

YD 1117 1985
1 10

Maternal and Infant Nutrition Reviews



YEMEN

an International Nutrition Communication Service publication

MATERNAL AND INFANT NUTRITION REVIEWS

YEMEN

A Guide to the Literature

Compiled by

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

December 1982

An International Nutrition Communication Service (INCS) Publication

© 1982 by Education Development Center, Inc.,
55 Chapel Street, Newton, MA 02160, USA

INCS Advisory Board: Derrick B. and E. F. Patrice Jelliffe, Richard K. Manoff, Marian L. Tompson,
R. R. N. Tuluhungwa, Joe D. Wray, Marian F. Zeitlin

INCS Steering Committee: Phyllis Dobyns, Marcia Griffiths, Charles N. Myers

*This project has been conducted under Contract A.I.D.6DSAN-C-0209,
Office of Nutrition, Development Support Bureau, Agency for International Development, Washington, D.C.*

edc

CONTENTS

Introduction	1
MINR Classification System	iii
Map	iv
Table I: Locations Studied	v
Review Highlights	vii
Review	1
Bibliography	65

INTRODUCTION

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

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

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

The Yemen Arab Republic MINR was greatly improved through the help of several people who have done health and nutrition work in Yemen. Special thanks are extended to Stina Almroth, Christine Ansell Moyer, Cliff David, Ted Greiner, Caryn Page, and John Salamack for their help in identifying and furnishing available materials and especially to Ted and Christine for their thorough review of earlier drafts.

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

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

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

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

MINR Country Reports:

AFRICA:

Cameroon
Congo
Gambia and Senegal
Ghana
Kenya
Lesotho
Liberia
Mali
Sudan
Tanzania
Zaire

NEAR EAST:

Egypt
Jordan
Morocco
Tunisia
Yemen

ASIA:

Bangladesh
Burma
India
Indonesia
Nepal
Pakistan
Philippines
South Pacific*
Sri Lanka
Thailand

LATIN AMERICA AND CARIBBEAN:

Bolivia
Costa Rica
Dominica
Ecuador
Guatemala
Haiti
Honduras
Jamaica
Panama
Peru

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

MATERNAL AND INFANT NUTRITION REVIEWS

CLASSIFICATION SYSTEM

1. Nutrition and Health Status
 - 1.1 General
 - 1.2 Women, Pregnant
 - 1.3 Women, Lactating
 - 1.4 Infants 0-6 Months
 - 1.5 Infants 6-24 Months
2. Dietary Beliefs
 - 2.1 General
 - 2.2 About Pregnancy
 - 2.3 About Lactation
 - 2.4 About Breast Milk Substitutes (including bottle feeding)
 - 2.5 About Weaning
3. Dietary Practices
 - 3.1 General
 - 3.2 Women
 - 3.2.1 During Pregnancy
 - 3.2.2 During Lactation
 - 3.3 Infants 0-24 Months
 - 3.3.1 Breast feeding
 - 3.3.2 Weaning
 - 3.3.3 After Weaning
 - 3.4 Health and Medicine
4. Nutrition Status Correlations
5. Nutrition and Health Policies and Programs
 - 5.1 Policies
 - 5.2 Programs
6. Commentaries

Bibliography

YEMEN ARAB REPUBLIC
GOVERNORATE BOUNDARIES

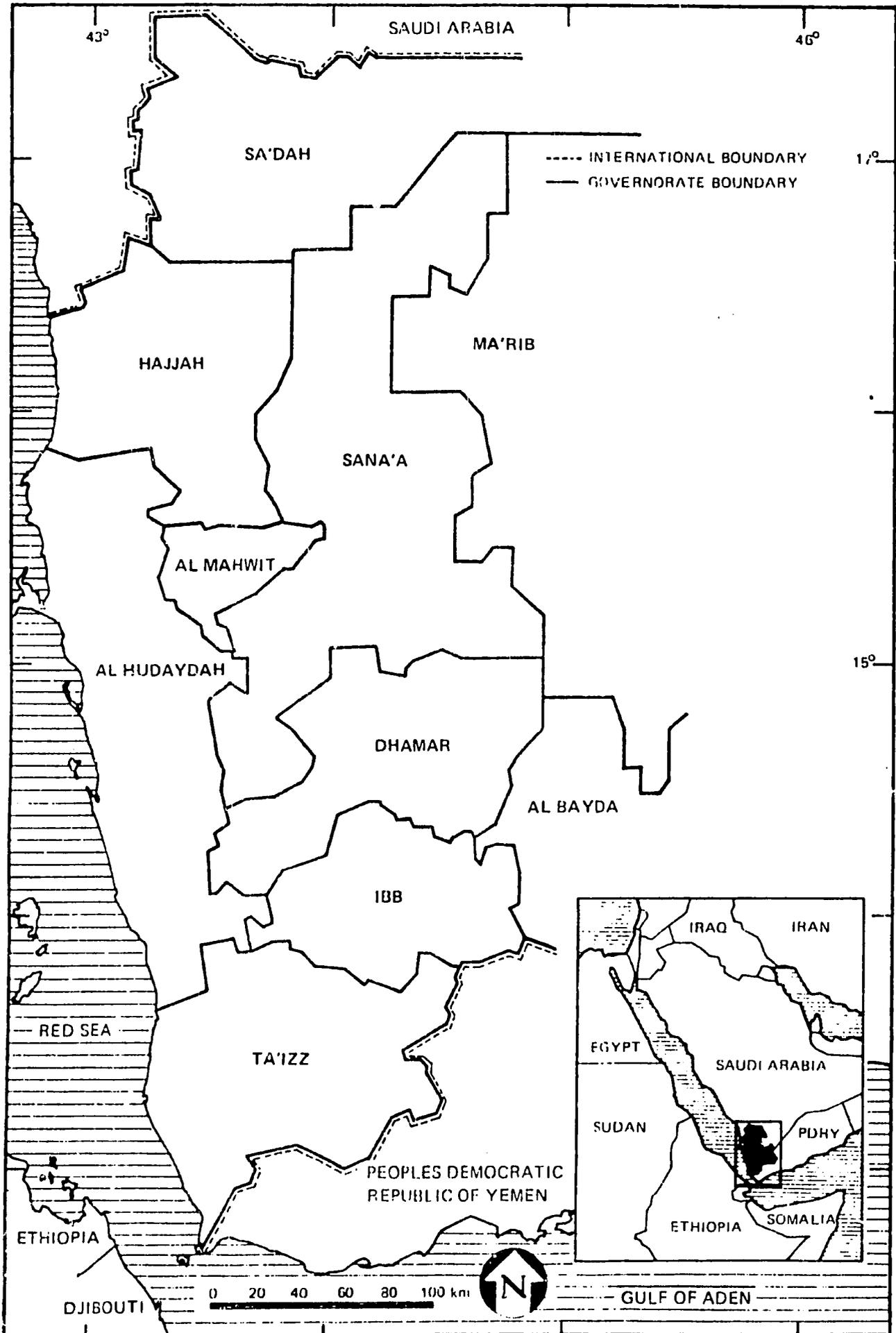


TABLE 1
LOCATIONS STUDIED

Province District Village/City	Allman and Hill, 1978	Almroth, 1979	Ansell, 1982a	Ansell, 1981	Ansell, 1980	Ansell, n.d.	Ansell and Burrows, 1981	Bornstein, 1973	David and David, in press	David et al., in press	El Daher and Greiner, 1979	El Daher and Greiner, 1980	Greiner, 1980	Hammam, 1972	Mynetti, 1979a	Rosser, 1981	Stern, 1981	Yemen General Grain Corporation, 1980	
Al Bayda																			x
Al Hudaydah																			x
Al Munirah Ibn Abas							x												
Zabid																			
Toheita																			x
Zabid City	x																		
Al Mahwit																			x
Mahwit Town				x	x														
Khabt																			
Wadi Ayyan					x	x													
Dhamari																			x
Hajjah																			x
Ibb																			x
Ibb City													x						
Udain																			
Udain											x								
Yarim																			
Yerim	x																		
Ma'rib																			x
Sa'dah																			x
Sana'a																			x
Sana'a																			
Sana'a City (Al Qa)	x						x	x	x				x						
(Suq Al Baqr)													x						
Al Jabel																			
Jabel Razih															x				
Ta'izz																			x
Sharab																			
Sharap														x					
Ta'izz																			
Ta'izz City	x							x						x					
Villages: Province not identified																			
Tihama (coastal) area																			
Al Homrah								x											
Al Zorah								x											
Coastal Village																			x
Highlands area																			
Al Maleka								x											
Arb								x											
Daral Ole-fi								x											
Hamani								x											
Southern Highlands area (Ibb & Ta'izz)																			
Al Gibala														x					
Bani Hassan														x					
Bani Ghazi														x					
Dar al Gahama														x					
Manam														x					
Tabani														x					

HIGHLIGHTS

1. NUTRITION AND HEALTH STATUS: Diarrheal diseases were ranked as the highest priority health problem by the Yemen Arab Republic Ministry of Health. Other widespread health problems are protein energy malnutrition, malaria, anemia, parasitic diseases, and respiratory diseases including tuberculosis. Estimates of the country's infant mortality rate range from 155 to 210 deaths per 1000 live births. According to the recent National Nutrition Survey, 67% of all the rural children surveyed and 50% of the urban sample were considered undernourished. The highest prevalence of wasting (low weight for height) was found in the coastal Tihama regions, while the highest prevalence of stunting (low height for age) was in the Northern Highlands. The 48- to 59-month old children had the highest overall rates of undernutrition. 56% of rural preschool children were anemic with the 6- to 24-month old group having the greatest prevalence. The Tihama region had the highest rates of anemia. Signs of rickets were found in 12% of the rural regions and 6% of the urban sample. The National Nutrition Survey also estimated that 36% of all rural mothers and 5% of urban women suffer from anemia. The 1976 maternal mortality rate was 10 deaths per 1000 live births.

2. DIETARY BELIEFS. Traditional dietary rules include hot-cold and "light-heavy" food classifications which fit into a complicated non-explicit belief system based in part on a humoral theory of disease. Pregnant women are not thought to have special nutritional needs; however, "heavy" and dry foods are avoided while "light" foods are thought to be more suitable for vulnerable groups. Much attention is given to the mother's diet during the forty days after birth, in order to "strengthen her blood." A diet considered beneficial to milk production includes: chicken, clarified butter, milk, dates, honey, and "hot" foods such as warm sorghum breads, meats, and meat broths. Nearly all mothers have positive attitudes toward breast feeding and think that two years is the ideal duration for breast feeding. However, colostrum and the breast milk of pregnant women are considered "dirty" and harmful to the infant. Characteristics of the mother or wet nurse are believed to be transmitted to an infant through breast milk. Sunshine is believed to be harmful for young children, and thus they are kept indoors during most of their first two years of life. Bottle feeding is considered "modern" and superior to breast feeding by a growing number of women and men, especially in the cities but also in the rural areas. Lack of milk and pregnancy were the main reasons given by mothers for weaning young children.

Women usually refer to the tastes and consistencies of foods, rather than their nutritive value, when considering foods for young children. "Light," soft foods that are bland and easily digested are believed to be "good" foods for young children. "Bad" foods are those considered "heavy" and hard to swallow and digest. Women are virtually excluded from the modern health sector due to deeply held and long-standing social conventions.

3. DIETARY PRACTICES: The midday meal is the largest and most important of the day. Normally families eat together from the same plate with no obvious inequalities in the shares received. On special occasions (e.g., guests, feasts) men eat first and receive the largest portion. Husbands decide how much of the total family budget to spend on food, and they also buy the food.

Bread is the staple food in the Yemeni diet. Most of the local breads are made of sorghum, millet, or barley flour. Porridge, rice, beans, and sauces

HIGHLIGHTS (Cont.)

are also consumed regularly. The consumption of dairy products, eggs, and meat depends on the economic status of the household. Meat, eggs, and fruits are considered status foods for special occasions. The chewing of gat (a mild narcotic stimulant) is a widespread habit among both men and women.

Women are responsible for all food preparation. Cooking is frugal and less time-consuming than in other parts of the Arab world. However, rural kitchens are very smoky, and water is scarce. The workload of rural Yemeni women is very heavy and also includes child rearing; fetching water, fuel, and fodder; washing clothes; and cleaning, as well as looking after the household animals and a wide range of agricultural tasks. During pregnancy women are seldom afforded a lighter workload, nor do they follow a special diet. Only after childbirth is there a rest from work and a major expenditure for foods to help the woman recover.

Breast feeding in Yemen usually begins on the second day of life and continues for about nine months in the rural areas, five to eight months in the cities. Supplemental bottle feeding is begun at two months in the countryside and three months in the urban areas. "Bottle propping"--leaving young infants alone with bottles stuck in their mouths--is a widespread, dangerous practice. Other harmful practices related to bottle feeding include overdilution of mixes and inadequate cleaning of bottles. Over the period 1976 to 1979 imports on milk and cream products increased ninefold. Labelling practices of major milk companies often fail to follow the current WHO/UNICEF recommendations and even their own limited code of ethics.

Traditionally, the first foods other than milk given to infants are soft, carbohydrate foods like biscuits, breads soaked in tea, potatoes, and rice. Recently biscuits have become the main weaning food. Mothers seldom prepare foods especially for small children. There are also several food restrictions for small children.

4. NUTRITION STATUS CORRELATIONS: Exclusively breast fed infants 0-6 months old have a better average nutritional status, based on weight for age, than breast and bottle fed babies or exclusively bottle fed babies. Urban Sana'a has a prevalence of preschool child undernutrition lower than the rural regions. The prevalence of stunting is highest in the Northern Highlands. The prevalence of wasting is highest in the Tihama region. The prevalence of concurrent stunting and wasting is somewhat higher among boys than girls.

Women who are married longer tend to breast feed for a longer period of time. Children of illiterate fathers tend to breast feed longer than children of literate fathers. Similarly, children living in houses without electricity tend to breast feed longer than those living with electricity.

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS: Self-sufficiency in food production is a priority of national development policy. The Five Year Plan (1976/77-1980/81) is in harmony with a "basic needs first" policy. The main health objective is the implementation of a wide-ranging health service, stressing primary health care in rural areas. In 1976 a Basic Health Service/Primary Health Care Plan was drafted. The Tihama Primary Health Care Project (1980-1985) is the first step in implementing this plan. Major funding is from USAID and the Yemeni Government.

In 1976 a National Committee for Food and Nutrition was established to oversee the distribution of food relief. A General Corporation for Foreign Trade was also set up to attempt to secure adequate supplies of basic foods at reasonable prices. A Nutrition Unit was established in the Basic Health Service Department of the Ministry of Health in 1981, staffed and funded by

HIGHLIGHTS (Cont.)

Oxfam. Breast feeding promotion has become a more firmly entrenched priority for the Ministry of Health and for general health workers over the past few years.

Since 1977, the Yemeni government has implemented various measures to arrest the decline in breast feeding, including the removal of television ads and the prohibition of all company representatives from visiting health institutions in the morning during mother and child clinics, and establishing creches for use by working women.

1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

NATIONAL

HEALTH PROBLEMS: Diarrheal diseases were ranked as the highest priority health problem by the Yemen Arab Republic (Y.A.R.) Ministry of Health in the National Health Program 1976/7-1981/2. "PCM and avitaminosis" was listed as the eighth highest priority in the country. (Greiner, 1979)

HEALTH PROBLEMS: The most widespread health problems are protein energy malnutrition, diarrheal diseases, respiratory diseases including tuberculosis, measles, malaria, bilharzia and other parasitic diseases, and anemia. (Firebrace, 1981)

ENDEMIC DISEASES: The five most frequently reported endemic diseases are gastroenteritis, malaria, amebiasis, schistosomiasis, and typhoid. Others include tuberculosis, paratyphoid, trachoma, and helminthiasis. (Pillsbury, 1978)

WOMEN'S HEALTH: Women, like the rest of the population, suffer from health problems due to poor public sanitation and hygiene. In addition women suffer from bone and muscle problems related to their heavy work load, especially the carrying of water on their heads. Statistically perhaps the most dangerous threat to women is related to childbearing. Many women in Yemen are anemic. (Myntti, 1979b)

ANEMIA--WOMEN: Anemia is the most serious health problem of women in Yemen. Generally it is from lack of iron and folic acid; however, in some areas, malaria causes severe anemia. (Rosser and Moxey, 1982)

RURAL

THREATS TO THE HEALTH OF WOMEN: The major health threats to women in three villages were childbirth, anemia, tuberculosis, and, on the coast, malaria. (Myntti, 1979a)

ANEMIA AMONG WOMEN: The overall prevalence of anemia was 36% among the 397 rural mothers sampled in the National Nutrition Survey. The Tihama region had the highest prevalence, 72%, while the Southern Highlands prevalence was 31%, and the Northern Highlands prevalence was 27%. The cut-off values were hemoglobin less than 11 grams per deciliter (g/dl) for pregnant women and 12 g/dl for all other women, lactating or non-lactating. (Yemen General Grain Corporation, 1980)

HEIGHTS AND WEIGHTS: The average height of 70 mothers (non-pregnant) was 150.5 cm (+6.5), and the average weight of 68 mothers was 42 kg (+5), according to a 1971-72 survey in 6 southern villages. 44% of the women had weights at 80% or less of Caucasian standards. The average height and weight of fathers was 161 cm (+6.5 cm, N=51) and 50.5 kg (+6 kg, N=53). 40% of the men had weights at 80% or less of standard. (Hammarin, 1972)

1.1 NUTRITION AND HEALTH STATUS, GENERAL (Cont.)

URBAN

ANEMIA AMONG WOMEN--SANA'A: The overall prevalence of anemia was 5% among the 128 urban Sana'a women sampled in the National Nutrition Survey, using 11 g/dl as the cut-off value for pregnant women and 12 g/dl for all other women, lactating and non-lactating. (Yemen General Grain Corporation, 1980)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

NATIONAL

MATERNAL MORTALITY RATE: The maternal mortality rate was 10 deaths per 1000 live births according to 1976 government estimates. (UNFPA, 1980)

EARLY MARRIAGE AND MATERNAL HEALTH: 65% of all ever-married women were married before menarche, according to a 1977 survey. In a 1980 survey of rural women, the average age at first marriage was 13.7 years. The early age at marriage is often cited as a major reason for poor maternal health as reproduction begins immediately. (UNFPA, 1980)

RURAL

AGE AT FIRST DELIVERY: 60% of all village women surveyed in 6 southern Yemen villages had their first child before the age of 18 years. The average was between 16 and 18 years. (Hammarin, 1972)

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

NATIONAL

INFANT MORTALITY RATE: The United Nations estimates that the infant mortality rate is 190 deaths per 1000 live births; the main cause of death is gastroenteritis. (UNFPA, 1980)

INFANT MORTALITY RATE: The infant mortality rate ranges between 155 and 210 per thousand live births. (Myntti, 1979a)

INFANT MORTALITY: Infant mortality is reported to be around 24%. (World Bank, 1979)

INFANT MORTALITY RATE: In 1976, the infant mortality rate was 155 deaths per 1000 live births. (Sivard, 1979)

MARASMUS: During the first year of life, marasmus was a contributing factor in 40% of the deaths among infants admitted to the CHC in Taiz which served both urban and rural areas. 56% of children who died in the first year had gastroenteritis. (Hammarin, 1972)

MARASMUS AND MILK: Severe cases of malnutrition in the first 6 months of life (marasmic type) have been observed in several clinics to occur only among infants fed powdered milk or animal milk. (Greiner, 1979)

RURAL

INFANT MORTALITY: The infant mortality rate was estimated to be 140 deaths per 1000 live births in six southern villages, according to retrospective questionnaire data. The rate varied from 115 in Dar al Gahama to 170 in Sharap. (Hammarin, 1972)

UNDERNUTRITION--WEIGHT FOR AGE--UDAIN: 85.3% (29 of 34) of the 0-6 month old infants were classified as undernourished (less than 90% of WHO standards) in the Udain village survey. Only one infant was severely malnourished (less than 60% of standard), but 50% (17 of 34) were moderately malnourished (60% to 80% of standard). The low number of severely malnourished children in the village was probably due to the fact that a measles epidemic occurred just prior to the survey, which led to the deaths of 20 to 40% of the children under three years of age, presumably mainly those of poor nutritional status. (El Daher and Greiner, 1979)

WASTED MUSCLES: Physical examination showed that 11% of the 76 infants under one year old in 6 southern villages had wasted muscles. (Hammarin, 1972)

CLINICAL IMPRESSIONS: Among the 40 infants 0-6 months of age from 6 southern villages, 75% were considered in good general nutritional condition based on physical examination. (Hammarin, 1972)

URBAN

SEVERE MALNUTRITION--WEIGHT FOR AGE--SANA'A: The prevalence of severe malnutrition (weight less than 60% of standard for age) among infants under 6 months of age was 11.3% in a 1977 survey of 510 mothers and their children under 3 years old. (David et al., in press)

UNDERNUTRITION--WEIGHT FOR AGE--ZABID: 55.6% (10 of 18) infants under 6 months of age surveyed in the Zabid clinic were undernourished (less than 80% of WHO standard weight for age), with 11% (2) being severely malnourished (less than 60% of standard). (Almroth, 1979)

UNDERNUTRITION--WEIGHT FOR AGE--TAIZ: 7% of the 103 infants under 6 months of age surveyed at the Swedish clinic in Taiz were severely malnourished (less than 60% of WHO standard weight for age). 11% and 21% were moderately (60 to 70% of standard) and mildly (70 to 80% of standard) malnourished respectively. (Almroth, 1979)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

NATIONAL

PROTEIN-ENERGY MALNUTRITION: 33% of all the rural children surveyed were considered normal while 50% of the urban children were classed as normal in the National Nutrition Survey using the NCHS/CDC references and standard deviation scores. Considerably lower prevalences of all three types of undernutrition (wasting, stunting, and concurrent wasting and

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

stunting) were apparent in the urban Sana'a sample of preschool children than in the samples from the three rural regions. (Yemen General Grain Corporation, 1980)

NO KWASHIORKOR: Kwashiorkor was readily ruled out as a public health problem among Yemeni children at the time of the National Nutrition Survey; only one of 3,245 children surveyed had bilateral pretibial edema. (Yemen General Grain Corporation, 1980)

RICKETS: Signs suggestive of rickets were significantly more prevalent ($p < .001$) in the combined rural regions (11.7%) than in urban Sana'a (5.8%). Rickets is most likely caused by inadequate exposure to sunlight, given the Yemeni cultural pattern of overly protecting young children from the sun's rays by excessive clothing. (Yemen General Grain Corporation, 1980)

RURAL-URBAN DIFFERENCES: The nutritional status of children under five in the rural village of Udain was significantly poorer than in the urban cities of Ibb and Sana'a, according to four of five anthropometric indices used in the three separate but comparable surveys. (Greiner, 1980)

RURAL

CHILD MORTALITY: The child mortality rate among 0-5 year olds was estimated to be 215 deaths per 1000 live births, in 6 villages of southern Yemen. This rate varied from 162 in Beni Hassan to 276 in Sharap. (Hammarin, 1972)

STUNTING AND WASTING BY REGION: In the three rural regions, the prevalence of stunting (height more than two standard deviations below the reference mean) was greatest in the Northern Highlands and lowest in the Tihama ($p < .001$). The prevalence of wasting (weight for height more than two standard deviations below the reference mean) shows the opposite relationship between regions, with the lowest prevalence found in the Northern Highlands and the greatest prevalence in the Tihama ($p < .001$). This shows that the most stunted children are not generally the most wasted children. (Yemen General Grain Corporation, 1980)

UNDERNUTRITION BY AGE: The highest rural prevalences of undernutrition (Gomez standards) were recorded among the 48 to 59 month old, the 36 to 47 month old, and 18 to 23 month old age groups respectively, according to the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

