taro, groundnuts, palm oil, and fruits and vegetables, including peas, beans, peppers, melons, green leaves, tomatoes, and bananas. (Bryson, 1979)

STAPLE FOODS IN THE NORTH: In the North, sorghum and millet are the staples, supplemented by groundnuts, root crops, and vegetables. Rice and maize are growing in popularity. (Bryson, 1979)

SOURCES OF CALORIES: Nationwide, in 1974, 35% of all calories consumed were obtained from grains, 23% from tubers, 10% from fruits, 6% from fats and oils, 3% from legumes, and 21% from miscellaneous sources. (Schuftan et al., 1980)

SOURCES OF PROTEIN: In 1974, of all protein consumed, 39% was obtained from grains, 12% from tubers, 10% from meat, 8% from legumes, 7% from fish, and 24% from miscellaneous sources. (Schuftan et al., 1980)

FAT CONSUMPTION: In 1974, per capita fat consumption was 50 grams daily, 25 grams below the recommended intake. (Schuftan et al., 1980)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

FAMILY FOOD DISTRIBUTION: Children age 6 to 11 months old receive foods of most food groups far less often than their families. In all food groups other than staples, both low availability to the family and poor distribution were common; the situation was the worst in the North. The proportion of children age 12 to 23 months receiving a food approached that of the family as a whole. (Government of Cameroon, 1978)

GRAIN PRODUCTION: Between 1970 and 1978, production of millet and sorghum was stagnant because of drought, but production of maize increased. (Schuftan et al., 1980)

FOOD PRODUCTION: During 1961-1970, per capita food production increased 2.1%, but in 1970-75 it decreased 0.7%. (FAO, 1977)

FOOD SUPPLY: Agricultural products provide 90% of the country's food supply as well as coffee and cocoa for export. (Fakambi et al., 1980)

AGRICULTURE: In 1979, 83% of the labor force was engaged in agriculture, as was 87% in 1960. (World Bank, 1981)

AGRICULTURAL PRODUCTS: Principal agricultural products are plantain, macabo-taro, manioc, banana, yams, corn, millet, sorghum, sweet potatoes, and sugar cane. (Schuftan et al., 1980)

WOMEN'S OCCUPATIONS: Almost 60% of Cameroon mothers were both farmers and housewives; the remainder were housewives. The North-West had the highest frequency of farming mothers (84.3%). 66.6% of rural mothers and 30.6% of urban mothers were involved in agriculture. (Government of Cameroon, 1978)

WOMEN CONTROL THE FOOD SUPPLY: Women see childbearing as their basic reason for living, and raising food to feed the children is part of the nurturing role. Therefore, women accept primary responsibility for farming, as well as control over operations, marketing, and income. (Bryson, 1979)

CORN WASTE: Recent estimates of the FEMEC grain storage team indicate that 80% of the corn in the south west region has some sort of infestation; 40% spoils and is unfit for consumption. (Eckerson, 1977b)

SEASONALITY OF CALORIE INTAKE: Calorie intake is inadequate from March to July, the period of heaviest agricultural work, despite the availability of peanuts and cassava from the previous growing season. Food may be inadequate because women do not have time to prepare it. (Bryson, 1979)

DIETARY PROBLEMS: The most common dietary problems are a lack of calories at certain times of the year and the poor quality of protein in the diet. (Bryson, 1979)

ADEQUACY OF BATANGA DIET: The Batanga diet in 1968 was found adequate in protein and calories, but deficient in fats and vitamins. Some urban

women recognized these deficiencies, especially in young children's diets, and bought baby foods and vitamin supplements to compensate. An alternate remedy would be to use green leaves more extensively in cooking, as the Pahouin do. (Bryson, 1979)

POLYGAMY AND FOOD DISTRIBUTION: Rivalry between co-wives in a polygamous household may result in their sending a major portion of available food to the husband, leaving insufficient amounts for themselves and the children. (Bryson, 1979)

PROTEIN AND CALORIE SUPPLIES: In 1976, the per capita supplies were 59 grams protein and 2,408 calories per day. (Sivard, 1979)

PROTEIN AND CALORIE SUPPLIES: In 1972-74, per capita supplies averaged 2383 calories (103% of requirement) and 59.3 grams protein. 16% of the population (990,000) had calorie intakes below the critical limit. (FAO, 1977)

CALORIE SUPPLY: In 1977, the available supply of calories, 2,069 per capita per day, met 89% of the FAO estimated requirement. (World Bank, 1981)

PROTEIN CONSUMPTION BY REGION: Studies conducted in 1967 and 1976 show that protein consumption is as follows: Islamic North, 122 gm per person per day, of which 22.4 gm (20%) is animal protein; Adamaoua, 96 gm (41.2, 43%); Douala, 76 gm. (42.5, 56%); Evodoula, 63 gm (17.0, 27%); Batouri (East), 51 gm (16.3, 32%); Gompouli, 113 gm (13.5, 12%); Non-Christians of the Plains, 106 gm (13.7, 13%); and Non-Christians of the Mountains, 110 gm (5.0, 5%). The FAO has recommended a daily intake of animal protein of 12 to 16 gm. (Eckerson, n.d.)

PROTEIN CONSUMPTION: Protein consumption averaged 58 grams per capita per day; the FAO recommends 41 to 53 grams. Proteins of animal origin made up 10 grams, and the FAO recommendation is 12 grams; but since the vegetable proteins were consumed in combinations which made them nutritionally complete, this apparent deficit is not a major concern. (Schuftan et al., 1980)

RURAL

STAPLE FOODS - JAKIRI: Jakiri is in the rural savannah zone, where the staple food is maize. Supporting crops are yams, Irish and sweet potatoes, beans, and some cassava, groundnuts, and gourds. (Lantum, 1978)

MILLET AND SORGHUM INTAKES- MOKOLO: Among 15 households studied in detail, the mean percent of caloric intake from millet and sorghum was 17% (+19), including 7 households where sorghum beer represented an average of 6% of caloric intake. On market days, nearly all adult household members would drink sorghum beer. (Warrack-Goldman, 1980)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

CASSAVA: Cassava, a major carbohydrate source, also provides leaves which are one of the most important source of green vegetables during the dry season, December to March. (Guyer, 1977)

FOOD SOURCES - MOKOKO: In the Mokolo area, most food, especially sorghum, dried green leaves, cowpeas, and sorrel seed-cakes, came from household stores. Fresh green leaves were gathered or purchased at market. Many poor families made no market purchases except salt and sorghum beer. (Warrack-Goldman, 1980)

PROTEIN SOURCES: Although some families ate dried fish purchased in the market, adequate protein could be obtained from the sorghum, cowpeas, sorrel seed-cakes and dried green leaves found in other households' diets. All households except one had diets in which protein supplied at least 10% of the calories (considered an adequate level). (Warrack-Goldman, 1980)

ANIMAL PROTEINS: Among 15 households studied in detail, 4 consumed protein from animal sources on the day of the survey. (Warrack-Goldman, 1980)

MEAT AND FISH CONSUMPTION: Rural consumption of meat in 1980 was 3.6 kg per capita; consumption of fish was 3 kg. (Schuftan et al., 1980)

MEAT AND MILK: In the North Province, a variety of livestock is raised, mostly to be used in bridewealth payments. Milk is used in the diet and is an important element during times of the year when there are limited supplies of high-quality food. (Bryson, 1979)

SOURCES OF VITAMIN C: Intakes of vitamin C were low because most vegetables were dried and fresh fruits were not eaten. Some vitamin C was obtained through fresh green leaves and an occasional onion. (Warrack-Goldman, 1980)

SEASON, TERRAIN, AND FOOD SUPPLY: In the northern province, many of the communities rely for food primarily on several varieties of rainy season sorghum, which are harvested in October. In areas of flat terrain and heavy clay content in the soil, however, inundation at the height of the rainy season means that residents are unable to count heavily on rainy season crops, but rely instead on dry-season sorghum, which is harvested in March. Therefore, communities in the same region, with similar weather conditions, may be subject to quite different patterns of alternating scarcity and plenty, with the nutritional consequences that such differences may produce. (Berggren and Murray, 1981)

TERRAIN AND SEASONAL FOOD SUPPLY. In the Northern province, communities on higher stretches of ground suffer more from seasonal water shortages than communities near rivers or in other places where the water table is high. Where wells are easily dug, reliable, and abundant, vegetable gardens and fruit trees can be irrigated from the wells, although there is no information on the impact of these gardens on the family diet. (Berggren and Murray, 1981)

SEASONAL HUNGER - NORTH: The pre-harvest "hungry" season occurs between June and August in the North. (Warrack-Goldman, 1980)

STAPLES AND FAMINE - MUSEY: In the north along the Chad border, the Musey had a precarious food supply vulnerable to flooding of the Logone, poor soils and low yields from hunting and fishing. In 1973, the rice-growing Musey suffered famine because of lack of flooding; those whose staple is sorghum had a much less difficult year. (de Garine, 1978)

MEAL PATTERNS: Among tribes of the north, who usually live in polygynous compounds, two systems of cooking are found: under one arrangement, all cooking is done on a given day by one of the wives, who must feed all the women and children. Another arrangement is for each woman to do her own cooking. Granaries may also be either communal or individual; some women have their own granaries from which they may draw additional food for themselves and their own children. (Berggren and Murray, 1981)

MEAL PATTERNS: In the Mokola area during the wet, preharvest season, women take turns cooking. Household members go to the fields at sunrise and the woman who is responsible for meals that day remains in the compound. She carries prepared food to the fields at 8 or 9 a.m., stays and works in the fields and returns with the rest of the household in the later afternoon to prepare the evening meal. (Warrack-Goldman, 1980)

MEAL PATTERNS: The Mafa of the North Province usually eat two meals a day; husband and wife eat together until a child is born. Then, the husband eats alone, and the wife and children share their meal. (Bryson, 1979)

GRAIN PREPARATION: In the North Province, women perform the laborious task of grinding the sorghum or millet used in preparing the paste which serves as a staple in the diet. If they have extra money, women may take their grain to a nearby mill to be ground. (Bryson, 1979)

FUEL SHORTAGES: In some areas, trees are scarce, and animal dung may be burned for fuel. Scarcity of fuel may affect the frequency of cooking, or the thoroughness with which food is cooked. (Berggren and Murray, 1981)

GIZIGA TRIBE: The Giziga are a non-Muslim tribe of the north, who live in villages dominated by the Fulbe tribe, or as the sole or dominant tribe (around Moutouroua). Although they now depend primarily on horticulture, their methods are not sophisticated, and some believe that this is because they were hunter-gatherers until more recently than many of their neighbors. (Berggren and Murray, 1981)

FULBE TRIBE: The dominant tribe in the north is the Fulbe, who depend on stable horticulture and trade as their economic mainstays. They hold the positions of economic and political power in the region, and their

3.1 DIETARY PRACTICES, GENERAL (Cont.)

language is frequently the second language of members of other tribes. Many seem to have become rural horticulturists. (Berggren and Murray, 1981)

ROLE OF FULBE WOMEN: Ideally, Muslim Fulbe women are confined to their homes, forbidden contacts with outsiders, and in general freed from the economic tasks, including water-hauling and garden labor, that are required of women in other tribes. The Fulbe make greater use of hired laborers (non-Fulbe) than other groups. (Berggren and Murray, 1981)

SEX ROLES IN AGRICULTURE: In northern Cameroon, there are alternative patterns of sexual divisions of agricultural labor. In some areas, the men control all the gardens; women work only in their husbands' fields under his supervision. In other areas, women not only work on their husbands' land, but also work their own independent gardens, over which they have more control. The differences may be tribe-specific, or may be a life-cycle phenomenon: older women are more frequently given "permission" to have their own gardens. Other alternatives may also exist. (Berggren and Murray, 1981)

WOMEN AS PROVIDERS: A woman's farm produce is used to feed her children, and any samples may be marketed for cash income. A woman of middle age with many children may have very little surplus to market, and, therefore, very little income to spend on soap, kerosene, and animal protein foods. (Guyer, 1977)

WOMEN AND FOOD PRODUCTION: Women raise the food crops, with little help from the children, who are in school, or the man, who raises cocoa for cash. (Guyer, 1977)

SUBSISTENCE AND SURPLUS: In the cocoa zone, the average woman farms 20 ares of groundnut per year, which can support four people and provide a small surplus of staples to market. (Guyer, 1977)

FOOD CROPS: Food crops commonly grown in the rural areas around Yaounde include maize, groundnuts, yams, melons, macabo, plantain, cassava, okra, peppers, and zom (green vegetables). (Guyer, 1977)

CROPS-NORTH: Agriculture in the North focuses mainly on the production of sorghum, cotton, and groundnuts. (Berggren and Murray, 1981)

MANIOC: Two varieties of manioc are grown: up to half the field is planted in the bitter variety used only for processing into flour, and the remainder is the sweet variety, which is boiled for eating as a household staple. (Guyer, 1977)

FOOD PRODUCTION: In the North Province, the family compound is placed in the middle of the main sorghum field, which the men of the household cultivate. Women cultivate their own fields on which they grow sorghum, sesame, beans, groundnuts, and vegetables. (Bryson, 1979)

CORN PRODUCTION: With the price of corn rising due to demands of breweries and urban residents, more and more farmers are considering it a cash crop, and cultivation is switching from the women to the men. To increase productivity, corn is no longer interspersed with other food crops. (Eckerson, 1977b)

CORN: The local population prefers to eat corn juicy and on the cob, so the harvest is consumed fresh, and drying and storage facilities are few. Grain storage projects aimed at increasing income by holding the grain until several months after harvest, when prices have risen, might also affect consumption patterns. On the other hand, projects which encourage the cash-cropping of corn at the expense of other food crops could have deleterious effects on local food supplies. (Eckerson, 1977b)

DECLINING YAM PRODUCTION: Yams are grown less often because their production is labor-intensive, because production per unit area is low, and because fertility demands are high, so crop failure in exhausted soils is a distinct possibility. Yam has dropped from the status of a major staple to that of an addition for variety. (Guyer, 1977)

COCOA: Cocoa is raised as a cash crop to pay for meat, fish, other goods, medicine, and school fees. (Guyer, 1977)

COTTON: Near the Chad border, cotton is the main cash crop in the non-flooded part of the region. It is alternated with sorghum and millet on plots, which taxes the sandy soils of the area, and has eliminated the former traditional culture of legumes and especially oil-yielding plants such as sesame and peanuts. Cotton also competes with food crops at hoeing time. On the other hand, fertilizer applied for the benefit of the cotton also benefits the sorghum and millet which follow it in rotation; processing creates local jobs; and the oil is used for human consumption and the oilseed cakes for animal feed. (de Garine, 1978)

PLANTATIONS - SOUTH WEST: The plantations of the South-West produce 7% of the total agricultural output of the country, but most of their palm oil, bananas, pepper and rubber are exported, and only the tea is consumed locally. Workers supplement their incomes with individual chop farms, which the women maintain, and cash crops such as cocoa and coffee, which the men grow. Workers have been accused of slighting their plantation work in order to give more attention to their chop farms, on which they grow corn, cassava, cocoyams, yams, and beans. About 70% of the chop farm produce is consumed, and the remainder marketed. Much of the home consumption is lost to weevils and other postharvest losses. (Eckerson, 1977b)

MILK CURES: Food prosperity is demonstrated by the tradition of ostentatious milk cures, "guru," held at certain times of year, particularly during the dry season. Young men, and older men who have not had a death in the family, withdraw with their cows into camps and spend their time gorging on milk and sorghum gruel. The objective is to acquire a figure that they can show off in dances and ritual wrestling matches. (de Garine, 1978)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

MILK CURE: The Massa and Toupouri of the North share a custom known as the "milk cure." Several times during the year, especially in the dry season, young men withdraw into camps with their herds and gorge themselves on milk and sorghum gruel. Although net food production in the area is adequate, the maldistribution resulting from this custom may leave inadequate amounts of foods, especially protein, for vulnerable groups. (Bryson, 1979)

