

Maternal and Infant Nutrition Reviews



TANZANIA

an International Nutrition Communication Service publication

MATERNAL AND INFANT NUTRITION REVIEWS

TANZANIA

A Guide to the Literature

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INTRODUCTION

This monograph reviews the available literature on maternal and infant nutritional status, beliefs, and practices in Tanzania. It also lists current government, USAID, international agency, and private voluntary organization nutrition-related programs and policies.

This is not an all-inclusive listing, but it should provide enough information to enable the health/nutrition planner (our primary target audience) to ascertain quickly what is known (and what needs to be studied) about this subject. The information is organized according to a Maternal and Infant Nutrition Review (MINR) system outlined on page iii.

The map on page iv and Table 1 on page v show the extent to which various regions and specific locations have been surveyed. Pages vii and viii present the highlights of our findings. Pages 1 to 61 contain the data categorized according to the MINR classification system with boldface titles within each category to describe specific listings.

Pages 63 to 82 contain an annotated bibliography with each entry described in terms of type of study (original data or literature review), with methodology, sample characteristics, and location, where relevant, and a summary. Pages 82-83 list references of interest not reviewed for this report.

These reviews are limited to documents available to us in the United States working under time constraints. We hope that we will be able to obtain further information and to update the reviews.

Special thanks are extended to Dr. V.P. Kimati and Dr. T.N. Maletnlema for commenting on earlier drafts of this report and furnishing further materials.

Ron Israel
INCS Project Manager

MATERNAL AND INFANT NUTRITION REVIEWS

CLASSIFICATION SYSTEM

1. Nutrition and Health Status

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

2. Dietary Beliefs

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

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The United Republic of Tanzania
Regions

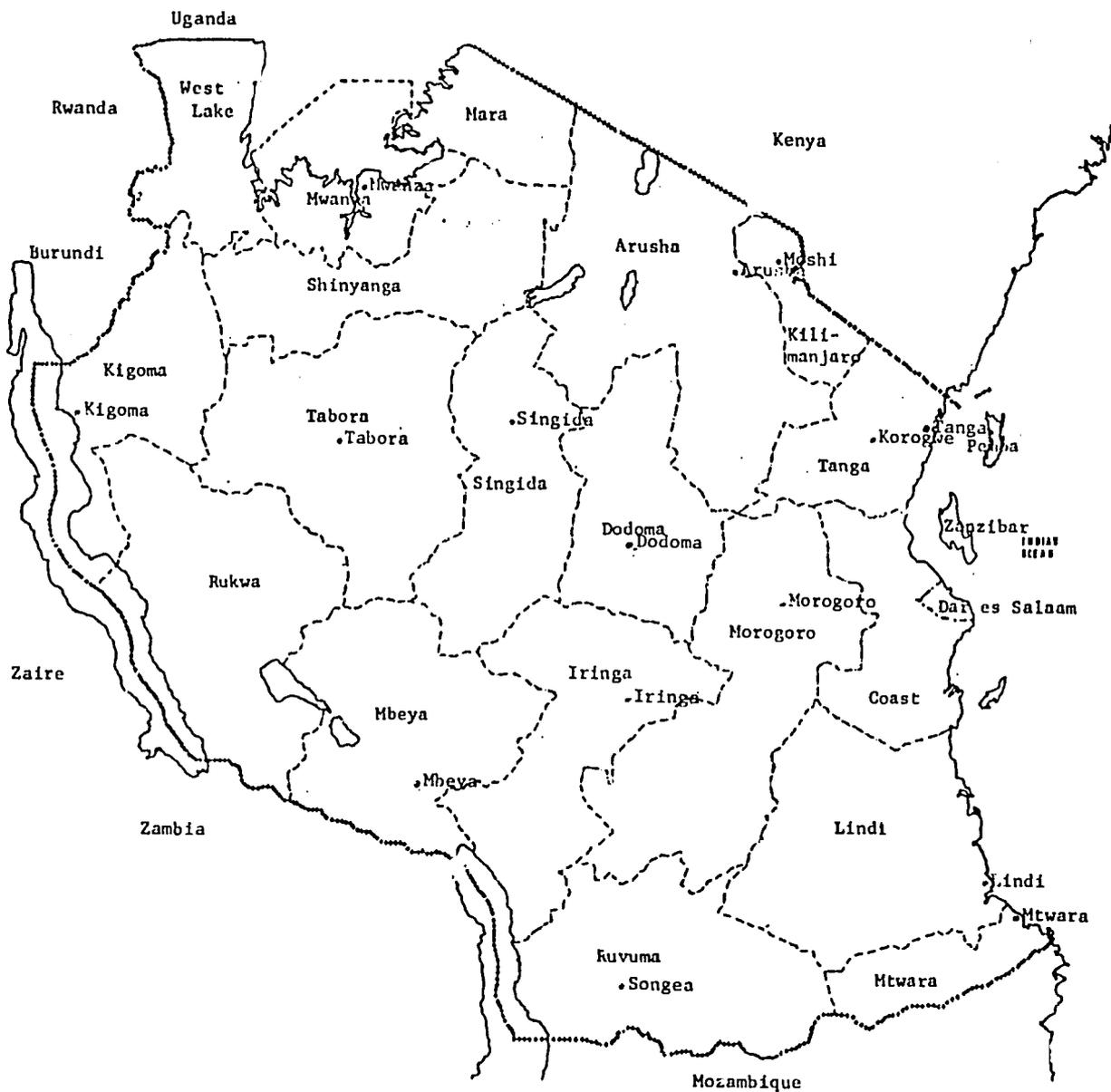


TABLE 1
LOCATIONS STUDIED

Region	District	Division	Village/City	Boersma & Mbiase, 1979	Bornstein, 1973	Fujura, 1973	Lurgess, 1969	Burgess et al., 1968	Ernster et al., 1976	Fleuret, 1979	Freyhold et al., 1973	Gupta & Mwambe, 1976	Kimati, in press	Kimati, 1981	Kimati, 1973a	Kimati, 1977	Kimati, no date	Korte & Patel, 1974	Kraut et al., 1978	Kreysler, 1973	Kreysler, 1970	Kreysler & Mndeme, 1975	Kreysler & Schulze-Western, 1973	Lomavani, 1973	Maletnlema, 1978	Maletnlema, no date	Maletnlema & Bavu, 1974	Maletnlema & Marealle, 1973	Marchione & Helsing, 1981	Newman, 1975	Omari, 1973	Robson, 1974	Swantz, 1973					
Coast																																						
Bagamoyo																																				x		
Bunju																x	x																					
Kasarawe																																						
Binga							x																															
Kasarawe																																						
Masanganya																																						
Dar es Salaam				x	x								x	x			x	x																				
Dodoma																																						
Dodoma																																						
Hombolo																																						
Makulu								x																														
Misui							x																															
Kilimanjaro																																						
Moshi																																						
Mwika																																						
Maringa																																						
Himo																																						
Makuuuni																																						
Kimangara																																						
Lindi																																						
Mbeya																																						
Morogoro																																						
Mtwara																																						
Mwanza																																						
Nachinawe																																						
Puvuma																																						
Songea																																						
Maposeni																																						
Singida																																						
Singida																																						
Taboro																																						
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Lushoto																																						
Bumbuli																																						
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Mayo																																						
Soni																																						
Soni																																						
Usambara																																						
Kwebaridi																																						
Kwemtoni																																						
Kwenzitu																																						
Mlola																																						
West Lake																																						
Bukola																																						
Unspecified																																						

HIGHLIGHTS

1. NUTRITION AND HEALTH STATUS: The main nutritional deficiency is PEM, affecting over one third of the population. Anemia is the second most prevalent nutritional problem, caused by malaria, hookworm and poor iron, protein and vitamin intakes. Goiter also is found everywhere in Tanzania, although the prevalence is low along the coast. 13.6% to 15.9% of infants are born with low birth weights, primarily because of maternal malnutrition during pregnancy. The national infant mortality rate is estimated at 152 deaths per 1000 live births with a range from 88 to 215 per thousand, depending on the region studied. Conservative estimates are that over 25% of children born die before the age of five, which is approximately 150,000 children per year. There are about 600,000 children under five with PEM, including 111,000 with severe PEM. The prevalence of protein energy malnutrition among rural children has not improved in the last ten years.

2. DIETARY BELIEFS: Rural mothers believe that cassava is not nutritious for children. Fish is considered a prestige food in north and northeast Tanzania. Cabbage is regarded as a prestigious vegetable. Food restrictions during pregnancy are based on the belief that they will help the mother have an easy labor and small baby. There are restrictions in rural areas on eating eggs for these reasons. In Dar es Salaam, pregnant women think of iron deficiency anemia in terms of "lack of blood," but don't associate it with diet. In several rural areas, e.g. Kilwa and Singida, colostrum is not given to newborns because it is considered bad milk. The provision of special dishes to the nursing mother traditionally has been an important obligation for the father and his family; the discharge of this obligation was considered a measure of the husband's love and devotion. "Mlaso" soup is a special food given to rural Chagga mothers of newborns in the belief that it will increase the flow of milk. Mlaso is made of meat, fat, milk, and cow's blood. The Nyika of northeast Tanzania believe that kwashiorkor results from sexual intercourse while the child is being breast fed. In Dar es Salaam, husbands often believe that milk powder from tins is "better for the baby" than breast milk. The usual reason for bottle feeding, given by women in Dar es Salaam, is fear that the baby is not getting enough breast milk.

3. DIETARY PRACTICES: Local dietary practices are often related to status fixed by cultural relationships rather than to nutritional needs. Frequently the senior male members of society are given the best diet, while young women of child bearing age have the worst diet. The traditional provision of special dishes for nursing mothers is no longer widespread. The per person daily availability of energy is 3,030 calories; of protein, 72.4 grams; and of fat, 33.2 grams. Maize, millet, and cassava are the main staple foods, whose individual use varies by region. Maize is eaten either as a thin gruel (ubwasbwas) or as a thick porridge (ngali). The Chagga people, of Moshi District, Kilimanjaro, use bananas as their main staple. Traditionally, Chagga children, particularly boys, are trained to share by being encouraged to leave some food on their plates for their mothers. The rainy season, also known as the "hunger months," is from December to April. Expectant mothers in most tribes have no special diet. Evidence of inadequate dietary intake, in combination with high energy expenditures and concurrent infections, suggest that Tanzanian women have poor weight gain during pregnancy. In Kisarawe District, a significant and direct relationship ($r=.37$, $p<.01$) has been established between maternal energy intake during pregnancy and infant birth

HIGHLIGHTS (Cont.)

weight. The mean duration of breast feeding among rural women in five regions is one and one half years. In Dar es Salaam, a relatively small proportion of infants are wholly breast fed. Artificial feeding, usually with a bottle, is introduced early. Working mothers typically continue with mixed feeding rather than abandoning breast feeding altogether. Nestle products comprise 90% of the infant formula market, with Lactogen being the preferred brand. The average age for the start of weaning is four months, but cases of early introduction of weaning foods and of prolonged breast feeding without supplementation do occur. Very few tribes have special weaning foods. Babies are usually weaned onto adult foods. Home made weaning diets (thin porridge) are thought to be a leading cause of PEM in under fives. Imports of commercial baby foods are increasing (from 76 tons in 1972 to approximately 1600 tons in 1976).

4. NUTRITION STATUS CORRELATIONS: Malnutrition has been shown to be associated with poverty in 90% of cases. Poor nutrition status is a strong contributor to a high rate of measles mortality. In rural areas, there is a significant correlation between protein calorie malnutrition and malaria, home births, families with 3 or more children, older siblings, lack of family stability, below average income, families having less than two acres of land and vegetable cash crop producing households. In Usambara communities, increasing commercialization and cash production is found to improve calorie supply. In urban areas, the length of exclusive breast feeding is shorter for formally employed women. The average birth weight of children in the highest income group is 200 gm higher than the average in the lowest income group.

5. NUTRITION AND HEALTH POLICIES: A food and nutrition policy was drafted, but not formally incorporated into the Third Five Year Plan (1976-1981). One objective of the Plan was to reduce malnutrition by 30% to 50%. The Tanzania Food and Nutrition Centre (TFNC) was established by an act of the Tanzania Parliament in December 1973. TFNC is empowered to plan, implement, and evaluate nutrition related activities. The TFNC has developed a food and nutrition policy for inclusion in the Fourth Five Year Plan. Its child feeding priorities include the control of infant formula advertising, the improvement of traditional weaning foods, promotion of breast feeding, and restrictions on the use of infant formula and feeding bottles. Government policy states that employed mothers are to get a three month maternity leave. Nursing mothers are entitled to two half-hour nursing breaks. There are restrictions upon the quantities of infant formula imported. The 1967 Arusha Declaration set out Tanzania's overall development policy which included self-sufficiency in food production. A National Expert Committee has recommended salt iodization as the best means of controlling widespread goiter in rural areas. TFNC developed a locally processed weaning food called "LISHA," made of maize flour, soya and dried skim milk. The quantity produced has never been enough to reach the rural areas. TFNC also has developed a village food production model for community based nutrition planning. Two national rural radio education projects, Mtu ni Afya (Man is health) and Chakula ni Uhai (Food is life), have incorporated health/nutrition education messages. Between 1974 and 1977, the Prime Minister's Office conducted a large famine relief project for the regions of Dodoma, Morogoro, Sengida, Mara, and Shinyanya. The Institute of Adult Education has initiated ten Farmer Education projects, which include teaching farmers ways of reducing

malnutrition. Nutrition education in MCH clinics includes basic nutrition and food science as it relates to child and mother health, and the production of supplemental foods through backyard fruit and vegetable gardening. The Tanzania/UNESCO/UNICEF Primary Education Reform Project integrates classroom nutrition instruction into large, problem-oriented themes, rather than presenting it as an isolated subject.

1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

NATIONAL

MAJOR NUTRITIONAL PROBLEMS: The main nutritional deficiency is PEM, affecting over one third of the population. Anemia is the second most prevalent nutritional problem, caused by malaria, hookworm and poor iron, protein, and vitamin intakes. Vitamin A deficiency (often leading to blindness) and endemic goiter are the other two major nutritional problems. (Tanzania Food and Nutrition Centre, 1980)

NUTRITIONAL DEFICIENCIES: Dietary and nutrition surveys and food balance sheets for Tanzania indicate that average intakes of energy, thiamine and iodine are low; vitamin A intake is very low; and protein intake is adequate. (Report of Working Group I, 1977)

ENDEMIC GOITER: From hospital records and the few surveys carried out, it is obvious that goiter is found almost everywhere on mainland Tanzania, although the prevalence is low along the coast. The areas with the highest prevalence include the highland parts of Arusha, Kilimanjaro, Iringa, Ruvuma, Mbeya, Rukwa, Kigoma and Kagera Regions. (Tanzania Food and Nutrition Centre, 1980)

GOITER PREVALENCE: Studies over the last three decades have demonstrated that goiter can be found in practically all districts in mainland Tanzania, although the prevalence is low along the coast and in certain central parts. The highest prevalences are found in the mountainous parts of Iringa, Mbeya, Ruvuma, Rukwa, Kigoma, West Lake, Arusha, and Kilimanjaro regions. Although the exact numbers and locations are not known, it is clear that goiter and cretinism are serious problems. (National Expert Committee, 1979)

MAJOR HEALTH PROBLEMS: In 1973, the Ministry of Health ranked acute respiratory disease, measles, enteritis and diarrhea, malaria, nutritional diseases including malnutrition, and complications following pregnancy and delivery as the major health problems of the country. (Djukanovic and Mach, 1975)

HEALTH SITUATION: The health situation in Tanzania in 1974 was inadequate with respect to meeting the basic needs of most of the population. The major constraints appear to be lack of a sufficient number of trained personnel and a population uneducated in nutrition and preventive procedures, rather than economic constraints. (Djukanovic and Mach, 1975)

RURAL

MAJOR HEALTH PROBLEMS: In Bagamoyo District, the major health problems identified were malaria, gastroenteritis, PEM, anemias, hookworm, tuberculosis, and leprosy. (Swantz, 1973)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

NATIONAL

MATERNAL MORTALITY: Among the 212,000 institutional deliveries in 1970, the maternal mortality rate was 2.7 per thousand. (Wood, 1973)

LOW BIRTH WEIGHT: Three studies reported that 13.6% to 15.9% of infants were born with low birth weights, primarily because of maternal malnutrition during pregnancy. (Kimati, 1981)

FOLIC ACID DEFICIENCY AND ANEMIA: Folic acid deficiency is common in pregnancy and often leads to anemia. (Maletnlema, 1977)

RURAL

EFFECTS OF POOR MATERNAL DIETS: Even on low energy and protein intakes, about 75% of women had babies of normal birth weights; only the low extreme had very underweight newborns. (Maletnlema and Bavu, 1974)

MATERNAL STUNTING: The mean height of Mlola mothers was about 5 cm shorter than Bagandan mothers and 2 cm. shorter than other Tanzanian women. (Kreysler and Mndeme, 1975)

URBAN

LOW BIRTH WEIGHT INCIDENCE: Among over 16,500 live births studied in the two Dar es Salaam public hospitals, the percent of low birth weight (<2500g) infants was 15.2%. The rate was higher in the lower socioeconomic status group than in higher socioeconomic status groups. (Boersma and Mbise, 1979)

BIRTH WEIGHT AND SOCIOECONOMIC STATUS: Among over 16,500 infants born in two hospitals in Dar es Salaam, the incidence of low birth weight (under 2500 grams) was higher in the low socioeconomic status group than in the high status group. (Boersma and Mbise, 1979)

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

RURAL

ANEMIA: Among the Kwavi (a small ethnic group) around the village of Chalinze, breast feeding women were in poor health, often suffering from severe anemia. (Swantz, 1973)

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

NATIONAL

INFANT MORTALITY RATES: The national infant mortality rate was estimated at 152 deaths per 1000 live births with a range from 88 to 215 per 1000, depending on the region studied. (Knutsson et al., 1979)

INFANT MORTALITY RATE: The infant mortality rate in Tanzania is approximately 160 per 1000 live births; i.e., 16% of the nation's infants die during the 1st year. 25% die before they are 5 years old (250/1000). (Kimati, 1976)

INFANT MORTALITY RATE: Among the population surveyed in nine regions, the average infant mortality rate was 108 deaths per 1000 live births. (Kimati, 1979b)

INFANT MORTALITY RATE AND PEM: The infant mortality rate, about 167 deaths per 1000 live births, ranges from 95 to 340/1000 throughout the country. 50% of these deaths are caused directly or indirectly by PEM. This means that PEM caused about 50,000 deaths in preschool children each year. (Tanzania Food and Nutrition Centre, 1980)

RURAL

INFANT MORTALITY RATE: The infant mortality rate for Bagamoyo District was estimated to be 123 deaths per 1000 live births according to a 1971 survey. (Swantz, 1973)

LOW BIRTH WEIGHT: 53% of all neonatal deaths in the pediatric ward at Mwanza Hospital between February and August 1973 were due to risks associated with low birth weight. (Kimati, 1976)

SATISFACTORY GROWTH: For 44 0-5 month old Tabora region infants examined, length and height compared very well with the Harvard standards (98.4% and 100.8% respectively). None of the infants were classified as protein-calorie deficient. (Maletnlema and Marealle, 1973)

NO MALNUTRITION: None of the 23 infants 0-5 months studied in the Mlola division sample were classed as protein-calorie deficient. (Kreysler and Mndeme, 1975)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

NATIONAL

CHILD MORTALITY: Conservative estimates from the Young Child in Tanzania study indicate that over 25% of children born die before the age of five (280/1000), which is approximately 150,000 children per year. (Wood, 1973)

MALNUTRITION AND MORTALITY: Estimates are that over 50 percent of the annual 120,000 deaths of children under five are related to malnutrition, with 10,000 of these directly caused by inadequate diet. Severe PEM affects 4% of the under-five population. (Lappe and Beccar-Varela, 1980)

INCIDENCE OF PEM: The incidence of protein energy malnutrition among children under five years old was reported to be 4% (third degree, Gomez) and 30% (all types) in a 1977 review. (Kimati, 1981)

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

PEM ESTIMATES: Based in a 22% average prevalence of total PEM and a 4% average prevalence of severe PEM found in four 1975-76 community surveys, there are about 600,000 children under five with PEM, including 111,000 with severe PEM. Annual data from Tanzania's hospitals and health centers suggest numbers much lower because some 60% of the population does not use these health institutions. (Kimati, 1977)

PEM IN THE 1970s: Nutritional status surveys conducted in nine regions of Tanzania from July 1975 to June 1977 showed a 4.6% average rate of severe PEM ranging from 0.3% in Dar es Salaam slum areas to 8.5% in rural Bunju, Coast region. The total rate of all forms of PEM was 30%, ranging from 2.5% in Dar es Salaam to 62% in the Coast region surveyed. (Kimati, n.d.)