WEIGHT FOR HEIGHT--WASTING: 10.9% of the National Nutrition Survey rural sample of 2501 preschool children were classified as wasted (more than two standard deviations below the NCHS/CDC weight for height reference standard). The percentage was highest by far in the coastal Tihama area at 23.9%, compared to 9.2% in the Southern Highlands, and 7.0% in the Northern Highlands ($p < .001$). (Yemen General Grain Corporation, 1980)

HEIGHT FOR AGE--STUNTING: 62.7% of the National Nutrition Survey rural sample of 2501 children 3 months to 5 years old were classified as stunted (more than two standard deviations below the NCHS/CDC height for age reference standard). Among the three rural areas, the percentage was highest (70.6%) in the Northern Highlands and lowest (51.8%) in the coastal Tihama ($p < .001$). (Yemen General Grain Corporation, 1980)

STUNTING ONLY--BY AGE: The prevalence of stunting only (height for age more than two standard deviations below the NCHS/CDC reference mean) increased dramatically from 25% in the 3 to 5 month age group to 47% of the 6-11 month age group in the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

STUNTING ONLY--BY AGE: The prevalence of stunting only (height for age less than 90% of the NCHS/CDC reference median) increased from 14% among the 3 to 5 month old age group to 22% of the 6 to 11 month olds, 28% of the 12 to 17 month olds, 47% of the 18 to 23 month olds, and peaked at 56% of the 48 to 59 month olds, according to the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

WASTING: 78.9% of the 2501 rural preschool children surveyed were more than two standard deviations below the NCHS/CDC weight for age reference standards. The three rural areas varied very little from this mean with a range from 77.9% to 80.2%. (Yemen General Grain Corporation, 1980)

WASTING AND STUNTING--RATES: 3.0% of the 2501 rural preschool children surveyed in the National Nutrition Survey were classified as both wasted and stunted (weight for height less than 80% of median and height for age less than 90% of median, NCHS/CDC reference). 3.7% were classed as wasted only (weight for height less than 80% of median and height for age equal to or greater than 90% of median), and 39.1% were classed as stunted only (height for age less than 90% of median and weight for height equal to or greater than 80% of median). Using these criteria 54.2% of the survey sample was considered nutritionally normal. (Yemen General Grain Corporation, 1980)

WASTING AND STUNTING--REGIONS: 6.5% of the 2501 rural preschool children were classified as both wasted and stunted (using the Waterlow classes, standard deviation scores, and the NCHS/CDC reference standards). 4.4% were wasted only and 56.2% were stunted only, leaving 32.9% of the rural preschoolers in the normal class. The Tihama region had the highest prevalence of wasting and stunting, 12.9%, and of wasting only, 11%. It also had the highest prevalence of preschool children classed as normal, 37.2%. The Northern Highlands region had the highest prevalence of stunting only, 66.4%, and the lowest prevalences of wasting, only 2.9%, wasting and stunting, 4.2%, and children classed as normal, 26.5%. (Yemen General Grain Corporation, 1980)

CONCURRENT WASTING AND STUNTING--BY AGE: The prevalence of concurrent wasting and stunting was greatest in the second year of life, 9% in the 12 to 17 month age range, and 15% in the 18 to 23 month age range, according to the National Nutrition Survey criterion of weight for height and height for age more than two standard deviations below the NCHS/CDC reference mean. (Yemen General Grain Corporation, 1980)

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

WASTING AND STUNTING--SEX DIFFERENCES: The prevalence of concurrent stunting and wasting (using standard deviation scores and the NCHS/CDC references) was somewhat higher among boys (7.1%) than girls (5.8%) ($p < .02$) in the National Nutrition Survey of preschool children. In addition, more males were classed as stunted only (56.8%) than females (55.4%). Thus 31.7% of the male and 34.3% of the female preschoolers were classed as nutritionally normal. (Yemen General Grain Corporation, 1980)

UNDERNUTRITION--WEIGHT FOR AGE--UDAIN: 86.6% (84 of 97) of the 6 to 24 month old children were classified as undernourished (less than 90% of WHO standards) in the Udain survey. Only one child was severely malnourished (less than 60% of standard), but 57.7% were moderately malnourished (60 to 80% of standard). The low rate of severely malnourished children in the village was probably due to the fact that just before the survey a measles epidemic occurred. 20 to 40% of the children under 3 years of age died. Presumably those of poor nutritional status were more seriously affected. (El Daher and Greiner, 1979)

UNDERNUTRITION--ARM CIRCUMFERENCE--UDAIN: 55% of the 206 1 to 5 year old children were mild to moderately malnourished according to arm circumference measurements (< 14 cm) in Udain village. (El Daher and Greiner, 1979)

UNDERNUTRITION--ARM AND HEAD CIRCUMFERENCES: 7% of 381 children between 3 months and 4 years of age were found to be suffering severe protein-calorie malnutrition using a ratio of midarm and head circumferences. Only 15% of the sample from 6 villages and one immigrant area in Taiz were found to be nutritionally healthy. (Bornstein, 1973)

WASTED MUSCLES: 27% of the 116 children 1 to 3 years of age who were examined in 6 southern villages had wasted muscles upon physical examination. (Hammarin, 1972)

VITAMIN D DEFICIENCY--RICKETS: Of the 211 children ages 6 months to 4 years examined in 6 southern villages, 16.5% had rickets. The rate was 37% among the children of the village of Manam. The rate was highest in the age group 6 months to 2 years. (Hammarin, 1972)

ANEMIA: 56% of the 426 rural preschool children with valid determinations of hemoglobin concentrations were considered anemic (hemoglobin less than 11 grams per deciliter). The highest prevalence of low hemoglobin values was in the Tihama region (82%). The prevalence was 53% in the Southern Highlands and 47% in the Northern Highlands. (Yemen General Grain Corporation, 1980)

ANEMIA BY AGE AND SEX: Children from 6 to 24 months of age had the greatest prevalence of anemia (hgb less than 11 g/dl), with the prevalences decreasing progressively from 2 to 5 years, according to the National Nutrition Survey. No sex differences in anemia prevalence were apparent. (Yemen General Grain Corporation, 1980)

ANEMIA--UDAIN: Approximately 20% of the 228 Udain village children tested were found to have iron deficiency anemia (mean corpuscular hemoglobin concentration less than 30). (El Daher and Greiner, 1979)

CLINICAL SIGNS OF VITAMIN DEFICIENCIES--UDAIN: Very few clinical signs of vitamin deficiencies were found in the Udain village nutrition survey: 4 cases of rickets, one case each with vitamin A and C deficiency signs, and a few cases for the B vitamins among the total sample of about 250. (El Daher and Greiner, 1979)

CLINICAL IMPRESSIONS: Among the 62 children 1 to 2 years of age examined in 6 southern villages, 27% were considered in "bad" general nutritional condition, 40% were considered "fair," and 33% were considered "good," based on physical examinations. (Hammarin, 1972)

CLINICAL IMPRESSIONS: Of the 310 children 0-5 years of age examined in 6 southern villages, 16% were considered to be in "bad" nutritional condition (these would probably have been hospitalized in a Western country), 32% were classed as "fair," and 52% as "good" (for Yemeni circumstances). (Hammarin, 1972)

MARASMUS AND BOTTLE FEEDING--UDAIN: The major health problem among young children in Udain was protein-calorie malnutrition of the marasmic type which is mainly responsible for the high levels of infant and child mortality. The major cause of both diarrhea and malnutrition among the younger infants is probably bottle feeding. (El Daher and Greiner, 1979)

SIBLING MORTALITY RATE--UDAIN: The sibling mortality rate in Udain village was 24% (the number of children who have died under 15 years of age divided by the number of live births among mothers in the sample). 63% of these deaths had occurred in children under one year old. (El Daher and Greiner, 1979)

DIARRHEA--UDAIN: Mothers in Udain village reported that diarrhea was very common, especially among younger infants. (El Daher and Greiner, 1979)

HEALTH PROBLEMS: Among the 100 children under 6 years old observed in Toheita, the most common disease was malaria. Diarrhea and vomiting, especially among bottle fed children, were frequent. Gross clinical signs of deficiency diseases were seen in 16 cases (10 with rickets, 4 marasmus, 2 kwashiorkor) with many others starting to show signs. (Stern, 1981)

PARASITES--UDAIN: 27% of the 171 Udain children under 5 had parasites (mainly Ascaris, Giardia, and E. histolytica). (El Daher and Greiner, 1979)

HIGHEST RISK GROUP--RAYMAH: The greatest health problem in Raymah, as in the rest of Yemen, is the status of children from about 3-4 months of age to 2 years, among whom the rates of death and disease are very high. (Rosser and Moxey, 1981)

BOTTLE FEEDING: Bottle feeding is by far the biggest cause of death and disease among babies and infants, because the milk powder is mixed in weak solution using unclean water, fed in filthy bottles, and often is the only food during the infant's first year of life. (Rosser and Moxey, 1982)

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

URBAN

UNDERNUTRITION BY AGE--SANA'A: 55% of the 48 to 59 month olds in the National Nutrition Survey were classified as undernourished (wasted, stunted, and/or concurrently wasted and stunted). 32 to 44% of the 18 to 47 month olds and 20 to 24% of the 3 to 17 month olds were so classified. (Yemen General Grain Corporation, 1980)

WEIGHT FOR HEIGHT--WASTING--SANA'A: 3.4% of the urban Sana'a sample of 744 preschool children were classified as wasted (more than two standard deviations below the NCHS/CDC weight for height reference standard) in the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

HEIGHT FOR AGE--STUNTING--SANA'A: 48.4% of the urban Sana'a sample of 744 children 3 months to 5 years of age were classified as stunted (more than two standard deviations below the NCHS/CDC height for age reference standard) in the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

STUNTING ONLY--BY AGE--SANA'A: The prevalence of stunting only (height for age less than 90% of the NCHS/CDC reference median) increased from 19% of the 3 to 5 month old age group, to 44% among the 18 to 23 month olds and peaked at 55% of the 48 to 59 month olds, according to the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

WEIGHT FOR AGE STANDARD DEVIATIONS--SANA'A: 58.4% of the urban Sana'a sample of 744 preschool children were more than two standard deviations below the NCHS/CDC weight for age reference standard. (Yemen General Grain Corporation, 1980)

WASTING AND STUNTING--SANA'A: 1.2% of the 744 urban preschool children of Sana'a were classified as both wasted and stunted in the National Nutrition Survey (using the Waterlow classes, standard deviation scores, and the NCHS/CDC reference standards). 2.1% and 47.2% were classified as wasted only and stunted only, respectively. 49.5% of the survey sample were classed as normal. (Yemen General Grain Corporation, 1980)

WASTING AND STUNTING--SANA'A: Only 0.3% of the 744 urban preschool children of Sana'a were classified as concurrently wasted and stunted (weight for height less than 80% of median and height for age less than 90% of median NCHS/CDC reference) in the National Nutrition Survey. 1.8% and 32.7% were classified respectively as wasted only (weight for height less than 80% of median and height for age equal to or greater than 90% of median), and stunted only (height for age less than 90% of median and weight for height equal to or more than 80% of median). With these criteria, 65.2% of the sample were considered normal. (Yemen General Grain Corporation, 1980)

WEIGHT FOR AGE 0 TO 24 MONTHS--SANA'A: 6% of the 193 children 0-24 months of age were severely malnourished (less than 60% of WHO standard weight for age) in a survey in Suq Al Baqr, Sana'a. 84% of these children suffered some degree of underweight (less than 90% of standard). (El Daher and Greiner, 1980)

WEIGHT FOR AGE--SANA'A: The overall prevalence of severe malnutrition (weight less than 60% of standard for age) was 8.3% among the under 3 year old children of 510 mothers surveyed in 1977. (David et al., in press)

WEIGHT FOR AGE--SANA'A: 86% of the total sample of 402 children under 5 in Suq Al Baqr, Sana'a were undernourished to some degree (less than 90% of WHO standard weight for age). 3% suffered severe malnutrition (less than 60% of standard). (El Daher and Greiner, 1980)

UNDERNUTRITION--ARM CIRCUMFERENCE--SANA'A: 25% of the 307 Suq Al Baqr children 1 to 5 years old were classified as undernourished using equal to or less than 14cm. as a cut off criterion. (El Daher and Greiner, 1980)

WEIGHT FOR AGE 6 TO 24 MONTHS--ZABID: 20% (9 of 45) of infants 6 months to 2 years old attending the Zabid clinic were classified as severely malnourished (less than 60% of WHO standard weight for age). An additional 77.8% (35 of 45) of these young children were undernourished (less than 80% of standard). Overall 71% (65 of 91) of the sampled clinic children under 5 were undernourished. (Almroth, 1979)

WEIGHT FOR AGE 6 TO 24 MONTHS--TAIZ: 5% of the 183 6 to 24 month old children attending the Swedish clinic in Taiz were severely malnourished (less than 60% of WHO standard weight for age). 19% were moderately malnourished (60 to 70% of standard), and another 31% were mildly malnourished (70 to 80% of standard). (Almroth, 1979)

WEIGHT FOR AGE UNDER 5 YEARS--TAIZ: 50% (N=207) of the 415 children under five years of age attending the Swedish clinic of Taiz were undernourished (less than 80% of WHO standard weight for age). 5.5% of the clinic children were severely malnourished (less than 60% of standard). (Almroth, 1979)

ANEMIA--SANA'A: 17% of the 135 urban Sana'a preschool children were classified as anemic according to WHO criteria (hemoglobin less than 11 grams per deciliter) in the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

RICKETS--SANA'A: 6% (19 of 301) of children under 5 examined for signs of rickets in the Suq Al Baqr area of Sana'a showed at least two clear signs. (El Daher and Greiner, 1980)

SIBLING MORTALITY RATE--SANA'A: The sibling mortality rate was 27% (i.e., the number of children who have died under 15 years of age divided by the number of live births) in the Suq Al Baqr area of Sana'a. 68% of these deaths had occurred in children under one year of age. (El Daher and Greiner, 1980)

CAUSES OF DEATH--TAIZ: Of the 148 patients who died during 1971 in a Child Health Clinic in Taiz (13.7% of admitted children), 40% had a diagnosis of tuberculosis, 40% had gastroenteritis, 30% had some serious infection, 26% had severe PCM (mainly marasmus), 15% had "post measles syndrome," 12% had anemia with Hgb below 30%, and 12% had malaria (many children had more than one condition). (Hammarin, 1972)

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

AGE AND MORTALITY--TAIZ: The mortality at a CHC in Taiz was highest within the age group 1 to 2 years, 20% of admitted children. The clinic served both urban and rural areas. (Hammarin, 1972)

REASONS FOR CLINIC VISITS: The two major reasons for children visiting the Taiz and Zabid clinics were respiratory diseases and diarrhea/vomiting. (Almroth, 1979)

GASTROENTERITIS--TAIZ: 50% of admissions of children under 5 years of age at the Swedish clinic in Taiz were caused by gastroenteritis, according to data collected by Thuriaux (1969) from 1966 to 1968. He claimed that the widespread use of "lethal plastic feeding bottles" made the situation worse. (Greiner, 1979)

PARASITES--SANA'A: 61% of the 194 children examined were found to have parasites in their stools, with 30% of these having two or more. The most common infestations were Giardia lamblia, Ascaris lumbricoides, Entamoeba histolytica, and Hymenolepsis nana. (El Daher and Greiner, 1980)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

NATIONAL

FOOD BELIEFS: Eating is considered a form of worship of God. Food is provided by God and should not be wasted. Sharing food and eating together is regarded as virtuous. (Pillsbury, 1978)

SPECIAL FOODS: There are special foods for celebrations of births, for marriages, for Ramadan, and for all other social and religious feasts. (Bornstein, 1973)

FOOD PROHIBITIONS: Apart from the Islamic prohibitions of pork and alcohol, there are no major food prohibitions in Yemen. (Pillsbury, 1978)

LACK OF SUNSHINE FOR CHILDREN: Sunshine is believed to be harmful for young children, and thus they are kept indoors during most of their first two years of life and are almost completely enveloped in clothes if taken outside. Infants are tightly swaddled for about nine months in rural areas and for shorter periods in towns. (Pillsbury, 1978)

HUMORAL THEORY: Humans are classified into four basic "characters," represented in the body by the predominance of one of the four bodily humors (blood, phlegm, black bile, and yellow bile) which correspond in nature to the four elements and four seasons. The four "states" or "characters" are the hot and dry (yellow bile, safra' corresponding to fire and summer), the hot and damp (blood, dam corresponding to air and spring), the cold and humid (phlegm, balgham corresponding to water and winter), and the cold and dry (black bile, spleen, sawda' corresponding to the earth and autumn). This theory may underlie many food prescriptions and proscriptions. (Pillsbury, 1978)

HUMORAL THEORY: During over 5 years of nutrition work in Yemen I have personally not found the humoral theory of disease to be very common among Yemeni women. (Ansell, 1982c)

RURAL

FISH: Although fish was quite popular in 2 villages in the south (Tabani and Beni Hassan), in other southern villages fish was often regarded as "poor man's food" and thus avoided. (Hammarin, 1972)

WATER--MAHWEIT PROVINCE: Women in Arqub subdistrict have an extensive cognitive categorization of household water (much more so than the men). "Clean" water is considered water that is "clear," i.e. free of visible particles of dirt or other matter, and "fresh," i.e. no more than a day old unless it is stored in a container with a spigot. Only when "clean" water has been used does it become "dirty" water, but several degrees or kinds of "dirtiness" are recognized. (Ansell, 1980)

2.1 DIETARY BELIEFS, GENERAL (Cont.)

WATER--MAHWEIT PROVINCE: Drinking too much water is generally thought to be harmful. Cold water is often thought to be especially harmful. Drinking it is believed to cause stomach complaints, and even diarrhea. (Ansell, 1980)

URBAN

TRADITIONAL FOODS: Among urban elites, traditional foods such as asid are looked down on as "peasant food." But the traditional foods still remain, if only for special occasions. (Pillsbury, 1978)

2.2 DIETARY BELIEFS, ABOUT PREGNANCY

NATIONAL

NO SPECIAL NUTRITIONAL NEEDS: Pregnant women are not considered a vulnerable group with special nutritional needs. Little relationship is recognized between a woman's food intake and the health and nutrition of the fetus. (Pillsbury, 1978)

FOOD RESTRICTIONS: Pregnant women are very much affected by the light-heavy food classification. The belief is that they should not eat "drying" foods or ones that will remain "heavily" in their stomach so that the baby will be able to move about easily. "Light" foods are suitable for vulnerable groups, such as pregnant women. (Ansell, 1979)

FOOD AVOIDANCE: During the latter part of pregnancy certain foods, such as meat, are sometimes avoided because of the belief that they make the fetus grow too big and cause a difficult delivery. "Hot" and spicy foods are also said to be avoided for fear they will induce miscarriage. (Pillsbury, 1978)

PREGNANCY AND BREAST MILK: Yemeni women believe that the breast milk of pregnant women is harmful to the child and thus stop breast feeding immediately when they become aware they are pregnant. (Bornstein, 1973)

RURAL

PREGNANCY AND BREAST MILK: The breast milk of a pregnant mother was thought to be poisonous for the child, according to interviews with 180 families in 6 villages. Some women expressed the opinion that breast milk now belonged to the unborn baby. (Hammarin, 1972)

WATER--MAHWEIT PROVINCE: Pregnant women do not drink very much water because it is thought to harm the baby. (Ansell, 1980)

URBAN

TRADITIONAL FOODS: Town women say that during pregnancy they prefer "good old village foods" like asid and sorghum bread which are "safe," "give strength," and "contain vitamins." (Pillsbury, 1978)

2.3 DIETARY BELIEFS, ABOUT LACTATION

NATIONAL

FORTY DAY POSTPARTUM REST: A 40 day postpartum period is strictly observed by most women, which permits them to rest and regain strength after childbirth. Much attention is paid to the mother's diet so that her blood "gets strengthened." (Pillsbury, 1978)

TRADITIONAL BELIEFS: According to traditional dietary rules, new mothers should remain in bed for 40 days following a birth and follow a diet considered beneficial to milk production: chicken, seman (clarified butter), milk, dates, honey, ribena (an imported black currant drink), and pomegranate juice. "Hot" foods such as warm sorghum breads, meat, and meat broths were also thought to aid lactating mothers. These notions fit into a complicated belief system about hot and cold foods and humoral pathology. (Nyntti, 1979a)

FOOD PRESCRIPTIONS: Hot and cold food prescriptions based on traditional humoral theory apply for foods eaten by a woman the 40 days after childbirth. "Hot" foods, such as chicken, dates, honey, and butter, are prescribed to "increase" the blood of which there has been a loss during delivery. (Pillsbury, 1978)

MATERNAL DIET: Women and health workers stress, perhaps even overestimate, the effects of mother's diet on lactation. Many women assume they do not have enough milk because they are not eating the traditional foods thought to be good for milk production (they are often eating modern foods). (Greiner, 1982)

MAGICAL ASPECTS: Breast milk is thought to transfer characteristics ranging from the seemingly obvious (e.g. water) to the unknown and supernatural. Maternal characteristics such as anger, upset, hotness, fright, or illness are thought to be passed to the baby. It is also held that a baby gets part of its mother's character. Even later illness or slow development are often blamed on the mother's milk. (Ansell, 1979)

TRANSMISSION OF CHARACTERISTICS: Both temporary and permanent characteristics of the mother are thought to be transmitted to an infant through breast milk. A lactating woman should not become angry or afraid lest anger and fear be transmitted to the infant through the milk. A woman who exposes herself to the hot sun before breast feeding will transmit "hot" milk and thus make the baby "hot." Infant skin disorders are usually attributed to such causes. (Pillsbury, 1978)

WET NURSES: If another woman is to wet nurse a child, her character must first be carefully scrutinized because she will transmit her nature to the infant. She should be kind, well-tempered, and in good health. A permanent legal and biological milk relationship is established between the infant and wet nurse and also with the wet nurse's husband. The infant acquires the same status as the biological children and is regarded as a full sibling. (Pillsbury, 1978)

2.3 DIETARY BELIEFS, ABOUT LACTATION (Cont.)

ALTERNATIVE FEEDING OPTIONS: Traditionally when a woman could not breast feed her baby, breast feeding by another woman was considered a less desirable option than cow or goat milk because it was thought to establish sibling relationships between the suckled child and his siblings and the the children of the woman who fed him. These relationships widened the incest category and presented marital problems in small communities. (Myntti, 1979a)

PHYSICAL BEAUTY: Many women are afraid that breast feeding will make their breasts sag and become unattractive, a sign of old age. (Myntti, 1979a)

PREGNANCY: If a woman thinks that she is pregnant, she will stop breast feeding because she believes her milk has become poisonous or because the warmth of her body is harmful to the suckling child. (Myntti, 1979a)

NEW REASONS FOR NOT BREAST FEEDING: Reasons for not breast feeding that have arisen recently include: 1) the woman may want to sleep with her husband and not be tied to a breast feeding schedule, and 2) the widespread belief that breast milk alone is not enough, often fostered by doctors and drug companies. (Ansell, 1979)

LIFE CONFLICTS: Several major conflicts in the lives of Yemeni women affect how long they breast feed. Many women do not want as many babies, or at least not as often, as their husbands do. Thus they try to breast feed for extended periods, but their husbands try to speed up weaning by purchasing bottles and powdered milk. Psychological stresses are numerous, especially in the cities. The major feeding-related stress is fear of insufficient milk or milk of poor quality, which is often tied to worry over their own health, lack of traditional foods, and fear of the "evil eye." (Greiner and Latham, 1981)

RURAL

BREAST MILK: When asked, women in three surveyed villages said that breast milk was definitely better than commercial milk products. (Myntti, 1979a)