USE OF ANIMALS: Animals, including goats, chicken and cattle, are kept not as food sources but as status symbols, sacrifices on special occasions, and marriage payments. Occasionally, a sick animal is killed and eaten, but only if it seems unlikely to recover. (Nelson et al., 1974)

DECREASING PER CAPITA CALORIE SUPPLY: 2800 calories per person per day were available in 1975-76 but this fell to 2640 calories in 1977-78. Cereal production dropped from 392 grams per capita to 268 grams during this period. Although starches increased from 884 grams to 1980 grams per person, there was a net calorie decrease of 6%. (Gwei, 1980)

NUTRIENT INTAKES: Among 15 households studied in detail, mean per capita intakes of calcium and vitamin C were below recommended allowances, and protein and iron intakes were well above. The mean caloric intake was 90% (+25, with one outlier removed). The standard deviations for all nutrients were quite large. (Warrack-Goldman, 1980)

CALORIE AND PROTEIN INTAKE BY HOUSEHOLD: Among 15 families in the North, 8 consumed less than 90% of the recommended total number of calories for the households based on household members' ages and sexes and WHO recommended intakes; but only 2 consumed less than 100% of the recommended amount of protein. Because of the calorie deficit, some protein value will be wasted by being diverted for use as energy. (Schuftan et al., 1980)

URBAN

FOODS USED: Everyday foods in Douala, imported from the surrounding countryside, include: maize, plantains, tubers, palm oil, and vegetables. Fish and beef are available, but rather expensive. (Drejer, 1980)

URBAN FOOD SUPPLY: Most food for Yaounde comes from surrounding rural areas; in 1975, 45 to 55% came from the Lekie. (Guyer, 1977)

URBAN FOOD SUPPLIES: A program was begun a few years ago to aid in the supply of foodstuffs to Douala and Yaounde, but it is now practically nonexistent. More and more local entrepreneurs are responding to the rising prices in the cities by entering the market, realizing profits of over 100%. Much of the marketed corn is used in beer production. (Eckerson, 1977b)

BREAD CONSUMPTION: Bakeries use 70% of the available commercial wheat flour. Bread consumption increases 5% each year in urban areas, and averaged 23 grams per day per capita in 1980. It would be desirable to make local bread using 70% wheat flour and 30% millet or maize. (Schuftan et al., 1980)

MEAT AND FISH CONSUMPTION: Urban consumption of meat in 1980 was 15 kg per capita; of fish, 35 to 50 kg. (Schuftan et al., 1980)

URBAN DIET PROBLEMS: Urban immigrants may have deficient diets because they are unwilling to use money to obtain food, because the available foods are unfamiliar, and because of budgeting difficulties. (Nelson et al., 1974)

URBAN MIGRATION AND FOOD HABITS: Urban populations are mixtures of ethnic groups, and detailed information is lacking. A 1964 census of Douala found that 60% of the women and 50% of the men had been in the city for less than 10 years, so food-related beliefs may be similar to those in rural areas. (Bryson, 1979)

3.2 DIETARY PRACTICES, WOMEN

3.2.1 DIETARY PRACTICES, WOMEN DURING PREGNANCY

NATIONAL

FOODS DURING LABOR: To give the mother energy or to prevent her from becoming exhausted during labor, she is given honey, soft drinks and other sugar sources, and stimulants such as kola nuts and a tea brewed from the shells of kola nuts. (Colgate, 1981)

3.2.2 DIETARY PRACTICES, WOMEN DURING LACTATION

NATIONAL

INTERCOURSE AND BREAST FEEDING: Women usually abstain from intercourse while breast feeding a child. (Bryson, 1979)

3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS

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

NATIONAL

PRELACTAL FEEDS: Among 299 infants less than 24 hours old born to mothers in Yaounde or in a rural dispensary, 70 (23%) had been given sugar water, 5 (1.7%) had been given plain water, and one had been given orange juice. These liquids were given from small spoons, not bottles. (Colgate, 1981)

DURATION: Among hospitalized children under 1 month old, 71% were still breast fed; 1 to 3 months old, 63%; 4 to 6 months, 82%; 7 to 9 months,

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

93%; 10 to 12 months, 74%; 13 to 18 months, 44%; and 19 to 47 months, 16%. Many of these children (22.5% of the total) were also being given bottle feedings. (Garrett, 1981)

PREVALENCE: In 1973, Martin (1974) found that of 100 mothers from a suburban and semi-rural area 7 km from Yaounde, 95 women breast fed for 5 to 18 months. (Garrett, 1981)

PREVALENCE: Among hospitalized children age 0 to 47 months, 38.1% were breast fed, 22.5% received both breast and bottle, 13.1% received bottles only, and 26.3% received neither. Among the children 0 to 18 months old, these rates were 44%, 27%, 15%, and 14% respectively. Among the children age 19 to 47 months, only 16% were still being breast fed, and 80% received neither breast nor bottle. (Garrett, 1981)

DURATION OF BREAST FEEDING: At 11 months of age, 98% of all infants were breast fed; at 21 months of age, 50% of all children, and 70% in the North, were still breast fed. (Government of Cameroon, 1978)

DURATION OF BREAST FEEDING: An informal survey of health workers indicated that the availability of dry milk and instant formula had little impact on the widespread customs of breast feeding for at least 18 months, and of abstaining from sexual relations during lactation. (Lenglet, 1980)

RURAL

INITIATION: Among mothers interviewed within 24 hours after delivery, 12.2% had nursed once; 23.5% twice; and 64.3% had not yet initiated breast feeding. (Colgate, 1981)

READY ACCESS TO BREAST MILK: Infants not yet weaned appear to be constantly either in their mothers' arms, or strapped to their backs, so the mothers may readily breast feed at any time. (Berggren and Murray, 1981)

DURATION OF BREAST FEEDING: Among Jakiri mothers, 5% breast feed their infants for one year or less; 9% for 13 to 18 months; 46% for 19 to 24 months; 30% for over 24 months; and 9% for unspecified lengths of time. (Lantum, 1979)

DURATION OF BREAST FEEDING: In the North Province, children are carried on their mothers' backs for one year, and are breast fed for at least two years. (Bryson, 1979)

DURATION OF BREAST FEEDING: In Zilli, prolonged breast feeding is accepted as a fertility-depressing practice. 3.2% of women breast fed their children for less than 6 months; 7.9% for 7 to 12 months; 11.2% for 13 to 18 months, and 31.7% for 19-24 months. 46% gave no specific response, but said they breast fed "as long as the baby asked for it." (Lantum, 1979)

DURATION OF BREAST FEEDING: Among women in Ndjore who had breast fed a child, 51% breast fed for one year or less, and only 13% for more than 16 months. (Lantum, 1979)

DURATION OF BREAST FEEDING: 93% of the women studied breast fed for more than one year; 58% for 16-24 months, and 3% for more than two years. (Lantum, 1978)

DURATION OF BREAST FEEDING: In the Jakiri Central village, 80% of the women breast fed their children for more than 20 months; only 1% breast fed for less than 12 months. (Lantum, 1978)

DURATION OF BREAST FEEDING: A fertility survey conducted in Jakiri district found that 99% of women breast feed for at least one year; 89.25% for more than 20 months; and 31.4% for two years or more. (Lantum, 1978)

URBAN

INITIATION: Among mothers in a public maternity ward interviewed within 24 hours after delivery, 16% had breast fed once; 24% twice; and 60% had not yet initiated breast feeding. Among private, higher socioeconomic status mothers, the rates were 12.9%, 6.9%, and 80.2%, respectively. (Colgate, 1981)

RATES OF BREAST FEEDING: Almost all infants are breast fed up to 9 months of age. By 15 months, the proportion varies, from 90% in the North, North-West and East provinces, to 69% in the Central South and 52% in Yaounde/Douala. By 21 months, rates are 51-71%, except in the Central South and Yaounde/Douala, where they are 15%. The North had the highest breast feeding rates for children 18-23 months old: 71%. (Government of Cameroon, 1978)

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING

NATIONAL

WEANING AND DECLINE OF POLYGAMY: Traditionally, sexual relations were resumed when the youngest child could understand instructions or already had his second molars--about 2 years old. Since the decline of polygamy, weaning has been advanced to 15 months for girls and 18 months for boys. (Guyer, 1977)

BOTTLE FEEDING RATES: 25% of all infants age 3-23 months in the Douala/Yaounde sample received artificial or commercial milk feeding. Bottle feeding was frequently used for infants in Yaounde/Douala (30%); for children age 3-5 months in Central South Province (24%) and in the Western Provinces (10%). (Government of Cameroon, 1978)

AVAILABILITY AND IMPACT OF FORMULA: Dry milk and instant formula are available, at CFA 350 (\$1.75) for 400 grams, but health workers and government health officials feel there has not yet been any impact on the

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

widespread customs of breast feeding for at least 18 months, with abstinence from sexual relations during lactation. (Lenglet, 1980)

BOTTLE HYGEINE: Almost all bottles in use were reported, subjectively, as being sterile or clean. (Government of Cameroon, 1978)

FRESH MILK: Fresh milk consumption was limited almost entirely to the North, where 7% of all children age 3-23 months received it. (Government of Cameroon, 1978)

AGE AT SUPPLEMENTATION: From 3 to 5 months of age, the proportion of children receiving any food apart from milk was just under 50%, but ranged from 29% in the North to 77% in the Northwest and West. (Government of Cameroon, 1978)

AGE AT SUPPLEMENTATION: From 6 to 11 months of age, about 70% of children in the North and East received some type of non-milk food, but over 90% in every other province did so. (Government of Cameroon, 1978)

FOODS GIVEN: Among children 6 to 11 months old, less than 40% received any vegetable protein; less than 30%, animal protein; 20%, dark green leafy vegetables; 20%, fruit or vegetable; and 20-60% an oil, depending on the area of the country. By 18 months, most children received the same types of food as the family, but not all families ate foods from all the groups. (Government of Cameroon, 1978)

USE OF SPECIAL FOODS: 40% of infants age 3-11 months received specially prepared foods, such as paps; the prevalence dropped to 25% in the second year. (Government of Cameroon, 1978)

SPECIAL FOODS FOR CHILDREN: Special foods prepared for children include gruel, bouillie, and commercial foods such as Cerelac. (Government of Cameroon, 1978)

COMMERCIAL AND LOCAL WEANING FOODS: At age 3 to 5 months, infants in the Central South Region received commercial weaning foods (17%) and local paps (4%). Proportions in other regions were: East, 13% and 5%; North, 0% and 6%; N. West/West, 15% and 22%; S. West/Littoral, 8% and 26%; and Yaounde/Douala, 34% and 22%. Local paps were usually made of corn, except in the North, where millet and sorghum predominated. (Government of Cameroon, 1978)

COMMERCIAL AND LOCAL WEANING FOODS: At age 6 to 11 months, infants in the Central South Region received commercial weaning foods (10%) and local paps (8%). Proportions in other regions were: East, 7% and 12%; North, 2% and 30%; N. West/West, 3% and 34%; S. West/Littoral, 16% and 28%; and Yaounde/Douala, 28% and 28%. Local paps were made of corn in all regions except the North, where millet and sorghum predominated. (Government of Cameroon, 1978)

COMMERCIAL AND LOCAL WEANING FOODS: At age 12 to 23 months, foods given to infants in the Central South Region included commercial weaning foods

(2%), local paps (5%), and wheat and bread (10). Proportions in other regions were: East, 0, 6%, and 0; North, 0, 55%, and 0; N. West/West, 1%, 10%, 0 and 9% plantains and bananas; S. West/Littoral, 3%, 6%, and 9%; and Yaounde/Douala, 10%, 18%, and 19%. Local paps were usually made of corn, except in the North, where 45% were millet, and 10% were corn. (Government of Cameroon, 1978)

FAMILY FOODS FOR CHILDREN: Family food was shared with 10.9% of children aged 3-5 months, 55.9% aged 6-11 months, and 88.0-95.9% (depending on the province) of those 12-23 months old. (Government of Cameroon, 1978)

FAMILY FOODS - TUBERS: Tubers were commonly consumed by all families, except in the North. Children age 6 to 11 months consistently received tubers 20 to 40% less often than the family; this deficit was the worst in the East. Children age 12 to 23 months received at least one type of tuber almost as frequently as the family. (Government of Cameroon, 1978)

FAMILY FOODS - CEREALS: Cereals were consumed by families mostly in the North, North-West, and West Provinces and in Yaounde-Douala. Children age 6 to 11 months received at least one type of cereal almost as frequently as their families in all areas, except in the North, where the deficit was high; 98% of all families ate cereals, but only 51% of children. The child deficit was much less in the group age 12 to 23 months. (Government of Cameroon, 1978)

QUALITY OF WEANING FOODS: Mothers in most ethnic groups begin providing supplemental foods by the sixth month, but the foods used are of low nutritional quality and are too bulky for the child to consume in sufficient quantities. (Bryson, 1979)

LACK OF WEANING FOODS: Up to 30% of children 6-11 months old (particularly in the North and East Provinces) do not receive any food other than milk, and an additional 20-30% receive pap as their only source of food. (Government of Cameroon, 1978)

BEER PURCHASES REPLACE FOOD: Beer consumption is increasing rapidly; a physician with the school health service believes that the diversion of income for beer has deprived children of needed food. (Lenglet, 1980)

RURAL

RATE OF BOTTLE FEEDING: The percentage of children being bottle fed was 7.1% at 3-5 months, 4.0% at 6-11 months, and 1.5% at 12-23 months. (Government of Cameroon, 1978)

ANIMAL MILKS: Unprocessed animal milk was given to 4.7% of infants 3-5 months old; 4.8% age 6-11 months, and 3.7% age 12-23 months. Reconstituted dry milk or formula was given to 3.5%, 0.9%, and 1.4% respectively. (Government of Cameroon, 1978)

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

NO MILK: No milk of any type was given to 0.9% of rural infants 6 to 11 months old, 12.5% of those 12 to 17 months old, and 41.3% of those 18 to 23 months old. (Government of Cameroon, 1978)

INTERGROUP DIFFERENCES: Substantial differences exist between tribal groups and communities regarding weaning practices, including age at introduction of foods, foods used, age at termination of breast feeding, the manner in which children are fed, and the physical relationship between the mother and child. (Berggren and Murray, 1981)

VARIETY OF FEEDING PRACTICES: Despite common climate and region, tribes of the north differ substantially from each other in child feeding practices. Practices may be influenced not only by cultural factors, but also by local differences in water sources, fuel, and other ecological factors. Therefore, practices cannot be assumed to apply beyond the community where they are observed. (Berggren and Murray, 1981)

OBSTACLES TO FOOD FOR CHILDREN: Mothers often must spend long days in the field producing food crops, and additional time collecting wood and water. They cannot cook for young children during the day, nor can the child-minders--older children and elderly women. If the young children are fed at all, they get leftovers which may not be appetizing. (Bryson, 1979)

EFFECTS OF MOTHERS' ABSENCE: In some communities in the northern province, at some times of year women must spend most of their time walking great distances to fetch water. These absences may prevent preparation of weaning foods for children, and the scarcity of water may affect the incidence of infectious diseases among the children. (Berggren and Murray, 1981)

BETI AND EARLY SUPPLEMENTATION: The Beti believe an infant needs food, so mashed yam, bananas, and cassava are given from the first days of life. (Bryson, 1979)

WEANING AND WALKING: The practice of weaning a child when it begins to walk, just when the child requires additional calories to meet the demands of increased activity, often results in inadequate nutrient intake. (Bryson, 1979)

URBAN

RATE OF BOTTLE FEEDING: The percentage of children being bottle fed in Yaounde/Douala included 32.0% of those 3 to 5 months old, 29.0% of those 6-11 months old, 16% of those 12-17 months old, and 3.9% of those 18-23 months old; in other urban areas, the rates were 10.7%, 11.9%, 4.5% and 0.0%, respectively. (Government of Cameroon, 1978)