PEM IN THE 1960s: Five nutritional status community surveys done in 1965 to 1968 showed a 4% average rate of severe PEM ranging from 1% to 7%, and a 22% rate of total PEM with a range of 8% to 31%. (Kimati, 1977)

PEM: PEM affected over 10% of the country's children and ranked fifth among the causes of child mortality. If multiple diagnoses were made, over 50% of all pediatric cases would show an underlying degree of malnutrition. (Maletnlema, 1977)

PEAK PREVELANCE OF PEM: Childhood PEM prevalence peaked at 39.3% in children 18-23 months of age in four regional nutrition surveys. (Report of Working Group I, 1977)

KWASHIORKOR AND DIET: Kwashiorkor is seen only rarely, except in the areas where banana and cassava are staples. (Maletnlema, 1977)

ANEMIA: Anemia is the second most common form of malnutrition. Malaria, parasitic infestations, and kwashiorkor cause more anemia than iron-deficient diets. (Maletnlema, 1977)

AVITAMINOSIS A: Avitaminosis A is a serious problem in many parts of the country. (Maletnlema, 1977)

MEASLES, BLINDNESS, AND VITAMIN A DEFICIENCY: Childhood blindness associated with measles occurs in some areas of Tanzania. The size of the problem and its causes are not known, but 14% of children admitted to the Muhimbili hospital in Dar es Salaam for measles showed some form of corneal involvement and 2% had corneal destructive lesions. The primary suspect for triggering this severe response is malnutrition in general and vitamin A deficiency in particular. Night blindness and Bitot's spots (signs of mild xerophthalmia) have only rarely been reported in hospital admissions. (Sommer, 1981)

OTHEE FORMS OF MALNUTRITION: Endemic goiter, avitaminosis, fluorosis and possibly calcium deficiency are the other major forms of malnutrition found in the country. (Maletnlema, 1977)

CAUSES OF DEATH: Of the nearly 120,000 children under five who die in Tanzania each year, 50,000 deaths are due to neonatal problems, 30,000 due to measles, 30,000 due to infection and other ailments, and 10,000 due to PEM. Over 50% of these deaths are connected directly or indirectly to PEM. (Kimati, 1977)

MORBIDITY CAUSES: The commonest illnesses found among 1568 children under five in three areas (Tanga, Dar es Salaam and Dodoma) were protein energy malnutrition, anemia, conjunctivitis and diarrhea. The morbidity rate was 23%. (Kimati, 1977)

MAJOR HEALTH PROBLEMS: The 1972 annual report of the Department of Pediatrics, Muhimbili Hospital showed that of the 14,214 admissions, the most common reasons were: respiratory diseases (27%), diarrheal diseases (21%), nutritional disorders (16%), measles (12%), malaria (7%), anemia (5%), and skin infections (3%). (Wood, 1973)

RURAL

CHILD MORTALITY RATE: The calculated rate for the sample of children under five was between 19.9 and 31.3%. (Maletnema and Marealle, 1973)

PEM: The prevalence of severe PEM for a sample of 268 children under five was 1.9%. (Ernster et al., 1976)

PEM TRENDS: The prevalence of protein energy malnutrition among rural children under five has not improved over the last ten years (1965-1976), according to the meager data available from community surveys and hospital records. (Kimati, 1977)

PEM IN 1960s: The prevalence of severe PEM and all forms of PEM in 1965-68 were: Kisarawe district, 7% severe PEM and 31% all forms PEM; Dodoma, 4% and 22%; Tabora, 1% and 8%; Bukuba, 3% and 12%; and Kilimanjaro, 5% and 26%. (Kreysler and Mndeme, 1975)

PEM - BAGAMOYO: 48% of 113 children 0-5 years old had protein energy malnutrition (with two severe cases), according to a June 1973 survey in Fukayose-Kiwangwa area, Bagamoyo District. Most of the mild cases were found in infants 0-17 months of age. Early weaning was thought to be the major cause. (Swantz, 1973)

PEM AND AGE - BOMBO: 49 (53.4%) of the 92 children hospitalized for malnutrition in the Bombo regional hospital, were between 1 and 2 years of age. (Gupta, 1976)

MALNUTRITION - BOMBO: In 1974 there was a 5.6% (92 of 1642) prevalence of malnutrition among hospitalized children in the Bombo regional hospital, Tanga, with more boys than girls being malnourished (no figure given). (Gupta, 1976)

PEM - HOMBULO: 13 of 401 children (3.2%) in the Hombulo sample were classed as having severe protein calorie malnutrition, while a total of

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

95 of the 401 children (21%) showed some form of PEM, most often marasmus. (Burgess et al., 1968)

AVITAMINOSIS A - HOMBOLLO: Few signs of avitaminosis A were seen in the Hombolo survey children. (Burgess et al., 1968)

PEM - KILIMANJARO: Only 7% of the children surveyed in 1979 were found to have PEM in four Moshi district villages in the Kilimanjaro region. This compares to the 43% total childhood malnutrition found in 1977 surveys in Morogoro, Mwanza, Lindi and Ruvuma regions. The weaning foods in the Moshi villages were good because of the extra energy and protein foods added. (Kimati, 1979a)

PEM - KILIMANJARO: The Tanzania Nutrition Committee survey of 1968 estimated that about 5% of children in Kilimanjaro had protein-energy malnutrition as defined by the presence of at least three of the following symptoms: sparse hair, golden hair, depigmentation of the face, moon face, parotid enlargement, angular stomatitis, hepatomegaly, muscle wasting, splenomegaly and hyperkeratosis. Milder cases of PEM including only two symptoms were seen among 28% of the children. Muscle wasting was seen among 39% of the children, with the highest rates in the following areas: Uru Shimbwe, Uru Mawella, Kibosho Sambarai, Kibosho Uchai/uri, and Marangu Nduweni. (Freyhold et al., 1973)

PEM - KILIMANJARO: In the earliest nutrition survey of the Pangani valley in Kilimanjaro Region, it was found that from the age of two years onwards, at least forty percent of the children had weights lower than 80% of the Harvard Standard reference weight. No difference was shown between highland and lowland children of the Pangani Basin. A second survey of the Kilimanjaro District conducted by the Tanzanian Human Nutrition Unit (1968) found essentially the same average weights of children at the different ages. Data from clinics in the area during 1972 showed 20% of the population of children were still underweight. (Freyhold et al., 1973)

MEASLES - KILIMANJARO: In 1972, 6,266 cases of measles (mostly children) were recorded by the Kilimanjaro District Health Office, which represented almost 6% of the total population of children under 7 years old. About one in fifteen children with measles died, usually due to a combination of measles, malnutrition, and pneumonia. Measles was the major killer disease of children in the area. (Freyhold et al., 1973)

PARASITES - KILIMANJARO: A 1968 study of Kilimanjaro children found that 15% had hookworms and 44% had other worms. The prevalence increased after the second year and peaked at 5 to 5 1/2 years old at 67% suffering from various roundworms. In 1972, district health statistics documented 12,554 cases which were treated for worms. (Freyhold et al., 1973)

MALARIA - KILIMANJARO: Malaria was rare on the Kilimanjaro District mountains in 1968; only 1.6% of children showed malarial parasites. Malaria was, however, frequent in the lower parts of the district; in 1965, 82% of children had malaria. (Freyhold et al., 1973)

PEM TRENDS - KISARAWA: Of the Kisarawe District children initially classified as malnourished and reexamined 15 months later, 31 (44%) were again diagnosed as having PCM. Of the children not classified at the first examination as malnourished, 29 (20%) were considered malnourished 15 months later upon reexamination. (Burgess et al., 1968)

PEM TRENDS - KISARAWA: 30% of 366 children under five were classified as malnourished and upon reexamination of 213 of these children 15 months later, 28% were diagnosed as suffering from PCM in two Kisarawe surveys. (Burgess, 1969)

WEIGHT GAIN BELOW STANDARD - KISARAWA: 87% of 15-20 month old children had weight gains below the Harvard standards during the previous 15 months in a Kisarawe follow-up study; 72% of the 21-26 month old children fell below standard; and 56% of the 27-32 month old children gained less than expected. (Burgess, 1969)

ANEMIA AND MALARIA - KISARAWA: Malaria parasitaemia was present in over 81% of the under-five children studied in the Kisarawe district during 1965. In these children malaria is the main cause of anemia. (Maletnlema and Bavu, 1974)

GASTROENTERITIS - KISARAWA: Enteric diseases are second only to malaria as a cause of mortality and morbidity in children in the Kisarawe district. (Maletnlema and Bavu, 1974)

PEM - LUSHOTO: Widespread malnutrition was found throughout Lushoto district, particularly in the one to five age range. Calorie deficiency seemed to predominate. (Korte and Patel, 1974)

MORTALITY RATE - MAKULU AND MISUI: 26% of all Makulu children and 32% of all Misui children born alive to surveyed mothers were said to have died before their fifth birthdays, but this is probably a low estimate of the actual rate. (Burgess et al., 1968)

PEM - MAKULU AND MISUI: The highest incidence of PEM occurred during the second year for children in Makulu (48%) and in Misui (67%). (Burgess et al., 1968)

ANEMIA - MAKULU AND MISUI: A widespread hypochromic anemia was found to affect all ages in both Makulu and Misui. The cause was not evident because intestinal parasites were not prevalent and malarial parasites were present in only one quarter of children sampled in an earlier study. Iron intakes in the young children were low. (Burgess et al., 1968)

CHILD MORTALITY RATE - MLOLA: The child mortality rate for children under five was 17.4% for the Mlola division with a sibling rate of 30.1% (range 18% to 38%). (Kreysler and Mndeme, 1975)

PEM - MLOLA: 17 of 209 (8.1%) 6-24 month old children were classed as having severe protein-calorie deficiency (based on physical signs and

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

anthropometric measurements) in the Mlola division sample. 8.9% of the total under five sample (506) were classed as having severe protein-calorie deficiency. 14% of the total sample were diagnosed as having moderately severe protein-calorie deficiency. (Kreysler and Mndeme, 1975)

OTHER DEFICIENCIES - MLOLA: Signs of non-protein calorie deficiencies were rare in the Mlola division sample. Anemia presented no problem. (Kreysler and Mndeme, 1975)

MORTALITY AND SEX - SONGEA: Up to 5 years of age, the Songea population lost males at a greater rate than females. (Robson, 1974)

PEM - TABORA: In the Tabora region only 3 of 150 (2%) sampled infants 6-24 months old were hospitalized for severe protein calorie malnutrition during the survey period. A total of 27 (18%) of the under two year old infants were classed as having some grade of PEM. The highest prevalence was in the 18-23 month old group (26.2%). (Maletnlema and Marealle, 1973)

PEM - TABORA: The overall prevalence of all grades of PEM in an under five Tabora sample was 8.2% (38 of 463). (Maletnlema and Marealle, 1973)

HEIGHT AND WEIGHT - TABORA: Height and weight measures of 150 6-24 month old infants in the Tabora sample compared favorably with the Harvard standards. The 12-17 month old subgroup had average heights 96% of standard and average weights 86.8% of standard. (Maletnlema and Marealle, 1973)

ANEMIA AND MALARIA - TABORA: 45% of the under-fives showed malarial parasitaemia on the day of examination in the Tabora region. (Maletnlema and Marealle, 1973)

ANEMIA - TABORA: The mean hemoglobin was 10.4 gms% (SD 1.9) with a PCV of 35.0 (SD 4.9) for the 463 under-five children in the Tabora region sample, which was about 80% and 90% of standard respectively. (Maletnlema and Marealle, 1973)

OTHER DEFICIENCIES - TABORA: Very few signs of nutritional deficiencies other than PCM were identified in the Tabora region sample. (Maletnlema and Marealle, 1973)

PEM - TANGA: Marasmus was more common (46.7%) than kwashiorkor (18.3%) among 92 malnourished, hospitalized children of Tanga. (Gupta, 1976)

URBAN

PEM: Of the 609 children under five surveyed in the Manzese area of Dar es Salaam, 92 (15%) were either underweight or severely malnourished. (Kimati, 1977)

DIARRHEA: Diarrhea is the most common cause of admission in the pediatric wards of Dar es Salaam. (Kimati, 1981)

INTESTINAL PARASITES: Of 126 children under five years old examined in Dar es Salaam, 26% had parasites, mainly hookworm, ascaris and Trichuris trichiura. (Kimati, 1977)

MORBIDITY AND MORTALITY: Among the 13,700 hospital admissions to the pediatric ward of Muhimbili Hospital, Dar es Salaam in 1976, 2430 were due to gastroenteritis, 2363 to measles, 2203 to respiratory disease (excluding tuberculosis) and 2053 to low birth weight. These four diseases accounted for 56% of all pediatric deaths. Another 11% of the pediatric deaths were due to neonatal septicemia. (Kimati, 1977)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

RURAL

STAPLE FOODS - CEREAL: In Bagamoyo District, cereal food was considered a substance man needs. Meat (mboga) and vegetables (kitoweo) were added only to make food more palatable. (Swantz, 1973)

FOOD RESTRICTIONS: Few families still have special food taboos for women and children in Moshi District, Kilimanjaro. (Freyhold et al., 1973)

FOOD RESTRICTIONS AND TABOOS: Only a few eating taboos were general for the whole Bagamoyo area. Taboos and restrictions may have been inherited clan observances or specifically designated by a medicine man as a result of some illness. Thus some families in the same compounds may observe different restrictions. The effects of breaking a taboo were described to be symptoms of an ordinary allergy (i.e. skin boils upon contact with anything that has touched the forbidden food). (Swantz, 1973)

EGG EATING RESTRICTION: There was a general taboo on eating eggs in Bagamoyo District and one did not see eggs being eaten, although it was said that the taboo was no longer followed. (Swantz, 1973)

QUANTITY AND QUALITY FOODS: 93% of the women made a distinction between the quantity and quality of food. (Kreysler, 1970)

PRESTIGE FOOD: Ugali, a stiff porridge of maize, sorghum, and millet, was thought to be a high prestige food by 69% of the mothers questioned. (Kreysler, 1970)

PRESTIGE FOOD: Fish was considered a prestige food in all 8 surveyed areas in the northern and north-eastern parts of Tanzania. (Protein-Calorie Advisory Group, 1977)

PRESTIGE FOOD: Cabbage has been regarded as a prestigious vegetable. (Kimati, 1981)

CASSAVA: All mothers agreed that cassava is not nutritious for children. 35% said their main reason was that cassava does not bring health. (Kreysler, 1970)

URBAN

STAPLES: Staples are considered the "real food" in the diet and the relishes are considered "little things." Carbohydrate foods are thus thought to be "what makes the baby strong." (Bujra, 1973)

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2.2 DIETARY BELIEFS ABOUT PREGNANCY

NATIONAL

FOOD RESTRICTIONS: Food restrictions during pregnancy are based on the belief that they will help the mother have an easy labor and small baby. (Kimati, 1977)

RURAL

FOOD RESTRICTIONS: Among the Zaramo people in Bagamoyo District, girls were taught not to eat liver when pregnant lest the child be born with much blood; not to eat meat from the ribs lest the child be only bone; not to eat stomach meat of a cow lest the cord be difficult to cut and strangle the baby; and not to eat meat of an animal with a large upper lip, crab, or bowe fish. The restrictions on eating eggs pertained to women generally, but if a pregnant woman ate eggs, the child was expected to be bald. Generally speaking, these restrictions were still considered appropriate. (Swantz, 1973)

EGG EATING RESTRICTION: Among the Wanyaturu of Singida, a pregnant woman is not allowed to eat eggs because of the belief that if she does she will deliver a sick child with sores and/or ulcers all over the head. Like most of the pregnancy restrictions this one has died away in most parts of the area. (Omari, 1973)

URBAN

IRON DEFICIENCY ANEMIA: Women in Dar es Salaam think of iron deficiency anemia in terms of "lack of blood." They go to clinics to get pills to "increase" it, but don't associate "lack of blood" with diet. (Bujra, 1973)

2.3 DIETARY BELIEFS ABOUT LACTATION

RURAL

COLOSTRUM: In Kilwa, colostrum is not given to newborns because it is considered bad milk. Water is given in its place. (Kimati, 1977)

FIRST MILK: According to Wanyaturu informants, women of Singida typically squeezed out the first breast milk and washed the breasts in warm water before initiating breast feeding. This process (Kinkhanda) was done in order to remove "bad milk" which would cause the infant to have stomach troubles. (Omari, 1973)

EFFECTS OF PREGNANCY: Three fourths of the Chagga women interviewed in a 1971 survey believed that the milk of pregnant women was unsuitable for babies. (Freyhold et al., 1973)

SPECIAL DIETS: Traditionally, the provision of special dishes to the nursing mother was an important obligation for the father and his family. This was impressed upon him before marriage and monitored by close observation by the women's family, and may even have been enforced by a

court of law. The discharge of this obligation was considered a measure of the husband's love and devotion. Not even poverty would excuse his omission. (Freyhold et al., 1973)

SPECIAL DIET: Until recently, Chagga mothers with newborns were entitled to a special diet with plenty of meat, butter and milk and a special soup called "mlaso," made of cow's blood, milk, and fat. This was a special privilege and duty of the husband. Now, not all women get it, and if they do, maybe only once. The "public" reason given for the decline of this special diet was that women do not like it anymore, but privately, women admit still liking it but pretend not to in order to avoid embarrassing their husbands. (Freyhold et al., 1973)

SPECIAL FOOD: "Mlaso" soup is a special food given to Chagga mothers of newborns several times during their confinement in the belief that it will increase the flow of milk. Mlaso is made of meat, fat, milk, and the blood obtained from cattle by a special process of blood-letting. (Freyhold et al., 1973)

SPECIAL FOODS: Chagga women have said that the custom of serving special foods to lactating women is now going out of fashion; not all women get them and even if they do it might only be once after birth (review of Freyhold, et. al., 1973, p. 180). (Protein-Calorie Advisory Group, 1977)

TABOOS AGAINST SEXUAL INTERCOURSE: Among the northeast coastal Bantu-speaking peoples of Tanzania (Nyika), kwashiorkor is thought to result from the breaking of the most important sexual taboo, chirwa, which forbids sexual intercourse during the period before the child is old enough to be weaned. While few Nyika now are willing to abstain for the required period, they attempt to prevent conception. (Protein-Calorie Advisory Group, 1977)

BREASTFEEDING AND PREGNANCY: Six village women who said they stopped breastfeeding because they had become pregnant, explained this practice with the belief that the fetus might "poison" the milk for the suckling child or that the "jealousy" of the suckling child might harm the fetus. (Bornstein, 1973)

URBAN

PROLONGED BREASTFEEDING: 14 school girls (8% of the total sample) gave the child's health as a positive reason for breastfeeding longer than one year on a survey questionnaire; 20 girls (12%) gave the child's health as a reason for not breastfeeding longer than a year. (Bornstein, 1973)

LENGTHY BREASTFEEDING: Of 166 urban secondary school girls questioned, 36% expressed positive judgements toward breastfeeding more than one year and 57% reacted negatively to this idea. (Bornstein, 1973)

BREASTFEEDING AND MOTHERS' HEALTH: 10 of 166 (6%) school girls gave the mothers' health as a reason for expressing a positive judgement on breastfeeding more than a year; 27 (16%) of these girls gave the mothers'

2.3 DIETARY BELIEFS ABOUT LACTATION (Cont.)

health as a reason for thinking that breastfeeding longer than a year was bad. (Bornstein, 1973)

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

RURAL

BOTTLE FEEDING: Uncertainty about having enough milk was never given as a reason for bottle feeding by rural mothers. (Bornstein, 1973)

URBAN

ATTITUDES TOWARD INFANT FORMULA: In interviews with 228 women, women often expressed a very strong desire for infant formula. People have become familiar with this alternative feeding method and some mothers have become quite dependent on formula. These responses were colored by the prevailing shortage of formula in the country. Lactogen (Nestle) was the preferred brand. (Marchione and Helsing, 1981)

MILK POWDER: In Dar es Salaam, husbands often believed that milk powder from tins was "better for the baby" than breast milk. (Bujra, 1973)

REASONS FOR BOTTLE FEEDING: The usual reason for bottle feeding given by women interviewed in Dar es Salaam was fear that the baby was not getting enough breast milk. Another reason given was that bottle milk makes the child healthy. (Bujra, 1973)

REASONS FOR BOTTLE FEEDING: Common reasons for bottle feeding given by 42 town mothers included: bottle was "clean" and "easy"; and milk had "dried up" or was insufficient. (Bornstein, 1973)

2.5 DIETARY BELIEFS ABOUT WEANING

NATIONAL

EGG RESTRICTION: About 95% of Tanzania's tribes have taboos on giving eggs to children, but this custom is rapidly disappearing after mass health education. (Kimati, 1977)

RURAL

FOOD RESTRICTIONS FOR INFANTS: Both egg and fish were forbidden foods for infants. Ground nuts were also not given to infants because they were believed to cause diarrhea. Ngori children received less food of animal origin because of taboos. (Robson, 1974)

MEAT RESTRICTIONS: According to Wanyaturu informants, young children of Singida District were restricted from eating meat, particularly the organs of animals, in the belief that they would develop kidney, spleen or heart disease when they grew up. Specifically for liver and small intestines, the restrictions were based on a belief that eating them would cause complications during later marriage arrangements. Although

not a taboo, meat was generally withheld to avoid the child's getting used to meat and crying gluttonously for it, embarrassing the parents. The child may be given soup to drink. These taboos were said to have disappeared in most areas and were considered as an excuse for parents. (Omari, 1973)

GOATS' MILK: In the Mayo area, goats' milk is not used for children because it is commonly believed to cause stammering. (Kreysler, 1970)

COOKING: Chagga mothers believe strongly that one should not let anyone else cook for one's child unless there is a crisis. (Freyhold et al., 1973)

URBAN

STAPLES: The staple foods high in carbohydrates are thought to make the baby strong. (Bujra, 1973)

2.6 DIETARY BELIEFS ABOUT ILLNESS AND CURE

RURAL

HEALTH CLINIC ATTENDANCE: The 122 reasons given by mothers for taking their children to health clinics included: surveillance of child's weight (39%); to safeguard the health of the child (20%); to obtain optimal medical care of the child (18%); and to improve the health and growth of the child (10%). Clinic staff felt that food supplements were also a strong motivation for clinic attendance. (Kreysler and Schulze-Western, 1973)

CAUSES OF ILLNESS: Mothers interviewed in Balangai and Kwshangarawe villages showed a high awareness of dirty water, flies, and infections as causes of illnesses; some cited cold weather, bad food, and spoilt milk as the most important factors. (Protein-Calorie Advisory Group, 1977)

THE SPIRIT THEORY: The Kisarawe people believe in the "spirit theory"--- i.e., that man is helpless and all misfortune is sent by the spirits (external causation). (Maletnlema and Bavu, 1974)

WITCHCRAFT: Belief in witchcraft is stronger in the mixed population of the Moshi District plains and Moshi towns than in the mountain areas. Belief in the danger of "bad eye" is stronger than belief in witchcraft. Fear of it is strong, but it is seldom diagnosed. In most cases, a mother does not consider supernatural forces unless modern medicine fails. (Freyhold et al., 1973)

2.6 DIETARY BELIEFS ABOUT ILLNESS AND CURE (Cont.)

URBAN

HEALTH AND DIET AWARENESS: Among women interviewed in Dar es Salaam, 42% mentioned foods rich in protein as good foods for children, 37% mentioned fruits and vegetables, and 18% mentioned milk. Only 22% named only starchy foods. The question was whether they are able to afford these foods. (Bujra, 1973)

KNOWLEDGE OF SPECIFIC CHILDHOOD DISEASES: Among women in Dar es Salaam, concepts of children's illnesses were not specific: homa (fever), tumbo (diarrhea or stomach pain), and kifua (chest infection, coughing). The Swahili language does not have specific words for many common illnesses. (Bujra, 1973)

3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

BASIC DIET: The diet usually consists of mixed pots of relish and staples served separately. Relishes are usually highly flavored dishes made from various spices, fish, green vegetables, legumes and/or various nuts, depending upon the area. The quantity of the relish is small compared to the staple starch (e.g. maize, bananas, cassava, rice). Snacks in between meals, consisting of fruits, roasted sweet potatoes, bananas, ground nuts, or boiled maize, are common. (Tanzania Food and Nutrition Centre, 1980)

STAPLE FOODS BY REGION: Maize is grown in every region of the country and is a major staple in eight out of twenty regions. Cassava is a major crop in eleven of the twenty regions and is a main staple in six regions. The other major foods include sorghum (9 regions), millet (7 regions), rice and bananas (6 regions each). (Maletnlema, 1977)

FOOD DEFICIT AND SURPLUS REGIONS: In the 1978/9 season, nine regions were classified as cereal deficit areas and 11 regions were classified surplus areas. The deficit regions, in order of increasing deficit, were Singida, Kigoma, Mara, Lindi, Mtwara, West Lahi, Tanga, Dar es Salaam and Coast. The surplus areas, in order of increasing surplus, were Mwanza, Morogoro, Rukwa, Shinyanga, Taboro, Kilimanjaro, Mbeya, Iringa, Ruvuma, Dodoma and Arusha. (Tanzania Food and Nutrition Centre, 1980)

FOOD IN 1980/81: The food situation for 1980/81 will depend on the harvest and availability of credit. In many regions, late rains and delayed planting point to a poor harvest. (Tanzania Food and Nutrition Centre, 1980)

FOOD SHORTAGES AND FAMINES: A study of annual rainfall and food shortages and near-famine conditions in Tanzania show a five-year cyclical problem, occurring most recently in 1974/5 and 1979/80. (Tanzania Food and Nutrition Centre, 1980)

DROUGHT PRONE AREA: Government records from the Dodoma District from 1928 to 1970 show 15 drought years, 11 years of fair rainfall and 15 good rainfall years. (World Hunger, Health and Refugee Problems, 1975)