POSITIVE ATTITUDE--UDAIN: Nearly all of the Udain mothers interviewed had a positive attitude toward breastfeeding and felt that it should be carried on for two years (as the Koran enjoins). (El Daher and Greiner, 1979)

EXCLUSIVE BREAST FEEDING--UDAIN: Of the 85 village women who answered a question concerning 5 months of exclusive breast feeding, 28% stated that it was not good for the baby because it would not be enough, 9% said it was good but had reservation, while 62% felt it was good for the baby. (Greiner, 1980)

INCREASING MILK SUPPLY--UDAIN: When asked how to increase a mother's milk supply, only 22% of the 101 responses given by 86 village women were correct (i.e. eat better, more sucking, stop the bottle, and rest) while the rest saw no way (70%) or only God's will (7%). (Greiner, 1980)

SOURCE OF HELP--UDAIN: When 85 mothers were asked who they would turn to if they had breast feeding problems, 35% of the responses were neighbor, 28% were no one, 14% their mother, 9% health professionals, 8% an older woman, and 6% others. (Greiner, 1980)

LOCAL RELIGIOUS LEADERS--BENI GHAZI: Local religious leaders in Bani Ghazi say that male infants should be breast fed for two years, female infants for eighteen months. (Myntti, 1979a)

CONTRACEPTIVE EFFECT--UDAIN: Awareness that breastfeeding helped to prevent another pregnancy from occurring too rapidly was widespread among Udain village women surveyed. (El Daher and Greiner, 1979)

LACK OF ENERGY--UDAIN: Mothers in Udain, especially middle-aged women, often complain that breast feeding "drains" their health or energy. (Greiner, 1979)

URBAN

BEST FEEDING METHOD-- EXCLUSIVE BREAST FEEDING: In three urban survey samples, the vast majority of mothers felt that exclusive breast feeding was the best feeding method for young babies: 97% in Suq Al Baqr, 96% in Ibb, and 79% in Al Qa. (Greiner, 1980)

IDEAL LENGTH OF BREAST FEEDING: In three urban survey samples (Suq Al Baqr, Al Qa, and Ibb) the majority of mothers stated that the ideal length for breast feeding was two years (as stated in the Koran), clearly far beyond actual practice. (Greiner, 1980)

EXCLUSIVE BREAST FEEDING--SUQ AL BAQR: Of the 221 mothers who answered a question concerning 5 months of exclusive breast feeding, 39% felt that it was not good because it would not be enough, 31% thought it was good but had reservations, and only 29% stated it was good for the baby. (Greiner, 1980)

INCREASING MILK SUPPLY--AL QA: Among the 41 women asked how they thought a mother could increase her milk supply, 84% felt there was no way while the other 16% suggested eating more. (Greiner, 1980)

INCREASING MILK SUPPLY--SUQ AL BAQR: Among the 105 mothers asked how they thought a mother could increase her milk supply, only 31% of the responses suggested no active way, while 30% suggested eating more, 27% more sucking, 6% stopping the bottle, and 6% rest. (Greiner, 1980)

INCREASING MILK SUPPLY--IBB: 65% of the responses from 199 mothers indicated that there was no way to increase a mother's supply of milk. 33% suggested correct ways of increasing milk supply: eat more, more sucking and rest. (Greiner, 1980)

SOURCE OF HELP: In three urban areas surveyed, mothers indicated that if they would turn to anyone for help with breast feeding problems (which in Al Qa and Ibb over 70% would not), they would turn to health professionals. In Suq Al Baqr, 41% stated that they would turn to health profes-

2.3 DIETARY BELIEFS, ABOUT LACTATION, (Cont.)

sionals, 24% said neighbors, 12% an older woman, 8% their mothers, and 13% said no one. (Greiner, 1980)

MIDWIVES--SANA'A: Traditional midwives in Sana'a said that breast feeding should be continued to 2 years, while trained midwives said only 6 to 9 months, according to Bornstein (1973). (Greiner, 1979)

ANXIETY: Several health-related professionals have noted high levels of anxiety among certain groups of women in Yemen, especially young urban women, as women's roles are becoming more uncertain. This anxiety may interfere with the "let down" reflex necessary for breast feeding. (Greiner, 1979)

COLOSTRUM--SANA'A: 48% of mothers in Al Qa, Sana'a thought that colostrum was good for babies; however, a number of health professionals have found that mothers believe colostrum to be dirty or otherwise unsuitable for giving to their babies. (Greiner, 1979)

BREAST MILK: Breast milk is considered the best food for a baby during the mother's forty day confinement in the house after delivery, except when the mother is ill or upset, according to the women of Mahweit Town. (Ansell, 1981)

BREAST MILK: Breast milk is thought by the women of Mahweit Town to be injurious to babies under certain circumstances, and thus they are not inclined to breast feed when these conditions prevail. They believe that an angry, upset, hot, or ill mother can transfer these harmful effects to her baby through her milk. (Ansell, 1981)

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

NATIONAL

LIGHT-HEAVY CLASSIFICATION: The light-heavy food classification has been extended to the baby bottle with dangerous implications. "Light" milk is better and less harmful for a small baby in the same way that "light" foods are more suitable for small children. Making the milk "light" may mean putting less than the prescribed amount of milk powder in the bottle. (Ansell, 1979)

"LIGHT" FOODS AND BOTTLE FEEDING: Traditionally, "light" foods are considered best for infants. This probably explains in part why Yemeni mothers give their infants diluted bottle feeds. For poorer families another reason is the saving of money. (Firebrace, 1981)

BOTTLE FEEDING IMAGE: Bottle feeding is considered "modern" and superior to breast feeding by a growing number of women, especially in the cities but also in rural areas. (Bornstein, 1973)

BOTTLE FEEDING REASONS: Complaints about inadequate milk or possible harm to the body (or the woman's figure) seem to serve as reasons for women who see bottle feeding as more modern and who now have an easily available alternative to breast feeding. (Myntti, 1979a)

BOTTLE FEEDING IMAGE: Bottle feeding has come to have a very positive image in the eyes of many Yemenis, both among young mothers and among men who are usually responsible for the family shopping and have influence on domestic decisions. The image of bottle feeding as the modern way to feed one's child is given credence and support through milk company promotion and the role of the medical profession and pharmacies. (Firebrace, 1981)

BOTTLE FEEDING EDUCATION: Baseline surveys suggest that mothers place an undue value on powdered milk and bottle feeding. But from follow-up evaluations, it appears that recent educational assaults on the "mystique" of bottle feeding have begun to reduce mothers' commitment to artificial feeding. (Greiner and Latham, 1981)

CONVENIENCE OF BOTTLES: Many mothers see bottle feeding as demanding less of their time and energy than breast feeding. It may also seem to be an answer to the fears and beliefs that go along with breast feeding. (Ansell, 1979)

STERILIZATION: The concept of sterilization of bottles is particularly foreign to Yemeni women because of the traditional views on the human body, health, and the causes and cures of sickness. (Firebrace, 1981)

RURAL

INTRODUCTION OF ADDITIONAL FOODS: To the survey question, "When should additional foods besides breast milk be given to babies?", 42 of 97 Tohieta mothers knew that some kind of additional foods should be given some time between the 6th and 9th month (28 said 6 months, 14 said at 9 months). More than 33 mothers suggested introducing solid foods when the child was a year or older. (Stern, 1981)

POWDERED MILK AND BOTTLES--UDAIN: A surprising number of Udain mothers felt that, although powdered milk was necessary, it was not good. Many knew that the bottle caused diarrhea. (El Daher and Greiner, 1979)

URBAN

POWDERED MILK--SANA'A: A large number of mothers from the Suq Al Baqr area in Sana'a felt that powdered milk was necessary, but that breast feeding was better, according to a preliminary analysis of survey results. (El Daher and Greiner, 1980)

2.5 DIETARY BELIEFS, ABOUT WEANING

NATIONAL

CRITERIA FOR FIRST FOODS: In addition to the light-heavy classification, mothers have certain criteria as to what to give young children as first foods. These criteria include: 1) that the food should be easily digestible, quick to prepare and preferably part of what they family is eating for lunch anyway; 2) that it be bland, not spicy, but not necessarily sweet; and 3) that it should be cheap (but not free) and available in the corner shop. Most mothers believe that the child's nutritional needs are

2.5 DIETARY BELIEFS, ABOUT WEANING (Cont.)

small (given small size) and that in avoiding heavy foods they are acting conscientiously. (Ansell, 1982a)

REASONS FOR INADEQUATE DIET: Most mothers believe young children eat when they are ready for it and thus do not persist in offering food if the child appears to refuse it. There are many justifications for why one should not feed children under 1 1/2 and 2 years, including: 1) fears that the child's stomach will swell and delay his walking, or even worse, burst altogether; 2) belief that children cannot swallow solid foods, and that by tempting them one risks the child choking and dying; 3) use of the "light-heavy" food classification to determine which foods are suitable (light foods) and which are not (heavy foods); and 4) belief that because children's stomachs are so small, their food needs are proportionally small. (Ansell, 1982b)

"GOOD" AND "BAD" FOODS: Women usually refer to the tastes and consistencies of foods, rather than their nutrient value. Foods considered good for young children are soft, "light" foods that are bland and easily swallowed and digested. "Bad" foods are those considered "heavy" and hard to chew and digest, such as meat, eggs, and beans which are said to cause stomach troubles. Vegetables and fruits are regarded as snacks rather than "real food." (Pillsbury, 1978)

RURAL

REASON FOR WEANING--NOT ENOUGH MILK: Lack of milk was the main reason given by mothers for early weaning in the studies of Myntti (1978) and Obermeyer (personal communication). "Breast milk stopped" was the most common reason for weaning (after pregnancy) in Turba and the second most common in Khokha and Rada'a, according to Bornstein's studies. (Greiner, 1979)

REASONS FOR WEANING--UDAIN: The major reasons given by Udain village women for weaning their children before two years of age were "not enough milk" and "pregnancy." (El Daher and Greiner, 1979)

REASONS FOR WEANING: 39 of 101 mothers who stopped breast feeding when the child was one year old or less said that they stopped because they were pregnant again. Other reasons given by mothers for all ages of termination included the mother or child being sick, breast milk finished, and child was too old and big and had started to eat more and more adult foods. (Hammarin, 1972)

"HEAVY" FOODS--UDAIN: The belief that young babies cannot tolerate "heavy" foods appeared to be widespread among the Udain village mothers. This accounted for the late introduction of solids and the fact that some mothers gave less concentrated milk to their younger infants (although gross overdilution was not a major problem). (El Daher and Greiner, 1979)

FISH AND MILK: In a fishing village in the Tihama, mothers believe that fish should not be given to young children under 3 or 4 years who are still on a milk diet. The reasons for the belief against mixing fish and milk is not known in the village. There is a belief in Arabic countries that fish and milk together cause madness and should never be mixed. (Bornstein, 1973)

HARMFUL FOODS: Among some of the 180 families surveyed in 6 southern villages, there was a belief that meat, eggs, and fish were harmful to small children because these foods were thought to be indigestible or to produce parasites, and could make the child stupid. It was not possible to determine how widespread this belief was. (Hammarin, 1972)

URBAN

REASONS FOR WEANING--SANA'A: Among the major reasons given by mothers in the Suq Al Baqr area of Sana'a for weaning from the breast before two years of age were "not enough milk" and "pregnancy." (El Daher and Greiner, 1980)

REASON FOR WEANING: MOTHER'S WORK--SANA'A: 35 of the 54 mothers working in the Sana'a Textile Factory cited their work as the reason for stopping breast feeding, in Bornstein's 1974 study. This appears to be the only study showing work as a significant factor in weaning. (Greiner, 1979)

"HARD" OR "HEAVY" FOODS: Babies and young children are thought to be particularly vulnerable to the ill effects of too much "hard" or "heavy" food, including meat, eggs, beans, porridges, and helba (ground fenugreek soaked in water and beaten by hand). These foods are withheld from children under two years of age for fear that their stomachs will get so big that they will not be able to walk. Instead a light diet of rice, potatoes, bread made from white flour, biscuits, and sweets is preferred. (Ansell, 1981)

LIGHT AND HEAVY FOODS--SANA'A: Mothers in a Sana'a survey said that the children liked only soft, light, mild, and sweet foods, easy to swallow and digest. Meat, foul (broad beans boiled in water and fat and spiced with chilies), and eggs were thought to be unsuitable for children because they were heavy and caused stomach trouble. This may have been true, considering the way these foods were prepared. (Bornstein, 1973)

2.6 DIETARY BELIEFS, ABOUT ILLNESS AND CURE

NATIONAL

EVIL EYE: Yemeni mothers are traditionally reluctant to take their young babies out of the house and thereby expose them to the "evil eye" and to the sun for long periods. (Firebrace, 1981)

RURAL

INFANTS AND SUNSHINE: According to parents in southern villages, sunshine was said to soften the brain of small children. Parents also feared that infants could get dark skin if exposed to sunshine. (Hammarin, 1972)

INSTANT HEALTH AND CURATIVE SERVICES: The major obstacle to the success of the Raymah Health Project was the entrenched belief of local people that health can be bought only with modern curative services. (Melrose, 1981)

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

WATER AND ILLNESS--MAHWEIT PROVINCE: When a child has diarrhea, giving him extra water is thought to be harmful and to increase the diarrhea. Water is also withheld from children who have "hasba," a group of unspecified conditions including rashes, fevers, coughs, and upset stomachs (and usually, but not always, measles). (Ansell, 1980)

TRADITIONAL VIEWS OF HEALTH AND DISEASE: The women of Mahweit share a widespread acceptance of disease and illness and consequently of death. Both disease and illness are thought to be ultimately matters of God's will and to tamper with this natural process is often felt to be wrong. Good health, referred to as afia, is something only God can give. Despite these beliefs, the women hold various more "earthly" beliefs as to the causes of illness over which they feel they have some control. Many customs of everyday life, in particular most customs concerning baby and child care, are specifically conceived measures to maintain and protect health during a time or situation of vulnerability. (Ansell, 1981)

WATER--MAHWEIT PROVINCE: Among the people of Al-Baghari and surrounding villages, the water from the local spring is believed to be "capable of carrying away its own dirt and keeping clean." The water is thought to cleanse itself and never be dirty. (Ansell and Burrowes, 1981)

URBAN

MODERN HEALTH SECTOR--WOMEN: Deeply held and long-standing social conventions virtually exclude Mahweit Town women from the modern health sector as either practitioners or consumers. Pharmacies and hospitals are socially out-of-bounds for most women. The only way many women receive any modern medical treatment is through local injectionists who, with the husband's or father's consent, give only an injection. It is unlikely that an injectionist would be able to examine a woman in any physical way, as this is considered entirely unnecessary. (Ansell, 1981)

3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

SUBSISTENCE DIET: Traditionally most people had to subsist on a simple diet of grains (mostly sorghum) supplemented by some vegetables and animal protein. (World Bank, 1979)

TRADITIONAL DIET: Everywhere in Yemen the staple foods are sorghum and other cereals. Fenugreek (*hiliba*), rice, vegetables, and beans are eaten occasionally, and the consumption of meat, dairy products, and eggs depends on the economic status of the household. Meat, eggs, and fresh and tinned fruits are status foods and would be eaten when men of the household are present or if guests are invited. (Myntti, 1979b)

BREAD: Bread is the staple food in the Yemeni diet. Most of the local breads are made of sorghum, millet, or barley, ground in local mills into a flour with a high extraction rate. The modern white loaves of bread, ruti, which are becoming popular in the cities, are made of flour with a low extraction rate and thus are of less nutritional value. (Bornstein, 1973)

BREAD: Bread is the most important basic food in rural Yemen. In the northern highland areas like Razih and Hamdan, the tannur cylindrical oven is heated twice daily (if fuel can be afforded) because warm bread is preferred at meals. In the south, fried bread (khubs tawwa) may be made once a day or ruti bread is bought where possible. Lahuh, a pancake-like sorghum bread, is fried for use on special occasions. (Myntti, 1979b)

EATING PATTERNS: Normally families eat together from the same plate with no obvious inequalities in the shares received. Food is eaten only with the right hand and with the help of bread dipped into common dishes served in pots and on trays on the floor. On special occasions (e.g. feasts, guests) men receive the largest and choicest portions and eat separately and first. (Pillsbury, 1978)

MEALS: The midday meal is the largest and most important of the day. Breakfast of tea or coffee and bread is served between 6 and 8 A.M. depending on the region. Agricultural labourers usually get a food break (often beans, fish, and bread) and tea or coffee. An evening meal, often consisting of leftovers from lunch or tea, bread, and beans, or eggs, is served when men return from sunset prayers at the mosque. (Myntti, 1979b)

FOOD DECISIONS: Husbands make all economic decisions. They decide how much of the total family budget to spend on food, and they also buy the food. Wives are responsible for all food preparation and for the feeding of infants and children. (Bornstein, 1973)

CEREALS: It is estimated that the Yemeni population derives 75% of its calories and 50% of its protein from cereals. These are consumed in a remarkable variety of ways, considering the traditional limitation of the

3.1 DIETARY PRACTICES, GENERAL (Cont.)

choice of foods. The cereals form the traditional base to the diet and are regularly mixed with dairy products, honey, meat, soups, and vegetables. (Ansell, n.d.)

PER CAPITA FOOD CONSUMPTION INCREASES: Fast-rising incomes have allowed a significant increase in per capita food consumption as well as an upgrading in the quality and nutritional value of food items. An increasing percentage of the population is able to purchase a variety of high value foodstuffs such as sugar, meat, dairy products, eggs, fish, edible oils, fruits, and vegetables. (World Bank, 1979)

PRODUCTION: Over 1970-77, agricultural production increased by an average of 2.9 to 3.9% per year. (FAO, 1977)

FOOD PRODUCTION AND IMPORTS: According to Yemeni Government estimates, total grain production went up from 2.5 million tons to 3.4 million tons in the ten years up to 1979/80, with wheat and maize increasing and millet and sorghum decreasing. Potato and vegetable production increased two and one half times, fruits three times, and legumes by more than one third. Food imports have also increased nearly eighteen times between 1971/2 and 1979/80 to YR 1630 million. (Grose et al., n.d.)

FOOD SUPPLY: There is no evidence of a general food shortage in the country, although there are pockets of poverty. (Grose et al., n.d.)

GRAIN STORAGE: The madfan, an earthen pit dug in the ground in the house, is an excellent storage place which keeps grains well-protected from humidity and insects for long periods of time. (Pillsbury, 1978)

COOKING AND FOOD PREPARATION: All aspects of cooking and food preparation are shared by the women and girls of the house. The making of bread is an art learned at a young age. In Tihama the grains are generally ground by hand. In many places village mills do the grinding. Dairy products are also processed by women, particularly older women. (Myntti, 1979b)

COOKING UTENSILS: The few basic cooking utensils are simple and include round platters for serving rice, metal pots for cooking rice, a tea kettle, metal or clay pots for boiling meat (stone pots in the North), flat baskets for storing and serving bread, and metal and wooden spoons. Imported items, such as thermoses, tea cups, china dishes, pressure cookers, and blenders, are also available in many areas. (Myntti, 1979b)

COOKING: Yemeni cooking is frugal and less time consuming than food preparation in other parts of the Arab world. Three "women-hours" maximum would be spent in the kitchen per day. In places where tannur-baked bread is not made twice a day and where butagas is used, preparation of the main midday meal can take as little as half an hour. (Myntti, 1979b)

KITCHENS IN THE HIGHLANDS: In the highlands, the kitchen is usually located on the upper level of the house. Windows are kept very small and ventilation holes are completely inadequate to let smoke out. The kitchen has a vertical cylindrical oven (tannur) that is used for making

bread. Wood is the main fuel and is expensive. Smoke rises directly out of the tannur into the darkly lit traditional kitchen. (Myntti, 1979b)

KITCHENS IN TIHAMA: In the coastal Tihama region, the usual rural kitchen consists of a designated place in the open-air courtyard of each house. Village kitchens use a simple oven made of stones that operates similar to the cylindrical (tannur) ovens of the highlands. Bread is cooked in this oven. Simple charcoal braziers are used for preparing other foods. (Myntti, 1979b)

FUEL: Fuels vary by region, but the most common are: wood, dung, sorghum stalks and roots, charcoal, kerosene, and butagas. Of all the tasks Yemeni women perform, collecting firewood is the most difficult and can involve up to 8 hours for 20 kilos of wood. Dung is an important supplement to wood in most northern areas. Dung cakes (dung, water, and straw) are made only by women. Fuels can be bought but remain expensive. Butagas is the most convenient alternative fuel. (Myntti, 1979b)

USE OF SCARCE WATER--MAHWEIT PROVINCE: Those with the first claims on "clean" water are the men and their male guests. Traditionally, water is withheld from the lesser-valued members of society, i.e. women, children, and the sick. Women and children in Arqub subdistrict seem to drink in relation to how much water is available (usually remarkably little). Village women drink significantly less than those in towns. (Ansell, 1980)

QAT CHEWING: The chewing of qat leaves (a mild narcotic stimulant) is a widespread habit among all social classes in towns and villages alike. It is the principal means of passing time and of entertainment. The majority of men chew qat daily, spending three to four hours every afternoon. Women usually chew it less frequently. It can have negative health effects including loss of appetite, insomnia, gastritis, and constipation. The large amount of money spent on qat also affects the daily family food expenditure. Often more money is spent daily on qat for the husband alone than on food for the whole family. (Bornstein, 1973)

PROTEIN AND CALORIE SUPPLY: In 1976, per capita supplies were 68 grams protein and 2,179 calories. (Sivard, 1979)

PROTEIN AND CALORIE SUPPLIES: In 1972-74, per capita supplies averaged 1996 calories (82% of requirement) and 59.2 grams protein. (FAO, 1977)

RURAL

CONSUMPTION OF MAJOR FOOD GROUPS--SANA'A: Beverages (98%), grains (97%), vegetables (84%), milk products (63%), milks (39%), fish (35%), and meat and legumes (26% each) were the most commonly consumed food groups among the families of the children surveyed in the National Nutrition Survey, according to a one day dietary recall. (Yemen General Grain Corporation, 1980)

SORGHUM AND MILLET: Sorghum is the basic component in the rural Yemeni diet. Sorghum and millet represent almost 80% of all cereal production and the source of about 70% of all calorie and protein intake. (Pillsbury, 1978)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

STAPLE GRAINS--MAHWEIT PROVINCE: The main subsistence crops in the riverbed valley of Wadi Ayyan are sorghum and millet, the former often intercropped with a legume. The locally grown grains are ground by hand with water on a small pounding stone into the thick base of the lohoh batter. Sorghum, millet, and the newly imported wheat are also ground and prepared into thick, round loaves of bread. (Ansell and Burrowes, 1981)

MAIN FOODS: Bread, asid (sorghum porridge), madid (thin wheat or barley gruel), and helbe (a protein-rich fenugreek bean sauce) are the main foods of rural Yemenis. (Pillsbury, 1978)

STAPLE FOOD--SOUTHERN YEMEN: Bread, porridge, and gruel prepared from the flour of durrah were the most common staple foods in the 6 surveyed villages of southern Yemen. (Hammarin, 1972)

MIDDAY MEAL--HUJARIYYA: A typical midday meal in Hujariyya might consist of rice (or sorghum porridge, asid) with a sauce of potatoes and tomato paste, ruti bread (a white, store-bought bread), karath (chive-like onions), and tea. If men are at home, meat may be added several times a week. If not, meat is eaten perhaps once a week on Friday. (Myntti, 1979b)

MIDDAY MEAL--JEBEL RAZIH: A typical midday meal in Jebel Razih would consist of fresh maluj bread, fenugreek (hilba), meat, and tea. A special bread and honey dish (fatut and bint as-sahn) might occasionally be served as a first course. (Myntti, 1979b)