AGE AT INTRODUCTION OF BOTTLE: Among infants under one year receiving bottle feedings, 34% had begun before 7 days of age; 44% between 7 days and 1 month; 14% between 1 and 3 months; and 8% after 3 months of age. (Drejer, 1980)

BOTTLES SUPPLEMENT BREAST: Among infants under one year attending a maternal and child care center, 14% received bottle feedings, but only 1% received bottles exclusively; 80% of the bottle fed children were also breast fed. (Drejer, 1980)

REASONS FOR BOTTLE FEEDING: Reasons given for bottle feeding included: insufficient milk (59%), ill health of mother (16%), working mother (11%), "bad milk" (4%), and other reasons (10%). (Drejer, 1980)

COST OF BOTTLE FEEDING: In 1974, the price of powdered formula sufficient to feed a six week old infant was 35% of the minimum wage, and 22% of the salary of a skilled carpenter. (Drejer, 1980)

NUMBER OF BOTTLES OWNED: Among mothers giving bottle feedings, 62% had only one feeding bottle, 34% had two, 4% had three, and none had more than 3. (Drejer, 1980)

BOTTLES PREPARED INCORRECTLY: Half of all bottles prepared from powdered formula were prepared in the wrong proportions: 19% were insufficiently diluted, and 31% were overdiluted, including 8% which contained only one third the recommended concentration of milk powder. (Drejer, 1980)

SOURCES OF ADVICE TO BOTTLE FEED: Bottle feeding mothers in Douala had been advised to do so by midwives (30%), doctors (4%), nurses (3%), social workers (1%), and others not in medical work (62%). (Drejer, 1980)

BOTTLE FEEDING AND HEALTH CARE: In one Mother and Child Care Center, many female nurses bottle fed their own children. Instruction in bottle feeding was given only to mothers already doing so, but many lacked the facilities to prepare bottles properly. (Drejer, 1980)

NO MILK: No milk of any type was given to 2.2% of infants age 6-11 months in Yaounde/Douala, 36.2% of those 12-17 months, and 80.8% of those 18-23 months. In the remainder of urban areas, the rates were 1.9%, 18.8% and 47.5%. (Government of Cameroon, 1978)

ARTIFICIAL MILKS: Artificial milk, including all processed milks, was given to 23.4% of infants 3 to 5 months old in Yaounde/Douala; to 25.4% of those 6 to 11 months; 11.7% of those 12 to 17 months, and 7.7% of those 18-23 months. In the remainder of urban areas, rates were 3.6%, 6.4%, 2.9% and 1.0% respectively. (Government of Cameroon, 1978)

ANIMAL MILKS: Fresh animal milk was given to none of the infants under 12 months old, to 0.7% of infants 12-23 months in urban Cameroon, and 0.5% of those in the Yaounde/Douala sample. (Government of Cameroon, 1978)

AVAILABILITY OF MILK: Virtually no fresh milk is available in urban areas, although powdered milk formulas are widely advertised and available. (Guillozet, 1976a)

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

COMMERCIAL WEANING FOODS: Commercial weaning foods were eaten by 30% of infants aged 3-11 months in the Yaounde/Douala sample. (Government of Cameroon, 1978)

COMMERCIAL WEANING FOODS: Among children under one year old attending a maternal and child care center, 21% received imported commercial infant foods as supplements to breast milk, and did not receive bottle feedings. (Drejer, 1980)

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

NATIONAL

PROTEIN AVAILABILITY: Protein foods are widely available, but many children whose parents could afford an adequate diet nevertheless suffer from malnutrition because of inappropriate dietary practices. (Guillozet, 1976a)

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE

NATIONAL

FOODS FOR FEVER AND MEASLES: Withholding food and liquids from children with fever or measles is customary. (Guillozet, 1976a)

INDIGENOUS MEDICATIONS: Part of the profits from the newly established pharmaceuticals industry is to be used for research on indigenous medications being used by indigenous practitioners, including the "guerisseurs." (Guillozet, 1976a)

TRADITIONAL PRACTITIONERS: Traditional medical practitioners are influenced to some extent by modern science; they may use injections and antibiotics. People often alternate between traditional and modern doctors. (Nelson et al., 1974)

TRADITIONAL PRACTITIONERS: Indigenous practitioners are frequently consulted in addition to modern hospitals. They utilize scarification of sites specific to a malady, which seems especially successful in dealing with mental illness. No effort is made to mimic or compete with modern facilities. (Guillozet, 1976a)

TRADITIONAL HEALERS: The national association of traditional healers reported that there were 4,000 well-accepted and initiated traditional medicine men in Cameroon, and several thousand others who were casual non-initiates who practiced other trades but had mastered the treatment of one or more diseases and treated them occasionally when professionals were not available. (Lantum, 1977)

RURAL

TREATMENT FOR DYSENTERY: Traditional healers in Bui division treat dysentery by administering herbal mixtures cooked in water and then feeding specific medicine in red palm oil to eat for 4 days. (Lantum, 1977)

TRADITIONAL MEASLES TREATMENT: Traditional healers in Etan treat a child with measles by giving the patient a drink made of water and leaves which have been heated in the sun. Cassava leaves mixed with water and lime juice, heated in the sun, are given as a drink and also used to rub on the child's body. (Lantum, 1977)

TRADITIONAL HEALING HERBS: Traditional healers treat many illnesses, using herbs and leaves prepared by soaking, grinding, burning (the ashes are used), or cooking in water, oil, or honey. Professional teams are not cataloguing the plants and their preparation, uses, and locations. (Lantum, 1977)

TRADITIONAL BIRTHS: Among the Toupouri of the North Province, birth takes place in the woman's room, assisted by an elderly woman and by the husband. (Bryson, 1979)

TRADITIONAL BIRTH ATTENDANTS: Mafa women in the North Province usually give birth at home, assisted by an older, experienced woman who is usually the wife of a blacksmith. She does not provide much pre-natal care but does visit the pregnant woman at the eighth month to check if the baby is in the right position; if not, she turns it. (Bryson, 1979)

ORGANIZATION AND ASSIMILATION OF TRADITIONAL HEALERS: In Jakiri district about 40 traditional healers have, since 1970, banded together in an association, which probably claims most of the local families' health budgets. They are gradually being initiated into the national primary health care system, taking part in sanitary campaigns, case detection, and referrals. The traditional birth attendants among them will be trained for integration in the health network. (Lantum, 1979)

URBAN

CHILD SPACING: In 1972, 18-19% of marriages were polygamous. Polygamy allows for traditional child spacing because a woman in a polygamous marriage does not resume sexual relations soon after childbirth. (Nasah et al., 1976)

4. NUTRITION STATUS CORRELATIONS

NATIONAL

UNDERWEIGHT AND FAMILY FOOD DISTRIBUTION: Children age 6 to 23 months who shared food with the family were far less likely to be underweight than those who did not share food. (Government of Cameroon, 1978)

WEIGHT AND SUPPLEMENTAL FOOD: The prevalence of underweight was far less in children aged 6 to 11 months who received some food (other than milk) as compared with those who did not. This finding tends to support the problems of weaning found in the North and East. (Government of Cameroon, 1978)

MALNUTRITION CORRELATES IN NORTH PROVINCE: The highest rates of acute undernutrition, underweight and arm wasting were found in North Province, which also had: greatest percent of agricultural workers as subsistence farmers, lowest literacy rates for mothers, most traditional houses, least access to health care and services, highest mortality rate for measles, greatest percent of unprotected wells, and families the greatest distance from water. (Government of Cameroon, 1978)

NUTRITION STATUS AND CLIMATE: The varied diet permitted by the climatic conditions, and the fact that harvests can be staggered throughout the year, have contributed to a relatively favorable nutritional status in Cameroon, as compared to other Sub-Saharan countries. (Bryson, 1979)

NUTRITION SURVEY RISK FACTORS: Bearing in mind the study's limitations, the National Nutrition Survey of 1978 points to several specific risk factors for chronic undernutrition or underweight. Factors which deal with demographic, socioeconomic, health, and diet characteristics can further identify target groups on a more functional approach than simple age and geographic categories. (Government of Cameroon, 1978)

NUTRITION SURVEY RISK FACTORS: The National Nutrition Survey found the following 14 "at risk" variables of significance: household size more than 10 members; over 4 dependents under 5 years in household; household head a farmer; household structure traditional or improved, not concrete; family owned more cattle, sheep, or goats; someone other than mother cared for child; mother illiterate in English, French, and other languages; child not born in a hospital; child with no birth or clinic record; recent onset of fever, diarrhea, or illness; children age 3 to 5 and 6 to 11 months receiving no food other than milk; children age 6 to 11 and 12 to 23 months who received no family food; children age 12 to 23 months still being breast fed; and children of all ages who received lower dietary evaluation ratings for variety, energy-containing, and protein-rich food groups. No association was found between undernutrition and sex of child, age of mother, or birth order of child. In interpreting these results, one must remember that correlation is not necessarily causation. (Government of Cameroon, 1978)

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4. NUTRITION STATUS CORRELATIONS (Cont.)

BOTTLE FEEDING AND HOSPITALIZATION: Among hospitalized children age 0 to 47 months, 13% of the bottle-fed children had been hospitalized before, as had 8% of the breast-fed children and 8% of the children receiving both breast and bottle feedings ($p=0.0002$). (Garrett, 1981)

BIRTH WEIGHTS AND INCOME: Average birth weights were 337 grams lower for infants born to low-income mothers than infants of middle-income mothers. (Schuftan et al., 1980)

LOCAL AND INTERNATIONAL GROWTH STANDARDS: A special group of 506 children under 5 years old from Douala families of relatively high socioeconomic status was included in the national survey. Their group curves, especially that of weight for age, corresponded closely to those of the National Academy Sciences reference median, confirming the validity of using those standards for the population of Cameroon. The national mean curves fell between 90% and 100% of the reference mean for height for age, and between 80% and 100% of the reference mean for weight for age. (Government of Cameroon, 1978)

UNDERNUTRITION AND BREAST FEEDING: Children age 12 to 23 months who were breast fed or having any milk were more likely to have chronic undernutrition and underweight than those without milk, of the same age. Other factors which may be related to this finding include inadequate foods other than milk. (Government of Cameroon, 1978)

PEM AND DIET: Significantly higher rates of underweight and chronic undernutrition were found among children age 3-11 months receiving no food other than human or animal milk; among children age 6-23 months who received no family food; among children age 12-23 months still being breast fed; and among children of all ages who received smaller numbers of total energy-containing and protein-rich food groups. (Government of Cameroon, 1978)

PEM AND HOUSEHOLD COMPOSITION: Significantly higher rates of chronic undernutrition and underweight were found among children in households with more than 10 members and in households with four or more children less than 5 years old. (Government of Cameroon, 1978)

WEIGHT FOR HEIGHT AND ARM CIRCUMFERENCE: Arm circumference findings based on the recommended ranges (under 12.5 cm., definitely malnourished; 12.5-13.4, probably malnourished; and over 13.5, well nourished) identified only 50.0% of all children with acute undernutrition (under 80% of standard median weight for height). This is a rather low sensitivity, indicating that the ranges might need to be adjusted. On the other hand, arm circumference successfully identified 90% of all children who were not underweight and had no acute undernutrition. (Government of Cameroon, 1978)

MALNUTRITION AND MEASLES MORTALITY: There was a weak but consistently positive correlation (.10 to .29, depending on type of malnutrition) between the rate of undernutrition at a study site and the case-specific measles mortality rate. The highest correlation was with arm wasting; the

weakest, with chronic PCM. There was no consistent relationship between undernutrition and non-measles fatality rates; the correlation was even negative in the cases of underweight (-.05) and arm wasting (-.11). (Government of Cameroon, 1978)

UNDERNUTRITION AND MATERNAL GOITER: For the country as a whole, children age 6 to 23 months of mothers who had obvious goiter were more likely to have chronic undernutrition and arm wasting than children of mothers without such a goiter. Goiter in the mother may result in cretinism or poor growth in a young child. (Government of Cameroon, 1978)

UNDERNUTRITION AND INFECTION: Children age 6 to 11 months were much more likely to have acute mild undernutrition (under 85% of reference median weight for height) if they were ill or had fever or diarrhea during the previous week; the same result occurred with recent arm wasting (under 82.5% of reference median arm circumference for height). The same positive relationship between ill health and undernutrition was found for children age 12 to 23 months, with the addition of underweight and arm wasting, and for diarrhea, chronic undernutrition. This last finding suggests that the illnesses had been recurrent in the past and the survey simply identified one recent cycle (the previous week). (Government of Cameroon, 1978)

UNDERNUTRITION AND METHOD OF COOKING: Children in households which cooked with wood were more likely to be undernourished than those in households that cooked with gas or kerosene. This indicator of socioeconomic status reflects degree of urbanization. (Government of Cameroon, 1978)

MALNUTRITION AND SEX: There was no significant correlation between the sex of a child and prevalence of malnutrition, with regard to the whole country. (Government of Cameroon, 1978)

PEM AND SOCIOECONOMIC FACTORS: Significantly higher rates of chronic undernutrition and underweight were found among children in households headed by farmers; among children cared for by someone other than their mothers; and among children of illiterate mothers. (Government of Cameroon, 1978)

PEM AND SEX, BIRTH ORDER, AND MOTHERS' AGE: No statistical relationships were found between underweight or chronic undernutrition and sex of child, age of mother, or birth order of child. (Government of Cameroon, 1978)

UNDERNUTRITION AND BIRTH ORDER: In the N. West/West provincial grouping, children under five years old with a high birth order were more likely ($p < .05$) to have chronic undernutrition. (Government of Cameroon, 1978)

UNDERNUTRITION AND CHILD CARE: There was a greater prevalence of chronic undernutrition when someone other than the mother took care of a child, both in the total country and in the North Province ($p < 0.05$). (Government of Cameroon)

4. NUTRITION STATUS CORRELATIONS (Cont.)

UNDERNUTRITION AND LITERACY: Children whose mothers could read neither English nor French had a greater prevalence of chronic undernutrition, underweight, and arm wasting than children of mothers who could. No association was found in Central South, and none was found in the North because there were too few mothers who could read these languages to be able to examine the relationship with child undernutrition. (Government of Cameroon, 1978)

UNDERNUTRITION AND LITERACY: Children of mothers who could read French or English were much less likely to be undernourished (chronic, underweight, or arm wasting). The S. West/Littoral Province (for English) and Yaounde/Douala (for French) showed a lower prevalence of child undernutrition when the mother could read French or English. (Government of Cameroon, 1978)

UNDERNUTRITION AND MOTHER'S AGE: There was no difference in undernutrition prevalence according to age of mother. Low sample sizes in mothers aged over 40 years limited this investigation to the under-21 and 21 to 40 year age groups. (Government of Cameroon, 1978)

CHRONIC UNDERNUTRITION AND HOUSEHOLD SIZE: Both in the country as a whole and in Yaounde/Douala, the greater the number of children under five years sample per household, the more likely ($p < 0.05$) they had chronic undernutrition. This may suggest that a high number of dependents in a household is related to this type of malnutrition. (Government of Cameroon, 1978)

UNDERNUTRITION AND OCCUPATION OF HOUSEHOLD HEAD: For the whole country, children who belonged to a household whose head was a farmer or unemployed had a higher percentage of chronic undernutrition, underweight, and arm wasting than those whose head was in a professional or other occupation category. This result may confirm urban/rural differences in prevalence rates for undernutrition for the country as a whole as well as for certain provinces. (Government of Cameroon, 1978)

UNDERNUTRITION AND ANIMAL OWNERSHIP: In almost all instances, the presence of undernutrition was positively associated with the number of animals owned; the more animals owned, the more likely the child had undernutrition. Families with more animals may be more rural, have less food available for their young children, or have poorer access to services. (Government of Cameroon, 1978)