DROUGHT AND FOOD SHORTAGES: By 1974 the two to three year drought was estimated to cover 50% of the country and caused such a severe food shortage that grain stocks required for seed were largely consumed. (World Hunger, Health and Refugee Problems, 1975)

DROUGHT AND FOOD IMPORTS: Food imports in 1974 cost \$147 million compared to an average of \$40 million in 1970-72. (World Hunger, Health and Refugee Problems, 1975)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

PROTEIN SOURCES: According to data from 1974 to 1978, most protein needs are met through cereals (46-53%), roots and tubers (6-12%), and pulses (12-24%). (Tanzania Food and Nutrition Centre, 1980)

ANIMAL PRODUCTS CONSUMPTION: In 1977, the average annual consumption of meat was 12 kg., of which 71% was beef. The per capita supply of milk for the same year was 22.2 liters in rural areas and 36.6 liters for urban areas. (Tanzania Food and Nutrition Centre, 1980)

MILK, MILK PRODUCTS AND EGG CONSUMPTION: For most people, milk, milk products and eggs are not basic items in the diet. The use of milk as a basic item is confined to a few pastoralist tribes, such as the Masai. The Chaggas also use milk for nursing mothers and weaning children. (Tanzania Food and Nutrition Centre, 1980)

ENERGY SOURCES: Most energy needs are met through cereals (41-47%), roots and tubers (35-38%) and pulses (7-11%) according to data from 1974 to 1978. (Tanzania Food and Nutrition Centre, 1980)

FOOD DISTRIBUTION AND SOCIAL STATUS: Local dietary practices are often related to status fixed by cultural relationships rather than to nutritional needs. Frequently, the senior male members of society are given the best diet (in quantity and quality), while the young women of child bearing age receive the worst diets. In child some communities, the lactating mother is given extra care during the first few months after delivery. (Tanzania Food and Nutrition Centre, 1980)

FOOD PREPARATION: The methods applied in domestic pounding of maize generally imply a loss of considerable amounts of vitamins and about 40% of the overall weight of the maize. (Knutsson et al., 1979)

POST-HARVEST LOSSES: National estimates have put food storage losses at 20-30% of harvested grain. Losses of other crops, such as fruits and vegetables, are as high as 50%. (Tanzania Food and Nutrition Centre, 1980)

FOOD PROCESSING: Almost 80% of foods harvested in the country, particularly cereals, are domestically processed. Some of the practices involved, such as soaking dehulled maize for more than three days in order to whiten it, cause considerable nutrient losses. (Tanzania Food and Nutrition Centre, 1980)

FOOD STORAGE: About 80% of the food grains produced in the country are stored at the farm and village levels using various traditional storage facilities, including Kihenge, dri, Chanja, pots, gourds, granaries and others, which do not insure their safety. (Tanzania Food and Nutrition Centre, 1980)

STORAGE WASTE: Between 25 and 30% of the Tanzanian grain harvest is wasted because of poor storage. Approximately 80% of the harvested grain is stored at the household level. Hybrid maize has proved to be more

vulnerable to storage pests than the indigenous varieties. (Knutsson et al., 1979)

FOOD PROCESSING AND STORAGE: The loss of cereals in processing and storage was estimated to be 30%; vegetables and fruits suffered even higher losses. Traditional methods have been abandoned in favor of selling the excess crop and buying later at higher prices. (Maletnlema, 1977)

NUTRIENT AVAILABILITY: According to National Food Balance Sheets, the 1976/77 per person daily availability of energy was 3,030 calories; of protein, 72.4 grams; and of fat, 33.2 grams. These figures have increased since 1972/3. The Food Balance Sheets prepared by FAO in Rome show much lower intakes of nutrients. (Jonsson, 1978)

REGIONAL FOOD BALANCE SHEETS - PROTEINS: The 1977/8 regional food balance sheets showed that the regions of greatest protein availability were Rukwa (166.5 grams per person per day), Kigoma (149.8), and Arusha (119.5 g). Lowest availability was in Iringa (33 grams per person per day), Kilimanjaro (33.7), and Mara (34.9). (Department of Planning, 1980)

REGIONAL FOOD BALANCE SHEETS -- CALORIES AVAILABLE: The 1977/8 regional food balance sheets show a wide range of available calories per person per day across the 20 regions. The highest levels are in Kigoma (7901 calories per person per day), Rukwa (5446), and Coast (4206) regions. The lowest are in Dar es Salaam (522), Iringa (1424), and Ziba Magharibi (1529). (Department of Planning, 1980)

RURAL

KNOWLEDGE AND PRACTICE: The mass adult literacy campaigns have increased people's knowledge, but much of what they know is not or cannot be put into practice. For example, most mothers in Kisarawe know that eating eggs does not harm them, but few have the courage to eat them. (Maletnlema and Bavu, 1974)

ENERGY SOURCES: A 1968 study showed that 40% of the energy intake was derived from cassava, 15% from maize, 10% from each coconuts, pulses, and rice, and 5% from white sugar. (Maletnlema and Bavu, 1974)

RAMADHAN FAST: A religious factor affecting nutrition in Bagamoyo District was the month of fast, Ramadhan, for the 75% of the population who are Moslems. Young children are not required to fast, but they are likely to suffer irregular feeding during this religious period. (Swantz, 1973)

HUNGER MONTHS: The rainy season is from December to April. During the "hunger months" the only available food produced was cassava. Cowpeas were available but not used as a source of food. (Robson, 1974)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

FAMILY FOOD DISTRIBUTION: Maldistribution of food within the family arises from the custom of allowing the father and visitors to take the most attractive and most nutritious item at each meal. (Kimati, 1976)

BANANAS: 58% of the mothers questioned said that bananas are eaten only when no other food is available. (Kreysler, 1970)

DIETARY INTAKE: In a 1968 study, the quantity of protein was found to be inadequate, but the quality was not poor; energy intake was also low. Vitamin A and calcium were even more deficient than energy and protein. (Maletnema and Bavu, 1974)

BASIC DIET - BAGAMOYO: The normal foods for the Zaramo in Yombo division, Bagamoyo District, generally were ugali, a stiff porridge of cassava or maize flour, and a relish of fish or kisamvu, cassava leaves. Meat was rarely eaten because it had to be obtained in larger towns or cities. Differences in diet due to income were mainly in the quantity, rather than the quality, of foods. Breakfast consisted of tea with sugar, buns or boiled cassava. (Swantz, 1973)

RICE - BAGAMOYO: In the Ruvi River valley, Bagamoyo District where rice was grown, some of the crop was sold and the rest was used for home consumption by those who cultivated it. It was mainly used for ritual celebrations which were arranged during the months after the harvest. (Swantz, 1973)

MEAT-EATING RESTRICTIONS - BAGAMOYO: Wild pig meat and rodents were generally not eaten in the Bagamoyo District. Individual differences existed for other wild meats. Chicken, goat, cow, or other meat had to be killed in a religiously acceptable manner before it could be eaten. (Swantz, 1973)

MEN'S BREAKFAST - BAGAMOYO: Male members of the Zaramo families from Yombo division, Bagamoyo District, usually had their breakfast at the local tea houses. This morning meal generally consisted of tea with milk, buns and a half bowl of beans. (Swantz, 1973)

FAMILY EATING PRACTICES - BAGAMOYO: Depending upon the family size and the occasion, Zaramo men and women in Yombo division, Bagamoyo District, ate separately, with the men usually eating first and having the larger servings. In small families, men and women ate together more readily. (Swantz, 1973)

BASIC DIET - CHAGGA: The major staple among the Chagga of Moshi District, Kilimanjaro is bananas served steamed, boiled, or roasted. Maize ugali is offered as a change. These are eaten with green vegetables (mainly mchicha), with ghee or sour milk, with beans (rarely), other legumes, or meat. Meat is served at least once per day when possible. In the prevalent banana and meat dish, the meat is cut and mixed with the bananas. The other common method of serving meat is to

boil the meat in one piece and place it before the husband, who cuts pieces for himself and each member of the family. (Freyhold et al., 1973)

VEGETABLES AND FRUITS - CHAGGA: For the Chagga families with enough land or money, a variety of food plants are available such as cocoyams, beans, peas, potatoes, sweet potatoes, onions, cabbage, carrots, sugar cane, lemon, oranges, pawpaw, and pineapples. Meat and milk are also usually available (although milk may be in short supply). (Freyhold et al., 1973)

CONTROL OF FOOD RESOURCES - CHAGGA: Among the Chagga of the Moshi District, the men usually control the money from the cash crops (e.g. coffee). After giving the husbands the first portions, women are free to dispose of milk, bananas and maize. The husband, however, may demand a share of the income from these. Beans and vegetables are the women's property. Most women have to support their children and themselves out of their own income from maize, beans and bananas with no help from their husbands. (Freyhold et al., 1973)

SHARING FOODS - CHAGGA: Traditionally, Chagga children, particularly boys, are trained to share by being encouraged to leave some pieces of meat on their plates for their mothers. Parents also may show their generosity by leaving something on their plates for the children. Children exposed to school education consider this an unhygienic habit, and may refuse to eat leftovers. (Freyhold et al., 1973)

ANIMAL PROTEIN - HOMBOLLO: In the Hombollo division meat was usually eaten only when an animal died or for feasts, although cow's milk was drunk, often after souring. Chickens were kept for special occasions and eggs and fish were seldom consumed. (Burgess et al., 1968)

FOOD SHORTAGES - HOMBOLLO: Food shortages due to failure of the rains have been relatively frequent in Hombollo division of Dodoma Region. (Burgess et al., 1968)

SEASONAL VARIATIONS - KILIMANJARO: In the Kilimanjaro region, the main rainy season is from March to May. During this time, women spend much of their time away from home and children cultivating and planting in the "pori" (the bush). Harvesting seasons start in June and go to July for beans, September for maize, and as late as December for coffee. There is more cash and food available during the harvesting periods. Children may be better off in terms of care and food in the second part of the year. (Freyhold et al., 1973)

BASIC DIET - KISARAWA: The diet in Kisarawe District is based upon cassava. Maize, beans, and peas are eaten frequently and so are small quantities of dried fish. Fresh coconut kernel is the main source of cooking oil. In the two studied villages, citrus fruits, pineapples, pawpaw, mango, and other tropical fruit grow abundantly. Sugar, tea, and wheat flour are bought with cash from the cashew nut cash crop. (Maletnlema and Bavu, 1974)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

FOOD AVAILABILITY - KISARAWA: The Kisarawe region has an abundance of coconut trees; and fruit and cashew nut trees grow easily. (Maletnlema and Bavu, 1974)

FAMILY FOOD DISTRIBUTION - KISARAWA: Domestic distribution of food appears to give women less than men based on the 1968 survey and the present sample in the Kisarawe District. (Maletnlema and Bavu, 1974)

DIETARY INTAKE - KISARAWA: A 1968 family consumption survey in Kisarawe showed an intake of 1,938 calories per person per day, which is comparable to the FAO estimate from the national food balance sheet of 2,141 calories per person per day. (Maletnlema and Bavu, 1974)

SUBSISTENCE AND LAND DISTRIBUTION - LUSHOTO: The majority of people in the Lushoto District live close to subsistence level because of inheritance customs (partition of land resulting in small scattered plots), overgrazing and lack of fertilization. (Kraut et al., 1978)

QUANTITATIVE DEFICIENCIES - LUSHOTO: From the variety of food materials and protein availability reported by 68 school children of the Mlola Lushoto, the diet was more likely to be deficient in quantity rather than quality. (Kreysler and Mndeme, 1975)

MEAL PATTERNS - MAYO: This study suggests 90% of Mayo families have 3 meals per day and 10% have 2 meals, but a previous survey found 70% of school children did not have breakfast on the day of the survey. (Kreysler, 1970)

BASIC DIET - MLOLA: The staple foods in rural Mlola, Lushoto were maize and cassava. Other food crops are beans (*phaseolus vulgaris*), cowpeas, sweet potatoes, bananas and mangoes. Vegetables and fruits in the diet consist mainly of cabbage, onions, tomatoes (in season), pumpkin, cassava leaves, and some wild spinach. Livestock consists mainly of cattle, goats, and chicken. (Kreysler and Mndeme, 1975)

DIETARY DIVERSITY - MLOLA: In a Mlola village 68 school children recalled consuming 25 different dishes the previous day. All but 7 included some form of protein as a major component. Maize (as ugali) was mentioned 39 times; spinach 19 times; beans 14 times, maize and pounded beans 14 times; milk 12 times; meat 11 times; cassava (as ugali) 10 times; fish 7 times; and rush potatoes, cabbage, tea, pumpkins, oil, taro, and bananas were mentioned a total of 13 times. (Kreysler and Mndeme, 1975)

MILK SOURCES - MOSHI: Most interviewees in Moshi District said they had two or three cows at home. Women have the responsibility for obtaining foliage for the cattle, spending an average 22 hours per week on this task. The cows, zebu, do not produce very much milk or calve as often as in the past, due to poor feeding, poor stable sanitation, and lack of bulls at the correct times. Although some 3/4 of fifty young women reported having a cow at home, only 7 claimed their cow was in milk. For

many, the milk was only enough for the calf. Many women consider their cattle a burden rather than an asset. (Freyhold et al., 1973)

COW'S MILK - MOSHI: The first milk from cows in Moshi District was offered to the husband. The wife was usually allowed to dispose of the rest of the milk herself. (Freyhold et al., 1973)

MEAL PATTERNS - MOSHI: In Moshi District, the mealtimes are not fixed. The mother cooks when she has time, once or twice a day. She hands out a plate of food to each family member, even the small child. The father is served the biggest piece of meat and may take his plate outside to eat. The mother and children sit together. Many fathers eat at the beer club as well. (Freyhold et al., 1973)

CASH CROPPING AND WOMEN'S WORKLOADS - MOSHI: Although cash crops generate income which allows a minority of women to have lighter work loads in the fields and more time for household and child care, the effects on poorer women include increased walking distances to fields for maize growing, heavier work loads as food producers, less time available for household tasks and a greater struggle to provide the family with adequate nutritious foods, according to a 1975 anthropological study in the Moshi District. (Protein-Calorie Advisory Group, 1977)

STAPLE FOOD - NGONI: Maize was the staple food of the Ngoni, eaten either as a thin gruel (ubwabwa) or as a thick porridge (ugali) of tough-like consistency. Ugali was made of 4 parts maize meal with ten parts water. Portions of the cooked meal was rolled into balls and a cavity made with the thumb. The crude cup was then dipped into relishes (consisting of beans and peas or green leaves or cassava). A man would eat about 15 maize balls at a meal. (Robson, 1974)

BASIC DIET - NGONI: The main sources of food in the Ngoni diet (Songea District) were: mixed beans (77% of population recalled eating); maize (76%); cassava (70%); bananas (44%); green leaves (41%); rice (18%); citrus (15%); and other fruit (10%). Not reported were the casual eating of grubs, ants, gleanings from groundnut gardens and wild honey. (Robson, 1974)

COMMUNAL EATING - NGONI: Food is served in a communal bowl with the father having priority over the children in the Ngoni tribe. (Robson, 1974)

DIETARY INTAKE - NGONI: Crude calculations of the daily nutrient and energy intake from the two main meals, consisting of ugali and relish, of the Ngoni were 50.6 grams protein and 1815 calories. (Robson, 1974)

BASIC DIET - SANDAWE: The staple food of the Sandawe is a stiff porridge like substance known as ugali, and was the main preparation at 91% of the mid-day and evening meals. Boiled or roasted sweet potatoes appeared as the main course at 5% of the meals. The other 4% of meals included ground nuts, bambara nuts, cowpeas, haricot beans and cassava as the main preparation. (Newman, 1975)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

DIETARY DIVERSITY - SANDAWE: The Sandawe partake of a wide variety of foods in addition to the main grain staple (maize): relishes eaten along with ugali range from cultivated and gathered plants, to eggs, milk, both domestic and wild meat and fish. Animal protein (eaten at about half the meals) consumption is relatively high compared to other peoples of East Africa. (Newman, 1975)

DIETARY DIVERSITY - SANDAWE: Gathered plants were used in relishes at 45% of the ugali-based meals recorded in the Sandawe survey and cultivated plants were added to the relishes at an additional 8.8% of the meals. Animal products were also included in 54.3% of these relishes with milk (25%) the most frequently used addition. Other animal sources included hunting and fishing (9.4%), beef (6.7%), goat (6.4%) and chicken (4.2%). (Newman, 1975)

SEASONAL VARIATIONS - SANDAWE: Significant seasonal variations exist in the use of relishes in the Sandawe diet. In the wet season, milk and domestic meat (mainly beef) consumption increased above the yearly average. In the early part of the dry season, gathered plants and milk declined but smoked-dried fish increased. By the end of the dry season milk completely disappeared and domestic meat decreased while gathered plants (mainly greens) and cultivated plants increased. Meat from wild game also reaches its peak consumption (13% frequency). (Newman, 1975)

STAPLE FOOD AND SEASONAL VARIATION - SANDAWE: There were no significant seasonal variations detectable in the use of the staple foods among the Sandawe. (Newman, 1975)

FOOD SHORTAGES - SANDAWE: Crop production in Sandawe county is precarious. There have been 20 significant food shortages since the mid-19th century. (Newman, 1975)

MEAL PATTERNS - SANDAWE: The main meals of the Sandawe are at mid-day and evening. Morning meals are infrequent, being restricted to young children and to occasions when major activities were to be undertaken. (Newman, 1975)

MEAL PATTERNS - SANDAWE: Men usually eat apart from the women and children among Sandawe peoples. (Newman, 1975)

BETWEEN MEAL FOODS - SANDAWE: A large variety of foods, classed as supplements are normally eaten between meals by the Sandawe. The most common food supplements are gathered nuts, fruits, seeds, and berries, cultivated honey, locally brewed alcoholic beverage (pombe), and small birds, rodents, and insects. (Newman, 1975)

FAMINE FOODS - SANDAWE: In times of food shortage, regularly gathered plants and special famine varieties take on special importance for the Sandawe. During the last two famine periods, food from outside replaced the traditional famine foods. (Newman, 1975)

WOMEN'S WORK LOAD - SINGIDA: In Singida District, women make up most of the agricultural production force, although men frequently help during planting, cultivation, harvesting and threshing. Winnowing is entirely women's work. Besides the task of preparing food, other women's activities include cleaning the house, fetching water, collecting firewood, milking cows, preparing beer, grinding flour, and preparing ghee, as well as child rearing. (Omari, 1973)

BASIC DIET - TABORA: A seven day dietary survey of 21 households in one village in the Tabora region showed cassava and millet as the staple food, with maize becoming more popular. Other common foods included rice, sorghum, sugar, legumes, green leaves, citrus fruits, fish and milk. (Maletnlema and Marealle, 1973)

FOOD DISTRIBUTION PATTERN - TABORA: The best (protein) and largest share of food was given to the father who ate together with his mature sons, as recorded in a household food consumption survey in the Tabora region. (Maletnlema and Marealle, 1973)

SUBSISTENCE FARMING - TABORA: In a food consumption survey in the Tabora region, most families reported that they grow their own food on family-owned land, with the exceptions of sugar and fish. (Maletnlema and Marealle, 1973)

DIETARY INTAKE - TABORA: Average daily intakes of 1850 calories and 27 gms. protein were calculated for each family member from 21 household 7-day dietary histories in the Tabora region. 38% of calories were derived from cassava and 35% from cereals. (Maletnlema and Marealle, 1973)

BASIC DIET - USAMBARA: Maize is the staple food in the Usambara mountains, Lushoto district. Cassava, green leaves, bananas, and beans are common and animal products are limited. Beans are the most important protein supplier. Other foods produced locally include carrots, potatoes, tomatoes, green beans, onion, green maize, plums, and papaya. Also available in the shops are rice, sugar and palm oil. (Kraut et al., 1978)

SIDE DISHES - RELISHES - USAMBARA: 75% of all non-breakfast meals surveyed in the Usambara contained some kind of side dish, such as meat, beans, fish, sour milk, nuts, or vegetables. The single most common accompaniment was a green leafy vegetable, michicha (either wild or cultivated), eaten at 29.4% of the meals. Thus, wild plants have not been entirely replaced by cultivated vegetables. (Fleuret, 1979)

WILD FOLIAGE PLANTS - USAMBARA: A variety of wild foliage plants accounts for as much of 80% of the total green leafy vegetable (michicha) consumption in three rural villages of the Usambara area. Wild plants were found to furnish significant amounts of carotene, calcium, iron, and protein to the local diet. They also had an economic value in that michicha (both wild and cultivated green leafy vegetables) vending was a significant source of income for single women in difficult circumstances. (Fleuret, 1979)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

BASIC DIET - WAGOGO: The main food of the Wagogo in Dodoma District is "ugali" (stiff porridge) made from milled cereal (millets, sorghum and maize). Relishes are mainly from the plant "mlenda," but also include cooked leaves from cow peas or "kunde," pumpkin leaves, and other local plants. Meat is available in the village butchers and markets. Sour and skimmed milk are used occasionally. (Lomayani, 1973)

BASIC DIET - WANYATURU: In Singida District, the Wanyaturu staple food is ugali (stiff porridge) made out of millet. This is served with a relish such as green vegetables, skimmed milk (maya), meat and chicken. (Omari, 1973)

FISH - WANYATURU: Traditionally, the Wanyaturu peoples of Singida District do not eat fish, although it is available. No substantial reason was given for this practice. Fish was said to resemble snake, which was considered dirty. It was also said to have an unpleasant and disgusting smell. (Omari, 1973)

URBAN

MEALS: Most of the women interviewed in Dar es Salam said that their previous breakfast had consisted of tea and bread (with milk and butter among the well-off). A variation on this was uji (thin maize porridge), vitumbwa or mwandazi (sweet cakes or buns) or leftovers from the night before. Cooking took place twice a day with rice at midday and ugali in the evening, though occasionally cassava, cooking bananas, potatoes or cocoyams were used as a staple. For the relish, a variety of foods were used, the main ones being beans, spinach, fish and meat. (Bujra, 1973)

3.2 DIETARY PRACTICES, WOMEN

3.2.1 DIETARY PRACTICES, WOMEN, DURING PREGNANCY

NATIONAL

SPECIAL DIETS: Expectant mothers in most tribes have no special diets. (Tanzania Food and Nutrition Centre, 1980)

RURAL

MATERNAL DIET AND BIRTH WEIGHT: There was a significant and direct relationship ($r=.37$, $p<.01$) between maternal energy intake during pregnancy and infant birth weight in the Kisarawe District. The relationship was even stronger for reference protein intake ($r=.51$, $p<.001$). (Maletnema and Bavu, 1974)

WEIGHT GAIN: Evidence of inadequate dietary intake in combination with high energy expenditures and concurrent infections suggest that Tanzanian women have poor weight gain during pregnancy. (Knutsson et al., 1979)

SPECIAL FOOD: Millet was reserved solely for pregnant women who consumed it in the form of a beer (togwa) fermented for 24 hours in Songea. (Robson, 1974)

NORMAL DIET: The Wanyaturu of Singida District had no food taboos for pregnant women (except one for eggs, which has died away). Pregnant women continued to take the usual foods, making no changes in their diets. (Omari, 1973)

NORMAL DIET: Pregnant Wagogo women in Dodoma District eat the same diet as the rest of the family. (Lomayani, 1973)