ASID: Asid is a thick cereal porridge prepared from flour of sorghum or a mixture of sorghum, millet, barley, and/or maize depending on local production. It is a common dish eaten almost daily in the mountain villages but less often in the cities. (Bornstein, 1973)

"ASID"--PORRIDGE: "Asid," a porridge prepared from the flour of durrah, borrh, maize, or from any other kind of cereal available, was eaten quite often, according to a survey of 6 southern Yemen villages. (Hammarin, 1972)

"MADID"--GRUELS: "Madid," gruels from durrah or other cereals were often strongly spiced with chili and different herbs in villages of southern Yemen. (Hammarin, 1972)

"HELBAN"--SAUCE: A sauce--"helban"--prepared from fenugreek seeds and strongly spiced with green herbs, onion, chili, and vegetables (e.g. tomatoes) was a well appreciated food in rural villages of the south. It was sometimes mixed with a meat soup--"marez"-- and eaten together with bread and vegetables. (Hammarin, 1972)

"FOUL"--BEAN DISH: "Foul," beans boiled in water and spiced with chili, was a common dish in rural villages in the south. Beans were not consumed in enough quantity, however, to cover the protein needs. (Hammarin, 1972)

FRUITS AND VEGETABLES: Among 6 villages of the south, consumption of fruits and vegetables seemed very low, and the vegetables were boiled for too long a time. Most fruits and vegetables, like tomatoes and carrots, were preferably sold on the market. (Hammarin, 1972)

FISH: Fish was eaten quite often in the southern lowland village of Tobani. Dried fish was also rather popular in the southern mountain village of Beni Hassan. However, in other villages in the south fish was often regarded as "poor man's food" and thus avoided. (Hammarin, 1972)

MEAT: In the mountain villages of Manam and Beni Hassan meat was generally consumed between once a month and once a week, although several surveyed families could not afford meat more than one or two times a year. In the lowland village of Tobani meat was usually eaten only at the major holidays, once or twice a year. (Hammarin, 1972)

MEATS: Goats and sheep are important sources of meat and dairy products in the Tihama region. Rabbits are raised solely as an extra source of meat in Taiz province. Chickens are raised both for cash income and for domestic consumption. (Myntti, 1979b)

EGGS: Eggs were consumed about once a week by families in the southern mountain villages of Manam and Beni Hassan. In the lowland village of Tobani eggs were seldom eaten. (Hammarin, 1972)

"GISHR"--MAHWEIT PROVINCE: Childbirth, death, and ceremonies for welcoming a guest all require that "gishr"--a hot beverage made by boiling coffee husks--be available for all who attend. Village women in Arqub subdistrict simply do not have enough water to provide this. (Ansell, 1980)

NUTRIENTS IN DIET: A 1978 nutrition survey in Yakhtul, 10 miles north of al-Mukha on the coast, revealed that the average daily diet furnished nutrients at a level above the WHO minimum requirements. However, the survey noted that the household food distribution was not always equal with women and girls eating less than their share. (Myntti, 1979b)

MEAL PATTERN: In most rural households food is eaten out of one communal dish, and sometimes spoons are used. (Myntti, 1979b)

COOKING PLACE: Almost all the 180 families surveyed in 6 villages of southern Yemen had a special room for a kitchen or a cooking-place outside. (Hammarin, 1972)

STORAGE--MAHWEIT PROVINCE: With the exception of unground grain (which is stored in tin trunks and ghee cans) foodstuffs are not usually kept in the house for more than a day or two by the villagers surrounding Al-Baghari springs. The lohoh (type of bread) batter is kept in a stone jar or in an aluminum pot covered with a basket. The prepared lohoh pancakes are stored between two baskets as are the loaves of bread. Soured milk is stored in the gourd in which it is prepared, which has a tight-fitting top. Most other foods, including local sweets, fruit, vegetables, and fish, are bought on Tuesdays at the local suq (market)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

and kept between two baskets until they are consumed in the next day or so. Meat is eaten on the market day and is stored in the cooking pot. (Ansell and Burrowes, 1981)

MARKET (SUQ)--MAHWEIT PROVINCE: Among the wadi (river bed) villages around the Al-Baghari springs, the Tuesday suq (market) at Hamadha Jadid provides the local villagers with meat, fresh and smoked/salted fish, green onion tops, horseradish, fruit, biscuits, and local sweets as well as tins of tomato paste, beans, and mackerel. (Ansell and Burrowes, 1981)

COMMUNITY FOOD AID: Among rural poor social bonds and responsibilities within a village insure that no one starves. The prevailing system of local aid provides at least enough food to keep each community member at a subsistence level. (Pillsbury, 1978)

WOMEN'S WORKLOAD: The workload of rural Yemeni women is very heavy and includes child rearing, cooking, food preparation, cleaning the home, washing clothes, fetching water, collecting fuel and fodder, looking after the household animals, and a wide range of agricultural tasks. With the migration of men, women are having to assume a larger share of agricultural tasks. (Firebrace, 1981)

WOMEN'S WORK LOAD: Women's most time-consuming tasks are water management, fuel collection, animal husbandry, and agricultural work. (Myntti, 1979b)

URBAN

CONSUMPTION OF MAJOR FOOD GROUPS: Grains (99%), beverages (97%), vegetables (89%), legumes (88%), root crops (73%), meats (60%), poultry (38%), milk products (34%), fruits (27%), milks (26%), and eggs (14%) were the most commonly consumed food groups among the families of the urban children surveyed, according to a one day dietary recall. (Yemen General Grain Corporation, 1980)

LOCAL VERSUS IMPORTED GRAINS: Although local grains are cheaper and more available to the agricultural population, the popular local grains are often more expensive than imported grains in the open markets of the main towns. (Ansell, 1982a)

KITCHEN: In Mahweit Town, the kitchen usually consists of one or two tannurs (round ovens) for making breads, a solee (skillet pan under which there is space for fuel) for making lohoh, a scooped out space for storing water, and maybe a stone for coarsely grinding wheat grains. The kitchen is at the top of the house and has poor ventilation for smoke through the square holes built in the kitchen wall. There are no benches or working spaces as most of the preparation for cooking is done on the floor. When the tannur is in use, the kitchen is filled with an acrid smoke. (Ansell, n.d.)

KITCHENS: One of Mahweit women's repeatedly expressed complaints is about their smoky kitchens. The questions of concern in planning interventions are: how much are they prepared to do about it, and how much will the owners of their kitchens (their menfolk) let them do about it? (Ansell, n.d.)

WATER: Water for domestic consumption is always cited as one of the most critical problems in rural Yemen. Both quantity and quality are often deficient. Only 8% of the total population have easy access to water. Women are the prime transporters of water. The carrying of water is a heavy and time consuming burden. (Myntti, 1979b)

WATER--MAHWEIT PROVINCE: Among the villagers of Wadi Ayyan, water for drinking is stored in round clay containers with narrow necks. Water for other purposes is stored in a variety of uncovered containers. Used rinse water and other dirty water is dumped on the ground. (Ansell and Burrowes, 1981)

WATER--MAHWEIT PROVINCE: The only time that women without able-bodied daughters were observed not to be carrying their own household water was during the forty-day lying-in period after birth. As part of the extensive system of reciprocal obligations among village women, friends and neighbors would perform this task for them. (Ansell, 1980)

3.2 DIETARY PRACTICES, WOMEN

3.2.1 DIETARY PRACTICES, WOMEN, DURING PREGNANCY

NATIONAL

TRADITIONAL PRACTICES: During pregnancy, women are seldom afforded a lighter work load, nor do they follow a special diet. Many women eat less so that the baby will be smaller and delivery easier. (UNFPA, 1980)

RITUAL FOODS: During and just before labor, drinks made from combinations of samn-helba and honey are offered with the intention of accelerating labor ("the baby slips out"). (Ansell, 1979)

RURAL

WATER--MAHWEIT PROVINCE: Pregnant women drink very little water since it is thought to harm the baby. (Ansell, 1980)

3.2.2 DIETARY PRACTICES, WOMEN, DURING LACTATION

NATIONAL

FORTY DAY POSTPARTUM PERIOD: Childbirth is an occasion for major food expenditures. During the strictly observed 40 day postpartum confinement period, the mother receives female relatives and friends every afternoon in her home in celebration. "Hot" foods, such as chicken, dates, honey, and butter fat, are selected to "strengthen" the blood. (Pillsbury, 1978)

URBAN

FORTY DAY CONFINEMENT--SPECIAL FOODS: After a Mahweit mother delivers her baby, her forty day confinement period is designed to cleanse and strengthen her body as well as to protect her from evil influences. Several traditional foods aid in this process: gishr is a spiced brew made from coffee husks and containing ginger, dates, and cinnamon which

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

is thought to accelerate the expulsion of dirt and blood within her and to relieve the pain; samn (clarified butter) in liquid form helps to clean out the "women's insides"; shugri, the meat from a young chicken; mareg, meat broth, preferably from a young chicken; harish, a coarse sorghum-flour porridge; local honey; and local eggs. The responsibility to provide these special foods lies with both her husband and her father and is considered part of the series of payments due to her. (Ansell, 1981)

QAT CHEWING--SANA'A: Mothers who chew qat regularly while breast feeding noticed a decrease in the amount of breast milk, according to a survey among Sana'a women. In addition, their infants suffered more from constipation, lack of sleep, and dryness of the mouth. (Bornstein, 1973)

3.3 DIETARY PRACTICES, INFANTS, 0-24 MONTHS

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

NATIONAL

TRADITIONAL BREAST FEEDING: The traditional practice is to breast feed infants up to the second year. However, many mothers interrupt breast feeding much earlier, sometimes after the second or third month, generally because they have become pregnant. (Bornstein, 1973)

TYPICAL INFANT FEEDING PATTERN: The typical infant feeding pattern that emerged from baseline surveys in four areas of Yemen was one in which breast feeding began on the second day of life and continued for about 9 months in rural Udain and 5 to 8 months in the cities. Supplemental bottle feeding began at 2 months in Udain and 3 months in the urban samples. Solid foods were introduced at 11 months in Udain and 3 to 5 months in the cities. (Greiner and Latham, 1981)

PREVALENCE: 54% of survey mothers in the combined rural regions were lactating (breast feeding any child), while only 27.3% of the survey mothers in urban Sana'a were lactating. (Yemen General Grain Corporation, 1980)

MAJOR PROBLEMS: According to baseline surveys in three urban and one rural areas, the major problems that disrupted lactation in the early months and led to its cessation included: (1) mothers' perception that their milk was inadequate, often because they felt their diets to be inadequate (i.e., lacking in traditional "milk producing" foods), (2) nipple and breast pains and problems, (3) child "weaning itself" to bottle once the bottle was begun, (4) earlier return of menstruation and pregnancy than women felt used to be the case combined with the traditional requirement that breast feeding be ceased once a woman was pregnant, and (5) mothers who felt they suffered from poor health often felt that they must stop breast feeding because of its extra strain on them and/or their illness' effect on the quality of the milk. (Greiner and Latham, 1981)

"DIRTY" MILK: The newly-born will not be breast fed for up to 3 days because the milk is considered unsuitable, dirty, and even poisonous, especially if the placenta is retained. The problem of "dirty milk" also appears when a woman becomes pregnant again. She will not feed the first child because pregnancy is supposed to make her milk sour or dirty. (Ansell, 1979)

COLOSTRUM: Babies are not put to the breast until the third day because of the belief that colostrum is polluted or "not milk." (Firebrace, 1981)

POVERTY: The poorest groups of women do not seem to have abandoned breast feeding in significant numbers. (Firebrace, 1981)

BREAST FEEDING DURATION AND MARRIAGE: In both urban Sana'a and rural Yerim village, women who were married longer breast fed for a longer period. Women married four years or less breast fed for 3.4 and 12.9 months in Sana'a and Yerim respectively. Those married 10 to 14 years breast fed 11.0 and 14.5 months respectively, while those married 15 to 19 years breast fed 12.9 and 15.4 months respectively. (Allman and Hill, 1978)

RURAL

INITIATION OF BREAST FEEDING AND PRELACTEAL FEEDS: Bornstein (1974) reported that a baby usually gets no breast milk during the first three days of life, only sweetened water and butter fat. (Greiner, 1979)

EXCLUSIVE BREAST FEEDING: In Beni Hassan and Manam 60 to 65% of children surveyed received "only breast milk" for 1 1/2 years or more. In the small villages around Taiz the rate was somewhat lower. (Hammarin, 1972)

WET NURSES: In Beni Hassan 38% of the children received breast milk from another woman (a relative) during the first 3 to 4 days of life, sometimes a longer period if needed. In Manam about 5% got another woman's breast milk. The custom of wet nursing was not practiced in the other 4 southern villages studied. (Hammarin, 1972)

PREVALENCE BY AGE: 95% of children 3 to 5 months of age consumed breast milk the day before they were surveyed according to the dietary questionnaire in the National Nutrition Survey. This percentage decreased to 74% among the 6 to 8 month olds, 66% among the 9 to 11 month olds, 62% among the 12 to 14 month olds, 43% of the 15 to 17 month olds, 39% of the 18 to 23 month olds, and 17% of the 24 to 30 month olds. Overall, 51% of the 695 sample children had consumed breast milk the previous day. After 14 months of age, breast milk was no longer the most common food item offered young children. (Yemen General Grain Corporation, 1980)

PREVALENCE BY AGE: 76% of the surveyed children were still being breast fed at 6 months of age, 55% were still breast fed at 12 months, and 18% at 24 months of age, according to the 1979 cross-sectional National Nutrition Survey. (Yemen General Grain Corporation, 1980)

PREVALENCE BY AGE: 28% of the 2490 survey children aged 3 to 59 months were being breast fed at the time of the 1979 National Nutrition Survey.

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

This included 83% of the 3 to 5 month olds, 70% of the 6 to 8 month olds, 64% of the 9 to 11 month olds, 56% of the 12 to 14 month olds, 36% of the 15 to 17 month olds, 25% of the 18 to 23 month olds, and 5% of the 24 to 59 month olds. (Yemen General Grain Corporation, 1980)

PREVALENCE--UDAIN: 17% (50 of 295) of the Udain village children under five were being breast fed at the time of the survey. (El Daher and Greiner, 1979)

PREVALENCE--YERIM: 97% (60 of 62) of the multiparous women had breast fed their last child, according to a 1976 survey in the village of Yerim. 51.6% of the surveyed women were still breast feeding their under three year old children at the time of the study. (Allman and Hill, 1978)

PREVALENCE--TOHEITA: 23 of 57 children below one year of age were exclusively breast fed, according to a survey in the village of Toheita, 8 km outside of Zabid. Another 3 children received both breast and bottle. (Stern, 1981)

DURATION: The median duration of breast feeding was 12.7 months among the 2490 rural children sampled in the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

DURATION: Infant feeding studies and observations in several villages of Yemen over the last decade suggest the following breast feeding durations: (1) an average of one year in Hamami (Bornstein, 1971), (2) an average of 18 months for girls and two years for boys in Al Maleka (Bornstein, 1972), (3) an average of 18 months in most of the studied villages in the southern half of the country (Hammarin, 1972), (4) an average of 18 months in Khokha (lowlands), 15 months in Turba (midlands), 13 months in Rada'a (highlands) (Bornstein, 1974), (5) a combined average of 13.5 months in the villages of Al Buta (lowlands), Beni Ghazi (midlands), and Al-Nadhir (north, near Saadah) (Myntti, 1978), and (6) an average of 9 months in Mahweit with 50% breast fed 6 months or less (Obermeyer, 1978). (Greiner, 1979)

DURATION--UDAIN: 50% of the Udain village children had received breast milk for less than 4.5 months according to maternal recall. (El Daher and Greiner, 1979)

DURATION TREND--UDAIN: Older siblings had been breast fed longer and bottle fed less than the young infants in Udain village. (El Daher and Greiner, 1979)

DURATION: 14 months was the average duration of breast feeding among the 347 women surveyed in three villages in 1977. In the village of Bani Ghazi, young mothers who had babies during 1977-78 breast fed their infants no longer than five months and some even bottle fed from birth. (Myntti, 1979a)

DURATION BY AGE--YERIM: The mean duration of breast feeding among the 60 breast feeding mothers surveyed in Yerim ranged from 7.7 months among women 20 to 24 years of age to 18.5 months among 30 to 34 year old women. (Allman and Hill, 1978)

DURATION: 50% of mothers had stopped breast feeding their infants by 6 months of age according to surveys in the smaller towns. Breast feeding is being abandoned earlier in towns in the southern half of the country. In rural areas and particularly the coastal Tihama stretch, breast feeding is continued for much longer, but this pattern is also rapidly changing. (Firebrace, 1981)

DURATION: Breast feeding was continued on average until the child was 1 1/2 to 2 1/2 years old in the 6 surveyed villages of southern Yemen. (Hammarin, 1972)

REASONS FOR STOPPING: The most common reasons for giving up breast feeding, in order of incidence, are: 1) not enough milk, 2) baby does not want breast, 3) mothers work away from house, and 4) new pregnancy. (Rosser, 1981)

DURATION AND EMPLOYMENT--UDAIN: Working mothers (part time, full time away, and farming) breast fed significantly longer than mothers who were not employed ($p < .001$). (Greiner, 1980)

BREAST FEEDING AND FATHER'S LITERACY: The 1462 children of illiterate fathers were breast fed longer than the 1001 children of literate fathers, 14.0 months versus 11.0 months. (Yemen General Grain Corporation, 1980)

BREAST FEEDING AND HOUSEHOLD ELECTRICITY: Children in households without electricity were breast fed longer (14.4 months) than those in households with electricity (9.9 months), according to the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

URBAN

INITIATION OF BREAST FEEDING--SANA'A: In the Al Qa area of Sana'a, 28% of infants received breast milk on the first day, 10% on the second day, and 56% on the third day, according to Beckerlag and Gault (1979). (Greiner, 1979)

COLOSTRUM--MAHWEIT: Among Mahweit Town women, colostrum is manually expressed and not fed to the baby. (Ansell, 1981)

PREVALENCE BY AGE--SANA'A: 12% of the surveyed Sana'a children aged 3 months to 60 months were being breast fed at the time of the National Nutrition Survey. This included 61% of the 3 to 5 month olds, 39% of the 6-8 month olds, 26% of the 9-11 month olds, 22% of the 12 to 14 month olds, and 2% of the 15 to 59 month olds. (Yemen General Grain Corporation, 1980)

PREVALENCE BY AGE--SANA'A: 54% of the Sana'a children sampled were being breast fed at 6 months, by 12 months 24% were still being breast fed, and by 24 months only 4% were still on the breast, according to the cross sectional National Nutrition Survey. (Yemen General Grain Corporation, 1980)

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

PREVALENCE--SANA'A: 36% of the 208 urban children 3 to 30 months of age consumed breast milk the day before they were surveyed, according to maternal dietary recall. The percentage decreased by age from 61% of the youngest sampled group (3 to 8 month olds) to 47% of the 9 to 14 month olds, to 29% of the 15 to 23 month olds, and 10% of the 24 to 30 month olds. It was the most common food item consumed only during the 3 to 8 month period. (Yemen General Grain Corporation, 1980)

PREVALENCE--SANA'A: 91% (111 of 122) of multiparous women breast fed their last child in a 1976 Sana'a survey. 48.4% of the survey mothers were still breast feeding their under 3 year old children at the time of the study. (Allman and Hill, 1978)

PREVALENCE--SANA'A: The vast majority of the Suq Al Baqr area children were breast fed for at least a short time, although only 18% of the under fives were being breast fed at the time of the survey. (El Daher and Greiner, 1980)

PREVALENCE--SANA'A: 40% (N=206) of surveyed children under 3 years of age were being partially or wholly breast fed at the time of a 1977 survey conducted at a Sana'a clinic. 56% (N=283) had been initially breast fed but had been weaned by the time of the survey. Only 4% (N=20) had never been breast fed. (David and David, in press)

BREAST FEEDING PATTERN--TAIZ: 65% of the Taiz mothers surveyed gave only breast milk for 0 to 4 months. 16.5% breast fed one year or more. (Hammarin, 1972)

INFANT FEEDING PATTERN--SANA'A: 16% of the 55 infants 6 months of age or less who were sampled in the Suq Al Baqr area of Sana'a were receiving only breast milk at the time of the 1979 survey. 7% received both breast and bottle, 31% received breast milk and solid foods, 20% received breast, bottle, and solids, and 25% received only the bottle. (El Daher and Greiner, 1980)

EARLY WEANING CORRELATES--SANA'A: Results of a regression analysis of early weaning among a sample of 510 mothers showed that the variables most significantly correlated with early weaning were the age non-breast milk began ($r=.474$), reason for weaning (lactation failure, $r=.379$ and new pregnancy, $r=-.375$), mother's radio listening ($r=.192$), previous use of contraception ($r=.177$), and child's birth order ($r=.105$). The total amount of variance accounted for by the 25 variables was 58% ($R^2=.577$). (David et al., in press)

DURATION--SANA'A: The median length of breast feeding was 5.6 months among the 743 urban Sana'a children sampled in the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

DURATION--SANA'A: The median duration of breast feeding was 7 months among a sample of 510 mothers with children under 3 years of age attending a MCH center. (David et al., in press)

DURATION: Infant feeding studies and observations in several urban areas suggest the following breast feeding durations over the last decade: 1)

among a Taiz CHC clinic population 65% had stopped breast feeding by 4 months and 16.5% breast fed over a year (Hammarin, 1972), 2) among 651 Safia MCH Center mothers in Sana'a, 40% with children under 2 years of age were breast feeding but only 2% were breastfeeding infants over 18 months (Engelberger, personal communication), 3) an average of 8 months at the textile factory in Sana'a (Bornstein, 1974), and 4) in the Al Qa area of Sana'a only about 50% of mothers breast fed for over 3 months (Beckerlag and Gault, 1979). (Greiner, 1979)

DURATION BY AGE--SANA'A: The mean duration of breast feeding among the 171 breast feeding women surveyed in Sana'a ranged from 6.9 months to 12 months. Mothers 15 to 24 years old breast fed for the shortest period (6.9 to 8.7 months), mothers 25 to 29 years old breast fed an average of 11.2 months, and mothers 30 to 39 breast fed for 9.7 to 12 months. (Allman and Hill, 1978)

DURATION--SANA'A: Slightly over 50% of the under five children (N=452) had received breast milk for 6 months or longer, in a Suq Al Baqr area survey. (El Daher and Greiner, 1980)

DURATION--SANA'A: In 1975 the mean breast feeding duration was 6-9 months among Sana'ani women aged 15-24 years in a survey at the Al-Qa Maternal and Child Health Center. (Myntti, 1979a)

REASONS FOR TERMINATION--IBB: Nearly 45% of mothers questioned gave insufficient milk as the reason for terminating breast feeding. Another 19% cited a new pregnancy as the reason. (Greiner, 1980)

DURATION AND DIARRHEA: In two of three urban samples (Ibb and Suq Al Baqr), a significant association ($p < .02$) was found between longer breast feeding duration and less frequent bouts of diarrhea. (Greiner, 1980)

DURATION AND MOTHER'S RADIO LISTENING: Mothers who reported listening to the radio were twice as likely to stop breast feeding their infants before 4 months of age as those who did not report listening to the radio (32% vs. 16%) among a sample of 315 mothers. 73% of the mothers not reporting radio listening breast fed more than six months compared to 47.5% of the mothers reporting radio listening. These differences were highly significant ($p < .001$). (David et al., in press)