UNDERNUTRITION AND TYPE OF HOUSE: Children who lived in traditional houses were more likely to be undernourished than those who did not. In most instances there was a gradation of reduced undernutrition prevalence, the highest for traditional houses and the lowest rates for concrete houses. These findings emphasize the importance of socioeconomic status as it relates to undernutrition. (Government of Cameroon, 1978)

PEM AND HEALTH SERVICES: Significantly higher rates of underweight and chronic undernutrition were found among children who were not born in

hospitals, had no birth or clinic records, or had a recent onset of fever, diarrhea, or other illness. (Government of Cameroon, 1978)

MALNUTRITION AND HEALTH RECORDS: Children were more likely to be underweight and have arm wasting if neither a birth record nor a clinic record was available at the time of interview. This may be related to degree of urbanization and health service availability; clinic records were used only when birth records were unavailable. (Government of Cameroon, 1978)

MALNUTRITION AND BIRTHPLACE OF CHILD: For all types of malnutrition, a child born in a hospital or clinic was least likely to be undernourished; a child born at home without a TBA (traditional birth attendant) was of intermediate risk; and one born at home with a TBA had the greatest likelihood of being undernourished. (Government of Cameroon, 1978)

CHILD HEIGHT AND MATERNAL STATURE: Of all children with "short" mothers (under 150 cm), 33.5% had chronic undernutrition; among children of average mothers, the rate was 24%, and among children of tall mothers, 11.7%. However, only 13.6% of all children with chronic undernutrition had a short mother, so environmental factors were more important in relation to the nutritional status of the young child. (Government of Cameroon, 1978)

WEIGHT AND FEEDING METHOD: Regression of admission weights of hospitalized children age 0 to 47 months, on feeding method and age, found a significant positive association between weight and breast feeding, an insignificant positive association with mixed breast and bottle feeding, and a negative association with bottle feeding which was not significant statistically. (Garrett, 1981)

WEIGHT AND FEEDING METHOD: Among hospitalized children age 0 to 24 months, less than half of the bottle-fed children attained 80% of the expected weight for their ages, as compared with 49% of those on mixed feedings and 58% on breast feeding. The proportion of bottle-fed children reaching less than 60% of the expected weight for age was twice that found in the breast or mixed-feeding groups (22.2% vs. 10.1%). (Garrett, 1981)

ETHNIC GROUP AND FEEDING METHOD: There was a significant difference among ethnic groups in feeding method (breast vs. bottle feeding) of hospitalized children age 0 to 47 months ($p=.007$). Over 67% of the children came from the predominating Beti and Bamileke tribes. Mothers of the more traditional Bamileke and northern tribes breast fed 61 and 47% of their children, respectively, as compared to 34% of the Beti and 19 to 27% of the remaining groups. (Garrett, 1981)

SEX OF CHILD AND FEEDING METHOD: Sex was not a significant variable in relation to feeding method (breast vs. bottle) among hospitalized children. (Garrett, 1981)

4. NUTRITION STATUS CORRELATIONS (Cont.)

BREAST FEEDING AND MOTHER'S AGE: Among mothers of hospitalized children age 0 to 47 months, there was a slight but not significant negative correlation between mother's age and the decision to breast feed. (Garrett, 1981)

FEEDING, BIRTH WEIGHT, AND BEHAVIOR: Better behavioral scores among neonates were associated with higher birth weight, recent feeding, and frequent feeding in the postpartum hospital ward. (Colgate, 1981)

FEEDING FREQUENCY AND ABNORMAL REFLEXES: Among healthy infants less than 24 hours old, those who had not eaten in over three hours had significantly more abnormal reflexes than those more recently fed. (Colgate, 1981)

BEHAVIOR, ANEMIA, AND FIRST FEEDING: Some association was found between neonate behavior scores and both maternal anemia in pregnancy and age when first fed. (Colgate, 1981)

DIETARY ADEQUACY AND FOOD PRODUCTION: In the early 1970s, total food production was adequate, but diets were often deficient because of regional, seasonal, or cultural factors, and inadequate storage and transportation. (Nelson et al., 1974)

POLYGAMY AND FOOD DISTRIBUTION: Polygamy is still practiced commonly. Younger wives may be in a servant status relative to the senior wife. The requirement that they do work for the senior wife may make it difficult for them to produce sufficient food for themselves and their children. (Bryson, 1979)

DISEASE AND SANITATION: Typhoid, cholera, amebiasis, and gastroenteritis abound in humid areas of the country, where latrines are rare and water is drawn from streams. (Guillozet, 1976a)

RURAL

MALNUTRITION AND INFECTION: The National Nutrition Survey confirmed that the nutritional status of rural children was partly dependent upon the number of days of illness experienced by the children just prior to examination. (Berggren and Murray, 1981)

BIRTH WEIGHT AND BIRTH ORDER: Primiparous births accounted for 24% of all births; mean weight of primiparous births was 2958 grams, while that of multi-parous births was 3154 grams (a significant difference, $p < 0.001$). (Lewis, 1974)

BIRTH WEIGHT AND SEASON: Birth weights were significantly lower in the rainy months of July, August, and September ($p < 0.01$), and then increased progressively to reach a peak in February, near the end of the dry season. (Lewis, 1974)

BIRTH WEIGHT AND SEASON: Food supplies are abundant during the dry season, and mean birth weights are greatest during that period. (Lewis, 1974)

BIRTH WEIGHT AND MOTHER'S WEIGHT: Paired maternal weights and weights of their babies at birth were positively correlated ($r=+0.38$). (Lewis, 1974)

POPULATION AND FOOD SHORTAGES: Regional population pressures have resulted in chronic undernourishment and seasonal food shortages. Impoverishment of overused soil and resulting crop failures have necessitated resettlement projects for populations in the northern plains and the South Central Province. (Nelson et al., 1974)

URBAN

UNDERNUTRITION AND MEASLES MORTALITY: A clear positive correlation was found between measles mortality and nutrition status. (Government of Cameroon, 1978)

UNDERNUTRITION AND OCCUPATION OF HOUSEHOLD HEAD: In the Yaounde/Douala sample, children of non-professionals had a higher prevalence of chronic undernutrition than those whose household head was a professional. (Government of Cameroon, 1978)

MALNUTRITION AND INCOME: Incidence of malnutrition is in inverse proportion to income. Among 315 malnourished infants studied at Yaounde Hospital, 53% had unemployed households, 16% were children of farmers, 25% were from middle-income families, 7% were from upper-income families, and none were from families of the highest socioeconomic category. The small numbers of farmers' children may be due to the fact that the hospital is in a major city. (Schuftan et al., 1980)

BOTTLE FEEDING AND FATHERS' EMPLOYMENT: Infants of fathers with "more rewarding" jobs were more frequently bottle fed than infants of fathers from other categories. (Drejer, 1980)

BOTTLE FEEDING AND EDUCATION: Higher educational level of the mother was associated with increased bottle feeding incidence. (Drejer, 1980)

BOTTLE FEEDING AND MOTHER'S AGE: Incidence of bottle feeding increased with the ages of mothers over 25 years. (Drejer, 1980)

BOTTLE FEEDING AND SOCIOECONOMIC STATUS: Bottle feeding incidence rises when household facilities are relatively more sophisticated. (Drejer, 1980)

FOOD EXPENDITURES AND INCOME: In Yaounde between 1978 and 1980, households with monthly incomes under 30,000 FCFA spent 80% of their income on food; FAO recommends that a maximum of 45% of income be spent on food. An overall average of 50% of household income was spent on food, but expenditures ranged from 272 FCFA per capita per day in

4. NUTRITION STATUS CORRELATIONS (Cont.)

households of 2, to 100 FCFA per capita per day in households of 10. (Schuftan et al., 1980)

FOOD EXPENDITURES AND INCOME: In Douala between 1978 and 1980, 57% of total household revenues were spent on food; families with monthly incomes under 30,000 FCFA spent over 90% of their incomes on food. In Garoua, 47% of revenues were spent on food. (Schuftan et al., 1980)

DIET AND INCOME: In many urban families, total income is less than the amount required to purchase a minimally adequate diet. (Schuftan et al., 1980)

PREMATURITY AND INCOME: Among infants born to an indigent patient group in Yaounde in 1974, the rate of prematurity, based on birth weight, was 10.8%; among infants born to the prosperous patient group, the rate was 5.9%. (Guillozet, 1976b)

BIRTH WEIGHT AND SOCIOECONOMIC STATUS: At the maternity unit in Yaounde, birth weights among indigent patients averaged 3.114 kg. Among a prosperous patient group, birth weights averaged 3.25 kg. (Guillozet, 1976b)

BIRTH INTERVAL AND SOCIAL CLASS: Among 540 women seen at the family planning clinic in Central Hospital, Yaounde, average child spacing interval was 24.5 months among upper and middle-class women, and 25.6 months among lower-class women. (Nasah et al., 1976)

BIRTH INTERVALS AND MOTHER'S EDUCATION: Among 540 women seen at the family planning clinic at Central Hospital, Yaounde, birth intervals ranged from 23.7 months for university educated mothers to 27.25 months for illiterate mothers. (Nasah et al., 1976)

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

5.1 NUTRITION AND HEALTH POLICIES

NATIONAL

DEVELOPMENT PLAN - NUTRITION CONTEXT: Within the Development Plan for 1976-1981, nutrition is treated in the context of economic, social and cultural development with an essential aim of making Cameroon self-sufficient in food production within the next decade. (U.S.A.I.D., 1979)

DEVELOPMENT PLAN - NUTRITION COMPONENTS: The basic components of the nutrition plan are 1) the eradication of goiter; 2) the attainment of adequate production levels for basic foodstuffs to insure a balanced and nutritious diet for the population; 3) nutritional research; 4) the increase in revenue and purchasing power of the population; 5) the improvement of food marketing and distribution throughout the country; 6) the extension of preventive health services; and 7) supplemental feeding programs. (U.S.A.I.D., 1979)

NATIONAL NUTRITION POLICY: The recent National Nutrition Survey showed multisectoral integration; it combined personnel from the Ministries of Social Affairs, Agriculture, Education, Health, Livestock and Planning. (U.S.A.I.D., 1979)

PROPOSED NUTRITION PLANNING PROJECT: In 1977-1979, USAID provided funding for nutrition advisors and interventions in the nutrition sectors, preliminary to a proposed \$1 million Nutrition Planning Project to be conducted in 1981-83, which will incorporate elements of training, technical assistance, and commodities. (U.S.A.I.D., 1979)

NUTRITION SURVEY PARTICIPANTS: The Cameroon National Nutrition Survey of 1977-1978 was administered by the Ministry of Economy and Planning (MINEP); also participating were the Ministries of Health, Social Affairs, Agriculture, Education, and Armed Forces. Aid was also provided by UNDP, UNICEF, WHO, and USAID. (Government of Cameroon, 1978)

NATIONAL NUTRITION SURVEY RECOMMENDATIONS: Short-term recommendations drawn from the findings of the National Nutrition Survey include: (1) the creation of a national structure responsible to study problems of food and nutrition; (2) the convening of a seminar/workshop in Yaounde; (3) the eradication of goiter; (4) the intensification of vaccination campaigns against measles; and (5) the preparation of a program of promotion and nutrition education. (Government of Cameroon, 1978)

NATIONAL NUTRITION SURVEY RECOMMENDATIONS: Long-term recommendations drawn from the findings of the National Nutrition Survey include: (1) the training of qualified personnel at all levels; (2) longitudinal studies focusing on seasonal and regional problems; (3) research on anemia; and (4) the creation of dietetic experimentation and rehabilitation centers. (Government of Cameroon, 1978)

NATIONAL NUTRITION SEMINAR: Following the National Nutrition Survey, a National Nutrition Seminar was held to assess the survey results, and to

5.1 NUTRITION AND HEALTH POLICIES (Cont.)

synthesize this data and other information about food and nutrition in Cameroon, and recommend policy and future activities. Attendees included 60 representatives from 6 Ministries, as well as scientific, academic, international, and private voluntary agencies. They prepared preliminary reports on nutrition and health status quo, including all known activities and research, met to discuss these findings, and presented at the end of the conference a report of their major findings and recommendations. (Ministry of Economic Affairs and Planning, 1979)

NATIONAL NUTRITION SEMINAR FUNDING: \$15,000 joint funding for the National Nutrition Seminar of 1979 was provided by UNDP/UNICEF/USAID. (USAID, 1979)

RECOMMENDED NUTRITION POLICY DEVELOPMENT: The First National Nutrition Seminar, held in April 1979, recommended the formation of an Interministerial Food and Nutrition Committee to develop a national nutrition strategy. The USAID-financed Nutrition Adviser/Planner in the Ministry of Economy and Planning assists the Committee in strategy development. (Lenglet, 1980)

NATIONAL NUTRITION SEMINAR RECOMMENDATIONS: The 38 recommendations of the seminar, based on gathering all available information on nutrition, agriculture, and health, were presented in general operational terms. For example, the recommendations concerning maternal nutrition include: "the treatment of malnutrition and its causes in a fashion that utilizes dietetic, medicinal, and socioeconomic possibilities"; "the promotion of mass nutrition education"; and "the institution of prenatal visits for appropriate groups that include . . . nutritional education for weaning." Many of the recommendations addressed underlying problems in agriculture, food distribution, transportation, and administration and management. (Ministry of Economic Affairs and Planning, 1979)

NATIONAL NUTRITION SEMINAR RECOMMENDATIONS: Recommendations of the First National Seminar on Nutrition (Yaounde, 9-12 April 1979) included advocacy of breast feeding and careful supervision of bottle feeding when it occurred, the development of local weaning foods, and the "control by health services of advertising concerning food and drink," but these recommendations have not yet been acted upon. (Lenglet, 1980)

NUTRITION EDUCATION CONFERENCE: A Regional Conference on the Use of Mass Media in Nutrition Education, organized by the Ministry of Public Health, was held in June 1979 to provide an overview of nutrition education approaches using mass media, including cases on Tunisia, Guatemala, Nicaragua, and Tanzania. (Lenglet, 1980)

HEALTH EDUCATION CONFERENCE: The Ministry of Health's Health Education Service had planned a national conference on Health Education in the School System for December 1981. (Leslie and Parlato, 1981)

HEALTH POLICY: Minister of Health Paul Fokam Kamga has spoken of the necessity of mobilizing the population so that they can participate actively in the effort to improve health undertaken by public and private organizations. This is done primarily through education. (Lenglet, 1980)

GOVERNMENT EXPENDITURES: In 1977, the central government expenditure for health was \$3 U.S. (1975 dollars) per capita; expenditures on health were \$11, and on defense, \$5. (World Bank, 1981)

BREAST FEEDING POLICIES: Mothers are granted maternity leave with pay and are allowed to take nursing breaks during working hours. (Nasah et al., 1976)

NURSING BREAKS: Labor laws provide women with a paid nursing break of one hour per day until the child is 15 months of age. (Bryson, 1979)

NURSING BREAKS: Cameroon law provided for two half-hour nursing breaks until the child was fifteen months old. The law does not specify whether mothers are paid for this time. (Richardson, 1975)

SOCIAL WELFARE: The 1967 labor code of the Ministry of Labor and Social Legislation provides hygiene standards for private enterprises, provides certain medical services, including payments to pregnant women, and provides a system of allowances to families with children. These programs have been hampered by personnel problems and their exclusion of family enterprises. Most people continued to rely on traditional methods of ensuring welfare. (Nelson et al., 1974)

POPULATION MONITORING: The Bureau Central de Recensement (BCR) has enumerated every village and its total population, and has indicated each village on a detailed map. They have cooperated with the DGRST in the identification of samples for their survey. (Berggren and Murray, 1981)

AGRICULTURE POLICY: The Green Revolution Policy of 1972/73 called for increased food production for domestic use. Cocoa, coffee, lumber, and bananas are the predominant exports, accounting for 70% of all exports in 1974/75. (Government of Cameroon, 1978)