DIETARY RECOMMENDATIONS: Traditional dietary prescriptions for pregnant women of yams and milk instead of bananas are no longer adhered to among the Chagga people of Moshi District. Now, women go to the prenatal clinic to receive whatever instructions they need. In most cases, diet and working routines remain the same until delivery. (Freyhold et al., 1973)

DIETARY INTAKE: The mean daily intake of 70 pregnant women in the Kisarawe District was 1845 calories per day (400 SD). Mean protein intake was 51.5 grams per day (18.6 SD), equal to 32.4 grams reference protein (10.4 SD). Iron intake ranged from 10 to 16.2 mg. per day. (Maletnema and Bavu, 1974)

ENERGY AND PROTEIN DEFICIENCIES: Energy intake in pregnant women in the Kisarawe District was more deficient than protein intake. Only 20% of the pregnant women had an energy intake sufficient to produce an infant weighing over 3.1 kg whereas 50% of these women had protein intake sufficient to produce an infant weighing 3.1 kg. (Maletnema and Bavu, 1974)

URBAN

POSTPARTUM SECLUSION: Most Muslim women interviewed stay inside the house resting after the birth of a child—a sort of ritual seclusion—for seven to forty days. (Bujra, 1973)

3.2.2 DIETARY PRACTICES, WOMEN, DURING LACTATION

RURAL

SPECIAL MEAL - BAGAMOYO: Traditionally, after a child was born, the husband had the responsibility of killing a chicken and having a soup prepared for the wife among the Zaramo and Kwere people of the Coastal District of Bagamoyo. However, reports suggested that the Kwere mothers were not actually receiving this special dish. (Swantz, 1973)

DIET - BAGAMOYO: Typically in Bagamoyo District, mothers received the same diet as others, but among the small ethnic group of Kwavi, mothers were not supposed to drink water. (Swantz, 1973)

3.2.2 DIETARY PRACTICES, WOMEN, DURING LACTATION (Cont.)

MEAT RESTRICTION - BAGAMOYO: In Bagamoyo District, pregnant women were not allowed to eat meat, but meat and other high-protein foods were not generally used for home consumption; they were used more often for ritual eating or to sell for cash. The small Kwavi tribe was an exception in that milk, blood and meat were part of their usual diet. (Swantz, 1973)

DIET - CHAGGA: Poorer Chagga mothers from Moshi District may be provided with a blood and meat soup (kisusio) after the birth of a child. The soup is not reserved for women, and is very nourishing. Other staple foods include bananas cooked in soup (mtori), a special stiff porridge made of eleusine (uru) and plenty of beer (mbege). (Freyhold et al., 1973)

SPECIAL STAPLE FOOD - CHAGGA: The staple food of young Chagga mothers in Moshi District is "kitawa," a dish of bananas and beans cooked with milk; some women grow fat on it. In addition, the husband is obliged to give his wife a special treat, i.e. the "mlaso" meal, several times during the new mother's confinement. Women from poorer families may not get either the staple food or the special "mlaso" meals. (Freyhold et al., 1973)

TRADITIONAL HELP - CHAGGA: Among the Chagga of Moshi District, the mother-in-law is supposed to look after the new mother after she gives birth. The mother-in-law will come and stay for a period, usually less than a month. She does the cooking and other housework and looks after the newborn. She is expected to divide the food equally between herself and her daughter-in-law. (Freyhold et al., 1973)

REST PERIOD - CHAGGA: Traditionally, a Chagga mother was entitled to three months of almost complete rest after having a baby, but more recently, women find themselves back with most of their chores within a month, except for carrying grass for the cows and cultivating land on the "pori" (the bush). (Freyhold et al., 1973)

NORMAL DIET - WAGOGO: Nursing Wagogo mothers in Dodoma District eat the same diet as the rest of the family. Nursing mothers eat "ugali" immediately after they give birth. There is almost nothing to supplement this diet. Rich men's wives or daughters who give birth for the first time are still sometimes given a slaughtered animal in a custom called "kudesa." (Lomayani, 1973)

3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS

3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREASTFEEDING

NATIONAL

BREAST FEEDING PREVALENCE: 100% of infants 0-18 months of age were breast fed, according to 1977 to 1979 surveys conducted in Wanging'ombe in Iringa region, Nyamwigura in Mara region, and Boko Mnemela and Rufiji in the Coast region. Among 19-30 month old infants, 75% in Wanging'ombe, 6% in Nyamwigura, 4% in Boko Mnemela and 30% in Rufiji were breast fed. (Department of Planning, 1980)

DURATION OF BREAST FEEDING: The mean duration of breast feeding in a study of rural women in five regions was calculated as one and one half years. The majority of mothers stopped breast feeding after 18-24 months. (Kimati, 1981)

RURAL

HIGH RATES OF BREAST FEEDING: Among 40 to 108 infants 0-6 months old who were examined in each of five districts (Karagwe, Taboro, Kisarawe, Kilimanjaro, Morogoro) between 93% and 100% were being breast fed. In the 7-12 month age group, 90% to 99% of infants sampled in these five areas (N=44-121) were still breast fed. Even at the 13-24 months old period, between 63% and 87% of the infants were breast fed. (Maletnlema, 1978)

BREAST FEEDING TRENDS: Most mothers breast feed during the infant's first year of life. Rural studies in the 1960s showed the prevalence of breast feeding at one year to be 90%, and 57% to 87% of children were breast fed up to two years. More recent studies in the late 1970s showed that the pattern in rural areas has remained essentially the same. About half of the children surveyed were breast fed up to two years. (Tanzania Food and Nutrition Centre, 1980)

BREAST FEEDING PREVALENCE BY AGE: 99% of the 0-6 month old infants (N=19) were on the breast according to a 1977 four-region survey of 1880 children under 36 months of age. 96% of the 6-12 month olds (N=71), 83% of the 12-18 month olds (N=323), 55% of the 18-24 month olds (N=852), 70% of the 24-36 month olds (N=559), and 97% of the 36 month olds (N=56) were still breast fed. (Maletnlema, 1980)

BREAST FEEDING PREVALENCE BY AGE: 98.8% of sampled rural mothers from five regions (Kilimanjaro, Lindi, Morogoro, Mwanza and Euvuma) of Tanzania were still breast feeding their infants at 6 months of age (range: 97.3%-100%). By 12 months, 93.3% of mothers still breast fed (range: 83.4%-100%), and at 18 months, 76.7% were breast feeding (range: 66% to 95.7%). By the infants' 24th month, only 28.7% were still receiving breast milk (range: 8%-65%), and at 36 months, only 3.7% (range: 0%-7.1%). (Kimati, 1981)

BREAST FEEDING PREVALENCE: 91% of infants 0-17 months were breast fed in the Homobolo areas of Makulu and Misui. 58% of children 18-23 months were breast fed, and 6% of the 24-29 month olds were breast fed. (Burgess et al., 1968)

BREAST FEEDING PREVALENCE: Among 12 infants in Shambala, 8 (75%) were exclusively breast fed for at least three months. (Bornstein, 1973)

DEMAND FEEDING: Children were breast fed on demand until one to two years old. (Burgess et al., 1968)

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

BREAST FEEDING PREVALENCE - REGIONAL VARIATION: The percent of surveyed mothers breast feeding their infants at one year was 100% in Lindi region, 96.8% in Morogoro region, 95.5% in Ruvuma, 88.8% in Mwanza, and 84.7% in Kilimanjaro. By 18 months, the rates were 95.7%, 80.5%, 70.5%, 67.8%, and 66% respectively. At 24 months, the respective breast feeding rates were 65%, 42.3%, 15.9%, 8.0%, and 19.3% in Lindi, Morogoro, Ruvuma, Mwanza, and Kilimanjaro. (Kimati, in press)

BREAST FEEDING PREVALENCE BY AGE: At six months of age, 98.8% of infants were breast feeding, according to a 1979 survey of four rural villages in the Moshi District. 93.2% at 12 months, 76.1% at 18 months, 30.4% at 24 months, and 4% at 36 months were still breast feeding. (Expert Committee Report, 1980)

BREAST FEEDING AFTER BIRTH: Almost all infants in the Tabora region are put to the breast after birth. (Maletnlema and Marealle, 1973)

PRELACTAL FOODS - CHAGGA: If Chagga mothers return home after birth before their milk comes in, most just wait and do not feed the newborn until their breast milk begins to flow. Sometimes the colostrum and the first milk are considered bad for the child, and feeding is delayed until the fourth day. Mothers sometimes give their babies a little water or even orange juice before they put them on the breast. Some babies may receive a mixture of chewed herbs after the first week. (Freyhold et al., 1973)

PRELACTAL FOODS - WANYATURU: Among the Wanyaturu of Singida District, newborn infants were bathed and given a medicinal juice prepared from fruits known as Lade which was supposed to open the gullet. If no Lade juice was available, the baby was given a little soft porridge (uji) made from millet flour. Breast milk was started after this. (Omari, 1973)

PRELACTAL FOODS - BAGAMOYO: Among the coastal people of Bagamoyo District, newborns were fed from a small cooking pot and given gruel, uji, with some sugar soon after birth when they cried. (Swantz, 1973)

COLOSTRUM: Several cases of neonatal marasmus have occurred along the Southeast Coast area because colostrum was not given to the child. The babies were given boiled water until the milk became "white." (Kimati, in press)

FIRST BREAST FEEDING: Newborns were given breast milk after the first milk was squeezed out and the breast washed in warm water, according to interviews of old Wanyaturu women. (Omari, 1973)

EXCLUSIVE BREAST FEEDING: Ngoni babies were breast fed from birth to six months. There was no evidence of failure to lactate and no mother used any other form of milk. All babies under 6 months of age had a well fed appearance. No cases of marasmus were observed. (Robson, 1974)

BREAST AND MIXED FEEDING: Of 180 interviewed mothers, 57% said they were exclusively breast feeding their youngest child (ages not given), 22%

said they were breast feeding plus using fresh cow's milk, 8% were breast feeding plus using artificial feeding (not defined), 8% were using only a bottle with either artificial or fresh cow's milk, 3% were only artificial feeding and 2% were using only fresh cow's milk. (Kimati, 1981)

DURATION: In four 1977 surveys, 77% of mothers breast fed up to 18 months and 30% continued up to two years. The proportion of mothers breast feeding up to 18 months included Lindi region, 95%; Morogoro region, 77%; Ruvuma region, 71%; and Mwanza region, 66%. (Moshi and Ljungqvist, 1979)

DURATION - CHAGGA: Among Chagga mothers in Moshi District, most mothers continue breast feeding until they are interrupted by a new pregnancy, an illness of mother or child, or some other unplanned event. There is no standard period for weaning. In a 1971 survey, more than half of the mothers interviewed breast fed between one and two years, and another third breast fed for longer. (Freyhold et al., 1973)

DURATION - WANYATURU: Among the Wanyaturu of Singida District, lactation continues for about two years, and even up to three years if the mother does not get pregnant sooner. (Omari, 1973)

DURATION - TABORA: Breast feeding continues unquestioned by almost all mothers (96%) up to the end of the first year. The number of breast feeders drops steadily to 43% by the end of the second year, according to dietary histories of 21 Tabora households. (Maletnlema and Marealle, 1973)

SUBSTITUTE BREAST FEEDING - BAGAMOYO: If a mother's milk fails, or she dies, or a medicine man tells her that her milk is not good, a substitute "wet nurse" is usually found. If not, the child's chances of survival are poor because of the high price of powdered milk. In some cases, goat's milk is used. (Swantz, 1973)

CHILD CARE DURING BREAST FEEDING: Among the coastal people of the Bagamoyo District, the child grows up in close contact with the mother's body, being carried on the side or back of the mother from the first days of life up to two years old. (Swantz, 1973)

BREAST FEEDING AND PEM: Rates of PEM were not significantly different between children who were breast fed and those who were not, among the Mlola sample. (Kreysler and Mndeme, 1975)

URBAN

BREAST FEEDING PATTERNS: In Dar es Salaam, a relatively small proportion of infants are wholly breast fed. Artificial feeding, usually with a bottle, is introduced early. Working mothers typically continue with mixed feeding rather than abandoning breast feeding altogether. (Tanzania Food and Nutrition Centre, 1980)

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

BREAST FEEDING PATTERNS: In 1979, 955 mothers in Dar es Salaam were interviewed about their infant feeding practices. 99 to 100% of one to three month old infants were breast fed, as were 98% of four to six month olds, 95% of nine month olds, 96% of 12 month olds, 50% of 18 month olds, and 18% of 24 month old infants. (Maletnema, 1980)

EXCLUSIVE BREAST FEEDING: Among a sample of 955 African mothers interviewed at MCH clinics and the Muhimbili Medical Center in Dar es Salaam, 95% were exclusively breast feeding during their child's first month, 68% during the second month and 31% during the third month. By the sixth month, 5% were exclusively breast feeding and by the 18th month, no mothers were only breast feeding their child. (Kimati, 1981)

EXCLUSIVE BREAST FEEDING: Among 21 infants studied, 12 (57%) were breast fed exclusively for at least three months. (Bornstein, 1973)

DURATION: Among a sample of 565 Indian Ismaili Moslem mothers in Dar es Salaam, the average duration of breast feeding was 3 to 4 months. At one week, 90% of these mothers were breast feeding; at one month, 79.6%; by three months, 57.5%; at six months, 37.3%; and by 12 months, only 4.2% of mothers were still breast feeding. (Kimati, in press)

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING

NATIONAL

WEANING PRACTICES: The average age for the start of weaning is four months, but cases of early introduction of weaning foods and of prolonged breast feeding without supplementation do occur. The main food used is a porridge made mainly of maize flour. Sorghum and millet are also used, and cassava is popular in cassava-eating communities. (Tanzania Food and Nutrition Centre, 1980)

WEANING FOODS: Very few tribes have special weaning foods. Babies are usually weaned onto adult foods. (Tanzania Food and Nutrition Centre, 1980)

WEANING PORRIDGES: Porridge made of maize, sorghum, cassava or millet flour, banana puree or rice are the main weaning foods. These thin cereal gruels are about 80% water. They have a low protein content of about 1.8%, and a low energy density of about 80 calories per 100 grams. (Mosha and Ljungquist, 1979)

HOME MADE WEANING DIET: The majority of mothers in rural and urban areas used a home made weaning diet consisting mainly (80%) of a specially cooked maize porridge. (Kimati, 1981)

COMMERCIAL WEANING FOODS: Imports of commercial baby foods have increased from 76 tons in 1972 to approximately 1600 tons in 1976, and are gradually replacing the local weaning foods. (Knutsson et al., 1979)

INFANT FORMULA: During the 1980 investigation, there was a shortage of artificial formula throughout the country. Nestle products comprise ninety percent of the market; Lactogen is the preferred brand. (Marchione and Helsing, 1981)

IMPORTS OF INFANT FORMULA: 1,524.8 tons of Nestle Lactogen, 154.6 tons of Nestle Nan, 131.7 tons of Wyeth's SMA and S-26, and 49.9 tons of Ross' Similac and Mamalac were imported in 1977. Over one third of this was distributed in the Coast region (including Dar es Salaam). (Department of Planning, 1980)

IMPORTS OF MILK PRODUCTS: In 1976, 1,104 tons of condensed or evaporated milk and 4,769 tons of whole or skim milk powder were imported. Approximately one third of this was distributed in the Coast region (including Dar es Salaam). (Department of Planning, 1980)

IMPORTED WEANING FOODS: According to GEFCO figures, Cerelac was the major imported weaning food from 1972 to 1980, ranging from about 3000 cartons in 1973 to 18,000 cartons in 1977. The value in Tanzanian shillings has ranged from over 1/2 million in 1973 to 3.4 million in 1977. The 1980 totals for Cerelac were 10,000 cartons at Sh. 2.6 million. The other major imported weaning food has been Farex which peaked in 1980 at 6000 cartons and Sh. 2.0 million. 1977 was also a big year for Farex importation, reaching 5,400 cartons and Sh. 1.0 million. (Kimati, 1981)

RURAL

HOME MADE WEANING DIET: In a 1971 interview study of 105 women (nurses and teachers) from 3 tribes, the common home made weaning diets were said to consist of a thin porridge; 70% were made of maize flour; 10% of sorghum, millet or eleusine; 10%, banana; 5%, cassava; 3%, baobab or other porridge; and 2%, rice. Another inquiry of 150 mothers of hospitalized children found that 75% of mothers did not add anything else to the porridge, 10% put salt in, 10% added sugar and only 5% added milk to the porridge. Such porridge is bulky, very low in fat content and caloric density, and marginal in protein content. (Kimati, 1981)

WEANING AND PEM: In a 1977 report of nutritional problems among the under five population, the preliminary impression was that the home made weaning diets (thin porridge) were the main cause of the 30% rate of PEM among children under five. (Kimati, 1981)

WEANING AND PEM: Early weaning due to either another pregnancy or the advice of "witch doctors" is a main cause of malnutrition among the Wagogo in Dodoma District, but under normal conditions, all mothers breast feed for at least 18 months. (Lomayani, 1973)

WEANING AND PEM: Age at weaning divided into early and late (ages not specified) was not significantly related to the prevalence of PCM in 111 Tanzanian infants. The authors suggest that the lack of relationship was

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

most likely due to the small number of weaned infants in one of the age groups sampled (6-11 months). (Ernster et al., 1976)

WEANING TIME AND NUTRITIONAL STATUS: Early or late cessation (not defined) of breast feeding did not show a significant relationship to the nutritional status of children under five years old sampled in Tabora region. (Maletnlema and Marealle, 1973)

EARLY WEANING: Among 21 infants less than ten months old, only one (5%) had been weaned completely. (Bornstein, 1973)

IMPROPER USE OF FOODS: Children are malnourished, not due to lack of foods, but due to improper use of the available food. (Maletnlema and Marealle, 1973)

INSUFFICIENT SUPPLEMENTATION: Despite continued breast feeding into the second year, the first signs of growth failure in the Hombolo survey children appeared around the sixth month, indicating a need for better supplementary feedings at this age. (Burgess et al., 1968)

AGE AT INTRODUCTION OF SUPPLEMENTAL FOODS: The average age when supplemental foods were introduced by the 189 mothers in Moshi district was 4.6 months. In four other districts, the average age was 4 months. (Kimati, 1979a)

EARLY SUPPLEMENTATION: Among 43 infants studied, all received supplementary foods by three months of age. (Bornstein, 1973)

EARLY SUPPLEMENTATION: Among 12 infants under 3 months old, 3 (25%) received foods to supplement breast milk, and one received no breast milk. (Bornstein, 1973)

SUPPLEMENTATION: Among 43 infants under two years old, 29 (68%) received breast milk and supplementary foods. (Bornstein, 1973)

LATE SUPPLEMENTATION: In the Hombolo area, solid foods were not traditionally given before the age of one year and meat and eggs were seldom used. (Burgess et al., 1968)

TRADITIONAL FEEDING PRACTICES: According to Wanyaturu informants in Singida District, the Wanyaturu child drank fermented skimmed milk or soft fermented porridge from a bowl. Often the child refused the sour drink (no sugar is added). A forced feeding system known as Ukhafiya was used in those circumstances. The child was placed on the seated mother's legs with his head on her stomach, and the mother's hand was used as a container into which the drink was poured. The child's nostrils were slightly blocked so that the liquid foods would get into the mouth and the stomach. This practice has died away in many rural areas due to the introduction of bottle feeding. (Omari, 1973)

WEANING PRACTICES: Among the Wagogo people in Dodoma District, the majority of families feed their babies "uwele" porridge made from

bullrush flour and water. It is given from the time the baby is born, and is thickened as the baby grows. It is normally cooked in the morning and left uncovered throughout the day. The mother feeds the baby with her fingers whenever the baby cries. If a baby rejects the porridge when first fed, a mother may breast feed exclusively. (Lomayani, 1973)

WEANING PRACTICES: Wanyaturu women of Singida District usually wean their children from the breast when they are between two and three years old, unless a pregnancy comes sooner. They use pepper on the nipple or send the child to relatives until the child no longer desires the breast. (Omari, 1973)

WEANING PRACTICES: Usually Chagga mothers weaned their children by putting pepper on their nipples or by leaving the child with someone else for a limited period. Sometimes the children weaned themselves because they got used to eating other food during the prolonged absence of their mothers. (Freyhold et al., 1973)

SUPPLEMENTAL FEEDING METHOD: Between the third and fifth months, Chagga mothers' milk is supplemented by additional feeding by spoon, bottle, or, rarely, by spitting into the child's mouth. (Freyhold et al., 1973)

WEANING PRACTICES: Female children being weaned were kept at home while males were sent into the care of grandparents in the Songea Ngoni. (Robson, 1974)

BOTTLE FEEDING: Bottle feeding was practically non-existent in the Hombolo area. (Burgess et al., 1968)

LACTOGEN FORMULA: Many grocery shops in Moshi District still sell Nestle Lactogen powdered formula, which is used by the better-off families. (Freyhold et al., 1973)

HAND FEEDING: The custom of many Ngoni mothers was to hand feed the children in the early days of weaning. Food was forced into the child's mouth which helped achieve the high intake of food to meet protein requirements. Because of poor personal hygiene, the child was at high risk for repeated diarrheal infections. (Robson, 1974)

BOTTLE VS. CUP AND SPOON: Only 3 of 35 rural mothers used a bottle to give additional milk. All the rest used a spoon and cup. (Bornstein, 1973)

SUPPLEMENTAL FOODS: In Singida District, children were given the staple food, ugali, with vegetables when they began to crawl or when they reached for the mothers' food. The mothers started with small pieces of soft porridge mixed with vegetables and gradually switched to the stiff porridge. At about the age of 1 1/2 years, the children started with ugali with milk and vegetables. (Omari, 1973)

FIRST SUPPLEMENTAL FOODS: The Wanyaturu child is given supplementary fermented cow's milk which is slightly sour and has been skimmed. If it

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

is too sour, some fresh milk is added to dilute it. This is put in a special gourd known as nkii. If the child develops stomach problems--normal diarrhea or indigestion--it is thought the child has refused the milk. The mother, with the consent of the father, switches to soft porridge made of millet or sorghum flour fermented in a gourd. If the families don't have the milk or porridge, they buy or exchange for it at any cost. (Omari, 1973)

SUPPLEMENTAL FOODS: At about six months of age, children of Chagga women receive bananas cooked in soup. Some mothers also give their children "kitawa" (bananas and beans cooked in milk) before the end of the first year. Adult dishes are introduced toward the end of the first year. If the family eats "kibulu" (bananas and beans cooked together and topped with ghee), the child gets the top layer containing some of the mashed beans. (Freyhold et al., 1973)

SUPPLEMENTAL FOODS: Chagga mothers in the Moshi District begin to introduce supplemental foods between the third and fifth months. Almost all mothers start by giving porridge (uji) made of maize or banana. The "traditional" food is more often bananas roasted in their skins and mashed with slightly fermented milk and ghee. If there is not enough money or milk, the bananas may be mashed with water. For those who can afford it, milk and fruit juice (e.g., orange juice) are added to the diet. (Freyhold et al., 1973)

WEANING FOODS: Among 189 mothers from four rural Moshi villages, 83.7% added extra energy foods (milk, sugar, eggs or oil) to the weaning porridge. (Kimati, 1979a)

WEANING FOODS: 75-85% of mothers do not add any extra energy food to the thin maize porridge used as the weaning food for children in four regions studied in 1977. (Kimati, 1979a)