DURATION AND SUPPLEMENTATION: The early introduction of artificial milk and mothers' perceived lactation failure were strongly related to the early cessation (before 4 months) of breast feeding ($r = .474$ and $r = .379$ respectively), whereas breast feeding for more than 6 months was associated ($r = .375$) with weaning being due to a new pregnancy, in a survey of 510 women. (David et al., in press)

DURATION AND FATHER'S LITERACY--SANA'A: Children of illiterate fathers breast fed for longer (7.8 months) than those of literate fathers (4.7 months) among the 743 urban Sana'a children in the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING

NATIONAL

CHANGING INFANT FEEDING PRACTICES: Infant feeding practices are changing rapidly even in the most remote villages, with young mothers in particular using the bottle rather than the breast. Many brands of powdered milk are available even in remote villages. (UNFPA, 1980)

FEEDING PATTERN TRENDS: Data from three surveys on the current age of the first child to be bottle fed suggest that bottle feeding became widespread at an earlier point in time in the town of Ibb (more contact with the port of Aden) than in Suq Al Baqr, and most recently in the village of Udain. In Suq Al Baqr and Udain bottle feeding had been introduced at a significantly earlier age to younger than to older children ($p < .005$). In addition, younger Udain mothers had a significant pattern of earlier supplementation with solids ($p < .001$) and a trend toward shorter periods of breast feeding. (Greiner, 1980)

WEANING DIET: A 1981 survey in Lawiya by Stern and others showed that fruits, vegetables, fish, eggs, and meat were rarely used in the young child's diet. Solids were introduced between 6 and 18 months of age. (Ansell, 1982b)

HARMFUL BOTTLE FEEDING PRACTICES: Three practices associated with bottle feeding in Yemen are widespread and particularly harmful: 1) the inadequate cleaning of bottles between feedings and the practice of mixing too much at one time, which is not changed until it is finished; 2) feeding often does not follow a regular schedule, the bottle is propped up so the infant can suck from it by itself or the bottle is given to the child who plays with it on the floor; and 3) overdilution of the mixes. (Firebrace, 1981)

LACK OF PERSEVERANCE: If a child shows that he does not want the offered food by either turning his head away, pushing the spoon away, or spitting the food out, then that is enough for the mother to stop trying. Most mothers believe children eat when they are ready for it, and thus do not persist in presenting it when it is refused. (Ansell, 1982a)

TECHNIQUES OF ARTIFICIAL FEEDING: Efforts made in clinics to educate mothers in the techniques of hygienic bottle feeding have seldom been successful for long. Given the lack of basic facilities, equipment, and resources, the process of maintaining hygienic feeding is time-consuming, tedious, and expensive and, thus, is often the first chore a busy mother drops from her routine. (Firebrace, 1981)

DRIED SKIMMED MILK: The dried skimmed milk given to Mother and Child Health Centers by the World Food Program is often fed in bottles to infants, even though it is intended for use by pregnant and lactating women. (Firebrace, 1981)

POWDERED MILK: There is a demand for milk powder as well as the ability to pay for it in both rural and urban areas. Even in the most remote

villages, it is possible to buy any number of brands of imported powdered milk. (Myntti, 1979a)

MILK PRODUCT IMPORTS: Over the period 1976 to 1979 imports in the category "milk and cream, preserved, concentrated" have increased ninefold to a value of over £10 million per year. These government figures underestimate the actual totals because they do not include goods smuggled in by truck over Yemen's northern border. However, not all items in this category are infant formulas, full dried milk, and condensed milks, and not all these items are consumed entirely by infants. (Firebrace, 1981)

MILK POWDER COST: Milk powder for a 6 month old child receiving the correct concentrations costs around £0.35 a day. Unskilled laborers earn around £6 a day, skilled laborers take home between £20 and £30 a day, and migrants in the oil-rich Arab states earn even more. While milk powder expenditures are small compared to the total average family income, the amount spent on baby foods is a significant portion of per capita food expenditures; thus, dilution still occurs. (Firebrace, 1981)

BOTTLES: Cheap plastic bottles had become available and increasingly common by 1971, according to Bornstein, whereas the bottle was virtually unknown before the 1962 revolution. Bornstein suggested that the use of a cup and spoon was still more common than the bottle in feeding milk. (Greiner, 1979)

BOTTLE PROPPING: Many health workers in Yemen have noted how widespread is the practice of "bottle propping." Even very young infants are left alone with bottles in their mouths. (Greiner, 1979)

BREAST MILK SUBSTITUTES FORMULAS: In 1979 and 1980 about 20 different brands of infant formulas, 30 brands of full cream milk, and 10 brands of evaporated milks were observed on sale. The most widespread infant formulas were: Guigoz 1, Nan, Pelargon, Nestogen half cream (Nestle, Switzerland), Crown Dia-G (Morinaga, Japan), Mamex (Dumex, Denmark), Meiji (Japan), Similac green, Similac red, Isomil (Abbott, USA), SMA and S-26 (Wyeth, USA), Enfamil (Bristol-Meyers, USA), Bebelac Z, Z12, Z18, and Humanized No. 1 (Ljempf, Holland), Lidamin, Humanized, and Linolac (Lidano, Denmark). (Firebrace, 1981)

BREAST MILK SUBSTITUTES--FULL CREAM MILKS: The most widely available full cream milks are: Nido, Guigoz 2, Nestogen full cream (Nestle, Switzerland), Nono, Famy (Oemolk, Austria), Dumex (Dumex, Denmark), France-Lait (Lyon, France), Coast (Holland Canned Milk, Holland), Mother's Boy, Kanny, Frisiana (Holland), Hung Mei (People's Republic of China), Farm (United Dairymen, Holland), Morny (Dutrad, Holland), Klim (Borden, USA), and Dutch Boy Instant Milk (Friesland, Holland). (Firebrace, 1981)

BREAST MILK SUBSTITUTES--EVAPORATED MILKS: In 1979-80 the most widely available evaporated milks in Yemen were Dutch Baby (Friesland, Holland), Carnation (Carnation, USA), Rose (Deutsches Milch-Kontor, W. Germany), and France-Lait evaporated milk (Lyon, France). (Firebrace, 1981)

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

PROMOTION OF BABY MILK PRODUCTS--INDIRECT: Milk companies' promotion of their products has taken two main forms--indirectly through the medical profession and more directly through various forms of advertising. The former has been the more important and has been effective because Yemen's foreign educated doctors have become figures of disproportionate power and influence. Doctors are visited regularly by milk company medical representatives who provide a variety of gifts, including free samples. (Firebrace, 1981)

PROMOTION OF BABY MILK PRODUCTS--DIRECT: Direct advertising to the public of baby milk products takes many forms in the Yemen: radio and television advertising of full cream milks; posters, calendars, and other gimmicks displaying the brand name in clinics, hospitals, and pharmacies; billboards and delivery cars with advertising on them in the larger towns; and point of sale displays and labelling on the tins. (Firebrace, 1981)

PROMOTION OF BABY MILK PRODUCTS--LABELLING: Based upon tins purchased in the Yemen in 1980, the labelling practices of the major milk companies often fail to follow the current WHO/UNICEF recommendations and even their own limited codes of ethics. For example, SMA (Wyeth) and Enfamil (Bristol-Myers) do not have Arabic instructions on their tins of powdered milk and most other companies' products have the Arabic instructions in such tiny script that they are very hard to read. Many of the unmodified full cream milks and one evaporated milk have feeding tables on the tins which start from the first week or month, despite the fact that they should not be used as breast milk substitutes (e.g., Nono, Nestogen full cream, Klim, Morny, Farm, and Carnation). The statements on some of these products suggest use for "newborns and babies" (e.g. Morny, Rose, France-Lait, and Dutch Baby). On the Morinaga tin, the Arabic and English statements differ, and the Arabic equates the formula to mother's milk. On the Nan (Nestle) tin is the statement, "comparable scientifically to mother's milk." Lidano's Humanised, Ljempf's Bebelac Humanised No. 1, and Morinaga's Crown Dia-G all use the word "humanised" on their labels. Reference to doctors and use of Western words transliterated into Arabic is also common. The net effect of most labels is to give the message that your baby could be as healthy as the smiling baby on the tin if fed on that product. (Firebrace, 1981)

PROMOTION OF BABY MILK PRODUCTS: Since the October 1979 WHO/UNICEF recommendations, it appears local milk company representatives are no better informed about the international debate on breast milk substitutes but the parent companies are being more careful in their promotion activities not to say that their products are for use as breast feeding substitutes or supplements on posters (e.g. Nido), billboards (e.g. Nono), and most television ads (e.g. Nido, Nono, France-Lait, Dumex, and Carnation). However, this is their main use. (Firebrace, 1981)

SPECIAL PREPARATION: Mothers seldom prepare any foods especially for small children. They give foods which require no extra preparation, like biscuits and bread. Several family dishes (e.g. helbah and madid) would be excellent foods for small children if they were not so strongly spiced. (Bornstein, 1973)

FIRST FOODS: The first foods other than milk given to infants are soft carbohydrate foods like biscuits, bread soaked in tea, potatoes, and rice. Gradually children are given small parts of the family foods including madid (a thin gruel prepared from flour), soured skimmed milk (labn), butter fat (zubda), sometimes with an egg mixed into it, and spiced with green herbs and chillies, asid (a thick porridge), and some boiled vegetables, if available. (Bornstein, 1973)

BISCUITS: Biscuits are very popular as an infant food, but they are made of flour with a low extraction rate and contain almost only carbohydrates. (Bornstein, 1973)

BISCUITS: Biscuits have become the main weaning food and represent a deterioration in the diet because they are made of highly milled flour. (Pillsbury, 1978)

TRADITIONAL WEANING FOODS: The major traditional weaning foods are asid, maded, harish, malalabia, and shabaza. Most of the traditional weaning foods are items that adults and older children also consume. (Yemen General Grain Corporation, 1980)

IMPORTED WEANING FOODS: Bottle feeding with imported weaning foods is rapidly replacing the traditional weaning of children with local foods and cow or goat's milk. (Firebrace, 1981)

IMPORTED BABY FOODS: In late 1980 the most commonly stocked brands of "semi solid" baby foods were Cerelac (Nestle, Switzerland) and Farley's Baby Food (Family Health products, Ltd., Glaxo, England). There were 14 brands on the market. These products are mostly fed to infants and children in bottles, and some products are actually promoted for use in bottles (e.g. Cerelac TV ads with a bottle, Buitoni Nipiol calls their product "bottle feeding biscuits"). (Firebrace, 1981)

CONSUMPTION BY RESIDENCE: Root crops, legumes, poultry, fruits, eggs, meats, and vegetables were consumed more by urban than rural children 3 to 30 months old. Milks, milk products, and fish were consumed more by children in rural than urban areas, according to dietary recalls conducted as part of the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

POSSIBLE FOOD RESTRICTIONS: Vegetables, legumes, fish, meats, and fruits are relatively uncommon in diets of children 3 to 30 months old, compared with the family diets in both rural and urban areas. This might indicate possible "taboo" foods for the child. (Yemen General Grain Corporation, 1980)

COMPLETE WEANING: When a child is to be completely weaned, the mother ususally applies bitter cactus juice to her nipples. (Pillsbury, 1978)

RURAL

TRADITIONAL PRACTICES: Women have traditionally given their own babies over to grandmothers, sisters, and others to be cared for while they left the house to work. The baby would receive cow's milk in a small goatskin

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

bag or a special tin cup. Nowadays the common pattern is to feed either fresh cow's milk or powdered milk in a bottle. (Rosser, 1981)

TRADITIONAL PRACTICES: When women were out of the house for long periods during the harvest season or while collecting grass for the family cow, the traditional practice was to leave young children at home with a female relative who fed them cow's or goat's milk from gourds, clay pots, or even a simple "pourer" made from leather. The gourds and pots were emptied between feeds, and sour milk could easily be detected. (Firebrace, 1981)

EARLY SUPPLEMENTATION--TOBANI: In the village of Tobani in the southern lowland, there was a special habit of giving almost all children an addition of diluted goat milk or cow milk from the third day of life and thereafter in increasing amounts. (Hammarin, 1972)

BOTTLE PROPPING: It is common for young infants to be left with a bottle in the house alone or with other children while the mother and other adult members of the family are out working. Even when female relatives are in the house, "bottle propping" is becoming a common sight. (Firebrace, 1981)

BOTTLE FEEDING PREPARATIONS: In rural areas the water and fuel necessary for proper sterilization of bottles and teats is scarce and prohibitively expensive. Only a tiny minority of women of child bearing age can read the instructions on the milk powder tin. (Firebrace, 1981)

POWDERED DRY MILKS: From 15 to 23 months of age powdered dry milk was the most common food item consumed. 43% of children 3 to 30 months of age consumed powdered dry milks (Nido, Nono, and Family Milk) the day before they were surveyed, according to the National dietary questionnaire. The percentage varied by age group from 29% among children 24 to 30 months of age to 63% among those 15 to 17 months of age. From 3 to 11 months of age dry powdered milk was the second most common food item consumed (breast milk was the most common). (Yemen General Grain Corporation, 1980)

POWDERED MILK--BANI GHAZI: In Bani Ghazi, it is possible to choose from three brands of powdered milk costing about 20YR (\$4.40) for a 24 ounce tin. (Myntti, 1979a)

FORMULA: 8% of the children 3 to 5 months of age consumed SMA or Morinaga brand formulas, according to the dietary history taken in the 1979 National Nutrition Survey. Thus, for this age group it was the fourth most common food item consumed. (Yemen General Grain Corporation, 1980)

MILK USE PREVALENCE--TOHEITA: 31 of 57 under-one year old children in Toheita were given powdered milk or fresh cow or goat milk, according to a recent survey. (Stern, 1981)

EARLY BOTTLE FEEDING--TOHEITA: Of the 31 children under one year of age in Toheita who were bottle fed at the time of the survey, 8 had received the bottle right from birth, 9 first received it in the second and third months, 6 in the fourth month, 2 in the fifth month, and the remaining 6 in months 6 through 8. (Stern, 1981)

EARLY BOTTLE FEEDING: 25% of the infants under one year of age in the villages around Sana'a were bottle feeding with or without breast feeding, according to Bornstein (1974). (Greiner, 1979)

EARLY BOTTLE FEEDING--UDAIN: Over 50% of the Udain children were introduced to the bottle before the age of one month, and 75% by 5 months of age. Less than 5% of the children under 2 years of age were not bottle feeding at the time of the maternal interview. Bottle feeding was commonly continued until the child was 3 years or older. (El Daher and Greiner, 1979)

ANIMAL MILKS: 41% of children 3 to 30 months of age consumed some animal milk (cow, goat, sheep, and camel milks) the day before they were surveyed according to a maternal dietary questionnaire. The percentage ranged from 30% among the 3 to 5 month olds where it was the third most common food item consumed (behind breast milk and dry powdered milks) to 49% among the 24 to 30 month olds where it was the most common food item consumed by the surveyed children. (Yemen General Grain Corporation, 1980)

ANIMAL MILK: In some areas of the Tihama there appears to be a long tradition of giving animal milk in addition to breast milk from an early age. For example, Hammarin (1972) found that all children got diluted cow or goat milk from the third day onward in the village of Tobani (near Mikha). In Yakhtul village (near Mokha), Martinez and Poulin (1979) found that animal milk, mainly goat milk, was introduced during the first days or weeks of life, and that 77% of infants received animal milk at the time of the study. Bornstein also found diluted cow or sheep milk being given to infants at an early age in Al Zohrab, Al Homrah, and Ibn Abas (1972). (Greiner, 1979)

BOTTLE USE AND SEX OF CHILD--UDAIN: Male children were started on the bottle significantly earlier than females ($p < .05$) and tended (not significant) to be breast fed longer. (Greiner, 1980)

INTRODUCTION OF WEANING FOODS: Mothers normally start to give supplementary foods other than milk at the age of 5 to 6 months, sometimes as late as after the first year. (Bornstein, 1973)

INTRODUCTION OF WEANING FOODS--UDAIN: The introduction of solid foods was unduly delayed, past the tenth month, for the majority of Udain village children. (El Daher and Greiner, 1979)

INTRODUCTION OF WEANING FOODS: Supplementary feeding customarily begins between 6 and 9 months. (Pillsbury, 1978)

INTRODUCTION AND TYPE OF WEANING FOODS: Solid foods were being introduced at earlier ages to younger children than they had been to their older siblings. Biscuits or commercial infant cereals, often fed from a bottle, were being used in place of the local preparations made from wheat, sorghum, rice, or potatoes. (El Daher and Greiner, 1979)

WEANING FOODS: In Toheita, the main supplemental foods given to young children were rice and biscuits. 50% of 100 mothers interviewed said

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

they gave only biscuits. 20 said they gave fish, 19 gave milk and tomatoes, 18 gave bread, 16 fruit and juice, 9 potatoes, 4 meat and eggs, and 3 Cerelac. (Stern, 1981)

OTHER COMMON WEANING FOODS: 28% of the surveyed children 3 to 30 months of age consumed yogurt, sour milk and/or cheese the day prior to the survey. The percentage of children increased with age from 3% of the 3 to 5 month olds to 46% of the 24 to 30 month olds. Traditional weaning foods were consumed by 19% of the total sample, ranging by age from 3% of the 3 to 5 month olds to 26% of the 24 to 30 month olds. Evaporated milk, baby biscuits (Farex, Farley's), and Cerelac were also consumed by 6 to 8% of the children. (Yemen General Grain Corporation, 1980)

CONSUMPTION OF MAJOR FOOD GROUPS: Beverages (71%), grains (68%), milks (47%), milk products (28%), fish (16%), meats (14%), vegetables (13%), and legumes (10%) were the major food groups mentioned in a one day dietary recall as consumed by children 3 to 30 months of age. (Yemen General Grain Corporation, 1980)

COMMON FOODS: Common weaning foods in southern villages were bread and porridge made from cereals like borrh and durrah, sour milk, biscuits, scrambled eggs, tea, and sometimes potatoes. Fruits and vegetables were used very seldom. The diet usually contained only carbohydrate foods, except for the milk. (Hammarin, 1972)

FOOD AVOIDANCES: The strongly spiced dishes like foul, helbah, and mareg were not regarded as suitable for infants and, therefore, were not given to them. Fish was usually not given to children below 3 years of age. (Hammarin, 1972)

TRANSITION PRACTICES: The children of 6 southern villages were generally brought directly from the breast to the adult diet with only slight modification, getting mashed adult foods often chewed in advance by the mother. No foods were especially prepared for children. (Hammarin, 1972)

TIMING: Among the 180 families studied in 6 southern villages, there were no special rules for the starting of weaning (addition of other foods), but the timing usually depended on when breast feeding finished. Diluted or undiluted milk from cow, goat, or sometimes camel was given now and then during the latter part of an infant's first year. Most often milk and additional foods were not given before the end of the first year. Children in the lowland village of Tobani received additional foods earlier than average--98% before the age of 1. In Beni Hassan 35% of the children started to get weaning foods before age of 1, but 50% had to wait until after 1 1/2 years of age. (Hammarin, 1972)

SOLIDS AND EMPLOYMENT--UDAIN: There was a significant linear relationship ($p < .03$) between the age solids were introduced and a mother's employment status, with introduction at 10.7 months by unemployed mothers, 11 months by mothers employed part time, 18 months by mothers employed in farming, and 17.7 months by mothers working full time away from the house. (Greiner, 1980)

WATER--MAHWEIT PROVINCE: Children receive very little water to drink. Comments by small children about being thirsty are often met with "You've drunk enough already--drink any more and your stomach will burst!" (Ansell, 1980)

WATER--MAHWEIT PROVINCE: Women in the Arqub subdistrict of Mahweit Province who have small babies often store water that has been boiled in a vacuum flask. (Ansell, 1980)

URBAN

CLEANSING FOOD: In Mahweit Town babies receive liquid samn (clarified butter) to clean the whole digestive channel. (Ansell, 1980)

BREAST MILK SUBSTITUTES--SANA'A: Nido (Nestle, Switzerland) was by far the most popular milk powder in Sana'a accounting for about 50% of 1979 sales. Crown Dia-G (Morinaga, Japan) was second with about 20% of the sales. Nono (Oemolk, Austria) and Guigoz (Nestle subsidiary) each have about 15% of sales. In 1980 other Nestle milk products occupied increasing shelf space in stores in Sana'a, and it was likely the Nestle share of sales was even greater. (Firebrace, 1981)

DRY POWDERED MILKS--SANA'A: 64% of the 208 Sana'a children 3 to 30 months of age consumed dry powdered milks (Nido, Nono, and Family Milk) the day before they were surveyed in the National Nutrition Survey. These were by far the most common food items consumed by the overall sample. The percentage of children consuming dry powdered milks ranged by age from 56% of the 3 to 8 month olds (second behind breast milk) to 75% of the 15 to 23 month olds. (Yemen General Grain Corporation, 1980)

TYPES OF NON-HUMAN MILK--SANA'A: Most bottle feeding mothers (73%) used unmodified dried whole milk products, 24% used more or less modified powdered infant formulas, and 6% used fresh milk, among a sample of 510 clinic-attending mothers and their under three year old children. (David and David, in press)

BOTTLE FEEDING--SANA'A: 85% of the Sana'a infants 1 month to 2 years of age surveyed were bottle fed with or without breast feeding, according to Bornstein (1974). (Greiner, 1979)

BOTTLE FEEDING--SANA'A: In Al Qa 22% of infants had been put on the bottle by one month of age, and two thirds by 3 months, according to Beckerlag and Gault (1979). (Greiner, 1979)

BOTTLE FEEDING--SANA'A: Nearly 50% of the infants sampled were bottle feeding by two months of age in the Suq Al Baqr area survey. 80% of the infants under one year of age were bottle fed. It was common for bottle feeding to continue until the child was two years of age or older. (El Daher and Greiner, 1980)

NON-HUMAN MILK AND BOTTLE FEEDING--SANA'A: 71% (N=363) of the under-three children surveyed had received non-human milk by the time of this 1977 study. Of the infants who were being bottle fed, 78% were receiving solid food as well, 22% were being partially breast fed, and only 11%

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

reported artificial milk as the only source of food. (David and David, in press)

BOTTLE FEEDING AND INTAKE--SANA'A: For the bottle fed group as a whole, median daily volume of milk intake was 451 ml (76 ml/kg), and median daily calories were 238 kcal (36 kcal/kg/day), according to this 1977 Sana'a clinic survey of children under 3 years old. Overall, only 21% of bottle fed infants received more than 60 kcal/kg from milk each day. Among the 3 to 9 month olds for whom milk feeding was the most important source of nourishment, only 27% received more than 60 kcal/kg/day. (David and David, in press)

PREPARATION OF POWDERED MILK--SANA'A: 64% of the mothers using powdered milk (188 of 294) reported preparing it at least 10% below the correct concentration of 67 kcal/dl. A sizeable minority of women made milk less than half the proper concentration (12% or 36). Another 17% (50) reported preparing concentrations 10% above the correct range. Only 19% (56) of the mothers were within 10% of the correct concentration. (David and David, in press)

PREPARATION OF POWDERED MILK--SANA'A: Brands of powdered milk that supplied small measuring scoops in the tins (3 or 5 gram scoops) were significantly more likely ($p < .001$) to be made more dilute than those with larger scoops (7 gram scoop). The one product with a 3 gram scoop tended to be made too dilute (mean concentration 45 kcal/dl vs. 78 kcal/dl for the 7 gram scoop), and infants fed this milk were twice as likely to have severe malnutrition as bottle fed infants on other milks (15.6% vs. 7.3%, $p < .05$). (David and David, in press)

COSTS OF ARTIFICIAL MILK--SANA'A: In 1977 the average monthly cost for feeding a 6 kg. infant the most popular milk brand was approximately \$15 US, which was comparable to the country's per capita gross national product. (David and David, in press)