AGRICULTURE POLICY: Major efforts are underway to develop interior markets for foodstuffs and the government is working to improve crop support infrastructures whereby increased services will be provided to farmers. (Government of Cameroon, 1978)

AGRICULTURE POLICY: The government's priorities for agricultural investment are focused on products for export, rather than on the nutritional needs of the population. (Schuftan et al., 1980)

AGRICULTURE POLICY PRIORITIES: 60% of the total budget under the Third Plan was designated for agricultural-industrial operations. The Ministry of Economy and Planning recommended that the next plan place more emphasis on rural peasant agriculture. (Schuftan et al., 1980)

5.1 NUTRITION AND HEALTH POLICIES (Cont.)

AGRICULTURE POLICY IMPLEMENTATION: 21 different developmental organizations are charged with implementing various aspects of federal agricultural policy. (Schuftan et al., 1980)

AGRICULTURE POLICY, PRODUCTION, AND EXPORTS: The agricultural sector employs 73% of the population, produces 70% of the GNP, and is allotted 30% to 40% of the federal budget. Agricultural exports increased in value from 56.2 billion FCFA in 1971/72 to 199 billion in 1978/79. (Schuftan et al., 1980)

FORD FOUNDATION AID FOR POLICY DEVELOPMENT: The Ford Foundation made a grant of \$140,000 to the University of Yaounde Center for Health Sciences in FY 1975 to assist with the formulation of health and population policies. The funds were budgeted for a workshop on health and population planning and for a three-year vital statistics survey. (TAICH, 1977)

RURAL

AGRICULTURE POLICY: Rural development under the Fourth Plan emphasizes increasing agricultural productivity to promote self-sufficiency in food. It represents 14% of the total budget of the Plan. (Schuftan et al., 1980)

5.2 NUTRITION AND HEALTH PROGRAMS

NATIONAL

ROLE OF NUTRITION SERVICE: The Nutrition Service of the Ministry of Public Health is mandated to conduct epidemiological nutrition and dietary research, nutrition surveillance, in-service nutrition training for all health personnel in the Ministry, and to supervise existing nutrition education activities. Shortages of trained personnel, adequate financing, and logistical means limit what the Service can do in rural areas; there are no national surveillance or research activities. (Lenglet, 1980)

NUTRITION PERSONNEL: 22 Nurses' aides and social workers from the Ministry of Health and the Ministry of Social Affairs were trained in nutritional assessment during the National Nutrition Survey. These persons are now working in their respective services and are a core group of people that can be drawn on if future nutritional assessment is desired. (Eckerson, 1979)

INTERMINISTERIAL COOPERATION IN NUTRITION TRAINING: The Ministries of Health and Social Affairs and the Department of Community Development are cooperating in the development of a basic nutrition training curriculum for their workers. Emphasis has been on the introduction of agricultural activities into the training program. (Eckerson, 1979)

NUTRITION TRAINING: The Community Development Ministry and CRS both train workers in nutrition, but do not coordinate their efforts in the areas where they do overlap. (Eckerson, 1977b)

MINISTRY OF HEALTH ACTIVITIES: The Ministry of Health, Division of Nutrition, conducts a salt iodization program, operates a nutrition clinic in the Central Hospital at Yaounde, and has begun a weaning food development project. (Fakambi et al., 1980)

NUTRITION SERVICE ACTIVITIES: The Nutrition Service in the Ministry of Health operates a Bureau of Surveys and a Bureau of Teaching and Nutrition Research. Research includes studies of food composition, protein nutrition in young children, iodine, selected vitamins, the acceptability of cottonseed meal as a food supplement, and ethnic groups and anthropometry. (Government of Cameroon, 1978)

GOITER CONTROL: Although hydrocyanic acid, a goitrogen found in unrefined cassava, has been found in saliva tests of mothers in most of Cameroon (except in Douala), Public Health Projects to prevent goiter have been successful by increasing the iodine supply to the affected population, not by excluding possible goitrogens. (Government of Cameroon, 1978)

GOITER CONTROL: In 1973, work began on a project with UNDP and UNICEF to eradicate goiter in the country. An iodized salt plant is nearing completion in Douala, but it is a private concern, and little has been done towards distributing the salt to the neediest areas. Production factors, accessibility, and intrafamilial distribution factors could inhibit effectiveness. (Eckerson, 1979)

NUTRITION SERVICE AND MASS MEDIA: The Nutrition Service, interested in developing mass-media approaches to nutrition education, has expressed continuing interest in technical assistance and has focused on developing a radio program. (Lenglet, 1980)

MINISTRY OF HEALTH RADIO PROGRAMS: The Ministry of Health broadcasts weekly 15-minute programs on health and nutrition in English and French. Health and nutrition information is sometimes included in weekly programs for women and for the farming community. None of the staff producing the Nutrition Service Radio messages has training in educational or communication methodologies or skills, and many have not seen the results of the National Nutrition Survey. The Ministry of Health radio programs have not been evaluated in terms of reach, appeal, understanding or effects; no audience surveys have been conducted. (Lenglet, 1980)

MINISTRY OF HEALTH RADIO PROGRAMS - EVALUATION: Consultant review of Ministry of Health radio programs led to several recommendations, focusing on development of strategies and programs based on current knowledge, development of management and staff skills and coordination, and contributions by USAID-Yaounde in the form of basic literature and logistical support. (Lenglet, 1980)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

MINISTRY OF HEALTH NUTRITION SERVICE MASS MEDIA PROGRAM: The Nutrition Service has been making preliminary efforts towards the use of radio for nutrition education. In 1979/80, they adopted a roundtable discussion format for their broadcasts, but after the June 1980 INCS consultancy of Frans Lenglet, they decided to develop radio spots. As of mid-1981, seven spots have been written, and there were plans to record them and do some pretesting in the near future. (Leslie and Parlato, 1981)

RADIO HEALTH BROADCASTS: Since 1980, the Health Education Service had been preparing weekly half-hour broadcasts, usually in the form of a health lecture. Similar, but not necessarily coordinated, broadcasts were also prepared by some of the provincial radio stations. At neither level had there been the required planning or staff to maintain a regular, uninterrupted broadcast schedule. (Leslie and Parlato, 1981)

MASS MEDIA RESOURCES: Each province has a radio station, most of which seem to be large and well-equipped but underutilized. (Leslie and Parlato, 1981)

MINISTRY OF PUBLIC HEALTH MASS MEDIA AND HEALTH PROJECT: The Health Education Service of the Ministry of Public Health has initiated a project with assistance from OPEC and USAID to utilize the mass media to transmit health messages, conduct a national seminar for regional health educators and radio producers, conduct three regional seminars for educators in other ministries, and provide equipment and technical assistance for conducting 26 hours of programming per year. Additional support for the present system of health education supervision will be provided by the Division of Health Education. The project is scheduled to be conducted for one year, beginning January 1982, and to cost about U.S. \$100,000, half from OPEC and half from USAID. (Leslie and Parlato, 1981)

PRACTICAL TRAINING IN HEALTH EDUCATION (PTHE) PROJECT: The PTHE Project, now in its fourth and final year, is part of the Ministry of Health's Direction of Preventive Medicine and Public Hygiene, but has been substantially developed with technical assistance from the University of North Carolina and funding from USAID. During its pilot phase, the PTHE Project emphasized formation of village health committees and training of health workers for interpersonal health education. Considerable effort has also gone into development of a primary school health education curriculum and into the establishment of a national communication and visual aids production center. A Peace Corps volunteer was taking major responsibility for setting up the production center. (Leslie and Parlato, 1981)

MINISTRY OF HEALTH AND USAID "PTHE" PROJECT: USAID provides support for the Health Education Service's ongoing Practical Training in Health Education (PTHE) Project, designed to integrate health education in the primary schools and to improve the quality of training of health paramedical personnel. (Leslie and Parlato, 1981)

PTHE HEALTH EDUCATION: The Practical Training in Health Education (PTHE) model programs incorporate education activities into regular health

services. The project also is designing curricula for training programs at the university level, for field programs, and for teacher training programs, and is to provide general consultation in health education. Funding and personnel constraints have hampered the project's impact. (Lenglet, 1980)

PTHE MODEL HEALTH EDUCATION PROGRAMS: The Practical Training in Health Education (PTHE) project has established model programs incorporating health education activities into regular health services. (Lenglet, 1980)

DASP ZONES: The DASP Zones project (Demonstration Zones for Public Health Action), with assistance from WHO and UNICEF, began in 1967 to bring comprehensive basic health services to all people, zone by zone, through the "adaptation and integration of community medicine." The health education component seems to have been effective in bringing about behavioral change. Workers are brought to Bamenda for periodic refresher courses in health education, including training to first study the attitudes and traditions of the community and the background of those views and practices. Emphasis is on locally made materials, but outside resources are used as well. Traditional healers and birth attendants are met as colleagues for dialogue on common interests. (Lenglet, 1980)

DASP ZONES: The DASP Zones project health education methods have been tested, evaluated and refined during the past 10 years, and health education is now a routine responsibility of all health professionals. Personnel at all levels receive periodic training in the development and administration of effective programs, including health-related projects in agriculture, education, public works and other development and self-reliance activities. (Lenglet, 1980)

HYGIENE CAMPAIGN: The National Campaign for Hygiene and Cleanliness (NCHC), begun in September 1978, has several specific health-related objectives, including teaching people the relationship between cleanliness and sickness. Under the Health Education Service of the Ministry of Public Health, the campaign reaches all levels of government and all health centers and schools. A radio series and primary school text are in production. (Lenglet, 1980)

HYGIENE CAMPAIGN: The National Campaign for Hygiene and Cleanliness (NCHC) aims to educate and train the population in the roles and practice of hygiene in preventing disease. Committees and representatives from numerous organizations and all levels of government assured thorough and careful project planning. Behavioral change seems to be occurring, although a formal evaluation has not been conducted. (Lenglet, 1980)

IMMUNIZATION PROGRAM: Using foreign aid, the government has initiated a five-year program to vaccinate all children under 3 years old against preventable diseases. The goal is to reach all children by 1990. (Schuftan et al., 1980)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

MINISTRY OF HEALTH SERVICES: The Ministry of Health coordinates all health services in the country. In 1976, there were 115 hospitals (with 16,442 beds) and 920 health centers, most of which were government sponsored. (Government of Cameroon, 1978)

NUTRITION TRAINING IN AGRICULTURE: Students in the five-year graduate program at the Ecole Nationale Superieure Agronomique are required to take fifteen hours of instruction in human nutrition, and 35 hours of rural sociology. (Ecole Nationale Superieure Agronomique, 1976)

AGRICULTURE APPROPRIATE TECHNOLOGY PROJECT: CEENEMA has been developing small-scale machines to aid in the production and harvesting of rice, egussi, groundnuts, and the like. Production and testing of these machines is being pursued. One proposal is that USAID will help in the training of local craftsmen to produce the machines and will develop a marketing structure to introduce the machines to the agricultural community on a major scale. (Eckerson, 1979)

GOVERNMENT FOOD STOCKS: To counter price rises during annual seasonal shortages, the government stocks reserves of staples. (Nelson et al., 1974)

PL-480 ALLOTMENT: For fiscal year 1982, the approved quantity of food for Cameroon totaled 1943 metric tons of cornmeal, non-fat dried milk, and soybean oil worth \$864,000 to be distributed through CRS pre-school feeding programs to about 35,000 recipients. (USDA, 1981)

PL-480 RECIPIENTS: In fiscal year 1977, 24,000 people received PL-480 food through World Food Program food-for-work projects, and 18,000 through maternal and child feeding programs run by CRS. (USDA, 1978)

FOOD DISTRIBUTION - CRS AND WFP: Catholic Relief Services and World Food Programme are the two major organizations distributing food in Cameroon. They have been advised to coordinate their activities; the first step in this has been a plan to share transport and storage facilities in the Eastern Province. The Eastern Province has not been a major focus of CRS activities, which had been concentrated in anglophone Cameroon. (Eckerson, 1979)

WFP AND CRS EVALUATION: Both CRS and WFP have been approached with proposals to measure the nutritional effects of their respective programs, but to date there has been no action, despite the fact that evaluation of their impact is essential to any planning function. (Eckerson, 1979)

CATHOLIC RELIEF SERVICES CLINICS: The Catholic Relief Services operates pre-school programs in 70 government and mission clinics and dispensaries. Children are given monthly examinations, and training is provided mothers in nutrition, health, and hygiene. Demonstrations show mothers how to use the protein-enriched foods donated by USAID. During 1976, average monthly attendance was 18,000. (TAICH, 1977)

CATHOLIC RELIEF SERVICES FOODS: The Catholic Relief Service distributes soybean oil, bulgur, and nonfat dry milk to mothers of children under five, stresses breast feeding, and teaches mixing the milk powder with porridge. (Lenglet, 1980)

CATHOLIC RELIEF SERVICES TRAINING: Catholic Relief Services supports a training program for health personnel and rural health extension agents in northern Cameroon. The agents work to establish village health committees which help transmit health education information and oversee the area's sanitary conditions. (TAICH, 1977)

WORLD FOOD PROGRAM: In 1972, 22,000 tons of food worth \$10.4 million were distributed to 50,000 beneficiaries age 1-12 years by the World Food Program (Programme Alimentaire Mondial); 49,932 persons received food in 1979. The Ministry believes that the program's impact on food problems is weak, that there is no pressing need for the food, and that complementary local food production should play a greater role in site selection. Furthermore, the foods are very high in protein while providing only part of the calorie requirement; if the infant does not receive enough calories, some of the protein will be used for energy. Since the government spends 100 million FCFA each year to support this program for 50,000 people, it should re-examine the foods donated and the needs of recipients, many of whom are not the most vulnerable; it should re-examine the desirability of depending on imported foods. (Schuftan et al., 1980)

WFP EVALUATION: Much of the WFP food was going to support hospital operating costs, rather than being targeted toward the areas of nutritional need. WFP has assessed this problem, and has resolved to support the use of food either towards a transitional step towards agricultural self-sufficiency, or for donation to groups with proven nutritional needs. They will concentrate on agricultural projects like SEMRY II and on food delivery through PMI structures. (Eckerson, 1979)

WFP EVALUATION: Evaluation of WFP distribution programs showed that much food was being lost due to contamination by weevils, rats, and poor storage facilities. Also, food was being prepared and not eaten because the cooks were limited in their ability to diversify their food preparation. A seminar on grain storage and food preparation was held for all those concerned. Simple storage procedures were discussed; insecticides were demonstrated; and a cook book was prepared and distributed. Followup visits assured that the new techniques were being implemented. (Eckerson, 1979)

CARE RURAL CONSTRUCTION PROJECT: This project seeks to establish basic facilities and infrastructures in several regions. Structures include nutrition and health centers, farm-to-market and feeder roads, storage and market facilities, and irrigation systems. The Community Development Department is cooperating with CARE. (CARE, 1980)

MISSION HEALTH SERVICES: Several U.S. church denominations operate hospitals, clinics and maternal and child health centers. (TAICH, 1977)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

MISSION RADIO PROGRAM: The American Lutheran Church broadcasts a radio program from Ngaoundere which includes health information. (TAICH, 1977)

PREVENTIVE MEDICINE EMPHASIZED: There is a national public health emphasis on preventive medicine and preventive health services are available throughout the country. (Government of Cameroon, 1978)

INCREASING HOSPITAL BIRTHS: Until recently, most births took place at home. Lately, over 50% of births take place in health facilities; others take place at home with assistance from professional midwives, traditional birth attendants, or friends and relations. (Bryson, 1979)

PHYSICIANS: Cameroon has fewer than 250 practicing physicians, half of whom are transient expatriates, for a population of over 6 million. Fewer than half of the physicians are career nationals in the Government health service. On a national basis, there is one physician per 22,000 population, but in some areas the actual ratio may reach 1:75,000. (Guillozet, 1976a)

MEDICAL FACILITIES: In 1975, at the national level, there were 100,000 persons per doctor and 32,000 per dispensary. (de Garine, 1978)