WEANING MIXTURES: 70-80% of mothers in 9 regions studied feed their children highly nutritious foods made from locally available foodstuffs. Some areas (e.g. Kilimanjaro) have special dishes for weaning, but in others, babies are weaned directly onto the family foods. (Mosha and Ljungquist, 1979)

WEANING FOODS: Among most of the ethnic groups of Bagamoyo District, the child was weaned on tea with sugar. If cash was available to buy milk powder in a tin, it was added. The child was introduced to the adult diet (i.e., ugali) quite early. (Swantz, 1973)

WEANING FOODS: Among the Kwavi (a small ethnic group), children were given cow's milk mixed with water if the mother's milk supply was exhausted or at the time of weaning. Kisamvu, cassava leaves, were added late and fruits were not given to children. Even ugali was given only now and then, and meat was an occasional part of the diet, as it was for the adults. (Swantz, 1973)

WEANING FOODS: In the Tabora region, children are weaned directly onto adult food, which is mainly cassava, millet, maize, rice, and meat. (Maletnlema and Marealle, 1973)

WEANING FOODS: In the Kisarawe district, children are weaned on to plain cassava porridge and in Kilimanjaro they are weaned on to bananas. (Maletnlema and Marealle, 1973)

WEANING FOOD AND METHOD OF FEEDING: A thin gruel (uji), often flavored with baobab fruit pulp, was the major weaning food offered in the Hombolo area. Milk in some form was sometimes added to the uji which the mother gave twice a day with her hand. (Burgess et al., 1968)

REASON FOR WEANING: Among Chagga others attending several clinics in Moshi District, the most common reason for weaning was a new pregnancy. (Freyhold et al., 1973)

REASONS FOR WEANING: Among six women who had weaned their infants all said they had done so because they were pregnant. (Bornstein, 1973)

REASONS FOR WEANING: 189 mothers interviewed in the Moshi rural district, Kilimanjaro Region gave as reasons for stopping breast feeding: having another pregnancy, 65%; child refused breast, 14%; child thought to be big enough, 13%; lack of milk, 2%; mother sick, 1%; and not known, 5%. (Kimati, 1981)

DEFICIENT WEANING FOODS: The typical meal used in weaning the Ngoni infant was deficient in 3 amino acids: methionine, cystine, and tryptophan. Weaning foods based on a cereal or starch root would be adequate only if the meal was supplemented with high quality protein such as breast milk, meat, or other protein complement. (Robson, 1974)

NUTRIENT INTAKE: An estimate of the daily intake of a Ngoni child one year of age (12 kgs) was 955 calories and 31.5 grams protein. (Robson, 1974)

URBAN

WEANING PATTERNS: Weaning usually is begun around the age of 4 to 6 months. The first food always is ugi (gruel). The next food usually introduced is ugali or rice in a soft form. By one year, the child is eating beans, fruits, and most other foods. (Bujra, 1973)

EARLY WEANING: 9 of 59 town infants (15%) were totally weaned by 10 months. (Bornstein, 1973)

WEANING PRACTICES: Maize porridge was the main weaning food even among the high income group, even though there was a tendency to vary the weaning diet by adding formula milks and fruit juices. Weaning was initiated earlier by high income mothers and employed mothers than by low income mothers. At three months, all employed mothers had started

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

weaning (corresponding to the length of the maternal leave period). (Marchione and Helsing, 1981)

EARLY SUPPLEMENTATION: In Tanga, 9 of 21 infants (43%) below 3 months of age received some supplementary food in addition to breast milk. (Bornstein, 1973)

EARLY SUPPLEMENTATION: Among 78 infants studied, only 3 (4%) were exclusively breast fed after three months of age. (Bornstein, 1973)

SUPPLEMENTATION: 47 of 78 (60%) Tanga mothers with children under 2 years old supplemented their breast feeding. (Bornstein, 1973)

BOTTLE FEEDING: Among families in Dar es Salaam, it was often the husbands who initiated bottle feeding. The husbands bought the milk powder tins because "it was better for the baby" than breast milk. (Bujra, 1973)

BOTTLE FEEDING: Among a sample of 565 Indian Ismaili Moslem mothers in Dar es Salaam, 15 (2.6%) never bottle fed while the other 550 (97.3%) bottle fed their infants at some stage. Spoon-and-cup feeding was not practiced at all. (Kimati, in press)

INFANT FORMULA FREE SAMPLES: For years it has been the practice in Aga Khan Hospital for milk firms to give powdered milk tins with a feeding bottle as a discharge gift to all new mothers. During a recent baby show, the consolation prize given to over 500 mothers was tinned powdered milk donated by one of the milk firms. (Kimati, 1981)

BOTTLE FEEDING: In the town of Tanga, 42 of the 78 sampled mothers (54%) bottle fed their infants. All of them had started before the infant was 6 months of age. (Bornstein, 1973)

BOTTLE FEEDING AND WORKING MOTHERS: 15 of 19 mothers (79%) working outside the home in Tanga bottle-fed their infants, whereas 27 of 59 of non-working mothers (46%) bottle-fed. (Bornstein, 1973)

BOTTLE FEEDING AND MOTHERS' AGE: 10 of 12 town mothers under 20 years old bottle-fed, although there was only a slight difference in the overall average age of bottle/non-bottle-feeders (23.1 years vs. 24.4). (Bornstein, 1973)

BOTTLE FEEDING AND TIME IN TOWN: Length of time in the urban town of Tanga was positively related to bottle feeding. Only 4 of 14 (29%) mothers in Tanga for 2 years or less bottle fed while 24 of 38 (63%) of mothers who had lived in Tanga 6 years or more bottle fed. (Bornstein, 1973)

PREVALENCE OF ARTIFICIAL FEEDING: Among 78 infants under two years old, 16 (21%) were receiving no breast milk. (Bornstein, 1973)

INFANT FORMULA USE: During the first month of the child's life, only 4% of mothers used formula in addition to their breast feeding and 1% used only formula. During the second month, 32% of mothers used artificial formula in addition to breast milk. By the third month, 69% of mothers supplemented breast feeding with formula. During the fourth through 12th months, 89 to 93% of mothers added formula and other foods to breast feeding and 2 to 7% relied only on the formula and other foods. The total sample was 955 African mothers interviewed at Dar es Salaam medical facilities. (Kimati, 1981)

ARTIFICIAL FEEDING: Artificial feeding is commonly practiced by Asian mothers and higher social class mothers in the urban areas. Among a sample of 564 Asian Ismaili Moslem mothers, 11% (55) did not start breast feeding at all, 15% (80) breast fed for less than one month, 71% (400) had stopped breast feeding before three months, 4% (24) breast fed for three months and only 1% (5) of these mothers breast fed for over 24 months. (Kimati, 1981)

COST OF ARTIFICIAL FEEDING: A 1975 study in Dar es Salaam showed that the minimum wage earner will spend 35 to 40% of his monthly earnings in order to give one child full artificial feeds. (Kimati, 1981)

COST OF INFANT FORMULA: A tin (1 lb., 454 g) of Lactogen costs Shs. 16/90 and is enough to feed a three month old baby for three days; the cost for one month is Shs. 169/00. (Maletnlema, 1980)

COST OF INFANT FORMULAS: To feed a baby 2-3 months of age on Nan infant formula costs 145/= which is 30% of a nurse's salary and 36% of the minimum wage. Similac, SMA, Cerelac, Farex and Lactogen are almost as expensive. (Kimati, 1977)

BABY FOOD PRODUCTS: Currently there are 15 brands of baby foods on the market and the retail price averages Shs. 30 per kg., which is prohibitively expensive. Bottle feeding and commercial cereal-based weaning foods are used widely in urban areas. (Moshia and Ljungquist, 1979)

REASONS FOR MIXED FEEDING: The majority of women interviewed in Dar es Salaam had both breast and bottle fed their babies. The usual reason for bottle feeding was fear that the baby was not getting enough milk. Another reason given was that bottle milk makes the child healthy. The most common powdered milk was Nettle's Lactogen. (Bujra, 1973)

REASONS FOR WEANING: An important cause of abandoning the breast among urban low income African mothers of Dar es Salaam is the advice of grandmothers to stop breast feeding because breast milk may cause frequent diarrhea and death among children. (Kimati, in press)

REASONS FOR WEANING: 16 town mothers who were not breast feeding their infants gave as their reason that they had no milk or that the baby was "big enough". (Bornstein, 1973)

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

RURAL

AGE: 20% of the 2 year old children received a full adult diet according to Mayo mothers. (Kreysler, 1970)

TRADITIONAL DIET: Two to three year old children in Moshi District usually have a morning meal consisting of tea without milk and some bread, roasted bananas or leftovers from the evening before. At midday, the child may get either heated leftovers again, a reheated meal prepared in the morning, or very often, roasted bananas (without fat) until the mother returns and cooks. Children from poorer families may get no fruit except bananas. (Freyhold et al., 1973)

CHILDREN'S EATING PRACTICES: In Yombo division, Bagamoyo District, Zaramo children seldom ate on their own. Most often they shared food with the women of the house. The ugali (porridge) or rice was served in a large tray. Fish gravy with one or two small fish in it was served in a small bowl. Everyone washed his or her right hand (the hand used in eating) in a water bowl. Each person broke off a piece of ugali and dipped it in the gravy. An adult helped the smallest children (less than three years). Children were not supposed to speak while they ate, nor were they allowed to touch the fish or meat unless it had been offered. (Swantz, 1973)

FAMILY FOOD DISTRIBUTION: Ngoni infants ate what was left in the communal bowl after the father had eaten his fill. The quantity available to the infant depended upon the father's appetite and showed wide variations. (Robson, 1974)

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE

RURAL

TRADITIONAL PRACTICES: For minor childhood ailments, a variety of herbs and roots are still used by the parents or bought from an herbalist. For more serious childhood illnesses, the mother will leave all her work to try to speed the child's recovery. Almost all mothers will take their children to a clinic or hospital. In most cases, a mother does not consider supernatural forces unless modern medicine fails. (Freyhold et al., 1973)

TRADITIONAL HEALTH CARE: People from the coast showed apprehension when questioned about their use of traditional practitioners or medicines. In a 1971 survey conducted by University of Dar-es-Salaam medical students, only 11% said they had been to a local mganga during their most recent illness, but observations confirmed that almost all make use of traditional methods of cure or prevention at some time. (Swantz, 1973)

4. NUTRITION STATUS CORRELATIONS

NATIONAL

FOOD INTAKE AND ENERGY EXPENDITURE: Groups of workers with high food intakes work harder and spend more energy than those with low food intakes, according to studies reported in 1974. In Kilimanjaro, where the mean intake per person per day was 2520 calories, the mean energy expenditure per person per day was 2900 calories. In Kisarawe and Morogoro, the mean intakes were 1890 and 1610 calories respectively, and the mean energy expenditure dropped to 1900 calories. (Tanzania Food and Nutrition Centre, 1980)

PEM AND POVERTY: From various nutrition surveys in the country, malnutrition was shown to coexist with poverty in 90% of all cases. (Tanzania Food and Nutrition Centre, 1980)

NUTRITIONAL STATUS AND MEASLES: A 1976 survey of 754 families in Dar es Salaam, Tanga, and Dodoma showed a 3% measles mortality rate among children under five years old. Poor nutritional status (PEM) is a strong contributor to this high measles mortality. Of those children who died of measles at Bugando Hospital, Mwanza, 80% were found to have frank PEM. (Kimati, 1977)

RURAL

PEM AND INFANT FEEDING PRACTICES: Prolonged breast feeding (average 18 months) and the addition of extra energy foods (milk, sugar, eggs and oil) to the weaning foods (average age of introduction, 4.6 months) seem to have produced one of the nation's lowest prevalences of PEM (7%) among children under five of the rural Moshi district in the country. (Kimati, 1979a)

PEM AND MATERNAL WEIGHT FOR HEIGHT: There was no significant difference between the weight for height ratios of women with and without children having protein calorie deficiency. (Kreysler and Mndeme, 1975)

PEM AND CHILD HEMOGLOBIN LEVELS: Malnourished children had a significantly lower hemoglobin than non-malnourished children in the Tabora region. (Maletnlema and Marealle, 1973)

PEM AND MALARIA: There was a significant correlation between malaria and protein calorie deficiency ($p=.05$). (Kreysler and Mndeme, 1975)

PEM AND PARASITES: The incidence of ascaris and hookworm infestations did not differ for children with or without protein-calorie deficiency. (Kreysler and Mndeme, 1975)

PEM AND HOME BIRTHS: Infants who were delivered at home were significantly more likely to suffer PCM than those delivered at a hospital ($p<.05$). (Ernster et al., 1976)

PEM AND FAMILY SIZE: 60.8% of the 92 malnourished children admitted to Bombo hospital came from families with 3 or more children. (Gupta, 1976)

4. NUTRITION STATUS CORRELATIONS (Cont.)

PEM AND NUMBER OF SIBLINGS: Malnourished children tended to have more elder siblings. This was the only family variable that distinguished malnourished from non-malnourished children in the Hombolo survey. (Burgess et al., 1968)

PEM AND LACK OF FAMILY STABILITY: 34.7% of the families with a malnourished child were classified as normal with no social problems in the home. Of the rest of the families, 25% had multiple social problems, 9.8% had drinking problems, 13% had large families and multiple wives or child with grandmother, and the other 9.8% had either a sick or dead parent (no comparison group), and no data was available for 7.6% of the families. (Gupta, 1976)

PEM AND DISRUPTIVE HISTORY: Because of the violent history of the Ngoni since 1823, the ethnic features of the tribe were a mix of 19 other tribes. Thus they had no real tribal roots, traditions, or heritage, which contributed to their high malnutrition rates. (Robson, 1974)

PEM AND TRIBAL ORIGIN: No significant differences were noted between the two groups of children with and without PCM with respect to tribal origin in the Mlola division survey. (Kreysler and Mndeme, 1975)

PEM AND HEALTH CLINIC ATTENDANCE: 42.4% of the children admitted to the Tanga regional hospital in 1974 for malnutrition had attended clinics six or more times and still developed severe grade malnutrition. (Gupta, 1976)

PEM AND INCOME: 46.7% of the families of malnourished children were classified as below average income (including unskilled work or cultivation of less than 3 acres of non-irrigated land); and 10.9% were classed as above average incomes. Over half of the families had fairly stable incomes. (Gupta, 1976)

PEM AND FARMING: Paternal farming occupation did not distinguish children with protein calorie malnutrition from those without PCM in the Mlola sample. (Kreysler and Mndeme, 1975)

PEM AND LAND HOLDINGS: Families having less than 2 acres of land holdings were significantly ($p < .05$) more likely to have an infant with PCM. (Ernster et al., 1976)

PEM AND LAND PRODUCTION: Among the Ngoni people, whose malnutrition rate was high, the land area available per person for crops was 0.76 acres, and it was of poor quality (low carbon-nitrogen ratio, low % organic materials, low calcium level). Thus, maize crop yield was only 150 pounds per acre as compared with a subsistence estimate of 400 pounds per acre (including seed and wastage). (Robson, 1974)

PEM AND EDUCATION: 45.6% of the fathers and 63% of the mothers of hospitalized malnourished children had negligible education. Only 9.7%

of the fathers and 1.1% of the mothers of these children had been educated up to secondary level. (Gupta, 1976)

PEM AND EDUCATION: Education of the mother was not significant in distinguishing children with PCM from those without PCM in the Mlola sample. (Kreysler and Mndeme, 1975)

MALNUTRITION AND CASH CROPS: There was more anthropometric evidence of malnutrition among children from vegetable cash-crop producing households than among those from non-cash-crop producing households in a highly cash-crop oriented area of Usambara, implying that the money earned from cash-cropping could not provide a nutrient supply comparable to that provided by traditional staple-food agriculture (review of 1972 unpublished data from Korte). (Fleuret, 1979)

NUTRITION STATUS AND TYPE OF FARMING: Lowland subsistence farmers were found to have better nutritional status than the more prosperous cash-cropping highland populations in a 1969 study of 250 families in 8 survey areas of the northern and northeastern regions. (Protein-Calorie Advisory Group, 1977)

GROWTH CORRELATES: The observed infant retardation in growth is believed to be due in large part to an insufficient protein intake due to bad weaning practices and poor environmental conditions. (Kraut et al., 1978)

NUTRITION STATUS CORRELATES: The marital status of the mothers, parents' education levels, pregnancy of the mother, and malaria parasitaemia did not show significant relationships to the nutritional status of children studied in Tabora region. (Maletnlema and Marealle, 1973)

WEIGHT GAIN AND CLINIC ATTENDANCE: The child's previous nutritional status and regularity of clinic attendance did not make a significant difference in whether weight gain was above or below Harvard standards in a 15 month follow-up study in a Kisarawe District sample. (Burgess, 1969)

CHILD MORTALITY AND INCOME: Preliminary data from Kilimanjaro indicate that children in more affluent families had a better chance of survival. (Freyhold et al., 1973)

BIRTH WEIGHT AND SOCIOECONOMIC STATUS: Among over 16,500 infants born in two hospitals in Dar es Salaam, the incidence of low birth weight (under 2500 grams) was higher in the low socioeconomic status group than in the high status group. (Boersma and Mbise, 1979)

BIRTH WEIGHT AND MATERNAL SERUM TRANSFERRIN LEVELS: 41 women with serum transferrin levels above the mean of a large sample (N=172; mean, 265.6 mg/100ml) delivered infants significantly heavier than the 18 women with levels below the mean. This finding also held on a larger sample of 81 mothers from the same 1970-3 Kisarawe district study. (Maletnlema, n.d.)

4. NUTRITION STATUS CORRELATIONS (Cont.)

MATERNAL DIET AND BLOOD CHANGES: Maternal diet during pregnancy had a significant effect on the rise in serum transferrin in a small subset of the 63 sample women of the Kisarawe District; women with higher dietary intakes had higher rises in serum transferrin than those with lower intakes (above and below the mean of 1846 cal. and 32.4 g. protein) over the trimesters of their pregnancy. Other blood values tended to be higher among women on higher energy and protein intakes, but the differences were not significant. (Maletnlema, n.d.)

NUTRIENT INTAKE AND DESCENT: In a sample of 70 pregnant women (70% of whom were of Wazaramo descent), the Wazaramo ate significantly less energy foods, protein and iron than the non-Wazaramo group. (Maletnlema and Bavu, 1974)

BOTTLE FEEDING AND EDUCATION: There appeared to be a slight positive relationship between formal education of the urban mothers and the use of bottle feeding. (Bornstein, 1973)

EARLY WEANING AND EDUCATION: Low educational attainment was not related to early weaning among 268 Tanzanian mothers. (Ernster et al., 1976)

FOOD SUPPLY AND POPULATION: The range of food sources (hunting and gathering, fishing, and crop and animal husbandry) for the Sandawe is seriously threatened by increasing population and the consequent spread of cultivation and livestock, suggesting an imminent decline in food variety and nutritional status. (Newman, 1975)

CALORIE SUPPLY AND CASH CROPS: Increasing commercialization and cash production was found to improve calorie supply and by implication nutritional status among farmers from three Usambara communities. The least commercialized community was least able to meet its nutritional needs (review of Attems, 1967). (Fleuret, 1979)

URBAN

BIRTH WEIGHTS AND INCOME: Among a sample of 228 Dar es Salaam households, the average birth weight of children in the highest income group was found to be 200 gm higher than the average in the lowest income group, suggesting better maternal health and nutritional status. (Marchione and Helsing, 1981)

INFANT FEEDING PATTERNS, INCOME AND HEALTH: Total household income was found to be the main factor correlated with infant feeding patterns. With rising income, the percent of mothers stopping breast feeding before 12 months increased dramatically from 10.7% to 69.7% in a sample of 228 Dar es Salaam mothers. The percent of mothers using feeding bottles increased with rising income as well, from 33.3% to 81%. The health and nutritional status of the children improved with rising income; under-five mortality decreased from 132/1000 to 13/1000 from the lowest to highest income groups. (Marchione and Helsing, 1981)

EXCLUSIVE BREAST FEEDING AND MATERNAL EMPLOYMENT: The length of exclusive breast feeding appeared to be shorter for formally employed women according to preliminary results of data from 228 Dar es Salaam mothers interviewed. (Marchione and Helsing, 1981)

DURATION OF BREAST FEEDING AND MATERNAL EMPLOYMENT: Within income levels, the duration of breast feeding was not correlated to mother's employment status. (Marchione and Helsing, 1981)

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

5.1 NUTRITION AND HEALTH POLICIES

NATIONAL

NATIONAL FOOD AND NUTRITION POLICY: A food and nutrition policy was drafted but not formally incorporated into the 1976-1981 Five Year Plan. However the Plan included a large number of uncoordinated objectives, statements and proposals on food and nutrition. The current proposal from TFNC still gives poverty, ignorance, and disease as the main constraints to better nutrition; it stresses an interdisciplinary approach to overcoming them. (Jonsson, 1980)

THIRD FIVE YEAR PLAN (1976-1981): One objective of the Third Five Year Plan (1976-1981) was to reduce malnutrition by 30 to 50% in every region by 1981. (Jonsson, 1980)

SECOND FIVE YEAR PLAN (1969-1974): The main objectives of the 1969 Five Year Plan were: to provide an adequate and balanced diet for all; to provide sufficient good clothing for all; to provide decent housing for all; and to provide educational opportunities for all, within a policy of socialism and self-reliance. (Jonsson, 1980)

TANZANIA FOOD AND NUTRITION CENTRE: Established by an Act of the Tanzania Parliament in December, 1973, the Tanzania Food and Nutrition Centre (TFNC) was empowered to plan, implement, and evaluate food and nutrition related activities. Three major areas of concern have been food industry and standards, food and nutrition policy, and food development, with particular emphasis on weaning foods. (Maletnema, 1977)

TFNC FOOD AND NUTRITION POLICY DRAFT: The Tanzania Food and Nutrition Centre (TFNC) has proposed, as part of a National Food and Nutrition Policy draft, that TFNC be strengthened in order to fulfill its role of coordinating food and nutrition activities. One means would be a special government-advising mechanism, such as monthly or quarterly reports to the Cabinet, some Cabinet Ministers, or the Prime Minister. After the establishment of a National Food and Nutrition Policy, the TFNC would also assist in its implementation. (Tanzania Food and Nutrition Centre, 1980)

TFNC RECOMMENDATIONS: The Tanzania Food and Nutrition Centre recommends the following to improve child feeding practices: 1) extend the maternity leave period; 2) explore possibilities for breast feeding at places of work (nursing breaks cannot be used because mothers live far from their places of work); 3) restrict the use of infant formulas and feeding bottles; 4) educate to improve traditional weaning foods; and 5) control or abolish infant formula advertising. (Tanzania Food and Nutrition Centre, 1980)

EVALUATION OF TFNC: An independent evaluation of the Tanzania Food and Nutrition Centre (TFNC) was carried out in April 1979 and a long series of recommendations were generated following a request by the Tanzania

5.1 NUTRITION AND HEALTH POLICIES (Cont.)

Government and an agreement with the Swedish Government. The team approached the evaluation project from within a theoretical framework that was "Tanzania centered," value oriented and normative so as to be able to incorporate the officially stated objective of alleviating malnutrition in the country. (Knutsson et al., 1979)