INCOME AND MILK INTAKE--SANA'A: Both the volume and concentration of artificial milk varied significantly across the income strata in a 1977 health clinic study. Volume of milk intake decreased for each successively lower income level ($p < .03$). Milk concentration was appreciably lower in only the poorest families (less than \$78 US/month; $p < .08$). Other factors that bore no relationship to milk volume and concentration were parental literacy, parents' level of education, infant's sex and birth order, mother's age, years of residence in the capital, death of previous children, desire for future children, and use of contraception. (David and David, in press)

BOTTLE USE AND SEX OF CHILD: In one of three urban surveys (Al Qa) the sex of the child was significantly related to the earlier introduction of the bottle; males earlier ($p < .05$). In all three samples there was a non-significant trend toward an earlier stop to breast feeding among females. (Greiner, 1980)

WEANING AND BOTTLE FEEDING--SANA'A: Introduction of bottle feeding was often followed promptly by weaning from the breast in a 1977 clinic survey of 510 mothers and their under 3 year old children. 54% of

mothers starting bottle feeding reported termination of breast feeding within a month. (David and David, in press)

EARLY WEANING AND SOCIOECONOMIC INDICATORS--SANA'A: Socioeconomic indicators as a group only accounted for 8% of the variability in the age at weaning among a sample of 510 MCH clinic mothers with children less than 3 years old. Father's and mother's education, family income, and the presence of piped water, electricity, or television did not help explain the variability of weaning age. Radio listening and previous use of contraception were significantly related to early weaning. (David et al., in press)

INTRODUCTION OF SOLIDS--SANA'A: By 2 1/2 months of age, 50% of infants in the Suq Al Baqr area of Sana'a were receiving solid foods on a regular basis. (El Daher and Greiner, 1980)

FIRST SOLID FOODS--SANA'A: The first solid foods introduced to infants in Suq Al Baqr were commercial infant cereals or crushed sweet biscuits in most cases. They were often added to the bottle during the early months of life. (El Daher and Greiner, 1980)

SOLIDS AND LENGTH OF RESIDENCE--IBB: The longer a mother had been in the town (either permanently or moved from rural areas), the earlier solids were introduced to her children's diet ($p < .007$). (Greiner, 1980)

CERELAC--SANA'A: 30% of the 3 to 30 month old children consumed Cerelac on the day before they were surveyed. Thus it was the fourth most common food item consumed. Consumption varied by age group from 49% of the 3 to 8 month olds to 23% of the 24 to 30 month olds. Among the children 3 to 8 months of age Cerelac was the third most common food item, behind breast milk and dry powdered milks. (Yemen General Grain Corporation, 1980)

TRADITIONAL WEANING FOODS--SANA'A: 37% of the 3 to 30 month old urban children surveyed consumed traditional weaning foods. This percentage varied by age group from 10% of the 3 to 8 month olds, 48% of the 9 to 14 month olds, 21% of the 15 to 23 month olds, and 58% of the 24 to 30 month olds. They were the second most common food items consumed by the total sample (behind dry powdered milk) and the most common for the 24 to 30 month olds. (Yemen General Grain Corporation, 1980)

BABY BISCUITS, FORMULA, AND EVAPORATED MILK--SANA'A: Among the 41 children 3 to 8 months of age the fourth, fifth, and sixth most commonly consumed food items were baby biscuits (24%), formula-SMA and Morinaga (22%), and evaporated milk (15%) respectively, according to the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

OTHER WEANING FOODS--SANA'A: Among the urban sample of children 3 to 30 months of age, other common weaning food items include: yogurt, sour milk and cheese (13%), evaporated milk (12%), formula-SAM and Morinaga (10%), and baby biscuits (9%). (Yemen General Grain Corporation, 1980)

CONSUMPTION OF MAJOR FOOD GROUPS--SANA'A: Grains (72%), beverages (65%), root crops (60%), legumes (39%), meats (29%), poultry (22%), vegetables (20%), fruits (17%), milks (13-15%), and eggs (13%) were the major food

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

groups consumed by children 3 to 30 months of age. (Yemen General Grain Corporation, 1980)

3.3.3 DIETARY PRACTICES, AFTER WEANING

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE

NATIONAL

CAUSE OF RICKETS: The high rate of rickets may be partly attributable to inadequate exposure to sunlight, a result of the practice of shielding children from sunlight with excessive clothing. (Yemen General Grain Corporation, 1980)

HOME BIRTHS: The majority of deliveries, especially in rural areas, are attended by elderly women of the family, usually the mother. (UNFPA, 1980)

TRADITIONAL MIDWIVES: Traditional midwives exist in most communities. They tend to be old women who have established a reputation as having specialized knowledge about birth. (Myntti, 1979b)

MEDICINE MEN--SOFIS: Of the 6 southern villages surveyed in 1971-72, none had any kind of modern health service or medical facilities. The only source of local help was from sofis--medicine men or sorcerers. (Hammarin, 1972)

HEALTH SERVICES: Health services in Yemen are desperately inadequate and are largely curative and urban in focus. One third of the health centers and virtually all the inpatient facilities are in towns where only 10% of the population lives. Only a tiny fraction of rural people live anywhere near a health center. (Melrose, 1981)

HEALTH FACILITY USAGE: Only about 20% of the population has access to modern health facilities. (UNFPA, 1980)

WOMEN'S ACCESS TO MEDICAL TREATMENT: Women may be forbidden to seek medical advice because many Yemeni men will not tolerate their wives to be examined by a male doctor. In addition, some medical facilities do not have good reputations, and no honorable woman would be allowed to be seen there. (Myntti, 1979b)

NUMBER OF DOCTORS: In 1976 there were only 234 physicians (of which 110 were expatriates) practicing in the country, or one doctor for every 23,536 inhabitants. (World Bank, 1979)

MEDICAL SPECIALISTS: Only nine of Yemen's doctors specialize in public health while 75 are specialists in other more prestigious and well paying fields. (Melrose, 1981)

ILLITERACY RATES: In 1975 the average rate of illiteracy among the Yemeni adult population (15 years and above) was estimated at 87%, with a 98% rate for women. (World Bank, 1979)

URBAN

USE OF LOCAL FOODS: Local foods are used in a variety of curative ways. Special broth (araq) from a young male chicken is fed to children with measles to accelerate the appearance of spots and thus guarantee recovery. Before their appearance, however, the rigid rules of care include complete withdrawal of water and fresh air. Local eggs are rubbed on rashes, especially in the mouth. Drinking gishr (a common drink made with coffee husks) with honey and garlic added is used to treat back pain. Coughs and colds are thought to benefit from a hot drink made from barley grains, raisins, sugar, and the sweet dried fruit from the arg tree. Hilba, samn, and oil are all remedies for constipation. (Ansell, 1981)

TRADITIONAL HEALTH SPECIALISTS: In Mahweit Town, one group of traditional health specialists is very popular among the women. They are called masahat (massagers) and provide a wide range of services, including massage of sick women and children and health and nutrition advice. Their popularity may be tied to the fact that these female healers provide health care for women and children within the women's own sphere. Their method usually consists of massaging with an oily substance, usually samn (clarified butter), and they rely on local (baladi) products such as samn, eggs, sorghum, herbs, and salt. For infertility problems they give cleansing and nutritional advice as well as massage. The other group of women health specialists are the mekwa-givers (burn-givers) who apply a burn to certain areas of the skin with a long red-hot iron rod, in the belief that it will protect a person from many common diseases. These are the only group of health specialists who work entirely within the women's domain; women can on their own volition decide to see them. (Ansell, 1981)

4. NUTRITION STATUS CORRELATIONS

NATIONAL

NUTRITIONAL STATUS AND DIARRHEA: A clear and significant relationship between lower nutritional status and more frequent diarrhea was found among the children of the town of Ibb. A similar but not so strong association was found among the samples of children from urban Suq Al Baqr and rural Udain. (Greiner, 1980)

FEEDING PATTERN TRENDS: Data from three surveys on the current age of the first child to be bottle fed suggest that bottle feeding became widespread at an earlier point in time in the town of Ibb (more contact with the port of Aden) than in Suq Al Baqr, and most recently in the village of Udain. In Suq Al Baqr and Udain bottle feeding had been introduced at a significantly earlier age to younger than to older children ($p < .005$). In addition, younger Udain mothers had a significant pattern of earlier supplementation with solids ($p < .001$) and a trend toward shorter periods of breast feeding. (Greiner, 1980)

BREAST FEEDING DURATION AND MARRIAGE: In both urban Sana'a and rural Yerim village, women who were married longer breast fed for a longer period. Women married four years or less breast fed for 3.4 and 12.9 months in Sana'a and Yerim respectively. Those married 10 to 14 years breast fed 11.0 and 14.5 months respectively, while those married 15 to 19 years breast fed 12.9 and 15.4 months respectively. (Allman and Hill, 1978)

RURAL

NUTRITION STATUS AND FEEDING METHOD--UDAIN: Exclusively breast fed infants 0-6 months of age ($N=6$) had the best average nutritional status, 89.2% of WHO standard weight for age. Breast and bottle fed babies in the same age group ($N=17$) were, on average, 82% of the weight for age standard, while exclusively bottle fed babies ($N=11$) were only 75.6% of standard, according to the Udain survey. (El Daher and Greiner, 1979)

NUTRITION STATUS AND FEEDING METHOD--MAHWEIT: Infants under one year of age in Mahweit who were breast fed for an average of 5 months were of normal nutritional status (weight for age). Those infants breast fed for nearly 4 months were mildly malnourished, and those who were moderately to severely malnourished had been breast fed on average only 1.6 months. (Greiner, 1979)

NUTRITIONAL STATUS AND QAT USE--UDAIN: In Udain where the prevalence and frequency of qat use is high among mothers, increased qat use is significantly ($p < .03$) associated with lower weight for height among the children. This analysis could not determine the reason for the relationship. (Greiner, 1980)

STUNTING AND SIZE OF FARM: 66% of children 3 to 30 months old whose families had farms of 5 feddan or less were stunted compared to 51% of the children whose families had larger farms, according to the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

4. NUTRITION STATUS CORRELATIONS (Cont.)

BREAST FEEDING AND FATHER'S LITERACY: The 1462 children of illiterate fathers were breast fed longer than the 1001 children of literate fathers, 14.0 months versus 11.0 months. (Yemen General Grain Corporation, 1980)

BREAST FEEDING AND HOUSEHOLD ELECTRICITY: Children in households without electricity were breast fed longer (14.4 months) than those in households with electricity (9.9 months), according to the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

BOTTLE USE AND SEX OF CHILD--UDAIN: Male children were started on the bottle significantly earlier than females ($p < .05$) and tended (not significant) to be breast fed longer. (Greiner, 1980)

SOLIDS AND EMPLOYMENT--UDAIN: There was a significant linear relationship ($p < .03$) between the age solids were introduced and a mother's employment status, with introduction at 10.7 months by unemployed mothers, 11 months by mothers employed part time, 18 months by mothers employed in farming, and 17.7 months by mothers working full time away from the house. (Greiner, 1980)

ANEMIA AND SIZE OF FARM: Farmers with more than 5 feddan of land had more anemic children (62% with hgb. less than 11 g/dl) than those with smaller farms (53%). (Yemen General Grain Corporation, 1980)

UNDERNUTRITION AND ILLNESS, FEVER, AND DIARRHEA: The prevalence rates for illness, fever, and diarrhea were significantly higher ($p < .001$) among rural children classed as concurrently wasted and stunted (22%, 31%, and 22% respectively) and as wasted only (16%, 22%, and 23% respectively) than nutritionally normal children (12%, 19%, and 14% respectively). (Yemen General Grain Corporation, 1980)

URBAN

BREAST FEEDING AND WEIGHT FOR AGE--SANA'A: In those infants 6 months of age or younger, present breast feeding status was the only significant predictor of weight-for-age, according to a 1977 Sana'a clinic survey of 510 mothers and their under 3 year old children. Younger infants who were being breast fed were significantly heavier by about 5% than those already off the breast. (David et al., in press)

INCOME AND MILK INTAKE--SANA'A: Both the volume and concentration of artificial milk varied significantly across the income strata in a 1977 health clinic study. Volume of milk intake decreased for each successively lower income level ($p < .03$). Milk concentration was appreciably lower in only the poorest families (less than \$78 US/month; $p < .08$). Other factors that bore no relationship to milk volume and concentration were parental literacy, parents' level of education, infant's sex and birth order, mother's age, years of residence in the capital, death of previous children, desire for future children, and use of contraception. (David and David, in press)

BOTTLE USE AND SEX OF CHILD: In one of three urban surveys (Al Qa) the sex of the child was significantly related to the earlier introduction of

the bottle; males earlier ($p < .05$). In all three samples there was a non-significant trend toward an earlier stop to breast feeding among females. (Greiner, 1980)

EARLY WEANING AND SOCIOECONOMIC INDICATORS--SANA'A: Socioeconomic indicators as a group only accounted for 8% of the variability in the age at weaning among a sample of 510 MCH clinic mothers with children less than 3 years old. Father's and mother's education, family income, and the presence of piped water, electricity, or television did not help explain the variability of weaning age. Radio listening and previous use of contraception were significantly related to early weaning. (David et al., in press)

SOLIDS AND LENGTH OF RESIDENCE--IBB: The longer a mother had been in the town (either permanently or moved from rural areas), the earlier solids were introduced to her children's diet ($p < .007$). (Greiner, 1980)

DURATION AND MOTHER'S RADIO LISTENING: Mothers who reported listening to the radio were twice as likely to stop breast feeding their infants before 4 months of age as those who did not report listening to the radio (32% vs. 16%) among a sample of 315 mothers. 73% of the mothers not reporting radio listening breast fed more than six months compared to 47.5% of the mothers reporting radio listening. These differences were highly significant ($p < .001$). (David et al., in press)

DURATION AND SUPPLEMENTATION: The early introduction of artificial milk and mothers' perceived lactation failure were strongly related to the early cessation (before 4 months) of breast feeding ($r = .474$ and $r = .379$ respectively), whereas breast feeding for more than 6 months was associated ($r = .375$) with weaning being due to a new pregnancy, in a survey of 510 women. (David et al., in press)

DURATION AND FATHER'S LITERACY--SANA'A: Children of illiterate fathers breast fed for longer (7.8 months) than those of literate fathers (4.7 months) among the 743 urban Sana'a children in the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

NON-HUMAN MILK AND MALNUTRITION--SANA'A: In infants under six months of age, use of non-human milks carried a more than 8-fold increase in risk of severe malnutrition (less than 60% of reference weight for age) compared to those on breast alone ($p < .01$), according to a 1977 survey of clinic patients. Those fed both breast and bottle had the same mean weight for age as those on breast alone, while the group on bottle alone were significantly lighter (an average of 5%). (David and David, in press)

NON-HUMAN MILK AND MALNUTRITION--SANA'A: In the children 6 to 36 months of age studied in a 1977 clinic survey, severe malnutrition (less than 60% of reference weight for age) became progressively less likely if the diet included non-human milk. Infants fed on whole milk did not differ in weight for age from those fed on special infant formulas. (David and David, in press)

4. NUTRITION STATUS CORRELATIONS (Cont.)

DILUTE MILK AND MALNUTRITION--SANA'A: Infants and children fed milk at a concentration less than 50 kcal/dl were significantly more likely to have severe or moderate malnutrition than other bottle fed infants in a 1977 clinic study in Sana'a. Although severely malnourished infants received significantly less milk per day ($p < .05$) and fewer calories from milk per day ($p < .05$), they actually received more milk and calories per unit of body weight than better-nourished infants. (David and David, in press)

WEIGHT FOR AGE CORRELATES--SANA'A: Among the 6 to 36 month old infants surveyed, the variables most strongly correlated with weight for age were the age solids were introduced ($r = -.324$), father's education ($r = .304$), and the present feeding of legumes ($r = .158$). The total amount of variance accounted for by the 26 variables was $R^2 = .505$. (David et al., in press)

STATUS AND FEEDING METHOD--SANA'A: Exclusively breast fed infants ($N = 9$) had slightly better nutritional status, 82% of standard weight for age (or 87% if two premature infants are excluded) than those infants receiving breast milk supplemented with powdered milk and/or solids ($N = 32$; 81% of standard) and those receiving no breast milk ($N = 14$; 72% of standard). (El Daher and Greiner, 1980)

BRANDS OF POWDERED MILK, PREPARATION, AND MALNUTRITION--SANA'A: According to a 1977 clinic study of infant feeding, brands of powdered milk that supplied small measuring scoops in the tins (3 or 5 grams) were significantly more likely to be made more dilute than those with larger scoops (7 gram scoop). Infants fed powdered milk from the one product with a 3 gram scoop received more diluted milk (mean concentration 45 kcal/dl vs 78 kcal/dl with a 7 gram scoop) and were twice as likely to have severe malnutrition as bottle fed infants on other milks (15.6% vs. 7.5%; $p < .05$). (David and David, in press)

INTRODUCTION OF SOLIDS AND WEIGHT FOR AGE--SANA'A: Among the bottle fed infants studied at a Sana'a health center, delayed introduction of solid foods was weakly but significantly ($p < .05$) related to weight for age (i.e. the later, the lighter). No effect was seen for the exclusively breast fed infants. (David and David, in press)

EARLY WEANING CORRELATES--SANA'A: Results of a regression analysis of early weaning among a sample of 510 mothers showed that the variables most significantly correlated with early weaning were the age non-breast milk began ($r = .474$), reason for weaning (lactation failure, $r = .379$ and new pregnancy, $r = -.375$), mother's radio listening ($r = .192$), previous use of contraception ($r = .177$), and child's birth order ($r = .105$). The total amount of variance accounted for by the 25 variables was 58% ($R^2 = .577$). (David et al., in press)

STUNTING (HEIGHT FOR AGE) AND FATHER'S LITERACY--SANA'A: 57% of the 184 children 3 to 30 months of age whose fathers could not read or write showed stunting compared to 45% of the 558 children whose fathers could read or write. This is a statistically significant difference ($p < .001$). (Yemen General Grain Corporation, 1980)

ANEMIA AND FATHER'S LITERACY--SANA'A: 28% of the children surveyed whose fathers could not read or write versus 14% of those whose fathers could read or write were anemic (hgb. less than 11 g/dl). (Yemen General Grain Corporation, 1980)

BREAST FEEDING AND FATHER'S LITERACY--SANA'A: Children of illiterate fathers breast fed for longer (7.8 months) than those of literate fathers (4.7 months) among the 743 urban Sana'a sample in the National Nutrition Survey. (Yemen General Grain Corporation, 1980)

STUNTING AND TYPE OF OCCUPATION--SANA'A: Skilled workers had fewer stunted children (56%) than unskilled workers (65%). (Yemen General Grain Corporation, 1980)

STATUS AND FEEDING METHOD--SANA'A: 7% of the 216 children under 3 years of age who were bottle fed were less than 70% of the weight standard whereas only 3% of the 132 children under 3 years who were breast fed were less than 70% of standard weight in a study of children attending the Safia Mother and Child Health Center in the capital city. 44% of the bottle fed children were above 80% of the weight standard, and 64% of the breast fed children were above 80%. (Firebrace, 1981)

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

5.1 NUTRITION AND HEALTH POLICIES AND PROGRAMS, POLICIES

NATIONAL

THREE AND FIVE YEAR PLANS & SELF SUFFICIENCY: One of the main objectives of the Three Year Program 1973/4-1975/6 and the Five Year Plan 1976/7-1980/1 is self-sufficiency in food production. However, domestic production of basic foodstuffs has grown relatively slowly or may even have stagnated due to several factors: the narrow agricultural resource base, the institutional and technical problems encountered in changing subsistence farmers into efficient food producers for the market, and the massive emigration of able-bodied men from the rural areas. (World Bank, 1979)

FIVE YEAR PLAN: The Five Year Plan states that at the basis of economic development lies the establishment of an adequate infrastructure and the maximization of human resources in the country. In spirit and directives, the Five Year Plan is in harmony with a "basic needs first" philosophy. (Myntti, 1979b)

FIVE YEAR PLAN HEALTH OBJECTIVES: The main health objectives of the Five Year Plan (1976/77-1980/81) are to increase the number of medical staff, to modernize and expand hospitals, to spread modern health care to the rural areas, to launch an effective disease control program, and to improve the administration of health services. A total of YR 247 million is included for development expenditures over the five year period. (World Bank, 1979)

FIVE YEAR HEALTH PLAN: The Five Year Health Program of the Ministry of Health stresses the implementation of a wide ranging health service which includes provision of safe water, sanitation, better housing, and nutrition education. The Program also stresses the implementation of a primary health care system, designed to provide rural communities with services for mother-child health and local birth attendants. (Myntti, 1979b)

HEALTH ALLOCATIONS: The current Five Year Development Plan allocates over one half of the development expenditure on health to improving the urban hospitals. (Melrose, 1981)

BASIC HEALTH SERVICE/PRIMARY HEALTH CARE PLAN (1976): As part of the WHO country programming process, the Yemen Arab Republic Government developed a Basic Health Service/Primary Health Care Plan in 1976 and invited international assistance to implement it. The plan is designed to improve health training, develop information systems, and increase technical assistance so that PHC could be implemented throughout Yemen. (USAID, 1980)

INFANT FEEDING: The first Five Year Health Program contains no specific plans to encourage women to return to breast feeding, nor any limits to the importation of powdered milks. (Myntti, 1979a)

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

MINISTRY OF HEALTH BREAST FEEDING PROMOTION: Breast feeding promotion appears to have become a much more firmly entrenched priority for the Ministry of Health and health workers in general over the past few years. (Greiner and Latham, 1981)

NATIONAL COMMITTEE FOR FOOD AND NUTRITION: In early 1976, the Government established the National Committee for Food and Nutrition to coordinate and supervise the distribution of food relief to needy persons. The food resources are obtained exclusively through foreign aid, primarily from the World Food Program. The recipients are mainly refugees (about 5,000) and local families whose income is below the subsistence level (about 8,000). (World Bank, 1979)

GENERAL CORPORATION FOR FOREIGN TRADE: In November 1976, the Government established the General Corporation for Foreign Trade (GCFT) in an effort to assume direct responsibility for securing adequate supplies of basic foodstuffs at reasonable prices. The GCFT imports large quantities of wheat, flour, and sugar. The products are sold mostly to wholesalers but increasingly also to final consumers through a growing chain of company-owned retail shops. (World Bank, 1979)

HEALTH EXPENDITURES: Government expenditures for public health have quadrupled in real terms since 1970/1. In 1976/77, the Government spent YR 43 million on modern health care. However, in absolute terms this represented only 1/2 of one percent of GNP or US \$2 per capita. (World Bank, 1979)

HEALTH EXPENDITURES: In 1976 public health expenditures were US \$7 million (US \$1.44 per capita). (Sivard, 1979)

GOVERNMENT HEALTH ALLOCATIONS: Under 3.5% of the Government's budget allocation is provided for health, while 44% is provided for the armed forces. (Melrose, 1981)

HEALTH SYSTEM CONSTRAINTS: The principal constraints on the Yemen health system are a shortage of funds and medical personnel. The 5 Year Plan for the health sector pays increasing attention to the problems of the rural population which include inefficient utilization of existing facilities, the almost complete absence of modern health care in rural areas, water pollution, lack of sewage disposal, and increases in endemic diseases. (World Bank, 1979)

MATERNITY LEAVE: Article 37 of the Presidential Decree of Law No. (5) 1970 Regarding the Issuance of the Labor Law states (as unofficially translated) that a working woman can obtain a total maternity leave of 70 days (before and after delivery). It also states that it is not permissible to assign work to a working woman for 40 days following the delivery date and that 70% of her wages will be paid during the leave. (Myntti, 1979b)