MEDICAL SCHOOL - CUSS: The Centre Universitaire des Sciences de la Sante (University Centre for Health Sciences, UCHS/CUSS) was established in 1969 to provide a six-year training program for medical students. The program provides "extensive clinical competence, an ecological orientation, and solid scientific training." Between 1975 and 1977, 121 doctors were graduated. (Lantum, 1980)

HEALTH PROFESSIONALS - CUSS TRAINING: Central Hospital in Yaounde, run by the Ministry of Health, is the base for the CUSS, a regional center for the training of physicians, nurses, technicians, administrators, and other health professionals. (Guillozet, 1976b)

MEDICAL TRAINING - CUSS: The CUSS includes an extensive nutrition component in its community medicine program for physicians. Medical students complete community work in nutrition as well as attending nutrition lectures. (Fakambi et al., 1980)

CUSS ACTIVITIES: The CUSS project worked closely with a local clinic to provide health care, including maternity services, dispensing medicine (including vermifuges), taking blood pressures, and advising on home and environmental sanitation. Health education on the "causes and prevention of diseases" was provided; the nutrition component of this was conducted in relation to a measles epidemic, focusing on "prevention by adequate nutrition." (Martin, 1974)

CUSS - CHILD HEALTH CARE: At the clinic at Mvolye, mothers brought children, mostly under 3 years old, seeking vaccinations and weighing. Weights were plotted on growth charts, which were shared with the mothers. Underweight children's mothers were given special advice on

feeding and on using milk and fortified cereal, and were seen weekly. Kwashiorkor was successfully treated at home. Vaccinations included measles, smallpox, TB (BCG), DPT, and polio. Records were not kept at the clinic so if a mother lost a child's card, there was no record of growth or immunizations. (Martin, 1976)

CUSS - PRENATAL CARE: At the Dispensary and Maternity at Mvolye, there were so many new patients that some had to be turned away. Women were given chloroquin, iron (500 mg ferrous oxalate per day) and folic acid (10 mg per week). At every visit, blood tests were taken to determine whether the chloroquin dose was adequate to keep women clinically free from malaria symptoms, but sufficiently affected by the disease to transmit passive antibodies to their babies. Blood tests for anemia could not be done, for technical reasons. Followup and postnatal care were difficult because many women delivered elsewhere; most returned to their home towns. (Martin, 1976)

CUSS - NUTRITION EDUCATION: To promote good nutrition as a way of promoting health, demonstrations were held to show appropriate foods for children age 6 months to 2 years. Local foodstuffs were used, to which were added milk, egg, and vegetable; reasons were given for preparing a "balanced meal." (Martin, 1974)

HEALTH SERVICE TRAINING CURRICULUM: The education program for health service personnel emphasizes sensitivity to local conditions and customs, including recognition of traditional birth attendants and healers, who are met as colleagues for dialogue on common interests. (Lenglet, 1980)

RURAL

HEALTH CLINIC NUTRITION ACTIVITIES - SOUTHWEST: In the Southwest, the government operates 39 clinics which conduct nutrition surveillance and education, including weighing and the use of weight charts and food demonstrations. The children who are underweight for age are given special attention, but programmatic needs for information are not met because there are no records as to which clinics deal with the greatest number of undernourished children. A simple tally of the numbers of below-standard children treated at each clinic would be of great help to planners, and enable them to spot areas of undernutrition where further investigation of local needs was justified. (Eckerson, 1977b)

NUTRITION EDUCATION IN THE SOUTHWEST: Nutrition education is conducted by the Public Health Service, the Ministry of Community Development, and the CRS. The system has not been formally evaluated, but CD workers report that they have to duplicate the cooperative efforts of the CRS and Public Health workers because the women are not taught effectively to use the foods they are given at the CRS clinics. (Eckerson, 1977b)

"ANIMATRICES RURALES" (RURAL ANIMATORS): Female rural community development agents ("animatrices rurales") are trained in health education. They conduct demonstrations of skills in agriculture, cooking, sewing, etc., within their ten assigned villages. Community

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

leaders are expected to take over and continue their own work. (Lenglet, 1980)

EXTENSION WORKERS: The Ministry of Social Affairs has trained and equipped 120 community extension workers, each of whom visits villages to demonstrate skills in agriculture and homemaking, including technical skills in nutrition and ensuring safe water. (Lenglet, 1980)

EXTENSION AGENTS: The Institute Panafricain pour le Developpement (IPD) trains extension agents to conduct nutrition education among rural populations. (Fakambi et al., 1980)

CATHOLIC RELIEF SERVICES: Catholic Relief Services reaches 32,000 children age 6 months to 5 years in the North-West, South-West, East and Central-South provinces. 1,350 tons of food were distributed in 1980. The program also includes anthropometric surveillance, nutrition education, and distribution of nivaquine and vermifuges. Participants pay 100 FCFA monthly; 75% is spent for medications, and the balance for salaries, transport, etc. (Schuftan et al., 1980)

CATHOLIC RELIEF SERVICES - NORTHWEST: A preschool feeding program using imported foods was being conducted in the North-West Province with the assistance of Catholic Relief Services. 58 clinics reached 17,000 children under 5 years old. (Government of Cameroon, 1978)

CRS ACTIVITIES - SOUTHWEST: CRS operated a feeding program through 33 health clinics in this region; 75% of these were maintained by the Ministry of Health, and the balance were private mission centers. About 19,000 infants received monthly allotments of 1.95 kilos of CSM, 1.35 kilos of CSB and .45 kilos of oil. The actual distribution depended on the food stock available at the clinic, but substitutes were given when other stocks are low. Mothers were asked to pay 50 francs for each child participating, and to attend food demonstrations with the distribution. CRS also distributed medicines at these centers. (Eckerson, 1977b)

CRS MANAGEMENT - SOUTHWEST: The CRS program has been operating for 7 years, so the distribution system has been worked out. Most food is stored in warehouses in Victoria and transferred to clinics in small quantities depending on need and storage capacities, thereby keeping storage losses at a minimum. The cost of in-country delivery of the food is about 65 francs per 250 francs worth of food, including all overhead and administrative support. (Eckerson, 1977b)

CRS EFFECTIVENESS - SOUTHWEST: The CRS program runs efficiently, but its effectiveness has not been measured in terms of nutritional impact. Mothers are given food to take home, and its actual consumers are not known. Also, the Southwest is better off nutritionally than the Northern provinces, so one might question the fact of its location. (Eckerson, 1977b)

WFP DISTRIBUTION - SOUTHWEST: Under an agreement with the Ministry of Health, WFP distributes food in hospitals and government schools. They

have been troubled with food being stolen at the various unloading zones. The food is not targeted toward a specific nutritional need, but serves to supplement the strained budgets of various participating government agencies, so they can spend their resources elsewhere. For example, at the agricultural colleges and nursing schools, the food enables the government to increase the number of scholarships available due to the savings in feeding the students. To date, the WFP has not entered the area of feeding preschool infants in the region. (Eckerson, 1977b)

WORLD FOOD PROGRAMME EVALUATION: World Food Program warehouses in the Eastern Province in August 1977 still had food left over from a distribution nearly a year before. The condition of the food ranged from excellent to unusable, depending on the type of facility used for storage. The hospitals and dispensaries charged with distributing the food often hoarded it since they used it for the most severe cases, and often did not know when their next shipment would be. Distribution problems included impassable roads and lack of gasoline. The region lacked the storage and personnel required for massive regular distribution being considered by PAM to aid the pygmies in the region, but infrastructure was expected to be developed after receipt of a World Bank loan to the Zapis of the Eastern Region. (Eckerson, 1977a)

CRS AND WFP - COMMUNITY DEVELOPMENT: CRS and WFP have used their food as payment for work such as the construction of roads, with the cooperation of the Ministry of Community Development. Most projects have now ceased functioning. (Eckerson, 1977b)

CARE HEALTH EDUCATION: As part of their current health project in the Mokolo region of Northern Province, CARE is involved in prompting interpersonal education in health and has made plans to prepare related radio broadcasts. CARE has also developed a proposal for "Health Education Through Community Development" to complement its Eastern Potable Water Project; the proposal places primary emphasis on the formation of village health committees, but the proposal also includes components for health education in the primary schools, training of health workers in health education techniques, and a program of health education by radio. (Leslie and Parlato, 1981)

CARE AGRICULTURE PROJECT: The Small Farmer Agriculture Project will provide aid and assistance to small subsistence farmers in rural areas of several provinces to increase production and discourage urban migration. Activities will include cultivation of corn, vegetables and cash crops, production of laying hens, formation of pig farms, and organization of "pre-cooperative" groups. This project is being implemented with the assistance of the Ministry of Agriculture's Departments of Agriculture and Community Development. (CARE, 1980)

AGRICULTURAL EXTENSION - SOUTHWEST: Although most efforts are aimed at food crops, there is some activity in agricultural extension to women, who grow most of the food crops. Implementation has been hampered by the lack of agricultural training of the Community Development workers. (Eckerson, 1977b)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

AGRICULTURAL RESEARCH - SOUTHWEST: Some research in food crops is being done by IRAF and the Dchang Research Center with regard to hybridization of seeds and treatment of brown rust disease in corn. These facilities have not yet succeeded in developing a truly integrated program of extending their findings into the community, despite some field agents. Most of the research is in the area of cash crops. The mechanism is geared to the cash-cropping needs of male farmers rather than to women, who grow most of the food crops. (Eckerson, 1977b)

FISH PONDS: Ministry of Agriculture personnel have cooperated with U.S. Peace Corps personnel in developing fish culture in the Eastern Province. The French had begun fisheries in the 1950s, but these had been neglected or abandoned. Rehabilitating the old ponds and stocking them with fingerlings to be harvested 6 months later by draining the ponds resulted in 300 operating ponds, with an average area of 400 square meters and an average yield of 7.4 kilos of fish for old, unfed ponds; 25.6 K for new, unfed ponds; and 57.2 K for well-fed ponds supplied with nourishment such as termites, beer draft, or scraps of refuse. No studies have been done on side effects such as increases in the incidence of bilharzia or malaria from the standing water. (Eckerson, n.d.)

IMMUNIZATION PROGRAMS: Immunization programs against measles, whooping cough, polio, etc. are few and scattered; where they do exist, they often founder because of vehicle failure, impassible roads, spoiled vaccines, and communications problems. (Guillozet, 1976a)

MEDICAL RECORDS: In the two rural areas studied, the village mothers kept the children's birth and health records carefully. (Lantum, 1978)

HOSPITAL BIRTHS: In Jakiri, 59% of the 548 births in 1976 took place in the health center, 26% in the hospital, 5% at the traditional healers' service, and 9% at home. Among the 12 births in the Mbandjock study district in 1976, eight births (67%) took place in the hospital, and four took place at home; in 1977, there were again 12 births, 5 (42%) in the hospital, and 7 (58%) at home. (Lantum, 1979)

HOSPITAL BIRTHS: In rural areas, 35% of all births take place in hospitals. (Bryson, 1979)

URBAN

TRAINING FOR WOMEN: The AFCA (Association pour la Formation des Cadres de l'Industrie de l'Administration) in Yaounde and Douala trains women in nutrition, child care, sewing and cooking. (Bryson, 1979)

MALNUTRITION AND HOSPITALIZATION: Malnutrition was involved in 75% of all admissions to the Pediatric Section of Central Hospital in Yaounde. (Guillozet, 1976b)

CLINIC EFFECT ON MORTALITY: In a Yaounde clinic, the perinatal mortality rate was 43.3 deaths per 1000 live births. After initiation of a High-

Risk Pregnancy Clinic at Central Maternity at UCHS, the rate dropped to 31.2 in 1975. (Guillozet, 1976b)

ACCESS TO MEDICAL CARE: Medical facilities are more available in towns and cities. A higher percentage of women receive prenatal care than in rural areas, and most deliver in hospitals or maternity homes. (Bryson, 1979)

HOSPITAL BIRTHS: Nearly all births in Yaounde and Douala take place in hospitals. (Bryson, 1979)

6. COMMENTARIES

NATIONAL

PROBLEMS IN INFANT DIET: The two major problems in infant diet are: unavailability of food to the family and distribution of foods to the young child, even when food is available to the family. (Government of Cameroon, 1978)

MALNUTRITION AND FOOD SUPPLY: Since 1967, food production has exceeded the recommended level of 2200 calories per capita per day. Since many infants nevertheless are malnourished, their problem must be the result of maldistribution. (Schuftan et al., 1980)

BOTTLE FEEDING AND INTERCOURSE TABOO: Sexual intercourse is believed to poison breast milk. Traditionally, there is a two-year wait to resume marital relations, but in urban areas a second wife may not be financially possible and a two-year wait is not realistic. The failure of bottle-feeding mothers to cite the sex taboo may accurately reflect respect for the taboo, or a bias in mothers not wishing to reveal their true reasons. (Garrett, 1981)

INEFFECTIVENESS OF LACTATION BREAKS: Since many mothers who bottle fed cited work as their reason, the government "lactation break" is not achieving the desired effect, even when split to permit mothers to arrive at work one half hour later and leave one half hour earlier. (Garrett, 1981)

PRIORITY NUTRITION ISSUE - WEANING: Personnel from the Medical Research Institute of the General Delegation of Scientific and Technical Research (DGRST) expressed the opinion that the weaning malnutrition commonest in the northern province constituted a high priority issue for the Government and a topic toward which the applied research skills of DGRST should be directed. (Berggren and Murray, 1981)

NATIONAL NUTRITION SURVEY AND SEASONS: Since the National Nutrition Survey data were collected by teams traveling across the country over a period of 3 1/2 months, seasonal changes were incorporated in the data. The survey began when most regions were having their dry season, which lasted until the teams reached the Northwestern Province. The areas surveyed during the rainy season encountered problems of transportation in reaching survey locations, and had more difficulty locating survey subjects, who often were out working in their fields. (Eckerson, 1978)

NATIONAL NUTRITION SURVEY - USEFULNESS: The survey design of the National Nutrition Survey was careful to include a representative sample (except in one region) and to be otherwise readily defensible statistically, but the design did not allow for causal interpretation, and did not look into many of the determinants of nutritional status. Therefore, although it provided good baseline data for the surveillance of nutritional status, it did not provide a good base for the design of nutrition interventions. The study did identify areas where problems existed, where further investigation into specific problems could then be conducted to yield the bases for intervention design. (Eckerson, 1978)

6. COMMENTARIES (Cont.)

NATIONAL NUTRITION SURVEY SAMPLE: The sample used in the national nutrition survey may not identify the nutrition problems in Cameroon, because they exist in pockets not taken into account in the sampling design. To conduct a survey to accurately identify the pockets of malnutrition, the sample would have to be large, and "the pockets of malnutrition become but torn threads in a large bolt of cloth." (Eckerson, 1979)

NATIONAL NUTRITION SURVEY - IMPLEMENTATION OBSTACLES: The National Nutrition Survey was adapted from a model originally proposed for Sierra Leone, so adaptations had to be made. In implementing the survey, problems were encountered in the areas of staff coordination and role clarification; salaries of support staff; inability of foreign staff to speak French; validity of sampling frame and design; identification of significant socioeconomic indicators; acquisition of adequate vehicles and the repairs and fuel necessary to operate them; costs of computer analysis of the data; communication with local officials in survey sample areas; and survey timetables. (Eckerson, 1978)

MINISTRY OF HEALTH CAMPAIGNS - EVALUATION: The impact of the Ministry of Health nutrition programs is limited, for several reasons: the content is academic or theoretical, and is not sequenced; programs are too long and cover too much material; personnel skills and logistical and financial means are limited; and radio does not reach populations which are remote, or which do not speak the major languages. (Lenglet, 1980)

MALNUTRITION AND MORTALITY: In the absence of mortality data, it is not known whether the communities showing higher rates of malnutrition in the national survey are in fact the worse-off communities. They could conceivably be better-off communities whose malnourished children are surviving. Conversely, the lower rates of acute malnutrition in other communities could simply mean that more of the at-risk children are dying. (Berggren and Murray, 1981)