FOOD AND NUTRITION PLAN: The Tanzania Nutrition Committee and the Nutrition Unit of the Ministry of Health presented the First Nutrition Plan (1965-1969), which put a high priority on nutrition surveys. These regional nutrition surveys gave a picture of the nutritional status of the country and are still the only comprehensive nutrition surveys of the country. (Jonsson, 1980)

DECENTRALIZATION OF HEALTH SERVICES: Following the overall principle of decentralization and mass mobilization in the country, the organization for health services was decentralized in July 1972 in an attempt to put most of the decision-making machinery in the hands of the people in the 20 regions, districts, divisions, and even at village level. (Djukanovic and Mach, 1975)

MASS MOBILIZATION: In strengthening the health services system the principle of self-reliance is stressed. Mass mobilization is used as a deliberate political measure to raise the social consciousness of the population. (Djukanovic and Mach, 1975)

FOOD AID USAGE: There are three practices for using food aid. The Ministry of Health has a policy of giving available food aid free to severely malnourished people. The Catholic Relief Service policy is to give food aid free to all children attending clinics. Other voluntary agencies sell all food aid at a reasonable price. (Tanzania Food and Nutrition Centre, 1980)

FAO MISSION: In May 1980, the Food and Agriculture Organization of the United Nations, with the assistance of DANIDA and at the request of the Tanzanian Ministry of Agriculture, sent a mission to Tanzania to formulate a project proposal on "A Comprehensive Food Strategy for Tanzania." During the visit, the Tanzania Food and Nutrition Centre offered several suggestions stressing the need for a food and nutrition policy as a basis for a food strategy. (Tanzania Food and Nutrition Centre, 1980)

GOITER CONTROL RECOMMENDATIONS: A National Expert Committee met in May 1979 to review existing evidence on the problem of goiter and cretinism in Tanzania. They recommended that of the various non-medical methods of goiter control, salt iodization was the best long-term solution. The committee set out a three year plan for the appropriate agencies and companies to implement in the priority areas of Iringa, Mbeya Kilimanjaro and Arusha. Evaluation was to be done by the Tanzania Food and Nutrition Centre. (National Expert Committee, 1979)

NURSING BREAKS: Provision is made for 2 half-hour nursing breaks, but the law does not specify whether they are to be remunerated. (Richardson, 1975)

NURSING BREAKS: The two half-hour nursing breaks allowed by legislation to all nursing mothers frequently remained unused due to the lack of nurseries for babies in all workplaces. (Marchione and Helsing, 1981)

MATERNITY LEAVE: Government policy states that employed mothers are to get a three month paid maternity leave. (Maletnema, 1980)

MATERNITY LEGISLATION: Legislation provides for 84 days maternity leave with full pay to all employed women once every three years. The legislation was found to be observed in all public institutions. (Marchione and Helsing, 1981)

IMPORTED BABY FOODS: A team made up of representatives from the Bureau of Resource Assessment and Land Use Planning (BRAULP), the International Union of Nutrition Sciences and Tanzania Food and Nutrition Centre is studying the growing dependence on imported processed baby foods in spite of import restrictions. Their goal is to help in the formulation of a national policy and practical solutions. (Masha and Ljungquist, 1979)

IMPORTED INFANT FORMULA: There are restrictions upon the quantities of infant formula imported. (Marchione and Helsing, 1981)

HEALTH CARE COMMITMENT: Tanzania's commitment to increase rural health coverage and to develop its rural health services is a long standing one. Recent intensified efforts to construct new rural health centers and dispensaries and to build and operate schools for rural health workers reflect the national priority given to the development of basic health services. Health policy is seen as an integral part of overall rural development policy and reflects the overall socio-political background in the country. (Djukanovic and Mach, 1975)

HEALTH EXPENDITURES: Central government health expenditures have risen from T Shs. 50 million (1 T Shs = \$0.14 US) in 1961/62 the first year of independence, to over four times that amount in 1973/74, amounting to about T Shs. 15 per person in 1973. The private sector spent about T Shs. 3 per person in 1973. Thus the total health expenditure is T Shs. 18 per person or about 3% of the GNP spent directly on health care (excluding indirect health status determinants, e.g., water, sanitation, nutrition). (Djukanovic and Mach, 1975)

BUDGETARY EMPHASIS: Rural services received 70% of the health budget in 1972/73. (Djukanovic and Mach, 1975)

NATIONAL PRIORITIES: The 1967 Arusha Declaration proclaimed the highest national priorities to be the provision of water, universal free primary education, and basic health services. Current policy on rural health delivery systems stresses local involvement and contribution (self-reliance). (Djukanovic and Mach, 1975)

5.1 NUTRITION AND HEALTH POLICIES (Cont.)

SELF-RELIANCE: Self-reliance was proclaimed to be of primary importance in the 1967 Arusha Declaration and foreign aid was not to be the major instrument of development--"Cooperation with other countries, but not poisoned aid." (Djukanovic and Mach, 1975)

UJAMAA NA KUJITEGEMEA (SELF-RELIANCE): In the Tanganzika African National Union (TANU) party conference of 1967, the Arusha Declaration set out the overall policy for development. The policy put highest priority on rural development and self-sufficiency in food production. (Mabele et al., 1980)

UJAMAA VILLAGES: Planning and development of ujamaa villages has become the basic political and economic concept for the country. Most Ujamaa villages are rural communities in which the socialist goal of politicization, communal production, and decision-making has been achieved in varying degrees. (Kreysler and Mndeme, 1975)

PRICE CONTROLS: The government has used price controls to differentiate between luxuries and necessities in the market basket. (Mabele et al., 1980)

FOOD PRICE CONTROLS: Prices of most consumer items are state-controlled and uniform throughout the country. The tendency at the moment is for price fixing to favor the producers rather than the consumers. (Tanzania Food and Nutrition Centre, 1980)

AGRICULTURAL PRICE INCENTIVES: In recent years the government has repeatedly raised the prices paid to producers of food crops. Peasants have responded to the incentives by switching from cash crops to food crops. (Mabele et al., 1980)

BACKYARD GARDENS: Backyard gardens for growing fruits and vegetables are emphasized in the draft of the proposed food and nutrition policy. (Kimati, 1981)

5.2 NUTRITION AND HEALTH PROGRAMS

NATIONAL

TFNC WEANING FOOD PROJECT: The Tanzania Food and Nutrition Centre initiated a locally processed weaning food called "LISHA." LISHA is made of maize flour, soya and dried skim milk and is manufactured by the National Milling Corporation with U.S. AID support. It was originally distributed by the Ministry of Health at MCH clinics, but is now on sale at shops. The subsidized price of LISHA is 15/=per kilo compared with 50/=per kilo for Cerelac. However, the quantity produced has never been large enough to reach the rural areas. (Kimati, 1981)

TFNC BREAST FEEDING CAMPAIGN: A breast feeding campaign is being led by the Tanzanian Food and Nutrition Center. (Kimati, 1981)

TFNC VILLAGE FOOD PRODUCTION MODEL: The Tanzania Food and Nutrition Centre developed a village food production model for community based planning toward nutritional goals. A training manual based on this model (estimated village food needs, crop pattern comparisons of expected energy and protein yields, and food production plan) was developed for the two new cadres (village management technicians and village managers). In use, the model was helpful in producing structured discussion. Open conflict sometimes arose between a food first strategy and a commercial output approach, but at least a direct dialogue between the village popular-based political representatives and the government representatives has begun. (Jonsson et al., 1981)

TFNC EVALUATION: The main recommendations of the TFNC evaluation of 1979 were that TFNC should: 1) complete its proposed national food and nutrition policy; 2) translate its suggested policy objectives into specified goals and targets, giving them priorities and scheduling them; 3) receive authority to require all relevant ministries and institutions to submit necessary information; 4) develop a more comprehensive and interdisciplinary professional staff (e.g. team of social analysts); 5) increase its understanding of the dynamics of social life at the village level; 6) focus more on the major productive and reproductive contributions of women; 7) develop the necessary political backing and access to power to translate its multisectorial advice into coordinated action; 8) become an agency within the Ministry of Finance and Planning; 9) place more focus within the TFNC on its "nutrition" role in comparison to its "food technology" role; 10) put more focus upon goal achievement and less on budgetary targets; 11) terminate its weaning food efforts; 12) pay less attention to international institutions; 13) add professional staff in mass communication; 14) establish a realistic surveillance system; and 15) speed up decisions on the establishment of a nutrition school, given shortage of trained personnel. (Knuttson, 1979)

NUTRITION EDUCATION PROGRAMS: At the community level, nutrition education is a component of programs such as Mtu ni Afya (Man is Life), farmers' education projects, folk development programs, functional literacy projects, Ukulima wa Kisasa program (modern farming), Chakula Bora (Nutrition), population and family life education, day care center programs, and family planning programs. (Expert Committee Report, 1980)

MAN IS HEALTH (MTU NI AFYA) CAMPAIGN: The Man is Health Campaign started the first of its twelve broadcasts on May 14, 1973 and ran through August 5, 1973. By the end of the sixteenth month of intensive preparation, 75,000 study group leaders had been trained and were ready to lead the twelve weekly study meetings. Two million Tanzanians participated. The study groups were designed to progress logically from learning to action. Modest but significant improvements in sanitation occurred, but direct nutritional themes were not included. (Hall, 1978)

SWEDISH AID: The Mtu ni Afya ("Man is health") radio education campaign was financed by a grant from the Swedish International Development Authority (SIDA) for approximately \$210,000 and by the Tanzania Government. (Hall and Dodds, 1977)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

MINISTRY OF HEALTH WEANING FOOD: A locally processed weaning food called LISHA has been subsidized and distributed at MCH clinics by the Ministry of Health. It consists of maize flour, soya and dried skim milk. Now it is on sale at shops. Its cost is only 15/=per kilo compared to the 50/=per kilo cost of Cerelac. However, the quantity of LISAH produced is too small to reach the rural areas. (Kimati, 1981)

VITAMIN A DEFICIENCY CONTROL: In February 1981, the first national seminar was held on vitamin A nutrition, its relation to various diseases, measles in particular, and means of controlling vitamin A deficiency. The Vitamin A Coordinating Committee suggested two lines of investigation: 1) whether vitamin A deficiency and PEM are responsible for measles blindness, and 2) whether xerophthalmia is present in Tanzania. (Sommer, 1981)

ENDEMIC GOITER CONTROL: A national screening of goiter prevalence is being carried out by district health personnel. Preliminary data suggest that the number of Tanzanians affected may be 3 million or more. (Tanzania Food and Nutrition Centre, 1980)

NUTRITION EDUCATION AND FUNCTIONAL LITERACY CAMPAIGN: The reading materials in the primers for the functional literacy campaign covered a wide range of topics, including nutrition, but the nutrition material covered aspects of nutrition science and education without having a problem-oriented content. (Expert Committee Report, 1980)

FAMINE RELIEF: The Prime Minister's Office conducted a huge famine relief program for the regions of Dodoma, Morogoro, Sengida, Mara and Shinyanya from 1974 to 1977. About 220 million T.Shs. were spent. (Jonsson, 1978)

CATHOLIC RELIEF SERVICE: During FY 77-78, CRS made available 12 million pounds of U.S. government donated PL 480 Title II foods valued at \$4.28 million. Corn-soya blend, bulgur wheat, peanut and other vegetable oils, dried skim milk, and corn meal were distributed through 80 centers throughout Tanzania to 174,000 people, especially preschool aged children. (TAICH, 1979)

HOLY GHOST FATHERS: Provide famine relief and food-for-work programs at missions throughout the country. (TAICH, 1979)

HEALTH CARE SYSTEM ADMINISTRATIVE STRUCTURE: In each of Tanzania's 20 regions, there is a regional medical officer, who is a member of the regional development committee and is responsible to the regional development director. The medical officer is the director of the regional hospital and the coordinator of the implementation of the health policy in the region. At the district level there is a district medical officer who has the same function at the district level. In the rural areas, there are health centers, dispensaries and village health posts. (Djukanovic and Mach, 1975)

HEALTH DELIVERY SYSTEM: The health delivery system structure is hierarchical with the Medical Aide Post at the village level, MCH clinics for two or more villages, one or two Dispensaries per division, two or three Health Centres per district, District Hospitals, Regional Hospitals and National Hospital. In 1976, there were 161 Rural Health Centres fairly evenly spread over the country, and 2,100 dispensaries. (Jonsson, 1978)

HEALTH CARE PRIORITIES: The training of paramedical personnel and the building of rural dispensaries and health centers have taken up the major share of medical expenditures since the Arusha Declaration. (Mabele et al., 1980)

MATERNAL AND CHILD HEALTH CLINICS: Maternal and Child Health Clinics now cover 40 to 70% of all the mothers and children in the various districts. Only 25% of villages have access to basic health services. (Tanzania Food and Nutrition Centre, 1980)

HEALTH FACILITIES: Mainland Tanzania had 128 hospitals (5 national, 18 regional, 105 district) with 18,700 beds (1 per 720 persons), distributed unevenly throughout the country. The number of graduate doctors was 494 (1 per 28,000 persons). (Djukanovic and Mach, 1975)

UJAMAA VILLAGES: By 1972, 1100 voluntary communal production "ujamaa" villages were formed with workers of the TANU party to motivate and guide them. But the pace was too slow, so a campaign of "villagization" was undertaken. By 1974 more than two million peasants were settled in 5,000 villages. (Mabele et al., 1980)

"VILLAGIZATION" PROGRAM: Various forms of coercion were used during the massive "villagization" project, from false promises to actual force. Such force was justified by the government as being "for the people's own good." (Lappe and Beccar-Varela, 1980)

"VILLAGIZATION" PROGRAMME: Between 1974 and 1976 about 13 million people moved into villages as part of the country-wide "villagization" program. (Jonsson, 1980)

RURAL

TFNC WEANING FOOD MANUALS: The Tanzania Food and Nutrition Centre has published manuals containing essential information on child feeding and recipes for weaning foods for local use in Morogoro and Singida regions in an effort to revive and promote use of nutrient-rich traditional weaning foods. A manual for the Mbeya region is being prepared. (Moshia and Ljungquist, 1979)

IMPACT OF HEALTH EDUCATION: After 2 years of health education and changed clinic concepts, attitudes of mothers attending under five clinics in Lushoto District showed improvement in their understanding of clinic activities: a) weighing of children was considered important by 63% in 1972 but by only 21% in 1971; b) health education by 54% in 1972

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

and 0% in 1971; c) vaccinations by 49% in 1972 and 0% in 1971, and d) food supplementation dropped from 85% in 1971 to 0% in 1972. (Korte and Patel, 1974)

HEALTH EDUCATION CAMPAIGNS: Several nutrition-related education campaigns were organized by the Adult Education Institute. The latest one was designed to reach 3 million people using training seminars for regional, district and divisional heads as a source of group leaders for the 120,000 radio study groups. (Maletnlema, 1978)

RADIO HEALTH EDUCATION: Two health education campaigns have used radio study groups on a mass scale. The first campaign Mtu ni Afya ("Man is health") in 1973 reached one to two million people and led to significant changes in the country's health practices at an estimated cost of 1 to 4 shillings per participant. The second, entitled Chakula ni Uhai ("Food is life") in 1975 emphasized nutrition, food production and child care; no data on evaluation was available for review. (Hall and Dodds, 1977)

EFFECT OF APPLIED NUTRITION PROJECT: After two years of an applied nutrition project at Hombolo, this survey could demonstrate no significant difference between the nutritional status of children at the center of the project (Makulu) and those at the fringe of the project (Misui). However, feeding habits seemed to be becoming more diverse, and protein intakes were increasing. (Burgess et al., 1968)

VILLAGE FOOD PRODUCTION MODEL IN USE: The village food production model was used in a detailed assessment of the 1977/78 food plans in 50 villages in Bagamoyo District, Coast Region. It showed that in almost all cases the planned production far exceeded the estimated requirements. However, malnutrition was still prevalent. Investigation into why malnutrition was present in spite of surplus food suggested that the villages sold too much of their crops to the National Milling Corporation and that food storage losses were very high. (Jonsson et al., 1981)

AGRICULTURAL EXTENSION ACTIVITIES: Agricultural extension activities at the village level have concentrated on crop and animal production without including nutrition. The radio program in agriculture has included foods and nutrition (Chakula Bora), but even this has not been problem-oriented. The establishment of village level agro-vets (multipurpose agriculturalists) opens the possibility for teaching the linkage between various aspects of production and distribution and nutritional status. (Expert Committee Report, 1980)

IMPROVED GRAIN STORAGE: Working with villagers of Bwakira Chini, the Community Development Trust Fund of Tanzania, the Institute of Adult Education, and associates from the Economic Development Bureau developed improved designs for grain storage and began implementing them in the village. (CDTFT, 1977)

INSTITUTE OF ADULT EDUCATION NUTRITION PROGRAMS: The Institute of Adult Education has initiated ten Farmer Education projects addressed to the basic problems of the rural poor. Their goals are to provide learning

situations for certain farm enterprise skills (e.g., fruit and vegetable growing, poultry keeping, and cattle rearing) and nutritional knowledge, and to help reduce malnutrition in the project areas. To date, the results appear encouraging. (Expert Committee Report, 1980)

FOLK DEVELOPMENT COLLEGE PROGRAMS: The intention of the Folk Development College (FDC) education program is to provide adults with the skills and knowledge essential for effective participation in development activities and programs. Nutrition is covered in the home economics section, but little attempt has been made to relate nutrition to basic services in a problem-oriented way. (Expert Committee Report, 1980)

TANZANIA PLANTING COMPANY FOOD SUPPLEMENTS: The Tanzania Planting Company (TPC) offered its employees one of the most comprehensive programs for health and social welfare in Moshi District and perhaps in the country. They had a separate welfare office, health clinics with a well-baby unit, a hospital, and two day care centers. The welfare department arranged for weekly house-to-house visits. In 1973, 4,500 children were seen each month at the clinic, where mothers received weekly supplies of milk powder, soya bean mixture and an orange for each child. All services for employees were free of charge. (Freyhold et al., 1973)

NUTRITION EDUCATION AND MATERNAL AND CHILD HEALTH CLINICS: The nutrition education in the MCH clinics includes basic nutrition and food science as it relates to child and mother health (e.g. what to feed infants and how to prepare these foods), and production of supplemental foods through backyard fruit and vegetable gardening. This program assumes that other extension programs deal with other nutrition-related factors such as sanitation, clean water supply, and food availability, and that a linkage is made between these and nutrition status. (Expert Committee Report, 1980)

NUTRITION PROGRAMS IN CHILD WELFARE CLINICS: There were both stationary and mobile child welfare clinics in the Kilimanjaro district in 1972. The Kilimanjaro Christian Medical Center (KCMC) coordinated the two mobile units and some of the stationary clinics (supported by the Catholic Relief Service). The routines in the various clinics differed slightly, but always included weighing of children and distribution of donated food supplements either to underweight children (KCMC, who had regular supplies) or to all children (CRS, who lacked regular supplies). Nutrition and health education, some cooking demonstrations, brief examinations, and some medication were also offered. (Freyhold et al., 1973)

NUTRITION EDUCATION AT REHABILITATION UNITS: Nutrition education was stressed at the Nutrition Rehabilitation Units where children with severe cases of kwashiorkor or marasmus stay with their mothers for about 3 weeks. The primary aim was to educate mothers to alter poor feeding habits by actual experience with nutrition, cooking methods, and economical ways of obtaining the necessary nutrients for their children.

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

A certificate was given to mothers who successfully completed their stay. (Freyhold et al., 1973)

FOOD SUPPLEMENTS AS A TREATMENT: Food supplements are given at the under five clinic Bumbuli Hospital to children whose weight for age is below 70% of the Harvard standard. Dried skimmed milk is distributed only as a mixture with cornflour or bulgur wheat. When available, CSM (corn flour, soybean flour, and dried skimmed milk) replaces the corn flour mixture. CSM was developed by the U.S. Department of Agriculture. (Kreysler and Schulze-Western, 1973)

WEIGHT CHARTS: The under-five clinic at Bumbuli Hospital uses the Ilesha "weight chart", a health scheme with practical demonstrations with all mothers, and also provides food supplements. (Kreysler and Schulze-Western, 1973)

CURATIVE MEDICAL CARE: Mothers' responses to a questionnaire on beliefs about health clinic activities and examination of actual clinic attendees suggested that curative medical care is still the chief attraction of the clinics. (Korte and Patel, 1974)

CLINIC ACTIVITIES - TANGA: In the Tanga District there is only one under five clinic center (Ngamiani). The emphasis of the clinic is the vaccination and weighing of children up to one year of age. After the first year coverage is irregular. (Gupta, 1976)

CLINIC ACTIVITIES - LUSHOTO: Between 1970 and 1972, the under-five clinics in Lushoto District conducted improved health education programs, while supplies and free food distribution were reduced. As a result, attendees' understanding of the purpose of the clinics improved. (Korte and Patel, 1974)

CLINIC ATTENDANCE: 86 (42%) of the 213 children over one year old examined were regular attendees of the mobile clinic in Kisarawe District. (Burgess, 1969)

CLINIC ATTENDANCE: 56% of the surveyed mothers attended the under-five clinic. Most were from the Muslim and more traditionally oriented part of the village. (Kreysler and Schulze-Western, 1973)

FOOD SUPPLEMENTS AND CLINIC ATTENDANCE: Mothers indicated that food supplements were a strong motivation for attending clinics. (Kreysler, 1973)

SUPPLEMENTS AND CLINIC ATTENDANCE: The use of free food supplements as a motivation for attendance at young child clinics was shown to lead mothers to believe that the main purpose of the clinics was to provide the free food. (Korte and Patel, 1974)

INFLUENCE ON CLINIC ATTENDANCE: In a survey of mothers in Balangai and Kwshangarawe, 60% of mothers who attended health clinics said that the husband had made the decision, 20% said that the ten-house cell leader

had advised them to go, and 12% were convinced after discussion with friends. For the non-attending mothers, the majority of the husbands either did not know about the clinic or had refused to pay the 20 cents charged at the clinic. (Protein-Calorie Advisory Group, 1977)

TIME CONSTRAINTS ON CLINIC ATTENDANCE: Although women in the Balangai and Kwshangarawe village survey showed positive feelings toward health clinic attendance, the time available for women to attend was restricted by their heavy physical workloads, which included taking care of house and children, preparing meals for the family, collecting fire wood and fetching water and often also cultivating the family land. (Protein-Calorie Advisory Group, 1977)

HEALTH CLINIC ATTENDANCE CORRELATES: Mothers most likely to use the under-five clinics were age 25-44 years, illiterate, and from families with a regular cash income. (Kreysler and Schulze-Western, 1973)

TANZANIA/UNESCO/UNICEF PRIMARY EDUCATION REFORM PROJECT: This program has been implemented on a trial basis in community schools and has now been recommended for replication. The community schools curriculum is both problem-oriented and participatory in nature. Nutrition is thus well-integrated into large, problem-oriented themes rather than presented as an isolated subject. (Expert Committee Report, 1980)

MISSIONS: 12 general hospitals and 90 clinics and dispensaries throughout Tanzania are supported jointly by 13 mission boards. (TAICH, 1979)

MARYKNOLL SISTERS OF ST. DOMINIC, INC.: In conjunction with USAID and the Government of Tanzania the Maryknoll sisters operate a training program for maternal and child health care throughout the country, based in Dares Salaam. The program provides personnel to the Medical Missionaries of Mary for training in village health work, including nutrition. Since 1977, 64 persons from 32 villages have been trained. (TAICH, 1979)