MATERNITY LEAVE: Article 48 of Law No. 49, 1977 covering regulations for government employees stipulates that women working in the Public Administration Office be granted maternity leave with the basic salary together with a subsistence allowance. (Myntti, 1979b)

NURSING BREAKS: As of 1978-79 Yemen law does not allow for nursing breaks, nurseries at the place of work, or child care leaves for working women. (Myntti, 1979b)

5.2 NUTRITION AND HEALTH POLICIES AND PROGRAMS, PROGRAMS

NATIONAL

BREAST FEEDING PROMOTION: The Yemeni government and Yemeni health workers have implemented various measures since 1977 to arrest the decline in breast feeding and alert people to the dangers of bottle feeding, including the temporary removal of TV ads in the past and on-going efforts to remove current ones, research on the implications of bottle feeding, removal of a Morinaga ad from an official magazine, prohibition of all company representatives from visiting health institutions in the morning during mother and child clinics, establishing creches for use by working women, production of posters and slides promoting breast feeding and warning of the dangers of bottle feeding, initiation of a project to train breast feeding counsellors, and assisting in the production of an educational film. (Firebrace, 1981)

PILOT PROJECT TO PROMOTE BREAST FEEDING: Investigators from Cornell University carried out a pilot project from June 1978 through May 1981 to investigate methods to increase breast feeding. It was funded by the Rockefeller Foundation. The project included baseline surveys in four areas of over 675 mothers and their preschool children, a local pilot intervention and evaluation to promote breast feeding in Ibb, various national efforts to influence infant feeding practices (e.g., efforts to fight infant formula advertising, influencing high government officials, work on teaching materials), and attempts to spark interest in breast feeding and to increase practical knowledge about it among health professionals at all levels. (Greiner and Latham, 1981)

NUTRITION UNIT: In May 1981 a Nutrition Unit was established in the Basic Health Service Department of the Ministry of Health. Currently it is staffed and funded by Oxfam. Its objectives are: 1) to prepare reports on nutrition work in the Primary Health Care Plan, Phase I- Training Centers and in nutrition education and rehabilitation units in the country, 2) to establish a nutrition resource center, and 3) train in-country counterparts for the nutrition unit staff. (Ansell, 1982b)

NUTRITION UNIT EVALUATIONS: The Nutrition Unit, MOH has conducted a series of evaluations of the nutritional activities of health centers at Al-Rowdah, Amran, Zabid, Tahrir, Zaydia, Rada, Shahriya, Bayt al Faqi, and Ibb. The general format of the reports consists of comments on the nutritional activities, place of the nutrition room in the clinic organization, qualifications of the nutrition staff, home visiting, teaching of the nutrition section of the Public Health Care Worker, and Local Birth Assistant syllabi and suggestions for improvement. (Ansell, 1982b)

BASIC HEALTH SERVICES/PRIMARY HEALTH CARE (BHS/PHC): The 1976-1981 Five Year Plan included the BHS/PHC as a priority program. It comprises a network of services including: primary health care units (health

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

stations) at the village level, dispensary (health subcenter) at the district and large village level, and health center at the relatively large community centers. The objective was to have 20% coverage by the BHS/PHC services by mid-1981 which would be 25 rural health centers, 56 health subcenters, and 194 PHCUs. (UNFPA, 1980)

MOTHER CHILD HEALTH/FAMILY HEALTH PROJECT: In 1976 the Government in collaboration with WHO developed a three year UNFPA assisted project (which has been extended to 1982). The objectives were to strengthen the existing MCH services and gradually expand them and also to provide family planning services for health objectives. (UNFPA, 1980)

MINISTRY OF EDUCATION--WOMEN: In the Ministry of Education, a Women's Section has been established to supervise formal and non-formal education for females. They have worked to establish an appropriate health and home economics curriculum for the schools. Centers have been established where older women can study for the Primary School certificate, learn basic literacy skills, study home economics, or gain some vocational training. (Myntti, 1979b)

MINISTRY OF SOCIAL AFFAIRS--WOMEN: The Ministry of Social Affairs has a Women's Bureau which organizes research on women (e.g. rights of females in the modern work force). The Ministry also gives moral and material support to the Yemeni Women's Association. (Myntti, 1979b)

MIDWIFERY TRAINING PROGRAM: A Midwifery Training Program is now being developed by the Ministry of Health with projects in several areas of Yemen. Nutritional aspects of pregnancy, lactation, and child feeding will be a major part of the training. (Rosser and Moxey, 1982)

FOREIGN AID: In 1976 26 foreign development aid agencies were participating in the provision of health care services in Yemen. (UNFPA, 1980)

CATHOLIC RELIEF SERVICE (CRS)--NUTRITION EDUCATION: The CRS is active in an ongoing three year nutrition education project supported by \$500,000 from the U.S. Agency for International Development. The project assisted 3,000 mothers and 5,400 children. CRS/Yemen has made efforts in 1979 to seek formal certification of project trainees as community health nurses by the Ministry of Health in recognition of their permanent health care role. Emergency relief has also been furnished. (TAICH, 1980)

CATHOLIC RELIEF SERVICE (CRS)--FOOD AID: During 1978, CRS imported 2 million pounds of food for the MCH centers in the major cities of Sana'a and Hodeidah. The target of this food aid was children 6 months to 3 years of age. Their health, nutrition, and education efforts expanded in 1979 into the rural areas of Tihama. (UNFPA, 1980)

WORLD FOOD PROGRAM: A 1976 to 1978 World Food Program (WFP) project furnished surplus foods to MCH centers to feed pregnant and lactating mothers and preschool children. (UNFPA, 1980)

WORLD FOOD PROGRAM (WFP): WFP continues to deliver skim milk powder, white flour, and other surplus foods to Yemen. The majority of Maternal and Child Health centers (except Catholic Relief Service Programs) do not

distribute these foods on a regular basis because they are thought not to be "appropriate." (Greiner, 1982)

FORTIFICATION OF BREAD: The Government is modernizing bakeries and introducing a modest nutrition program designed to fortify bread with vitamins and minerals. This effort is part of the larger grain storage project which is run by the newly established Yemen General Grain Corporation, a semi-autonomous government owned enterprise under the supervision of the Ministry of Supply. (World Bank, 1979)

HEALTH SERVICES: Health services in Yemen are desperately inadequate and are largely curative and urban in focus. One third of the health centers and virtually all the inpatient facilities are in towns where only 10% of the population lives. Only a tiny fraction of rural people live anywhere near a health center. (Melrose, 1981)

RURAL

PRIMARY HEALTH CARE PROJECT: The Government's Primary Health Care Project was developed with the help of UNICEF and the World Bank. The project's long-term objective is to provide basic health services through the establishment of PHC systems in 17 rural areas (population 540,000). (UNFPA, 1980)

PRIMARY HEALTH CARE PROJECT: Plans are now underway to set up the first primary health care project in Yemen in conjunction with UNICEF and the WHO. In its first phase, one tenth of the population will be covered. (Melrose, 1981)

RURAL HEALTH CARE: A special program has been launched to provide basic medical services to rural areas. The original objectives were to establish about 1300 nurse clinics, several mobile health units, and 120 health centers by 1980/81. Coverage was intended to be about 20-25 percent of the rural population by 1980/81. (World Bank, 1979)

TIHAMA PRIMARY HEALTH CARE: The Tihama Primary Health Care Project in Hodeidah Governorate, to be implemented by Catholic Relief Service, is funded by USAID (\$11.4 million), Yemen Arab Republic Government (\$10.6 million), Catholic Relief Service (\$1.1 million), Peace Corps (\$.5 million), and others, including Germany and UNICEF (\$1.8 million). USAID/Sana'a has estimated that one half million of USAID monies in FY 1982 is earmarked for breast feeding, weaning, and maternal nutrition activities. These include a daily course in maternal nutrition education and one third of the public health care training course devoted to nutrition. (USAID, 1980)

TIHAMA PRIMARY HEALTH CARE: The Tihama Primary Health Care Project (FY 1980 to FY 1985) seeks to assist the Ministry of Health develop a primary health care system that will reach at least 75% of the population in Hodeidah Governorate and serve as a model for the rest of the country. This \$20+ million project is the first project to attempt to implement the Basic Health Services plan in Yemen and will develop the PHC system from scratch, including facilities, personnel, logistics, and management capabilities. The project calls for a network of one referral hospital

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

(existing), three existing health centers, 12 new health subcenters, and up to 250 new, community services areas. Training of health providers will include local birth attendants (LBAs), public health care workers (PHCWs), community nurses, medical assistants, and mid-level administrators and managers. The implementing agency is Catholic Relief Service. CRS will have two technical assistant teams to help develop the infrastructure and training materials. Local development associations (LDAs) will receive assistance to develop their capacities to plan, finance, and manage primary health care units. (USAID, 1980)

LOCAL DEVELOPMENT ASSOCIATIONS: Rural development has been promoted through Local Development Associations (LDA) which have focused on providing access to roads, water supply, schools, and health centers for villages. There are some 150 active associations, most of them in the Governorates of Sana'a, Taiz, Ibb, and Hajja. The principal objective of the 1963 legislation establishing LDAs was to encourage local self help. (World Bank, 1979)

RAYMAH HEALTH PROJECT: The Raymah Health Project is run by the Catholic Institute for International Relations (CIIR), a British voluntary agency. The project began in 1974 and was mainly involved with curative health care. The focus has now changed to preventive health. With funding from Oxfam, the small team of midwives, a nurse, and a doctor are training the local saheen (medicine men) and jiddaat (traditional midwives) on the importance of preventive health and breast feeding. (Melrose, 1981)

AMERICAN SAVE THE CHILDREN--MAHWEIT NUTRITION CENTER; American Save the Children/Yemen established and operated a community-based integrated rural development project in Mahweit Town, the capital of Mahweit Province, between 1978 and 1980. Women's activities in general and a health/nutrition program for women and children in particular were major components of the larger project. (Ansell, 1981)

MAHWEIT LOCAL DEVELOPMENT ASSOCIATION--SAVE THE CHILDREN FEDERATION: Save the Children provided assistance in rural development to the Governorate of Mahweit through an integrated community-based approach. The Mahweit Local Development Association was the sponsoring organization. The only direct nutrition component was the opening of a health nutrition center for children which included a weighing program, an immunization program, and nutrition education for mothers. (TAICH, 1980)

MAHWEIT INTEGRATED RURAL DEVELOPMENT PROJECT--SAVE THE CHILDREN FOUNDATION: This project had two foci: infrastructure building and health education. The health program started with nutrition education. However, it seems that the U.S. professionals tried to move the "social development" aspects of the program too quickly and the community has resisted. The future of the project is in doubt. (UNFPA, 1980)

RIDA INTEGRATED RURAL DEVELOPMENT PROJECT: The Rida Integrated Rural Development Project (Dutch) has done an extensive and systematic investigation of women. Their "action-oriented" research into agricultural practices and society in and around Rida has helped identify what messages to use and how to communicate with the society at large.

Their policy suggestions should help devise a model strategy on women in development. (Myntti, 1979b)

WADI AYYAN WATER AND HYGIENE PROJECT: An 8-week hygiene/sanitation campaign was combined with a water project that consisted of the protection of Al-Bagheri spring, the creation of a water storage facility, and an improved distribution system in the rural, isolated Wadi Ayyan area, Khabt District, Mahweit Province. The overall project was designed and supervised by the staff of American Save the Children/Yemen with the sponsorship and assistance of the Local Development Association (LDA) of the district. The health messages were delivered in person by a ASTC staff woman using audio-visuals (drawings, pictures, and tape cassette) and consisted of simple health messages to wash one's hands and body and to have sick children drink water. (Ansell and Burrowes, 1981)

LOCAL BIRTH ATTENDENTS: LBAs in a remote mountain area of North Yemen, who were trained in lactation management and practical communication skills, were very successful as active promoters of breast feeding. They visited mothers regularly from early pregnancy through 5 to 6 months post-partum. Very few of the mothers visited have begun bottle feeding. (Rosser, 1981)

URBAN

CRECHES AND OTHER MATERNITY BENEFITS: The Sana'a Textile Factory, which is the largest single employer of Yemeni women, has its own nursery. Other creches supported by women's associations and government ministries are being established. Maternity leave, nursing breaks, and transport for working mothers still need to be introduced. (Firebrace, 1981)

MCH FEEDING PROGRAM: This program conducts demonstrations for mothers of food recipients, covering weaning, illness, hygiene and sanitation, balanced diet, pregnancy and lactation, kitchen gardens, food preparation, and weight charts. The demonstrations are conducted daily at the health facilities. The program provides PL-480 wheat-soy blend, S.F. sorghum, peanut oil, and M.F.D.M. for on-site and take-home consumption by pregnant and lactating women and children age 1 to 6 years, selected by nutrition status. There are 12,000 participants in 3 provinces, in urban areas. (Austin et al., 1978)

YEMENI WOMEN'S ASSOCIATION: The Yemeni Women's Association is a women's organization that offers basic literacy and training to women in Sana'a. (Myntti, 1979b)

6. COMMENTARIES

NATIONAL

NUTRITION PRIORITIES FOR ACTION: According to the National Nutrition Survey report, the following priorities for action should be considered: 1) for preschool children, interventions to decrease the prevalence of concurrent wasting and stunting, particularly among 12 to 24 month old children and in Tihama; of wasting alone among the same subgroups; and of anemia, particularly among 3 to 36 month old children in all three rural regions; and 2) among women of child bearing age, interventions to decrease the prevalence of anemia, particularly in the rural regions. (Yemen General Grain Corporation, 1980)

NUTRITIONAL STATUS: The nutritional standard of the diet appears to have become worse with the beginnings of modernization. Trends are away from the wholesale sorghum-based foods and toward imported white wheat and white rice. Given that men do the shopping and women do the cooking, nutrition education should be directed at both. (Myntti, 1979b)

CAUSES OF MALNUTRITION: In Yemen, malnutrition does not generally seem to be due to a lack of nutritious foods, but to: 1) small groups of people who lack the income to sustain an adequate diet, 2) use of powdered milk and bottle feeding, 3) the tendency to feed children less nutritious foods (i.e. "light foods") and at a later age, and 4) poor intra-family distribution of foods. (Grose et al., n.d.)

EVALUATION OF SUPPLEMENTAL FEEDING PROGRAMS: A subcommittee report to the Ministry of Health's Basic Health Services General Committee on the design, implementation, and actual effect of supplemental feeding programs at Yemeni health centers (e.g. World Food Program), concluded that: 1) there is no evidence that the food distribution at MCH centers increases nutritional levels, 2) food distribution is very expensive, 3) there are strong arguments against food distribution as a solution to malnutrition, and 4) the solution lies in a coordinated nutrition campaign including family education on infant feeding, weaning, and the use of local foods, as well as increased production of local foods, training of nutritionists, and the creation of alternative assistance for the genuinely destitute. (Grose et al., n.d.)

INCREASE IN BOTTLE FEEDING: Growth in the popularity of bottle feeding and the rapid and recent influx of milk powders is part of the larger social and economic changes Yemen is experiencing. Some of the important factors include the emergence of Yemen as a profitable export market, the status and influence of foreign educated doctors, the "fragmentation" of family life due to migration and changing class relations, the introduction of "luxury" goods and foreign foods and drinks, the changing work patterns and aspirations of Yemeni women, and traditional beliefs about breast feeding. (Firebrace, 1981)

ARTIFICIAL FEEDING: According to Bornstein (1974), it is virtually impossible to carry out artificial feeding in a satisfactory way at the present time in Yemen given the poor hygienic conditions, lack of education, and high costs of formula. (Greiner, 1979)

6. COMMENTARIES (Cont.)

ARTIFICIAL MILK PRODUCT PROMOTION: The promotional activities of persons and companies who profit from the sales of milk powder and feeding bottles, including advertising in cinemas and on radio and television, the use of sales agents for health workers, and free samples for mothers, have played a major role in getting mothers to switch to bottle feeding. (Greiner, 1979)

MILK COMPANY INFLUENCES: Recent researches by Almroth revealed that many doctors receive frequent visits and benefits from milk company agents. Evidence also suggests that pharmacists allow milk company personnel to examine the prescription blanks that they receive to determine whether doctors follow through on their promises to prescribe certain brands for goods and services provided. (Greiner, 1980)

MILK POWDER PREPARATION AND POLICY IMPLICATIONS: In a 1977 Sana'a clinic sample, both daily milk volumes and milk concentrations of non-human milks were more strongly related to family income than to parental education or literacy. Nevertheless, incorrect preparation was not limited to the poor: size of the scoop furnished in the milk powder tins was highly correlated with level of dilution and degree of malnutrition. Educational efforts aimed at promoting breast feeding for at least the first 6 months, understanding proper bottle feeding, and providing additional calories for young infants are called for. Given the fact that most mothers use unmodified powdered whole milk and not special infant formulas, attempts to regulate the infant formula industry must also include producers of other milk products as well. (David and David, in press)

BASIC NEEDS: The Government is making a major effort in developing programs aimed at satisfying the basic needs of the population. However, effective programs in public health for the rural areas have still to be developed. In addition, food relief programs need to identify more precisely their principal target groups. (World Bank, 1979)

NUTRITIONAL EDUCATION INTERVENTIONS: Possible avenues of intervention to improve health would include persuading mothers to breast feed for at least one year and teaching practical and acceptable ways of utilizing and preparing indigenous weaning foods. (Yemen General Grain Corporation, 1980)

RECOMMENDATIONS FOR BREAST FEEDING PROMOTION: Promotion of breast feeding should be undertaken at all levels of Yemeni society. It should start from a respect for and utilization of mothers' existing knowledge about breast feeding and could include using older women who had been successful at breast feeding. The priority breast feeding messages should be the superiority of breast feeding, the importance of immediate breast feeding, knowledge of how to increase milk supply, and the high quality of all breast milk. The emphasis on breast feeding must become an important part of the training of all health workers, and clinics must actively incorporate this emphasis. The Government could take actions on baby milk advertising, the use of free powdered milk by the World Food Program and other aid donors, maternity leaves, and the availability of baby milk products. (Greiner, 1979)

RURAL

RECOMMENDED VILLAGE INTERVENTION--UDAIN: The results of the Udain village nutrition survey suggest that an improvement in village health will depend far more on educational efforts than on any curative medical practices. Informal group meetings at individual homes to discuss infant feeding practices are suggested as a means of establishing a two-way dialog between health workers and community members. Topics should include: Why do mothers bottle feed? What is good about breast feeding? How can they increase their milk supply? When does a baby need to begin solid foods? Is it good for a baby to be pale? (anemia), and Is it good to let babies get some sun? (rickets) (El Daher and Greiner, 1979)

MAJOR CAUSES OF PEM AND DIARRHEA--UDAIN: Bottle feeding is probably the major cause of both protein-calorie malnutrition and diarrhea in the younger infants in Udain village. Insufficient solid foods and bottle feeding probably combine to cause these health problems among the older children. (El Daher and Greiner, 1979)

REJECTION OF NEW FOOD: Women in the Wadi Zabid have refused to cook with a new strain of sorghum developed by the agricultural extension service (Tihama Development Authority) because of its darker color. This points to the need to incorporate social parameters, local priorities, and "felt needs" into the initial and ongoing phases of projects. (Myntti, 1979b)

URBAN

RECOMMENDATIONS ON INFANT FEEDING--SANA'A: The importance of proper infant feeding practices must be given the high priority it deserves. The Suq Al Baqr clinic should intensify its educational efforts around the following messages: 1) exclusive breast feeding for 4 to 6 months, 2) continued breast feeding for as long as possible, 3) dangers of bottle feeding at any age, 4) delayed introduction of solids until 4 to 6 months of age, and 5) increasing daily exposure of infants to the sun. (El Daher and Greiner, 1980)

BIBLIOGRAPHY

Allman, J. and Hill, A.

- 1978 Fertility, mortality, migration, and family planning in the Yemen Arab Republic. Population Studies, Spring.

Original data

Method: cross sectional; retrospective questionnaire with 26 questions on fertility, births, breast feeding, post partum amenorrhea, use of qat, and social-demographic variables.

Sample: 184 (62 rural and 122 urban) multiparous women whose most recent birth was not more than three years ago, and who attended the two clinics.

Location: two Maternal and Child Health Centers, one urban in the Al Qa'a area of Sana'a and one rural in the village of Yerim, about 125 km south of Sana'a.

This article discusses the dynamics of the population in Yemen as presented in the National Population Census of 1975. In addition, the authors report on the results of a small sample survey carried out in May 1976 which provides insights into the factors affecting fertility and mortality. Data on breast feeding is presented.

Almroth, S.

- 1979 Pilot survey of children visiting the Swedish clinics in Taiz and Zabid, the Yemen Arab Republic, 1978. Mimeograph, Taiz: Swedish clinic, July.

Original data

Method: cross sectional data collected during one week at each of two clinics in October-November, 1978; questionnaire; physical exam; weight.

Sample: every other child in the outpatient department in Taiz and every child in the Zabid clinic.

Location: 2 urban clinics: 1) outpatient department, Swedish clinic, Taiz, and 2) Child Health Center, Swedish clinic, Zabid.

This paper presents the results of a pilot survey carried out at two Swedish clinics in Yemen. The purpose of the survey was to gather information on the characteristics of the clinic population in order to plan the clinic work. Weight measures were taken, thus making available some nutrition status data.

Ansell, C.

- 1982a Nutrition Unit Position Paper (1): Supplementary, or weaning foods. Sana'a, Yemen: Nutrition Unit, BHS, Ministry of Health, January.

This short report from the Nutrition Unit (Oxfam), Basic Health Service, MOH, reviews existing literature and research on weaning, or supplemental feeding in Yemen. It discusses some reasons why children do not receive adequate supplementary foods and evaluates one not very

BIBLIOGRAPHY (Cont.)

successful education effort. The author offers ideas surrounding the introduction of a suitable (to mothers, nutritionists, and others involved) weaning food.

Ansell, C.

- 1982b Yemen 27: Six Monthly Report to Oxfam--Nutrition Unit, Department of Basic Health Services, Ministry of Health. Unpublished report, March.

This document presents a brief review of the objectives, achievements, plans, and constraints of the Oxfam-supported Nutrition Unit of the Department of Basic Services, Ministry of Health, YAR.

Ansell (Moyer), C.

- 1982c Personal communication.

Ansell, C.

- 1981 Women and Health in Mahweit Town. Applied Research Report No. 4. Westport, Conn., USA: American Save the Children/Yemen, March.

With the opening of the Mahweit Nutrition Center in June 1978 as part of the American Save the Children community-based integrated rural development project, a need was felt for an investigation of local conditions. This report is the result of the investigation carried out over the period May 1979 to May 1980. The report deals with "the average Mahweit Town woman's perceptions of health and sickness" and shows how their perceptions of prevention and cure permeate women's lives. The author highlights the fact that women are virtually excluded from the medical health sector due to deep social conventions and that women's health care suffers as a result. The traditional women's health system consists of self-help and traditional health specialists. Ideas about proper feeding and special foods play a significant role in the prevention and cure of illness and disease. The author cautions against generalizing beyond the women of Mahweit Town.

Ansell, C.

- 1980 Domestic Water Use in a Subdistrict of Mahweit Province. Applied Research Report No. 2. Westport, Conn., USA: American Save the Childre/Yemen, November.

This report for American Save the Children/Yemen looks at the cultural practices surrounding the storage and use of water for domestic purposes in the Arqub subdistrict of Mahweit Province. It is based on participant-observation data gathered by the author during field visits between November 1979 and March 1980. It covers the transport, storage, conceptions of different kinds of water, and their various uses. The discussion of water scarcity, conservation efforts, conceptions of kinds and uses of water, and unequal access are focused on their relevance to intervention efforts. A very good review of cultural beliefs and practices surrounding domestic water use.

Ansell, C.