NUTRITION EDUCATION AND LITERACY: Since so few mothers are literate, and because undernutrition is positively correlated with illiteracy (whether in English, French, or other languages), nutrition education programs must rely primarily on the spoken word. Mothers of the children more likely to be malnourished would not be reached any other way, for practical purposes. (Government of Cameroon, 1978)

DEMAND FEEDING AND NEONATAL DEVELOPMENT: Because close maternal-infant contact and liberal demand feeding in the newborn period were associated with better infant behavioral scores, family-oriented postpartum care can apparently benefit neonatal development. (Colgate, 1981)

NUTRITION PLANNING: The goal of nutrition planning is to better the quality of life of a given population. It includes not only the planning of health benefits, but also includes agricultural policies, food pricing structures, and the availability of food and health services. (Eckerson, 1979)

GOITER CONTROL: Since the production and distribution of iodized salt is a difficult and uncertain way of coping with the goiter problem, it may be more effective to conduct research into the effects of cassava consumption upon goiter, which may be an avenue of investigation more amenable to intervention. (Eckerson, 1979)

CRS AND WFP: A consultant who studied the operations of CRS and WFP in the Southwest for the Ministry of Plan suggested that: 1) the nutritional impact of the CRS program should be assessed; 2) CRS and WFP should be approached concerning food-for-work projects in development projects, and the Community Development Ministry should streamline its related procedures; and 3) CRS and WFP should be brought together to discuss areas of overlapping interest, particularly in the area of transport. (Eckerson, 1977b)

RISKS OF DONATED FOODS: Without a proper planning component, feeding programs had been shown to encourage dependence upon imported foods; they may also discourage breast feeding and in some cases they serve to divert attention from local self-sufficiency in agriculture. Therefore, all food donations must be part of an overall strategy to combat undernutrition. (Eckerson, 1979)

ROLE OF VOLUNTARY AGENCIES: Since voluntary agencies' activities can serve to inhibit or enhance larger national nutrition goals, volunteer programs must be evaluated, and their roles considered within the framework of the achievement of nutrition planning objectives. (Eckerson, 1979)

HEALTH PLANNING PRIORITIES: Since rural residence was associated with poorer maternal health, less prenatal care, and poorer infant behavioral scores, health planning in Cameroon should continue to give priority to rural areas. (Colgate, 1981)

EMPHASIZING PREVENTIVE CARE: The medical school curriculum generally provides adequate lecture time on preventive medicine, but lack of practical experience results in preventive care taking a back seat to curative care. If preventive medicine teaching is not taken seriously, the investment in the University Center for Health Sciences (CUSS) may not yield the health improvements expected, through failure to apply simple, rather than complex, technology. (Guillozet, 1976b)

OBSTACLES TO HEALTH CARE: Obstacles to effective delivery of health care include shortages of trained personnel, including physicians, nurses, and medical assistants; transportation problems; language differences arising from unwritten dialects; and tribalism. (Guillozet, 1976a)

TRADITIONAL HEALERS: To ignore traditional medicine men, or treat them contemptuously, in the development of primary health care, would be unrealistic because they will continue to practice and many of their methods are time proven. (Lantum, 1977)

6. COMMENTARIES (Cont.)

MEDICAL TRAINING NEEDS: Recent graduates of the national medical school, surveyed 1 to 3 years after graduation, indicated that training in preventive skills such as vaccination, health education, and environmental sanitation should be intensified. (Lantum and Atangana, 1980)

OBSTACLES TO USE OF RADIO: The actual audience for the health/nutrition radio programs is probably very limited because: (1) programs are mostly in French or English rather than local languages; (2) broadcasting is not done at peak listening times; (3) rural radio ownership is limited, primarily by the cost of equipment and batteries. (Lenglet, 1980)

BEER REPLACING FOOD PURCHASES: Dr. Tangyie of the school health service feels that the diversion of income for beer has deprived children of needed food. (Lenglet, 1980)

RURAL

RECOMMENDED INTERVENTIONS: In Mbandjock, nutrition education is needed to help the population make better use of existing "abundant nutritional resources." Better farming methods and health care are needed. (Lantum, 1978)

RECOMMENDED INTERVENTIONS: Jakiri district children's poor nutrition status was attributed to inadequate protein intake. Recommended remedies included encouraging increased production and consumption of animal protein through public education campaigns and existing community organizations. (Lantum, 1978)

EMPHASIZE PREVENTIVE CARE: Programs emphasizing simple preventive child health care should be one of the highest teaching priorities. Improvements in acute clinical care management appear to contribute little to the solution of the problems of young children who suffer much chronic and avoidable disease and an appalling death rate. (Guillozet, 1976b)

PHYSICIAN AWARENESS: Medical students at the University Center for the Health Sciences (C.U.S.S.) had very low immunization status. It appears that many medical students arrive at a point of considerable technical skill without having acquired a true sense of the importance of these fundamental requisites for good health in the tropical African community. (Guillozet, 1976b)

EFFECTS OF SCHOOLING: Schooling reduces the population active in agriculture, because students returning home refuse to participate in manual tasks; it encourages emigration from farming areas. It also creates a demand for imported foods while at the same time creating disdain for local foods and a refusal to eat anything but white or light-colored sorghum or millet flours, eliminating the traditional staple food, wet-season red sorghum. Sorghums which yield white flour are mainly late and low-yielding, and require special soils. (de Garine, 1978)

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- 1981 Consultant Report for Cameroon (March 9-21, 1981) (The feeding of infants in northern Cameroon: guidelines for a field study). Conducted under contract AID/DSAN-C-0209. Newton, MA: International Nutrition Communication Service, Education Development Center, 1981.

The findings of the National Nutrition Survey indicated that there was a particular problem of weanling malnutrition in the Northern Province. In order to address the causes of this problem, DGRST invited USAID consultants to help design a survey which would establish the causes of this malnutrition in order to form a basis for the design of appropriate interventions. This report details the consultants' findings and recommendations for the design of the survey. They recommend a longitudinal study of 300 families in the area, measuring a variety of variables in a design that will permit causal inferences for use in government planning. Suggestions are included for personnel, survey policies and for ethnographic groundwork needed for satisfactory design.

Bryson, Judy C.

- 1979 Women and Economic Development in Cameroon. Office of Women in Development, AID, Washington, D.C. 20523.

The author surveyed written sources and "perspectives of knowledgeable individuals," including Cameroonians whenever possible. Very few accounts were contributed directly by Cameroonian women; therefore, most of the sources used are secondhand information. The author describes traditional social and economic systems and their evolution. She also includes information from an extensive survey of the literature and an annotated bibliography of 208 items.

CARE

- 1980 Resume: CARE Projects, Fiscal Year 1980.

This report describes the proposed and ongoing CARE projects in many countries, giving project numbers and projected activity and staffing levels, but no budget information.

Colgate, S.H.

- 1981 Midwifery, Mothering, and Behavioral Assessments of African Neonates. Unpublished Ph. D. Thesis, University of Illinois Medical Center, 1981.

Original data.

Method: Mothers were interviewed within 24 hours after delivery to collect data about their demographic backgrounds, general health, prenatal course, prenatal care, labor, delivery, postpartum experience, and the care given their newborn infants.

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Sample: 299 mothers of normal newborns.

Location: In Yaounde, one public and one private maternity ward; and the rural Catholic mission dispensary at Nsimalen, 20 km. southeast of Yaounde.

This quasi-experimental study investigated the relationship between neonatal behavioral development and local midwifery and mothering practices. Newborn behavioral examinations looked for evidence of possible African infant precocity, which remains a controversial concept.

de Garine, I.

- 1978 Population, Production, and Culture in the Plains Societies of Northern Cameroon and Chad: The Anthropologist in Development Projects. Current Anthropology 19(1):42-65, 1978.

The author, an anthropologist, presents information about the tribes which occupy the region straddling the boundary between Cameroon and Chad, with the objective of demonstrating the contributions which anthropologists can, and must, make in order for development projects adequately to take into account the relationships between population, agriculture, and culture. The discussion includes extensive details on the North and South Masa, Tuburi, and Musey tribes, including their demographics, traditional structures such as land organization and ownership, food production, the matrimonial system, economic factors in changes, schooling, food demand and trade; and new possibilities for responses to both new and chronic problems.

Drejer, G.F.

- 1980 Bottlefeeding in Douala, Cameroons. J. Trop. Pediatrics, 26(1):31-36, February.

Original data.

Method: interviews conducted August to November, 1973, with mothers of infants under one year old.

Sample: 476 mothers attending a mother and child care center.

Location: Akwa, a quarter of Douala, a city of 500,000.

Bottle feeding is penetrating the society together with other elements of the western way of life, but most mothers who bottle feed do so only as a supplement to breast feeding. Proper preparation of bottles is impossible for most families because of limited budgets and inadequate kitchen facilities.

Eckerson, D.

1979 Report of Activities. Ministry of Economic Affairs and Planning, Division of Human Resources.

This report describes the activities of the author during his two years on assignment as a nutrition planner within the Ministry of Planning. Descriptions are included on activities in research and evaluation, feeding programs, training, the conduct of the National Nutrition Survey, and nutrition planning groundwork and coordination. Finally, a discussion of the constraints and outlook based on the author's experience expresses his hope that nutrition planning can become a vital part of the government's interests and activities. He suggests a concerted effort to address the problem of goiter; the creation of an interministerial committee meeting to discuss the forthcoming results of the National Nutrition Survey; the creation of a nutrition planning unit within MINEP; and the creation of an interministerial body charged with food and nutrition concerns to be a base of interministerial communication between MINEP and other ministries to deal with nutrition concerns.

Eckerson, D.

1978 Report of First National Nutrition Survey. Yaounde.

This report is a frank discussion of the development and execution of the National Nutrition Survey, as observed by a USAID consultant on long-term assignment. He discusses the background, organization, and activities of the project, and adds his observations regarding the strengths and weaknesses of the survey. The major difficulties were those which could easily affect any international effort; this report would be a useful backup document for the development of any rural aid survey.

Eckerson, D.

1977a Report of World Food Program (PAM) Mission.

This consultant report describes the conditions in three PAM food distribution warehouses, problems in effective distribution of the food to needy women and children in the areas served, and the feasibility of extending assistance to the pygmies in the area. The author concludes that PAM had little impact on nutrition at that time, serving mostly as sustaining medical overhead costs (food for hospitals and institutions), and doing little towards aiding the nutritionally deficient groups in the region. To deliver aid effectively, an infrastructure was needed. The PAM delivery system could be made more effective by expediting procedures for distribution of food to the community warehouses, and possibly by using PAM trucks to make deliveries to the centers themselves.

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Eckerson, D.

- 1977b The Southwest Province: A Nutritional Overview of Selected Sectors; Report of Mission 8/6/77 to 18/6/77. Yaounde: Ministry of Plan.

This mission was conducted as a preliminary study of health and nutrition factors in the region and their impact on the population. Consultation with over 20 local health and other relevant personnel, and visits to health and nutrition programs, showed where there were problems in agriculture production, distribution, marketing, and storage; in feeding programs; in nutrition education of professionals and mothers; and in health services. Several recommendations are made to address the problems identified.

Eckerson, D.

- n.d. Fish Ponds and Their Impact on Nutrition. Mimeograph, submitted to USAID as part of a project report on consultant activities in Cameroon.

This report describes a joint effort of the National Forestry and Pisciculture Fund of the Ministry of Agriculture and U.S. Peace Corps volunteers to improve protein resources by rehabilitating fish ponds originally begun by the French in the 1950s in the Eastern Province. The paper describes the ponds' size, maintenance, and yields, and discusses their possible role in significantly augmenting protein intake among vulnerable groups in the Eastern Province.

Ecole Nationale Supérieure Agronomique

- 1976 Livret de l'étudiant 1975-76. Université de Yaounde.

This catalogue describes the philosophy, organization, and courses of the five-year program of the principal national agricultural college, founded in 1960 and situated 8 kilometers from Yaounde.

FAO

- 1977 The Fourth World Food Survey. Rome: Food and Agriculture Organization of the United Nations. FAO Statistics Series No. 11; FAO Food and Nutrition Series No. 10.

This survey, part of the FAO's continuous work in assessing the world food situation, is based on the best data available. Most data presented in this report are aggregated by continent or by development categories. National data are given for agriculture and food production, and for calorie and protein supplies per capita. Calculations are made of the per capita calorie requirement for each nation and for the "critical limit" of calorie intake (set at 1.2 times the estimated Basal Metabolic Rate) below which the individual is nearly certain to be calorie deficient.

Fakambi, L., Franklin, R.R., Ndiaye, A.M., Schuftan, C., Vis, H.L., and Waslien, C.

- 1980 Training and Research in the Fields of Nutrition and Food Sciences in Cameroon and Zaire, Findings of the United Nations University Mission, October, unpublished document.

This report details the investigations of a U.N. University team which spent 4 days in Yaounde and Douala investigating organizations and institutions which provide training and conduct research in agriculture, human and animal nutrition, forestry, and relevant areas of engineering.

Garrett, N.R.

- 1981 A study of Feeding Practices in Hospitalized Cameroonian Children. J. National Medical Association (Canada) 73(7):625, 1981.

Original data.

Method: 400 questionnaires were administered to mothers of hospitalized children shortly after admission. Mothers of children with measles and neonatal tetanus were excluded. Questions regarded admission and discharge weight, sex, age, number of hospitalizations, duration of current stay, age of first diarrhea, first bottle feeding, ethnic group, age of mother, and occupation of father. Principal admitting diagnosis was considered the reason for admission, although most children suffered from multiple problems.

Sample: 365 mothers of children age 0 to 47 months admitted to the hospital between February and July.

Location: 65-bed pediatric unit of the Central Hospital in Yaounde, which "saw a large share of Cameroon's sick infants."

This study of the association between feeding method and sociomedical characteristics found several significant correlates of bottle and breast feeding. A small majority of the children were not entirely breast fed. The majority of malnourished children had been bottle-fed by two months of age. The article gives mothers' reasons for weaning or introducing the bottle, and various beliefs about breast feeding and health. The discussion is unclear at some points about its definition of weaning.

Government of Cameroon

- 1978 United Republic of Cameroon National Nutrition Survey, Final Report. Undertaken by the Government of Cameroon with the assistance of the UCLA Nutrition Assessment Unit, Division of Population, Family, and International Health, School of Public Health, University of California, Los Angeles, California; in cooperation with USAID, October, 1978.

Method: Anthropometric measures, clinical signs, and hemoglobin assessment; interviews with mothers. Conducted during February 1978.

BIBLIOGRAPHY (Cont.)

Sample: 5689 children age 3-59 months, 3350 mothers and 3383 households selected using a multistage cluster sampling technique, based on population proportions by province; plus 506 children from families in Douala with high socioeconomic status.

Location: All provinces, plus the major cities Yaounde and Douala combined.

The purposes of the Cameroon National Nutrition Survey were to provide an estimate of nutritional status of young children and their mothers, to compare nutritional status among selected areas, and to provide information about certain factors associated with nutritional status such as diet, socioeconomic factors, health, and demographic variables. This project report describes the development and implementation of the National Nutrition Survey conducted in 1977. The entire development process is described, including organization, preliminary activities, staff selection and training, development of the survey questionnaire and other methodology, budget considerations, and the conduct of the field phase. A thorough discussion of the decisions made and the obstacles encountered provides a valuable insight into the nature of rural field work. This document was prepared when the data had been collected and were about to be sent back for data processing. It includes a thoughtful critique of the pragmatic positive and negative aspects of the experience, and a commentary on the possible uses of the results in future Ministry activities. Appendices give extensive details of survey procedures, including statistical analyses. All reported correlations were significant at the level of $p < 0.05$.

Guillozet, N.

1976a Dilemmas of Child Health Care in Tropical Africa. Clinical Pediatrics 15(6):530-538.