MEDICAL MISSIONARIES OF MARY, INC.: The U.S. branch of Medical Missionaries of Mary provides financial assistance to four hospitals, each with some form of maternal and child health clinic and/or health education, and the Hanang District Village Health Project. (TAICH, 1979)

THE MORAVIAN CHURCH: The Moravian church operates hospitals and many general clinics in Sikonge and Rungwe. Nutrition classes are given at the hospitals and include basic nutrition, food storage, introduction and production of nutritious foods, and food preparation. (TAICH, 1979)

WORLD NEIGHBORS AND WORLD VISION RELIEF ORGANIZATION, INC.: Both organizations support Mvumi Hospital Community Health Development in the Dodoma District, which is attempting to establish integrated health services for 65 villages. The emphasis is on health education, maternal-child health and other preventive measures. (TAICH, 1979)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

DAY CARE CENTERS: There were five rural day care centers in Moshi District in 1973. The fee charged covered the salary of the teacher, but was not enough to buy milk powder for the children. Children received nothing at the centers unless milk donations from UNICEF or elsewhere came, because both parents and teachers thought that milk was the only suitable snack for children at the centers. (Freyhold et al., 1973)

URBAN

HOSPITAL PRACTICES AND BREAST FEEDING: In the government health units where low income women generally deliver their babies, rooming-in of babies and mothers is standard practice. As a result, breast feeding is initiated within hours of delivery, even though there is very little conscious encouragement of breast feeding. In the private clinics, there are no rooming-in facilities, and thus breast feeding is often delayed for many hours or even days. (Marchione and Helsing, 1981)

HOSPITAL FORMULA PRACTICE: For years, Aga Khan Hospital has allowed milk firms to give powdered milk tins and feeding bottles as discharge gifts to all new mothers. (Kimati, 1981)

INFANT FORMULA PROMOTION: Advertisements and other promotional activities for infant formula have quite recently been removed from government institutions, through the influence of health personnel rather than legislation. Public promotion has almost entirely been stopped. However, in private health institutions, free samples and gift kits are given to mothers and bottle feeding of formula milk is standard practice, regardless of the mothers' lactating performances. Site visits and mothers' responses show that private health institutions remain the main promotional agent for infant formula. (Marchione and Helsing, 1981)

6. COMMENTARIES

NATIONAL

NO NATIONAL NUTRITION SURVEY: There has not been a national nutrition survey. National estimates of PEM prevalence have been made based upon data from the following sources: 1) MCH clinics; 2) community surveys; 3) age-specific mortality data; and 4) hospital records on the pattern of morbidity and causes of death. (Tanzania Food and Nutrition Centre, 1980)

FOOD AID POLICIES: At present, there are no policies regarding food aid, and it is simply used to make up for existing deficits. Because donor countries use food aid as surplus disposal programs, the products available to Tanzania are often not targeted to existing needs such as sorghum grits, butterfat and dry skimmed milk. (Tanzania Food and Nutrition Centre, 1980)

INFANT FORMULA: Free marketing of infant formula is inconsistent with Tanzanian policies to promote breastfeeding. However, banning formula from the country would be unrealistic. To counteract the threat of widespread bottle feeding, several measures were suggested including the following: 1) pending the provision of workplace creches, nursing breaks should be abolished and nursing mothers allowed to go home earlier; 2) change rooming procedures in private maternity clinics; 3) stop the local manufacturing and marketing of feeding bottles; and 4) promotion of good feeding practices through all possible media. (Marchione and Helsing, 1981)

COST OF BREAST MILK SUBSTITUTES: Calculations suggest that a decline of only 20% in breast feeding in Tanzania would require importation of powdered milk costing 2 million pounds at 1970 prices, an amount equivalent to one third of the 1961 total country health budget. (Kimati, 1981)

REASON FOR NUTRITION INTERVENTION PROGRAMS' INEFFECTIVENESS: The major nutrition intervention programs have been supplementary infant and school feeding, nutrition education, child spacing and food commodity price controls. These programs have not succeeded because of several factors including: 1) a narrow interpretation of nutritional problems as caused by ignorance and failure to use existing resources appropriately; 2) defective content and approach to nutrition education; 3) low priority status of nutrition; 4) non-systematic and non-integrated nutrition services; and 5) no coordination of nutrition policies and programs among various institutions and ministries. (Tanzania Food and Nutrition Centre, 1980)

BALANCE BETWEEN PROTEIN AND ENERGY MALNUTRITION: Most experts agree that the average protein intake is adequate to meet requirements when enough calories are eaten. PEM is thus mainly a result of too little intake of foods in general. The bulkiness of the starchy diet may in itself limit intakes, particularly among small children who eat only a few times a day. (Tanzania Food and Nutrition Centre, 1980)

6. COMMENTARIES (Cont.)

MAN IS HEALTH (MTU NI AFYA) CAMPAIGN: An analysis of the Man is Health campaign suggests that the program did not make the linkage between poor health and nutritional status. (Expert Committee Report, 1980)

RURAL HEALTH CARE: A very large part of both Government (74%) and Regional (53%) recurrent health expenditures go to hospital and curative services despite policy emphasis on developing rural health care. (Jonsson, 1978)

LIMITED ACCESS TO HEALTH SERVICES: At all levels in the health services, the most vulnerable 70% of the Tanzanian population (mothers and children) are not given equal access to health services. (Kimati, 1976)

LEADERSHIP VIEWS OF DEVELOPMENT: Development appears to be viewed as the outcome of better organization, more technological inputs, and government by the goodwill of the leaders. Progress is thus viewed as the result of establishing an organizational structure and exhorting people to move toward the realization of egalitarian ideals. Leadership needs to be brought into villages from without. (Lappe and Beccar-Varela, 1980)

OBSTACLES TO SELF-SUFFICIENCY: The obstacles to the implementation of a policy of Ujamaa villages specializing in production suited to their area are poor communication systems, inadequate transport facilities, inadequate storage facilities, and poor marketing of produce. (Report of Working Group I, 1977)

RURAL

PEM AND CASSAVA ROOT PORRIDGE: In Tunduru district, cassava root porridge is the only weaning food available and is a cause of PEM among young children. Use of the cassava leaves would improve the diet. (Kimati, 1977)

PEM AND BANANA PORRIDGE: In the Kilimanjaro region, use of banana porridge as the sole weaning food is a well-known cause of protein energy malnutrition among young children. Better weaning foods are available in the region. (Kimati, 1977)

NUTRITION EDUCATION AND MATURITY RITES: Almost all the village boys and girls in Bagamoyo District receive instruction at the time of maturity rites. Thus, there is great potential for these rites to be vehicles of health instruction in cooperation with the elders concerned. Local health instructors and local married village midwives could be present and participate in the instruction. For example, since it is understood that mother's blood is needed for the development of the growing fetus, the idea that this blood should be strengthened should not be difficult to teach. (Swantz, 1973)

ROLE OF MEN IN NUTRITION EDUCATION: Because men still largely determine the family diet on the coast (Bagamoyo District), instruction concerning nutrition must be given to them as well. (Swantz, 1973)

LOCAL "MAN IS HEALTH" CAMPAIGN: In villages of Bagamoyo District, the "Man is Health" mass media campaign was hampered by lack of literate ten-cell leaders to coordinate the organization of the groups. Too much responsibility was left with the local leaders for implementation. Nevertheless, some groups were organized and were planning health activities. (Swantz, 1973)

HEALTH EDUCATION - MTU NI AFYA: A review of the Mtu Ni Afya (Man is Health) campaign in Moshi District reported 1,553 groups participating in April-May 1973, with reported membership exceeding the total population of the district. One group was visited and consisted of only 10 women from a village of several hundred families. Lessons consisted of listening to the radio and reading the primer, but no discussion of the topics or practical activities had resulted. (Freyhold et al., 1973)

URBAN

ECONOMIC COSTS OF PEM: It costs the state 2520/= to keep a severely malnourished child and her mother in Muhimbili Medical Centre, Dar es Salaam for three weeks, whereas it would have cost about 100/= for this child to have had 6 to 8 visits in one year at a MCH clinic. (Kimati, n.d.)

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Method: cross-sectional prospective study 7 month period; anthropometry and clinical exam.

Sample: 16,532 consecutive live-born infants.

Location: Muhimbili and Ocean Road Hospitals, Dar es Salaam.

This report documents the anthropometric status of a very large sample of live-born infants in Dar es Salaam. Stress is put on the incidence of low birth weight infants. Comparisons with previous studies are discussed. The mean birth weight of this hospital-delivered sample was approximately 3 kg.

Bornstein, A.

- 1973 "Breast feeding in Tanzania: Studies on infant feeding practices and attitudes." Nutrition Newsletter, 2(3): 1-8.

Original data.

Method: Two cross-sectional surveys; one survey used a questionnaire interview of mothers - only part of the data is presented; the other was an attitude survey using an incomplete sentence test. Selection was nonrandom and nonrepresentative.

Sample: The Shambala tribe of North Eastern Tanzania. 1st sample: 48 rural mothers in three MCH clinics and 78 town mothers at the Tanga MCH. 2nd sample: 166 secondary school girls 15-20 years old in a boarding school in Tanga, mainly from the Chagga tribe.

Geographic location: Urban town of Tanga, rural villages of Lushoto District.

The paper discussed the problem of a tendency toward earlier artificial feeding of infants and the consequent decline in breastfeeding time. Two surveys made in 1970 are presented. The first explores the way child feeding practices, especially breastfeeding, are affected by a move from a rural to an urban situation. The second attempts to show the values and attitudes of a group of secondary girl students toward the breastfeeding/artificial feeding issue. Simple survey methods are used and show that useful information can be collected relatively easily.

Bujra, J.

- 1973 "Peri-urban settlement: Dar-es-Salaam" In: Tanzania National Scientific Research Council (ed.), The Young Child in Tanzania, Vol. 1, pp. 396-452. Dar-es-Salaam, Tanzania: UNICEF Liaison Office, October.

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Original data.

Method: Three month field study, April to June 1973; observation of social facilities, interviews with available women.

Sample: 71 women.

Location: Three areas in and around Dar es Salaam: Keko, Msasani and Mtoni.

The variables considered as important influences on child care included family income, income in kind, patterns of expenditures, fertility, general intelligence of mother, ethnic background, extended family support, housing environment, and availability of services. Some information on knowledge, beliefs and practices surrounding child care is included.

Burgess, H.J.L.

- 1969 "A brief follow-up study of malnutrition in village children in Tanzania," East African Medical Journal, 46(1): 26-9.

Original data.

Method: Follow-up cross-sectional survey 15 months after original examination - weight, clinical nutritional status and regularity of clinic attendance was measured.

Sample: Of the 366 village pre-school population all of whom were originally seen, 213 (58%) were actually examined and information was obtained on 139 (38%) more.

Geographic location: Binga Village Development Committee Area in Kisarawe District, Coast Region.

This brief study reports the results of a 15 month follow-up examination of pre-school children in Kisarawe District. Malnutrition was found to be chronic and the surprising thing was the number of malnourished, underweight, anemic and malarious children who were able to survive the second and third years. After one year of monthly visits, the effect of the mobile clinic could not be detected.

Burgess, H.J.L., Maletnlema, T.N. and Burgess, A.P.

- 1968 "The nutritional status of young children in Hombolo, Tanzania," East African Medical Journal, 45(9): 605-612.

Original data.

Method: Cross-sectional survey, September 1965, interviews of mothers for background data; anthropometric measurements and clinical examination of children, and blood sample. Two sample areas, one with a nutritional intervention program and one without.

Sample: A total of 401 children under five (215 from Makulu and 186 from Misui) which was 93% of all the children in the area. The vast majority were from the Wagogo tribe.

Geographic location: Makulu and Misui villages, in the Hombolo Division of Dodoma Region in Central Tanzania.

The purpose of this nutrition status survey was to examine the nutritional status of children in Hombolo and to collect demographic and sociological information. In the process it was hoped to evaluate the impact of an applied nutrition project that had been in effect for two years.

CDTFT (Community Development Trust Fund of Tanzania)

- 1977 Appropriate Technology for Grain Storage: Report of a Pilot Project, New Haven, CT: Economic Development Bureau.

The project described in this report for improving small-scale grain storage at village level was undertaken by a team composed of staff of the Community Development Trust Fund, the Institute of Adult Education and associates of Economic Development Bureau. The project's goal was to develop, in the course of discussion meetings with villagers, improved designs and strategies of grain storage appropriate to local conditions and to begin implementing these improvements. The project was in the village of Bwakira Chini in Morogoro District.

Department of Planning, Tanzania Food and Nutrition Centre

- 1980 Data report on the food and nutrition situation in Tanzania 1973/74-1977/78. Dar es Salaam: Department of Planning, Tanzania Food and Nutrition Centre, April, 1980.

This comprehensive report compiles available data on the Tanzanian food and nutrition system and presents it in a comprehensive and systematic format of tables. Data is presented on agriculture, food processing and distribution, and the household. Judgements are not made on the validity of the data collected from various sources, mainly government ministries.

Djukanovic, V. and Mach, E.P. (eds.)

- 1975 Alternative approaches to meeting basic health needs in developing countries: A joint UNICEF/WHO study. Geneva: World Health Organization, 1975.

This document attempts to take a new look at the world's priority health problems and at alternative approaches to their solution. Case studies from Tanzania, Bangladesh, Cuba, India, Niger, Nigeria, China, Venezuela and Yugoslavia single out and describe the most interesting characteristics of each approach. The Tanzania case study is based upon a larger report by Drs. Djukanovic, Kalimo and Omari, whose purpose was to highlight recent Tanzanian health policy and implementation programmes. Although it is not intended to offer a health status report, it does briefly review the actual health situation in the country. Stress is put on understanding health policy in the context of the overall socio-political development of Tanzania. The health system is based on the philosophy of providing

BIBLIOGRAPHY (Cont.)

wide coverage of primary services to meet basic health needs rather than less accessible, but more sophisticated services.

Ernster, M., McAleenan, M. and Larkin, F.

- 1976 "Social research methods applied to nutritional assesment in Tanzania". Ecology of Food and Nutrition, 5(3): 143-151, 1976.

Research data and methodological information.

Method: Clinical anthropometric and interview data.

Sample: Non-random selection of the first 100 mothers with infants 5 years or younger identified within a six mile radius of several rural health clinics. A total of 272 subjects. The sample was drawn from one of the largest tribal units in the country (4-5% of the total population).

Geographic location: Rural, area not specified.

This paper describes one method of using social research techniques in nutritional assessment. It highlights the importance of considering ecological factors predisposing specific populations to malnutrition. A case study based on unpublished data from Tanzania is used to illustrate the authors' method. The data is used to explore the relationships between PCM prevalence and the educational levels of parents, weaning beliefs and practices, location of infant birth and size of land holdings.

Expert Committee Report

- 1980 Nutrition Education in Tanzania. TFNC Report No. 456. Dar es Salaam: Tanzania Food and Nutrition Centre, June, 1980.

This report of an expert committee, convened in response to a Tanzania Food and Nutrition Centre workshop recommendation, attempts to redefine nutrition education in terms of community participation, problem orientation, and strategic appropriations. In addition to reviewing the overall food and nutrition situation in Tanzania, the committee analyzed the current nutrition education programs and offered recommendations to incorporate the essential features of the redefined nutrition education.

Fleuret, A.

- 1979 "The role of wild foliage plants in diet," Ecology of Food and Nutrition, 8: 87-93.

Original data.

Method: Food consumption survey with frequency measures of certain foodstuffs; using local research assistants visiting each household to ask what was eaten the previous day or evening.

Sample: Shambana tribe; 57 households over 3 seasonal periods (total of 53 days); 21 households for 12 consecutive days; and 30 households over 13 consecutive days (evening meals only).

Geographic location: Kwemzitu, Kwemtoni, and Kwebaridi in the Lushoto District.

The present study was undertaken to discover the extent to which wild plants were actually consumed and their nutritional significance in the diet. Data gathered indicated that vegetable relishes prepared from the foliage of wild plants were an integral and essential part of the Shambara peoples diet at all seasons of the year. Cultivated vegetables were not replacing them.

Freyhold, M., Sawaki, K., and Zalla, M.

- 1973 "Rural Area-Moshi District." In: Tanzania National Scientific Research Council (ed.), The Young Child in Tanzania, Vol. 1, pp. 166-240. Dar-es-Salaam, Tanzania: UNICEF Liaison Office, October.

Original data.

Method: Field work from April to July 1973; literature review; interviews with project directors; observations of program functioning; questionnaire; discussion groups; participant observation of two villages.

Sample: The general sample consisted mainly of the indigeneous people known as the Chagga who live on the lower slopes of Mount Kilimanjaro, but no exact number is given because of the various methods of data collection.

Location: The rural area of Moshi District extending from Kibangoto to Mwika above the Moshi-Himo Mombasa Road (excluding Moshi town), in Kilimanjaro Region.

This report on Moshi District was part of the 1973 Young Child in Tanzania study. Moshi District is the second most densely populated rural district in Tanzania, and is inhabited mainly by the Chagga people. The study attempted a complete review of the factors influencing the young child, including the general socioeconomic situation, physical aspects of child rearing, the social environment of children, and self-help and community action. Information was gathered from a variety of sources, and thus varies in quality. A revealing picture of life in the district is presented.

Gupta, B.M. and Mwambe, A.

- 1976 "Study of malnourished children in Tanga, Tanzania I: Socio-economic and cultural aspects". Journal of Tropical Pediatrics and Environmental Child Health, 22(6): 1976

Original data.

Method: Cross-sectional; questionnaire, hospital study.

Sample: All of the 92 malnourished children (defined by weight less than 80% for age on Harvard standard) who were referred and admitted to Bombo regional hospital, Tanga, in 1974. No control group.

Geographic location: The catchment area for the regional hospital included both Tanga town and rural parts of the district of Tanga.

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The study was carried out to assess various socio-economic and cultural conditions prevailing in Tanga District of Tanzania in order to identify the "at risk child." Details included child's age, sex, attendance at under-five clinic, parents' income source and education level, family size and stability. With no comparison group of "normal" children the results are of limited use.

Hall, B.L.

- 1978 Mtu Ni Afya: Tanzania's Health Campaign. Washington, D.C.: The Clearinghouse on Development Communication, June, 1978.

The purpose of this report is to describe and analyze in detail how the Mtu ni Afya (Man is Health) campaign came about, its planning, methodology, and impact. In addition, the report examines the case for mass radio study group campaigns as an integral and continuous part of national development strategies.

Hall, B.L. and Dodds, T.

- 1977 "Voices for development: The Tanzanian national radio study campaigns." In Radio for Education and Development: Case Studies, Vol. II, World Bank Staff Working Paper No. 266, prepared by P.L. Spain, D.T. Jamison, and E.G. McAnany, pp. 260-299. Washington, D.C.: The World Bank.

This chapter attempts to trace the development of radio study groups in Tanzania from their first small scale beginnings in 1967 to the massive organization involved in the 1973-75 health education and agriculture campaigns; Mtu ni Afya (man is health) and Chakula ni Uhai (food is life). It is an admittedly biased presentation by two central actors in the campaigns, but offers a very useful description of the programs, their difficulties and successes, and the evaluation data to date.

Johnsson, U., Shaqude, N.W., and Sutta, S.M.

- 1981 Village food and nutrition planning in Tanzania. Food and Nutrition Bulletin, 3(4):12-20, October, 1981.

This article reviews the history of Tanzania's attempts to develop a national food and nutrition policy consonant with socialist ideology. The government's village food and nutrition planning model is presented and the experiences gained in using it are evaluated.

Jonsson, U.

1980 "Towards a food and nutrition policy in Tanzania," Food Policy pp. 143-147, May, 1980.

This article reviews the history of the formation of a national food and nutrition policy in Tanzania. One conclusion drawn from this historical examination is the surprising similarity between proposed actions over the different time periods. Even though the priorities have under gone little change, only after the Arusha Declaration was the political will to implement the programmes existant.

Jonsson, U.

1978 The food and nutrition situation in Tanzania, 1971-1977. Report No. 274, mimeographed. Dar es Salaam: Tanzania Food and Nutrition Centre, 1978.

This Tanzania Food and Nutrition Centre report presents a systematic description of food production and basic needs in Tanzania. Only a selection of available data is presented on the following aspects of the food and nutrition situation: 1) land use, ecology and agriculture; 2) food processing and distribution; 3) household consumption, health and nutrition situation; and 4) investments and costs. Nutrition is viewed as only one part of the overall picture.

Kimati, V.P.

in Breastfeeding in rural and urban areas of Tanzania. Journal of Tropical Pediatrics, in press, April 1982.

Original data.

Method: Questionnaire in rural areas (with minor changes in the one used in Kiliminjaro) and interviewing mothers at a baby show competition in the urban area. Only part of the results are relevant to breast feeding.

Subjects: 2130 rural African mothers and in Dar es Salaam 628 Indian stock mothers (Ismaili Moslems, followers of the Aga Khan).

Location: In 1977: Lindi, Mwanza, Morogoro and Ruvuma regions; and in 1979: Dar es Salaam (urban) and Kilimanjaro regions. Except for Dar es Salaam, all areas studied were rural, at least 20 km from urban centers.

This is a report on breast feeding surveys in 6 regions done in 1977 and 1979 that concludes that prolonged breast feeding is still widely practiced; that in urban and even in rural areas the trend to feed the child artificially is picking up fast, and that there should be a campaign to halt this trend.

BIBLIOGRAPHY (Cont.)

Kimati, V.P.

- 1981 Problems of maternal and infant feeding: The Tanzanian viewpoint. Paper at the "Workshop on Breast Feeding and Problems of Weaning, Karen College, Nairobi, Kenya" (sponsored by USAID through EDC and organized by the University of Nairobi), May, 1981.

This paper reviews a series of recent studies including several by the author himself in an attempt to present an overview of maternal and child health and nutritional status in Tanzania. Data on women's pregnancy food intake; breast feeding patterns, reasons and substitutes; and weaning practices, foods and problems are presented and discussed. Methodologies for the studies are not presented.

Kimati, V.P.

- 1979a "Medical and Health Facilities for the Child's Development in Tanzania." In Early Childhood Development and Education. Nairobi: UNICEF, Eastern Africa Regional Office, pp. 66-74, 1979.

Original data.

Method: Examination of medical health and social welfare facilities; interviews with government personnel; interview/questionnaire of mothers; clinical examination and arm circumference of youngest child. Subjects: 189 mothers and their youngest child.

Location: Maringa, Himo, Makuyuni and Kimangara, four villages around Mwika Rural Health Center, Moshi rural district, Kilimanjaro reion. Some data from previous 1977 surveys in Morogoro, Mwanga, Lindi (Nachingwea) and Ruvuma (Songea) regions is presented.

In this chapter, the author presents the results of his study of the medical and health status and facilities in four villages. The results are compared to similar studies in four other regions of Tanzania. Of special interest are the data presented on weaning foods used in the four study villages. Recommendations on the overall medical and health-related facilities are made.

Fimati, V.P.

- 1979b The role and importance of reorganized maternal and child health services in the promotion of child care in Tanzania. In Kenya Paediatric Association and International Paediatric Association, Proceedings of the First Regional Paediatric Congress for Africa, Nairobi: I.P.A., February 19-23rd, 1979, pp. 21-29.