- 1979 Notes of Food Classification in Sana'a. Unpublished paper.
(Appendices not attached). March.

This unpublished document reviews the results of a short project designed to learn more about how food was culturally defined in Yemen, in other words, to see what the word "nutrition" means to Yemen women. Using participant observation and open-ended interviews, the author is able to present a very useful and coherent view of cultural feeding beliefs and practices that any person or institution planning health, nutrition or integrated development projects should find useful.

Ansell, C.

- n.d. Cooking habits and attitudes in Mahweit. American Save the Children/Yemen, n.d. (c. 1980-81).

This short report provides information on the cooking habits of Mahweit Town women. Its purpose was to help the American Save the Children project to decide on whether to develop an intervention focused on the kitchens. The author provides a detailed description of kitchen conditions and suggests that the real question is not simply one of improving stove and kitchen conditions, but rather of women's active participation in the planning to improve conditions. Given the social conventions, serious limitations to action exist.

Ansell, C. and Burrowes, R.

- 1981 Communicating Hygiene/Sanitation Messages to Villagers: An experiment in Wadi Ayyan. Westport, Conn.: American Save the Children. June.

This report describes in detail the 8-week hygiene/sanitation campaign that was part of the water project in Wadi Ayyan, Khabt District, Mahweit Province. It offers a very useful description of the villagers and their way of life. The discussion of the campaign, including the format, use of local assistants, and the materials, has much relevance to other health education efforts aimed at illiterate populations. No formal evaluation was presented, but the review of the campaign highlighted, for example, the preference for tape cassettes over visual materials.

Austin, J.E., Mahin, M., Pyle, D., and Zeitlin, M.

- 1978 Annotated Directory of Nutrition Programs in Developing Countries. Cambridge, Mass: Harvard Institute for International Development.

This document presents responses to a questionnaire mailed to nutrition program personnel in developing countries. Program descriptions appear in tabular form. The nutrition programs of those who replied to the questionnaire are not an exhaustive or random sampling of programs.

BIBLIOGRAPHY (Cont.)

Bornstein, A.

- 1973 Some observations on Yemeni food habits. FAO Nutrition Newsletter, 10(3):1-9.

Original data

Method: cross sectional; mid-arm and head circumferences; mortality data; nutrition surveys; 1971-72 time period.

Sample: 381 children between 3 months and 4 years of age.

Location: Hamani village, Highlands; Al Zorah, Ibn Abas, and Al Homrah villages, Tihama; Al Maleka, and Dar al Ole-fi villages, Midlands; one immigrant area in urban Taiz; urban Sana'a; and Arb, Highlands.

In this paper the author gives a picture of the eating habits prevailing in the Yemen. The author attempts to establish the economic and social reasons behind these habits and outlines the steps that are being taken and that might be taken toward promoting sounder eating habits. In particular, the problem of unsatisfactory child feeding practices is dealt with at some length, since infants and young children are at highest risk of poor feeding habits.

David, C.B. and David, P.H.

- In Press Bottle feeding and malnutrition in a developing country: The "bottle starved" baby. Journal of Tropical Pediatrics (in press). Portions of this paper were presented at the Ambulatory Pediatrics Association Annual Meeting, San Francisco, April 30, 1981.

Original data

Method: cross sectional survey; interview; observation of method of bottle preparation, weighing of children, caloric calculations.

Subjects: 510 consecutive women with children under three years of age attending a health center.

Location: a busy child-health center in Sana'a.

The four objectives of this study were 1) to estimate the caloric impact of artificial milk on the diets of infants and young children, 2) to compare the nutritional status of infants by feeding technique, 3) to survey the kinds of milk products used and their preparation, and 4) to examine the relationship between underfeeding and various socioeconomic measures. The study affirmed the nutritional advantage of breastfeeding for infants under six months of age. Overdilution of powdered milk was common and was related to poorer nutritional status, the brand of milk powder, and low income. Policy implications are discussed. This study offers a unique look at infant feeding practices.

David, C.B., David, P.H., and El Lozy, M.

- In Press Determinants of breast feeding duration and nutrition in a transitional society. Journal of Tropical Pediatrics. Draft accepted for publication.

Original data

Method: cross-sectional survey conducted in 1977; interview of consecutive mothers with children under 3 years of age attending a maternal child health center; weight measures of children; statistical analysis of data.

Subjects: 510 mothers and their children under 3 years of age; the women were from a wide range of income and education levels, although most were low income.

Location: urban MCH center, Sana'a.

The two objectives of this exploratory clinic survey were to examine the relationships between a variety of social and economic factors and early weaning from the breast and to measure the effects of feeding practices on nutrition status as determined by anthropometry. The population surveyed is in transition from a traditional to a modern society. The sample shows a wide variability in social and economic indices. One of the major findings was the significant correlation between early weaning and mother's radio listening. Formula advertising is common on the radio and may play a role here. Weaning was not strongly related to family income or to father's or mother's education.

El Daher, S. and Greiner, T.

1980 Preliminary analysis of an infant feeding and health survey in the Suq Al Baqr area, Sana'a. Mimeograph, January 1980.

Original data

Method: cross sectional survey during June, July, and September 1979; home interviews; clinic anthropometrics, examinations and fecal samples.

Sample: 452 children under five years of age and their 251 mothers or guardians in the immediate neighborhoods around the clinic; this was a complete survey of the defined area except for 31 mothers and 46 children for whom anthropometrics were not obtained.

Location: the following neighborhoods surrounding the Suq Al Baqr MCH clinic in the old part of Sana'a: Daoud, Hamman Saba'a, Harat Al Jawafi, Al Fulaihi, and Suq Al Baqr.

This is a preliminary report to the Rockefeller Foundation on a nutrition and health survey done in cooperation with the Suq Al Baqr MCH clinic and the German Medical Team, with the involvement of the Ministry of Health. The purpose of the study was to identify the community health needs, to understand the community's infant feeding practices and to evaluate the community attitudes toward the clinic and health care system. This report presents a general descriptive picture of the findings with only a few quantitative analyses. More detailed reports will follow. Protein calorie malnutrition was identified as the major health problem for infants, and infant feeding practices were identified as the major area for intervention. Recommendations are offered.

BIBLIOGRAPHY (Cont.)

El Daher, S. and Greiner, T.

- 1979 Infant feeding and health in Udain: Preliminary analysis of a nutritional survey. Mimeograph, May.

Original data

Method: cross sectional census survey of all the village children with a home interview, clinic anthropometry, clinical examination, fecal and blood samples.

Sample: a complete sample of all the 302 children under 5 in the village, and interviews with their 174 mothers or guardians.

Location: village of Udain, Udain district, 30 km west of the city of Ibb.

This is a preliminary report on a nutrition and health survey done for the Norwegian Save the Children Project in Ibb, with the involvement of the Y.A.R. Ministry of Health. The study was designed to produce background information for the establishment of a health care service in Udain by the Norwegian Project in cooperation with the local development board. This report presents only a general description of the findings with few quantitative analyses. More detailed reports will be produced later. A series of concrete program suggestions are made.

FAO

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

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

Firebrace, J.

- 1981 Infant Feeding in the Yemen Arab Republic. London: Catholic Institute for International Relations, War on Want and WOW Campaigns, January.

This document outlines the increase of bottle feeding in Yemen, its associated health problems, and the role of the infant food industry in this process. The study puts the rapid and recent influx of milk powders into Yemen into a wider perspective by examining a combination of seven social and economic factors. Industry products and promotional activities are described in detail. Interventions are discussed in light of the WHO/UNICEF recommendations of October 1979.

Greiner, T.H.

1982 Personal communication.

Greiner, T.

1980 Infant feeding and nutritional status in Udain, Ibb, and two areas of Sana'a in the Yemen Arab Republic. Mimeograph, submitted to the Rockefeller Foundation, December.

Original data

Method: Essentially the same questionnaire was administered to mothers of all children under 5 years of age (60 months) who lived within the defined geographic areas of the four survey sites. In the Al Qa survey several questions were excluded and sample selection was more selective.

Sample: See El Daher and Greiner, 1980 and 1979 for detailed description of sample in Suq Al Baqr and Udain areas; 50 mothers and 188 children in Al Qa; and 200 mothers and 389 children in Ibb.

Location: Two old areas of the capital city of Sana'a; Ibb, a small city located 60 km north of Taiz on the road to Sana'a; and Udain, a village located about 30 km west of Ibb midway between the high mountains and the desert Tihama region.

This report summarizes findings on infant feedings from four surveys carried out from late 1978 through early 1980 in four areas in the Yemen Arab Republic. More precise computer analysis of the Udain and Suq al Baqr surveys (El Daher and Greiner, 1979 and 1980) are presented. In addition, data from an Al Qa survey (Beckerlag and Gault, 1979) and an Ibb survey not written up anywhere else are reported. Information from the four surveys includes anthropometric measurements, seven variables related to breast and bottle feeding, 6 variables related to mortality and fertility, frequency of listening to radio and television, frequency of gat use, mothers' responses to four questions on breast feeding, frequency of diarrhea, 6 tables relating infant feeding patterns to other variables, and four tables relating nutritional status to other variables.

Greiner, T.

1979 Background paper on breast and bottle feeding--revised. Mimeograph, May.

This paper reviews the available information on infant feeding in the Yemen Arab Republic (Y.A.R.). The author presents data from published and unpublished studies as well as from the observations of health professionals. He focuses on the decline of breast feeding and the increase of bottle feeding as one of the two major causes of the high levels of malnutrition in Yemen. The scattered information available over the last decade suggests that the easy availability of artificial milk products, the promotional activities of the sellers of these products, the lack of adequate health worker training on nutrition, and the beliefs of the Yemeni women all contribute to this situation. Recommendations for interventions are detailed.

BIBLIOGRAPHY (Cont.)

Greiner, T.H. and Latham, M.C.

- 1981 Summary report on the outcome of: A pilot project to investigate methods to increase breast feeding in the Yemen Arab Republic.
Rockefeller Foundation Supported Project, June 20.

This report provides a brief description of a pilot project to investigate methods to increase breast feeding in the Y.A.R. The project ran from June 1978 through May 1981, was funded by the Rockefeller Foundation, and was administered by investigators from Cornell University. This report describes the overall project activities. Actual baseline survey data is presented in a series of other documents. The various formal and informal interventions and evaluation information are described in more detail. However, a full description will await Ted Greiner's PhD dissertation.

Grose, R. et al.

- n.d. Subcommittee Report to the Basic Health Services General Committee, MOH, on the effect of supplementary feeding at health centers (c. 1981).

This document is a draft of a subcommittee report to the Basic Health Services General Committee of the Ministry of Health on the effects of supplementary feeding programs at health centers. Information was gathered from attitudinal surveys of health workers, questionnaires on the distribution of food aid at clinics, discussions with World Food Program staff and the Ministry of Health project manager, clinic visits, statements from and discussions with nutritionists and other health workers, and published and unpublished materials. It attempts to offer positive new ideas on improving mother and child nutrition, while being critical of the design, implementation, and effects of the World Food Program assistance to MCH services (but not of the Government of the Yemen Arab Republic). The report concludes that the solution to child malnutrition lies in a coordinated nutrition campaign that does not include food handouts but does include family education on infant feeding, weaning, and use of local foods, as well as increased production of local foods to replace imports, training of nutritionists, and the creation of alternative assistance for the genuinely destitute.

Hammarin, L.

- 1972 A socio-medical study of some villages in Yemen Arab Republic.
Stockholm: Swedish Save the Children Foundation.

Original data

Method: cross-sectional; questionnaire piloted in three small villages before being used in the three "typical" medium size villages; 4-5 day stay in each village between December 1971 and May 1972; home visits included questions on demographics and food practices, physical exam, blood tests, anthropometry.

Subjects: All the 180 village families with children under 12 years of age in the 6 villages were questioned and the 618 children examined.

76 infants were under 12 months. 234 children were 1 to 5 years old, and the rest were over 5 years.

Location: Three small "pilot villages" were Dar al Gahama, Al Gibala, and Sharap; three larger villages were Manam, Tabani, and Beni Hassan; all in southern Yemen in the provinces of Taiz and Ibb. Some data also comes from urban Taiz.

This survey should be regarded as a pilot study concerning anthropometric and clinical data on children, food, weaning habits, frequency of nutritional deficiencies, socioeconomic problems, and traditional behaviors. Its purpose was to collect background data to serve future practical activities, especially for work on the main problems identified--lack of hygiene and ignorance of appropriate weaning foods.

Melrose, D.

1981 The Great Health Robbery: Baby milk and medicines in Yemen. Oxford, England: Oxfam Public Affairs Unit.

This booklet describes social conditions in Yemen and looks briefly at the political, economic, and cultural factors within and outside the country that create obstacles to better health. The focus is on the marketing of products designed for use in rich countries which can aggravate ill health in countries like Yemen: artificial baby milk and modern medicines. This Oxfam document also stresses ways in which people can act to help improve the situation in Yemen.

Myntti, C.

1979a Population processes in rural Yemen: temporary emigration, breastfeeding, and contraception. Studies in Family Planning, 10(10):282-89.

Original data

Method: first stage, a six month small demographic survey; second stage, participant-observation anthropological field work; 1977-78 time period.

Sample: first survey, all ever-married women in the three villages (N=347); second stage, residents of the target village.

Location: first survey in three villages, one in the coastal Tihama plain, another was Jebel Razih in the northern highlands, and the other Bani Ghazi on the southern plateau; second stage was carried out in Bani Ghazi.

This paper discusses the effects of three important variables on fertility in the Yemen Arab Republic: temporary emigration, breast feeding, and contraception. There appears to be a growing contradiction between the traditional beliefs about breast feeding and the increasing use of bottles and powdered milks. Old and new beliefs are discussed in light of declining breast feeding durations and the easy availability of powdered milks.

BIBLIOGRAPHY (Cont.)

Myntti, C.

- 1979b Women and development in Yemen Arab Republic. Germany: German Agency for Technical Cooperation, Ltd. (GTZ).

The Central Planning Organization of the Government of Yemen asked its Advisory Team to provide a basic report on the subject of "women in development." The female author was hired as a short term consultant to produce an intensive analysis of the status quo of Yemeni women. The main intended audience was those, both foreigners and Yemenis, who are responsible for the planning and implementation of development projects and programs in Yemen. The author takes the position that the roles and positions of Yemeni women in society should be viewed in the context of the important social and economic changes taking place. To understand these changes and their effects on women, one must acknowledge women's traditional dependency and the duty of men to support them financially, the bases of all family laws and customs. The book offers insights into the kinship and household organization, legal institutions, work roles, social roles, education, health, Yemeni government policies, evaluation of ongoing projects, and recommendations as they affect women.

Pillsbury, B.L.K.

- 1978 Traditional health care in the Near East. A report prepared for the U.S. Agency for International Development. Contract No. AID/NE-C-1395. Washington D.C.: March.

This report is the result of a four month study that attempted to collect and examine written sources of information on health beliefs and practices indigenous to the Near East. The overall goal was to provide assistance to the US AID/Near East Bureau for the design of projects that would be compatible with indigenous values and healthy practices. Information on the seven Near East countries, including Yemen, was gathered from all available written sources and is presented country by country as a preliminary overview. Useful food habits and beliefs are included.

Rosser, J.

- 1981 The promotion of breast feeding at village level. Unpublished paper, British Organization for Community Development: Raymah Health Project.

This brief paper discusses the need to promote breast feeding at the village level. It reviews some of the reasons women switch to bottle feeding. Local Birth Attendants (LBAs) or village midwives are identified as the "perfect promoters." LBAs in a rural mountain area of North Yemen were given practical training and showed that they could successfully promote breast feeding.

Rosser, J. and Moxey, L.

- 1982 Training Illiterate Women to be Midwives. Jabel Raymah Health Project, British Volunteers Programme, January.

This short report discusses the approach used in Al Jabel, Raymah to train midwives. The training program was designed to be culturally acceptable in a highly traditional society, effective in a population with very poor health and practical for the rough terrain. Traditional birth attendants were used and training was made highly relevant to the midwifery situations which they faced. Promotion of breast feeding was stressed. The program appears to have integrated itself into the existing culture in a very sensitive and positive way.

Rosser, J. and Moxey, L.

- 1981 Notes and Recommendations on Birth Attendant and Midwifery Training in the Yemen Arab Republic. Jabel Raymah Health Project, British Volunteers Programme, December.

This document describes in great detail the design of a midwifery program that is ideally suited to Yemen and is based on a careful understanding of the women's culture. It discusses the traditional local birth attendants (LBAs) and their cultural context. In addition the report lists in detail job descriptions for LBAs and assistant midwives, selection procedures, training, supervision, certification, and curriculum, and presents a full syllabus with clear learning objectives. A very useful document as much for its approach to the community as for its excellent presentation.

Sivard, R.L.

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

Using data from many sources, including WHO, USAID, and FAO, the author profiles nations, regions, and groups of countries by development status, to illustrate the dearth of social and human services worldwide and the large share of world resources spent on military activities. Calorie and protein supplies per capita were estimated at the retail level, after making allowances for animal feed, seed, storage and marketing losses, and waste.

Stern, U.

- 1981 Primary Report: Food Habit Survey among the Under Fives: Toheita Survey (Hodeidah). Unpublished paper, Radda Barnen.

Original data

Method: Simple survey questionnaire on food habits; no anthropometric measures were taken.

Sample: 100 families, mainly mothers, with 63 boys and 37 girls 0-6 years old.

BIBLIOGRAPHY (Cont.)

Location: Toheita, a small village about 8 km outside Zabid, in Tihama region.

This brief report presents the main results of a survey in Toheita undertaken to find out the actual feeding habits and nutritional status of young children. Anthropometric measures were not taken, however, because the children of the village were afraid of the instruments. The survey highlights the need for emphasizing the advantages of breast feeding, introducing the right types of weaning foods, and the prevention and cure of anemia. Radda Barnen is planning to open a nutrition center with an education component soon in Toheita.

TAICH (Technical Assistance Information Clearing House)

- 1980 TAICH Country Report: Development Assistance Programs for Yemen. 3rd edition. New York: American Council of Voluntary Agencies for Foreign Services, Inc., Technical Assistance Information Clearing House, February.

This is one of a series of periodically revised country reports which describe the development assistance activities of U.S. private non-profit organizations. This report describes the programs of 9 US non-profit organizations which provide Yemen with developmental assistance and material aid. The information given on each organization is based on data submitted by the organization itself.

UNFPA (United Nations Fund for Population Activities)

- 1980 Yemen Arab Republic: Report of mission on needs assessment for population assistance. Report No. 32. New York: United Nations Fund for Population Activities, September.

U.S.A.I.D.

- 1980 Project Directory: Yemen Arab Republic. Washington D.C.: USAID/Office of Nutrition, Fall.

This document lists and reviews all nutrition-related USAID funded projects by country. For the Yemen Arab Republic, the Tihama Primary Health Care project is reviewed. Besides a thorough description, the review includes a discussion of constraints in the financial, manpower, and infrastructure aspects of the project.

U.S.A.I.D.

- 1979 Preliminary Overview on Nutrition Planning Activities in Selected Developing Countries. Washington, D.C.: U.S. Agency for International Development, Office of Nutrition, July 3.

This document presents an overview of USAID-supported nutrition programs and activities in selected developing countries. Each project is identified and described in some detail and appropriate background information is provided. For the Yemen Arab Republic, the

USAID project listed is the Tihama Primary Health Care Project (No. 279-0065) running from FY 1980 to FY 1985. This project is the first major attempt to implement the Yemeni Basic Health Service/Primary Health Care Plan of 1976.

World Bank Country Study

- 1979 Yemen Arab Republic: Development of a traditional economy. Washington D.C.: International Bank for Reconstruction and Development/The World Bank, January.

This report is based on the findings of two economic missions which visited the Yemen Arab Republic in March/April and in October 1977. The aim of the report was to provide the basis for an understanding of the country's development issues and policies. Despite the scarcity of reliable statistical data, the broad features of present economic and social structure, major past trends, and future development options are outlined. Very little information is presented on health or nutrition.

Yemen General Grain Corporation, Ministry of Supply & Ministry of Health,
Yemen Arab Republic

- 1980 Yemen Arab Republic National Nutrition Survey, 1979. Washington D.C.: US Department of Health and Human Services, Public Health Service, Center for Disease Control and US Agency of International Development.

Original data

Method: cross sectional national survey from early July to late October 1979; four survey universes, three rural and one urban, were sampled by a two stage procedure to insure comparable statistical testing between regions; anthropometrics, clinical exams, blood samples, and interviews were used to collect data.

Sample: 3,245 children 3 months to 5 years old; 561 children for blood samples; 525 women (every fifth woman).

Location: seven of ten governorates (Hajjah, Al Hudaydah, Ta'izz, Ibb, Dhamar, Al Mahwit, and Sana'a) divided into three rural universes (Tihama coastal, Northern and Southern Highlands areas) and one urban universe (Sana'a city only).

The overall goal of the 1979 National Nutrition Survey was to provide baseline data on the nutritional status of preschool children which would be useful for determining priorities for planning and managing applied nutrition programs and for suggesting further nutrition research needs. The survey produced data on the prevalence and distribution of protein energy malnutrition in children, clinical signs suggestive of micronutrient deficiencies in children, the prevalence and distribution of low hemoglobin (anemia) in children and their mothers, duration of breast feeding, patterns of infant feeding and weaning, associations of children's nutritional status with certain socioeconomic and demographic characteristics, and estimates of foods consumed by children and their families.

BIBLIOGRAPHY (Cont.)

REFERENCES OF INTEREST

Ansell, C.

1978 The Veiled Struggle. Dialogue, Summer/Fall, pp. 21-31.

Ansell, C. and Burrowes, R.

1981 Training Manual in Elementary Hygiene/Sanitation and Its Instruction. Westport, Conn., USA: American Save the Children/Yemen, August.

Beckerlag, A. and Gault, R.

1979 Infant feeding survey in Al Qa area, Sana'a. Typed report.

Bornstein, A.

1974 Food and Society in the Yemen Arab Republic. Mimeograph. Rome: Food and Agriculture Organization, United Nations, ESN: MISC/74/4.

Bornstein, A.

1974 The conditions of young children in the Yemen Arab Republic: Report on a survey made for the UNICEF Study on the Young Child. Mimeograph, January 1974.

Makhlouf, C. and Overmeyer, G. J.

1978 "Women and social change in urban North Yemen." In J. Allman (ed.) Women's Status and Fertility in the Muslim World (New York: Praeger), pp. 333-47.

Ministry of Health

1978 The Yemen Arab Republic Ministry of Health Project for Basic Health Services/Primary Health Care. Sana'a.

Ministry of Health

1976 The Yemen Arab Republic Ministry of Health National Health Programme 1976/7-1981/2. Sana'a, August.

Nutrition Unit

1982 Nutrition Unit Resources. Nutrition Unit, Basic Health Service, Ministry of Health, Yemen Arab Republic, February.

Said, A.K.

1972 Clinical and anthropometric appraisal of nutrition status in school children, Yemen Arab Republic. Geneva: WHO Document EM/NUTR/57, Yemen S601/UNDP, July.

Swanson, R.L.

1975 Role of women in the Yemen Arab Republic. Mimeograph. U.S.A.I.D.: Sana'a.

Yemen General Grain Corporation, Ministry of Supply & Ministry of Health,
Yemen Arab Republic

1980 Summary: Yemen Arab Republic National Nutrition Survey, 1979.
Washington D.C.: U.S. DHHS, Public Health Service, Center for Disease
Control & U.S. Agency of International Development, Nov. 25, 1980.

See the full report above of the 1979 National Nutrition Survey (Yemen
General Grain Corporation, 1980) for details of procedures, results,
analyses, and recommendations. This summary volume simply highlights
the major aspects of the full survey report.