This paper presents an overview of problems common to many developing nations, including allocation of resources; overcoming obstacles of income, education, and transportation; the impacts of traditional practices; the effects of modernization; lack of public health institutional structure and adequately trained personnel; and the effects of infection and malnutrition.

Guillozet, N.

1976b "Mid-Contract Progress Report on the Harvard University Project for Maternal and Child Health Team Teaching at the University Center for the Health Sciences at Yaounde, Cameroon." Mimeo.

The purpose of the project was to help the University Center for the Health Sciences (CUSS) in a three-part institution-building effort through faculty support in teaching, direct patient care, and research in maternal and child health. Emphasizing community medicine and preventive care, the Harvard team of four health professionals worked with CUSS staff in training a variety of health care personnel.

Guyer, J.I.

- 1977 The Women's Farming System: The Lekie, Southern Cameroon. Yaounde: National Advanced School of Agriculture.

Original data.

Method: Interviews with 40 women in each village as they worked in the fields; accessible fields were measured; daily work, income and expenditure records of individuals; household census; interviews with men and women; and examination of court records and cocoa incomes.

Sample: Detailed records for 13 women in each village, matched and representative on basis of age and marital status.

Location: Nkolfeb village in the Arrondissement of Okola, in the Southern part of the Lekie, about 30 km. from Yaounde; and Nkometon, which is along the main paved road from Obala to Yaounde.

This report examines the organization of women's food farming. Most women seemed able to provide reliable supplies of food for their dependents, while producing cash crops or surplus staples to sell, which paid for the women's clothing, soap, kerosene, and other personal needs. These cash crops provided much of the food supply of Yaounde. Men raised cocoa or tomatoes to sell for cash to spend on housing, their children's education and bride prices, and other major expenses.

Gwei, S.N.

- 1980 Cameroon Food Security Strategy, Policy Paper presented at the 6th Session of the World Food Council held at Arusha, Tanzania, June 3-6, 1980. In: Ministère de l'Economie et du Plan, 1980 (below).

Lantum, D. and Atangana, S.

- 1980 The Evaluation of U.C.H.S. (C.U.S.S.) Doctors in the Field (Comprehensive Report). Public Health Unit, University Centre for Health Sciences (C.U.S.S.), University of Yaounde, Cameroon.

Original data.

Method: Survey questionnaires, mailed.

Sample: The 121 graduates of the first three classes at UCHS (CUSS) - 1975 to 1977 - of whom 86 responded; their immediate supervisors; and representatives of the public, usually local opinion leaders.

Geography: Rural; all young doctors are posted to rural areas immediately after graduation.

Recent medical school graduates rated their training as "good," but suggested that certain aspects of the curriculum be strengthened, including administration and preventive medicine. Evaluations by supervisors and the public rated the majority (over 70%) as "good" or "excellent" in each skill surveyed. The study concludes that the UCHS did successfully attain its teaching objectives.

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Lantum, D.N.

- 1979 Population Dynamics of Rural Cameroon and its Public Health Repercussions, Public Health Unit, University Centre for Health Sciences, University of Yaounde, Cameroon, October.

Geography: 20 villages of Jakiri district and 3 villages of Mbandjock.

Subtitled "A Socio-Demographic Investigation of Infertility in Mbandjock and Jakiri Districts," the study was conducted to determine whether perceptions of a serious fertility problem were accurate. According to WHO criteria, rates were 20% in Ndjoie, 25% in Zielli, and 20% in Konteng, a mean for Mbandjock district of 21.6%. Since WHO criteria set 15% as the limit for declaring a serious public health problem, there was indeed a serious infertility problem in each village.

Lantum, D.N.

- 1978 Report of the Nutrition Survey of Pre-School Age Children of Jakiri and Mbandjock Districts of Cameroon Conducted in May 1977. Yaounde, Cameroon: Public Health Unit, U.C.H.S., University of Yaounde.

Original data.

Method: cross-sectional and longitudinal study of population size, structure, and composition; this portion of study included children's age, height, weight, and arm circumference.

Sample: All children age 1-5, "except those who were obviously ill;" included 1,511 children in Jakiri and 95 in Mbandjock. Breast feeding habits of 130 women in Jakiri Central village and 99 women in Mbandjock were also studied.

Geography: All 20 villages in Jakiri sub-prefect; and 3 villages in Mbandjock in the Upper Sanaga division of the Central South Province.

This survey had the triple purpose of establishing the nutrition status of communities, training village primary health care workers to use simple tools to diagnose nutrition problems, and the investigation of nutrition as "a cofactor that can influence the vital statistics of a community, especially the fertility aspects." The Jakiri survey was performed in May 1977, at the beginning of the rainy season, the "starvation" period in that zone, so nutritional status was assumed to be at its lowest. The Mbandjock study took place in August.

Lantum, D.N., ed.

- 1977 Traditional Medicine Problems of Practice and Communication in Cameroon (Experiences of Village Health Care Providers). Report of a Seminar held by Traditional Medicine-men in the Public Health Unit of U.C.H.S. of the University of Yaounde, 3-7th October.

Dr. Lantum gathered traditional healers from many parts of Cameroon, together with scientific medical practitioners, at a seminar to stimulate and assess the extent to which the healers could collaborate and be useful in the Primary Health Care services. Participants presented descriptions of their work, and the group drew up a list of recommendations for the development of cooperation.

Lenglet, F.

1980 Consultant Report for Cameroon, June 18-29, 1980.

This report describes efforts to develop a mass media nutrition education program over the Chaine Nationale, Cameroon's national radio network. The consultant suggests that the campaign could strengthen its impact through more systematic use of development communications techniques. He recommends a workshop for health education and communication specialists in Cameroon, providing training in message development, formative evaluation, materials design, and other development communication processes.

Leslie, J., and Parlato, R.

1981 Consultant Report for Cameroon (August 3-20, 1981) (A Plan for the development of the Mass Media and Health Project). Conducted under contract USAID/DSAN-C-0209, through subcontract to Manoff International. Newton, MA: International Nutrition Communication, Service Education Development Center.

The consultants visited all the departments, ministries, and private voluntary organizations conducting health education, as well as assessing resources for radio broadcasting. The final report (in French) is a plan for a one-year project for developing radio-broadcast health education messages, a national nutrition education seminar, and a series of regional seminars, and project surveys to ascertain radio use and relevant knowledge, attitudes, and practices. A list of essential equipment and a budget are included.

Lewis, J.R.

1974 The Birth Weights of Babies in the Cameroun Grasslands. J. Tropical Pediatrics and Environmental Child Health, 25:300-301, December.

Original data.

Method: Birth weights of all births were collected from 9 institutions (3 hospitals and 6 health centers) for three time periods: 1953-55, 1962-64, and 1971-73.

Sample: All 8,519 births available at these locations in these time periods, including premature and stillbirths. Not all institutions were operating in the early periods; 4754 births were for 1971-73.

Geography: Rural Cameroon "with particular reference to the indigenous people of Tikar stock."

BIBLIOGRAPHY (Cont.)

The mean birth weight of 4,754 singleton births in 1971-73 was 3,112 grams (6.87 lbs.) reflecting good nutritional status of the mothers. Birth weight varied with sex, plurality, parity, year and month of birth, institution, maternal weight, and ante-natal clinic attendance. These figures are not representative of the rural population as a whole because they do not include the large proportion of births which take place in the home.

Martin, G.E.

1977 University Centre for Health Sciences, Community Medicine, Mvolye, Report for 1976-77. Mvolye, 1977; mimeograph.

1976 Community Medicine, Family Health, Mvolye, Report for 1975-1976. Mvolye, 1976; mimeograph.

1974 Report on Activities in Mvolye, 1973-1974. Mimeograph, 1974.

This series of annual reports describes the activities of the University Center for Health Sciences (CUSS) family health project at Mvolye, where project staff supervised medical students, nurses and technicians who were assigned there for their period of field experience in family medicine. Activities included assisting with local prenatal care and deliveries, nutrition and health surveillance, and community health activities including education and vaccination. The greatest obstacles to the program's effectiveness were lack of adequate transportation, and interpersonal and interagency communications.

Ministry of Economic Affairs and Planning

1979 Report of the First National Nutrition Seminar, Yaounde, 9-12 April 1979. Yaounde: Ministry of Economic Affairs and Planning, Division of Planning, Division of Human Resources.

This 24-page document summarizes the organization, process, and the extensive recommendations of the seminar, which was held in order to bring together the many agencies and Ministries which must interact to improve the nutritional status of the population relative to the problems found in the National Nutrition Survey.

Nasah, B.T., Drouin, P., and Cousineau, L.

1976 Family Planning in the United Republic of Cameroon, Analysis of First Years (sic) Experience. Mimeo, August 1976.

This report presents clinical and socioeconomic profiles of the first 540 patients seen in 1975 at the family planning service at the Central Maternity of the Central Hospital in Yaounde. The government's official pro-natalist policy prohibits active promotion

of family planning, but women are accustomed to child-spacing through prolonged breast feeding, and accepted intrauterine devices and birth control pills.

Nelson, H.D., Dobert, M., McDonald, G.C., McLaughlin, J., Marvin, B., and Moeller, P.W.

- 1974 Area Handbook for the United Republic of Cameroon, First Edition, Foreign Area Studies of the American University, Washington, D.C.: U.S. Government Printing Office.

This compilation of basic information about social, economic, political, and military institutions and practices includes objective descriptions without technical details and data, and an extensive bibliography. The discussion of social conditions includes general descriptions of housing, health, and diet.

Ngong, B.D.

- 1979 A Study of the Epidemiological and Clinical Aspects of the Cataract Problem, and the Management (sic) of Cataracts as Seen at the Bansa Baptist Hospital, Kimbo, Cameroon, Thesis for M.D., University of Yaounde, Cameroon.

Method: Retrospective study 4/74-12/78; prospective, 1/79-4/79. Examined records of all patients with cataract problems admitted into Bansa Baptist Hospital from 4/74-12/78. From direct observations a more complete questionnaire was used.

Sample: 439 patients, all ages.

Geography: Kimbo, Bui division in the savannah region of the North-West Province.

This study described the age, sex, professional, and geographic distribution of cataract patients surveyed, determined the common types of cataracts, described the techniques of cataract management used in this hospital and complications which ensued, and made recommendations for prevention and treatment.

Richardson, J.L.

- 1975 Review of International Legislation Establishing Nursing Breaks. J. Trop. Pediatr. 21(5): 249-258, 1975.

The purpose of this paper is to determine what legislation exists in various countries to protect the nursing relationship between mother and child. The intent of most of these laws is not so much to promote breast feeding as to retain mothers in the labor force, so they are usually found in maternity protection labor laws rather than in child welfare laws. The International Labour Organization, affiliated with the United Nations, recommended a half-hour twice during each working day.

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Schuftan, C., Mba, C., and Mandeng, P.

- 1980 Document d'Information de Base pour le Planning Nutritionnel au Cameroun. Ministere de l'Economie et du Plan, Direction de la Planification, July.

This document served as a needs assessment for nutrition planning by reviewing government and other documents relating to the nation's agriculture and nutrition status.

Sivard, R.L.

- 1979 World Military and Social Expenditures 1979. Leesburg, Virginia: World Priorities.

This document summarizes the world situation in 1979 in statistics concerning military development and expenditures, and juxtaposes these with figures on social underdevelopment concerning poverty, employment, food, health and education. Extensive statistical tables with figures for every country make up the core of this document.

TAICH

- 1977 TAICH Country Report: Development Assistance Programs for Cameroon. American Council of Voluntary Agencies for Foreign Service, Inc., Technical Assistance Information Clearing House, January.

This report describes the activities of 20 private, non-profit U.S. organizations which provide the people of Cameroon with development assistance and material aid.

USAID (U.S. Agency for International Development)

- 1979 A Preliminary Overview of Nutrition Planning Activities in Selected Developing Countries. Washington, D.C.: U.S.A.I.D., Office of Nutrition, July 3, 1979.

This report provides two-page, country-specific summaries of nutrition planning activities, such as national nutrition plans and their scope; the legal and political structure of nutrition planning agencies; utilization of food-related outputs and evidence of integration of planning; and source of external assistance.

USDA (U.S. Department of Agriculture)

- 1981 Fiscal Year 1982 Public Law 480 Title II, ISC Approved Quantities, Voluntary Agencies/WFP/Government-to-Government. Washington, D.C.: Food for Peace, Program Operation Division, A.I.D., State Department, October 1981.

This report is a computer printout showing the countries expected to receive Title II PL-480 foods in fiscal 1982, with the program

sponsor, program category, recipients, and commodities (by weight and dollar value) approved for distribution by various voluntary agencies.

USDA (U.S. Department of Agriculture)

- 1978 Food for Peace: 1977 Annual Report on Public Law 480. Washington, D.C.: U.S.D.A., July 10, 1978.

This report describes the PL-480 Title I (sales) and Title II (donations) activities for fiscal year 1977, giving activity summaries and highlights, and tables showing the commodities, countries, recipient categories and sponsors of food distribution programs.

Warrack-Goldman, H.

- 1980 A Study of Food Consumption among the Mafa and Kapsiki. Yaounde, Cameroon: U.S.A.I.D., April 15, 1980.

Methodology: Household visits with observations and weighing of some meals and recalls of others; total record of one day's intakes. Nutrient intakes calculated using standard FAO and USDA references; household RDAs estimated on basis of members' age and sex, using WHO standards.

Sample: 15 households of 3 to 15 members.

Location: Mandara Mountains Area, including several quartiers (neighborhoods) of Mokolo (18 households), the Djingliya-Koza road (4 households), and Rhoumzo (3 households).

This project, a collaboration among the Ministry of Social Affairs, USAID, and the Department of Agricultural Economics at Michigan State University, was the pilot study for proposing a household consumption study in the pre-harvest hungry season, June to August, of 1980. Although the final study was not performed, this profile of intakes does provide an overview of the region's diet. The report includes tables of all standards used, a bibliography, full records of all 15 household interviews, and household nutrient consumption calculations for calories, protein, vitamin C, calcium, and iron.

WHO (World Health Organization)

- 1980 The incidence of Low Birth Weight: A Critical Review of Available Information. World Health Statistics Quarterly 33(3): 197-224, 1980, (Division of Family Health, World Health Organization, Geneva).

This review article, in French and English, summarizes studies of low birth weight incidence and causes in discussion and tabular form. Additional tables present data on total live births and low birth weight rates in specific countries and on regional bases. Extensive bibliography.

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World Bank

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

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

World Bank

- 1980 World Economic and Social Indicators. Washington, D.C.: World Bank, Economic and Social Data Division, Report No. 700/80/2, October 1980.

This document summarizes, in tabular form, aggregate and country-specific data on economic indicators such as commodity prices, consumer prices, and industrial production as well as socioeconomic indicators. The World Bank notes that this document should not be quoted as representing the views of the Bank, nor does the Bank accept responsibility for the accuracy or completeness of the report.

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- 1976 Alimentary Behavior in Non-industrialized Countries: Cameroon. Ann. Nutr. Aliment. 30(2/3):453-466.

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Frohberg, H.

- 1978 The Relationship between Nutrition and Health: The Present Situation in Africa. Laxenburg, Austria: International Institute for Applied Systems Analysis, Research Memorandum 78-72.

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- 1980 Household Budgets and Women's Incomes. Brookline, MA: Boston University African Studies Center, Working Papers, No. 28.

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- 1974 Hospital Diagnosis of Children age 0-5 years in Yaounde, Cameroon. J. Tropical Pediatrics 20:191-195.

Nasah, B.

- 1975 Caring for mother and child in Cameroon: Part 2: Running the maternity service. Harvard Medical Alumni Bulletin. November/December 1975, p. 23.

Trechter, D.

- 1981 Nutrition and Health during the hungry season in the Mandara Mountains of Cameroon. Report (first draft) submitted to USAID/Yaounde, 1981.