This report discusses the reorganizing of the health priorities in response to the Arusha Declaration of 1967. Top priority to and wide coverage by Maternal and Child Health clinics are the basis of Tanzania's socialist health planning. Some health costs and personnel data are presented as well as general health statistics.

Kimati, V.P.

- 1977 The situation on under fives in Tanzania Today. Lishe: Tanzania Food and Nutrition Journal, II(1): English version of Swahili original, 16 pp., 1977.

Original data.

Method: Point prevalence nutrition surveys 1975-76, methodology not given; the simplified classification of PEM was used (60-80% of normal weight for age and less than 60%)

Subjects: 1,733 children under five years old.

Location: 3 rural areas: Bunju, Coast region; Mabokweni, Tanga region; and Ilindi, Dodoma region, and Manzese in urban Dar es Salaam.

This article presents a thorough review of recent and past data on the health and nutrition situation of children under five years old. Data from recent studies conducted by the author is presented and compared with other available information. The author also offers an overview of nutritional and non-nutritional causes of malnutrition, a discussion of other diseases related to nutrition, and suggestions for the future.

Kimati, V.P.

- 1976 "Maternal and child health organization in Tanzania - Urgency of implementation." Journal of Tropical Pediatrics and Environmental Child Health, 22(3): 172-178, 1976.

Discusses the need to improve the implementation of the maternal and child health organization in Tanzania. The problem is conceived of in terms of a 4 point cycle: population explosion, poor nutrition, pathology, and poverty.

Kimati, V.P.

- n.d. Malnutrition in Tanzania. Unpublished lecture notes.

Original data.

Method: Point prevalence survey 1975-1977, methodology not given.

Subjects: 7834 children under five years old.

Locations: 7 rural areas: Bunju (Coast region); Mabokweni (Tanga region); Ilindi (Dodoma region); Mbeya region; Morogoro region; Nachingwea (Mwanza region); and Songea region; and Manzese (urban Dar es Salaam).

This document is an unpublished version of lecture notes on malnutrition in Tanzania. It is included because it presents 1977 data on PEM prevalence in 4 regions not reported elsewhere.

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Knutsson, K.E., Gebre-Medhin, M., Hultcrantz, G., Tobisson, E. and Wallstam, E.

- 1979 Food and Nutrition in National Development: An evaluation of the Tanzania Food and Nutrition Centre (TFNC), Swedish International Development Authority.

This evaluation report on the Tanzania Food and Nutrition Centre sponsored by the Swedish International Development Authority used a theoretical framework that was Tanzania-centered, value-oriented, and normative. In its attempt to meet the overall evaluation objectives, the evaluation team remained aware of the actual possibilities and constraints facing Tanzania, as well as of the politically stated objectives of Tanzanian development policies - socialism and self-reliance. The report offers a very useful and insightful critique of both the strong and weak points of the TFNC. Constructive recommendations are given.

Korte, R., and Patel, P.M.

- 1974 "Operational aspects of mobile and stationary young child clinics in Lushoto, Tanzania." Journal of Tropical Pediatrics and Environmental Child Health, 20(2): 90-105.

Research and evaluation.

Method: Review of existing records of health/medicine dispensaries; additional evaluations of examinations, diagnosis and treatments; questionnaires of mother attendees; and cost analysis of mobile vs. stationary young child clinics.

Sample: Rural health dispensaries, mobile and stationary young child clinics, their staffs and operations and their attendees.

Geographic location: Throughout the Lushoto District of southwest Tanzania.

The operation of government basic health services and a network of mobile young child clinics supported by a voluntary agency are described and evaluated. Questionnaires of attendees and medical forms from staff are used to show that two experimental stationary young child clinics integrated into the existing dispensaries and using mobile supervisory support were as efficient as mobile clinics for a significantly lower cost.

Kraut, H., Kreyster, J., Kantilal, Mende, K., Moshi, H., Oltersdorf, U., Plessner, T., Schach, E., and Bock, E.

- 1978 "Rehabilitation of undernourished children in Tanzania using locally available food," Ecology of Food and Nutrition, 6:231-242.

Research data and background information.

Method: Experimental intervention (feeding-daycare) rehabilitation study for 88 weeks (May 1969 to Jan. 1971); no controls.

Sample: 49 children aged 2-6 years with 70-80% of Harvard weight for

age standards at entry. Selection process not given.
Geographic location: rural; Soni area of Lushoto District.

This experimental study attempted to examine the rehabilitation effects of a long term feeding trial using locally available foods in a day care center (with no controls for center treatment effects) on moderately under nourished children. Both a maize-bean and an animal protein diet trial period were used. Average weight/height ratio increased from 77.5% to 81% of Harvard standard (or from 80.8% to 88.2% of Baganda Standard) during the 74 week maize-bean diet. During the following 14 week animal protein diet, no significant improvement was noted for the group. Age at entry, sex and initial nutritional status seemed not to be important determinants of future growth.

Kreysler, J.V.

1973 "Nutrition" In Tanzania National Scientific Research Council (ed.), The Young Child in Tanzania Vol. 1, pp. 12-53, Dar-es-Salaam, Tanzania: UNICEF Liaison Office, October 1973.

This review chapter presents a summary of existing nutrition data from previous nutritional status surveys in the late 1960s. A discussion of nutrition programs is also included. The chapter serves as a background for the case studies included in the Young Child in Tanzania study.

Kreysler, J.V

1970 "Uhuru na maji," (health, water supply and self-reliance in Mayo village), Journal of Tropical Medicine, 16: 116-123.

Review of survey and self-help projects.

Method: Survey method not given.

Sample: Not specified.

Geographic location: Mayo village, Bumbuli Division, Lushoto District.

This article discussed the development of several community projects in the village of Mayo. Working within the aim of "creating villages in which people live and work together and govern themselves," the village sanitation and improvement projects were carried out in large part by the people themselves. These projects developed out of the awareness generated through repeated nutrition surveys in the Mayo area. The results of these surveys are highlighted.

BIBLIOGRAPHY (Cont.)

Kreysler, J. and Mndeme, M.

- 1975 "The nutritional status of preschool village children in Tanzania: Observations in Lushoto District," Ecology of Food and Nutrition, 4: 15-26.

Research data.

Method: Cross-sectional; health and nutrition survey including interview, anthropometry, clinical examination, and blood and stool sampling.

Sample: 506 children under five (232 under 24 months old); sampling in five selected villages; random selection of clusters. The main tribe represented was the Wasambaa (88%); 80% of sample parents were Muslim.

Geographic location: Rural; Mlolo Division, Lushoto District, Tanga Region.

This study was undertaken prior to 1973 to establish baseline data and to gain information on the possible immediate and remote causes of the type and magnitude of malnutrition syndromes existant. The diet was found to be surprisingly varied and no socio-economic variable differentiated children with protein calorie deficiency from those without.

Kreysler, J. and I. Schulze-Western

- 1973 "Social factors influencing attitudes of mothers toward nutrition services in rural populations: A case study in Usambara, Tanzania," Ecology of Food and Nutrition, 2(1): 49-60.

Research data.

Method: Cross-sectional; survey questionnaire; interviews conducted in the homes by locally trained interviewers of Shambala origin; topics included socio-economic conditions, educational levels, occupation, knowledge of under-fives clinic, attendance and motivation to attend.

Sample: 193 Bantu mothers of the Shambala tribe with 253 under-five children.

Geographic location: Bumbuli village in the Bumbuli Division, Lushoto District.

A study of the attitudes of 193 mothers with under-five children was undertaken in 1969. Attendance and motivations were compared with respect to the age of the mother, the school education of both parents and the occupation of the father. No data are presented on the relationship between attitudes and health and nutritional status.

Lappe, F.M. and A. Beccar-Varela

- 1980 Mozambique and Tanzania: Asking the big questions. San Francisco, California: Institute for Food and Development Policy.

This book-essay is the first of the Institute for Food and Development Policy series on Food Security - Alternative Strategies. Based upon the premise that a prime test of the effectiveness of any economic and political system is whether or not people are achieving food security, the authors offer a critical review of Tanzania and Mozambique "socialist" systems. They highlight the differences between the two countries in their approaches to basic questions of development, leadership, participation, motivation, equality and production. The actual practice, as observed in a 1978 summer trip, appears to show Tanzania more committed to a "top-down" control of development in contrast to Mozambique's efforts toward local control through actual participation and accountable leaders. Very interesting discussion of critical issues based upon limited information.

Lomayani, I.B.

- 1973 "Group of Ujamaa Villages, Dodoma District" In: Tanzania National Scientific Research Council (ed.), The Young Child in Tanzania, Vol. 1, pp. 369-395. Dar-es-Salaam, Tanzania: UNICEF Liaison Office, October.

Original data.

Method: Informal interviews with families, informal discussions with village women, practical observation during living with Wagogo families, and visits to public institutions.

Subjects: Wagogo tube.

Location: 12 ujamaa villages in Dodoma District.

This descriptive report of traditional and ujamaa village life among the Wagogo includes information on water, sanitation, maternal and child care, clothing and handicapped children. Conditions are poor with much malnutrition. The report makes suggestions for changes.

Mabele, R.B. Lyakurwa, W.M., Ndulu, B.J., and Wangwe, S.M.

- 1980 "The economic development of Tanzania," Scientific American, 243(3), 182-190.

This is an overview article stressing the unique effort of the Tanzanian government to create a "Ujamaa" society; society as the extended family, the ideal of familyhood. Starting from its colonial past the authors review the country's progress towards this goal. Various components of the policy are mentioned including the rural focus, self-reliance, villagization, and price incentives and controls. Very little data is presented.

Maletnlema, T.N.

- 1980 How will you feed your baby in the 80's. Tanzania Food and Nutrition Centre Report No. 445. Dar es Salaam: Tanzania Food and Nutrition Centre.

BIBLIOGRAPHY (Cont.)

In this document, the author raises the issue of breast versus bottle feeding in the Tanzanian context. A history of the infant formula industry (i.e. Nestle) is presented, showing its health contradictions. A case is presented for breast feeding but the goal of the paper is to "let the debate begin." Review data on breast feeding prevalence, imports of infant formula and costs are included.

Maletnlema, T.N.

- 1978 "Tanzania: Nutrition and government policy - socialism as a solution," in Winikoff, Beverly, Nutrition and National Policy, Cambridge: M.I.T. Press, p. 291.

This report was prepared for a 1975 Conference on Nutrition and Government Policy sponsored by the Rockefeller Foundation and held in Bellagio, Italy. It used a common outline of questions designed to retrieve parallel information from all the countries represented. An overview of the country's nutrition problems, the health services, food production and government activities affecting these areas is presented. Some useful summary data is presented.

Maletnlema, T.N.

- 1977 "Solving the nutrition problem in Tanzania," in Nutrition Planning and Policy for African Countries, M.C. Latham and S.B. Westley (eds.), Ithaca, NY: Cornell International Nutrition Monograph Series #5.

A report given at a seminar in Nairobi, Kenya, June 2-19, 1976 briefly reviewed food availability, food processing and storage, food consumption and nutrition problems in Tanzania. The creation of the Tanzania Food and Nutrition Centre is described and steps taken to eliminate malnutrition are outlined.

Maletnlema, T.N.

- n.d. Nutrition in Pregnancy, Part II: Blood Changes in Pregnancy Related to Birth Weight and Maternal Diet. In local Tanzania Nutrition Newsletter (personal communication).

Original data.

Method: Total serum proteins, albumin, globulin, and serum transferrin were determined through blood samples in the first, second and the end of the third trimester of pregnancy; additional data collected as in Maletnlema and Bavu, 1974.

Sample: Of the 700 pregnant women attending an antenatal clinic and participating in the overall study, 397 had enough information collected for inclusion in this report; 63 of these women also were part of a food consumption survey.

Location: Kisarawe and Masanganya villages, Kisarawe district, Coast Region.

This paper reports data from the author's Ph.D. dissertation research of 1970-73. The aim of the overall study was to investigate methods of detecting pregnancies likely to end in small full term neonates (<2.5 kg.) and to elucidate the causes. From blood sample measurements and food intake data, this report concluded that the levels of serum total protein, serum albumin and globulin are poor indicators of maternal nutritional status (and thus of pregnancy outcome), but that serum transferrin may be a useful indicator. Given the small sample sizes for most analyses and the fact that oral iron and folic acid were given, the results must be taken with caution.

Maletnlema, T.N. and Bavu, J.L.

- 1974 "Nutrition studies in pregnancy. Part I: Energy, protein and iron intakes of pregnant women in Kasarawe, Tanzania," East African Medical Journal, 51: 520-528.

Research and review data.

Method: Longitudinal and cross-sectional data; anthropometric and biochemical measurements and a 24 hour recall were done, one every fortnight, including a detailed seven day food consumption history with food weighing.

Sample: 10% of 700 pregnant women who were undergoing anthropometric and biochemical studies throughout pregnancy; 70% of Wazaramo descent. Geographic location: Kasarawe and Masanganya villages; Kasarawe District, Coast Region.

This study reported on detailed food consumption data gathered in the 1970-1973 period from 70 pregnant women and compared the data with a 1968 family consumption survey and the FAO food balance sheet for Tanzania. The energy intake of the women was lower than that estimated or recommended in other sources, suggesting that women ate less than the family mean. Data on the relationship of intake to social class indices and to birth weight are given.

Maletnlema, T.N. and Marealle, A.L.

- 1973 "The health and nutritional status of children in Tabora Region, Tanzania," Journal of Tropical Pediatrics and Environmental Child Health, 19(1): 14-8.

Research data.

Method: Cross-sectional; preschool nutrition status survey conducted in October 1967; examination included registration, brief history, anthropometry, clinical exam, laboratory specimens, dietary questionnaire, nutrition education and treatment.

Sample: Ten villages from Tabora and Nzega Districts chosen at random, with approximately 100 children from each requested to attend for examination. Actual sample was 463 under-five children, 194 under 2 years of age.

Geographic location: Nzega and Tabora Districts, Tabora Region, West Central Tanzania.

BIBLIOGRAPHY (Cont.)

This article described the third of six baseline nutrition surveys in Tanzania to be published. Results of a dietary survey in one village were also briefly presented. It was concluded that protein calorie deficiency was not a very serious problem for the rural Tabora region in comparison with other regions. Malaria was viewed as the most serious problem. Seasonal variations in food intake and disease incidence were not considered.

Marchione, T. and Helsing E.

- 1981 Rethinking Infant Nutrition Policies under Changing Socio-Economic Conditions: Interim Report for 1980 and Future Plans. Oslo, Norway: Institute for Nutrition Research, University of Oslo, February.

Original data.

Method: multi-method research; household survey interview; in-depth study (5-7 visits) of subsample of women with interview, 24 hour activity record and 24 hour dietary recall; focused group discussions with women's groups; site visits in the health, marketing and employment sectors; and background literature review.

Sample: random sample of 228 women with children 0 to 24 months of age; subsample of 28 women for in-depth study of daily life over 2-3 month period; 110 women were formally employed, 25 were informally employed and 93 unemployed.

Location: four areas of Dar es Salaam: one upper income, one middle income with an Asian character, and two lower income African areas.

The Tanzanian investigation presented in this collaborative study was undertaken jointly by the Tanzanian Food and Nutrition Centre (TFNC) and the Bureau of Resource Assessment and Land Use Planning (BRALUP), University of Dar es Salaam between November 1979 and December 1980. Data from the investigation not only served the larger project, but also was useful in providing information for national food and nutrition policy. Data on urban women's behavior and feeding patterns is scarce. The proposed objective was to stimulate action to remove the negative material constraints on breastfeeding. It was designed to document changing material conditions of women's lives, and to suggest ways to solve the conflicts between requirements of prolonged breastfeeding and of female employment.

Mosha, A.C. and Ljungquist, B.

- 1979 The nutritional status of the child in Tanzania. In Early Childhood Development and Education, Nairobi: UNICEF Eastern Africa Regional Office, pp. 75-82, 1979.

This chapter discusses the intake of foods and nutrients among children in Tanzania and tries to identify the constraints to improved nutrition. Breast feeding data is briefly reviewed, but the bulk of the discussion is on weaning foods. The weaning period has the highest prevalence of malnutrition. Availability and dietary bulk of weaning foods are identified as the major constraints. Properly

balanced traditional weaning food mixtures are discussed in light of present practices. Programs and strategies are mentioned.

National Expert Committee on Goitre Control in Tanzania

- 1979 Goitre control in Tanzania. Report No. 364. Dar es Salaam, Tanzania Food and Nutrition Centre, May 1979.

This report by a national expert committee chaired by Dr. Kimati reviewed available information on the problem of goiter and cretinism in Tanzania. Their task was to recommend proper measures to be instituted by the concerned agencies. A salt iodization scheme was proposed as the best long-term method of goiter control and the logistics of the scheme were outlined.

Newman, J.L.

- 1975 "Dimensions of Sandawe diet," Ecology of Food and Nutrition, 4(1): 33-39.

Method: Qualitative dietary records carried out by 5 local students (4th grade) of their family consumption patterns for three separate one-month periods; especially knowledgeable informants.
Sample: 5 Sandawe families, in-depth food consumption records of day to day meals.
Geographic location: Sandawe people, Central Tanzania.

This study collected information on the types, frequencies, and seasonal variations in food consumed in the Sandawe diet. This non-qualitative, simple and relatively non-intrusive approach appears to be a useful compromise between rigor and practicality. Results were presented under four food headings: staple foods, relishes, supplements and famine foods. Significant discussion of the implication of changing socio-economic status is included.

Omari, C.K.

- 1973 "Less Developed Interior area: Singida District" In: Tanzania National Scientific Research Council (ed.), The Young Child in Tanzania, Vol. 1, pp. 315-368, Dar-es-Salaam, Tanzania: UNICEF Liaison Office, October.

Method: Field work from April to June 1973; interview; collection of information on social facilities.
Sample: (Wa)nyaturu ethnic group; old parents from southern and central Singida District.
Location: Singida District, Central Tanzania.

This report on young child rearing practices in Singida District is the result of field work which included collecting oral traditions on practices, customs and beliefs on child rearing among the Nyaturu and collecting all available information on social facilities and agencies

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in the study area. The bulk of the results are presented in a descriptive form.

Protein-Calorie Advisory Group

- 1977 "Women in food production, food handling and nutrition; with special emphasis on Africa," New York: Protein-Calorie Advisory Group of the United Nations System, Final Report.

This report presents an excellent appraisal of the information currently available concerning womens' role in food production, handling and nutrition in Africa and the extent to which the conditions under which women live and work effect food availability and thus the nutritional status of their families and communities. The report critiques existing conceptual and methodological approaches and presents a model for future research and action. Nutritional and socio-cultural data from several African countries is used, including several studies in Tanzania.

Report of Working Group I

- 1977 "Planning for nutritional self-sufficiency for Ujamaa Villages in the context of Tanzania's goals for national development," in Nutrition Planning and Policy for African Countries, M.C. Latham and S.B. Westley (eds.), Ithaca, NY: Cornell International Nutrition Monograph Series #5.

A report of a working group given at a seminar held in Nairobi, Kenya, June 2-19, 1976 reviews the Tanzanian approach to nutritional self-sufficiency in the context of the overall development strategy, the Ujamaa villages. A hypothetical village is used to show in outline form the steps involved.

Robson, J.R.K.

- 1974 "The ecology of malnutrition in a rural community in Tanzania," Ecology of Food and Nutrition, 3: 61-72.

Research data.

Method: Questionnaire, 24 hour dietary recall, homestead surveys and a four month stay by an informant in an area identified as having a high rate of protein calorie deficiency.

Sample: 98 families (378 people); Ngoni tribe.

Geographic location: Maposeni village area, southwest Songea District.

The remote and immediate causes of protein and calorie deficiency in a southwest Tanzanian community were examined using a broad ecological framework. The inadequate nutrition of infants and children was attributed to a variety of factors including; the cultural background of the tribe; the land tenure system; poor agricultural practices;

endemic, parasitic and communicable diseases; child rearing practices; and a series of historical events.

Sommer, A.

- 1981 Childhood blindness in Tanzania. Bulletin Res. Inf., I(3):32-33, 1981.

This short article identifies measles blindness and explores its causes. The focus is on vitamin A deficiency. Recommendations from a recent seminar are presented.

Swantz, M.L.

- 1973 "Less Developed Coastal Area: Bagamoyo District" In: Tanzania National Scientific Research Council (ed.), The Young Child in Tanzania, Vol. 1, pp. 241-314. Dar-es-Salaam; Tanzania: UNICEF Liaison Office, October.

Method: No clear discussion of methodology is presented; a literature review, observations and interviews were used.

Sample: 20 families in Sadani fishing villages; 22 families in Yombo Division (11 each from Matimbwa and Mbwawa villages).

Location: Rural district of Bagamoyo, Coast Region, (with one urban town - Bagamoyo).

This report on the conditions of life for young children in Bagamoyo District is based upon a limited amount of systematic data. Traditional concepts and practices prevail in large parts of the District. The only urban town is Bagamoyo, which contains less than 5% of the District population. The five largest ethnic groups are the Kwere (32%), Zigua (18%), Zaramo (17%), Doe (8%), and Luguru (5%). The Kwavi (3%) need special mention because their living habits are distinctly different from the rest of the population. 75% of the population was Muslim. A general overview of the life of various groups in the District is presented. Nutrition was not a major aspect of the report.

TAICH

- 1979 "Development assistance programs of U S. non-profit organizations: TANZANIA," American Council of Voluntary Agencies for Foreign Service, Inc., Technical Assistance Information Clearing House.

This report described the programs of 48 private non-profit U.S. organizations which provide the Tanzanian people with assistance and material aid. The information given on each organization is based upon the data furnished to TAICH by the organization.

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- 1980 Food and Nutrition Policy for Tanzania: Theories, facts, views and proposals for consideration by the 1st Tanzania Food and Nutrition Conference, September 3rd-5th, 1980, Moshi. Report No. 483. Dar es Salaam: Tanzania Food and Nutrition Centre, 1980.

This document is the third and final collection of facts and views necessary for the formulation of a Food and Nutrition Centre (TFNC) with the intention that it would serve as a discussion paper at the First National Food and Nutrition Conference. As an outcome of the conference, it is proposed that a TFNC Committee on Food and Nutrition Policy be appointed to carry out the final task of drafting the actual policy. The document presents an integrated analysis of food and nutrition planning, previous steps toward a national policy, a sectorial problem description in ten areas, research use and needs and a summary statement.

Wood, E.

- 1973 "Maternal and Child Health in Tanzania Today." In Tanzania National Scientific Research Council (ed.), The Young Child in Tanzania, Vol. 1, pp. 1-11. Dar es Salaam, Tanzania: UNICEF Liaison Office, October.

This introductory review of maternal and child health status offers an overview of existing data and highlights some of the findings from the five case studies included in The Young Child in Tanzania study.

World Hunger, Health and Refugee Problems

- 1975 "Part IV: Special Study Mission to Africa, Asia and the Middle East," Hearings before the Subcommittees on Refugees and Health, Washington, D.C.: U.S. Government Printing Office.

This summary document presents the reports of two study mission teams to approximately 15 African, Asian, and Middle East countries to the U.S. Senate Subcommittees on Refugees and Health. Brief statements and hearing presentations discuss the impact of the African drought of 1970-1974 on the food supply and health status of the Tanzanian population and the response to the drought by various governmental, international and non-governmental agencies.

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