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MATERNAL AND INFANT NUTRITION REVIEWS

THAILAND

A Guide to the Literature

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INTRODUCTION

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

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

The map on page iv and Table 1 on page v show the extent to which various regions and specific locations have been surveyed. Pages vii through ix present the highlights of our findings. Pages 1 to 71 contain the data categorized according to the MINR classification system with boldface titles within each category to describe specific listings.

Pages 73 to 94 contain an annotated bibliography with each entry described in terms of type of study (original data or literature review), with methodology, sample characteristics, and location, where relevant, and a summary, and pages 94 through 96 list other references of interest.

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

Special thanks are extended to Betsy Brown; Kathy Fogel of the World Bank; Dr. Virginia Hight Laukaran of the Population Council; Dr. John Knodel; Henry Merrill of USAID; David Radel of the World Bank; Dr. Aree Valyasevi of the Institute of Nutrition, Mahidol University, Thailand; Dr. Penny Van Esterik; and Dr. Joe Wray for reading and commenting on earlier drafts of this report and/or for identifying further resources. Final responsibility for this document rests with us.

Ron Israel
INCS Project Manager

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MATERNAL AND INFANT NUTRITION REVIEWS

CLASSIFICATION SYSTEM

1. Nutrition and Health Status

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

2. Dietary Beliefs

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

3. Dietary Practices

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

4. Nutrition Status Correlations

5. Nutrition and Health Policies and Programs

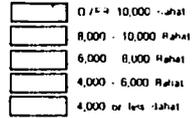
- 5.1 Policies
- 5.2 Programs

6. Commentaries

Bibliography

THAILAND

INCOME PER CAPITA 1976



- - - INTERNATIONAL BOUNDARIES
- SUR REGION BOUNDARIES
- - - CHANGWAT (PROVINCIAL) BOUNDARIES
- - - REGIONAL BOUNDARIES

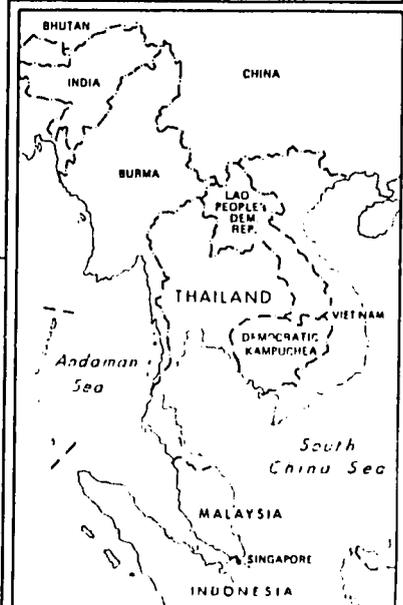
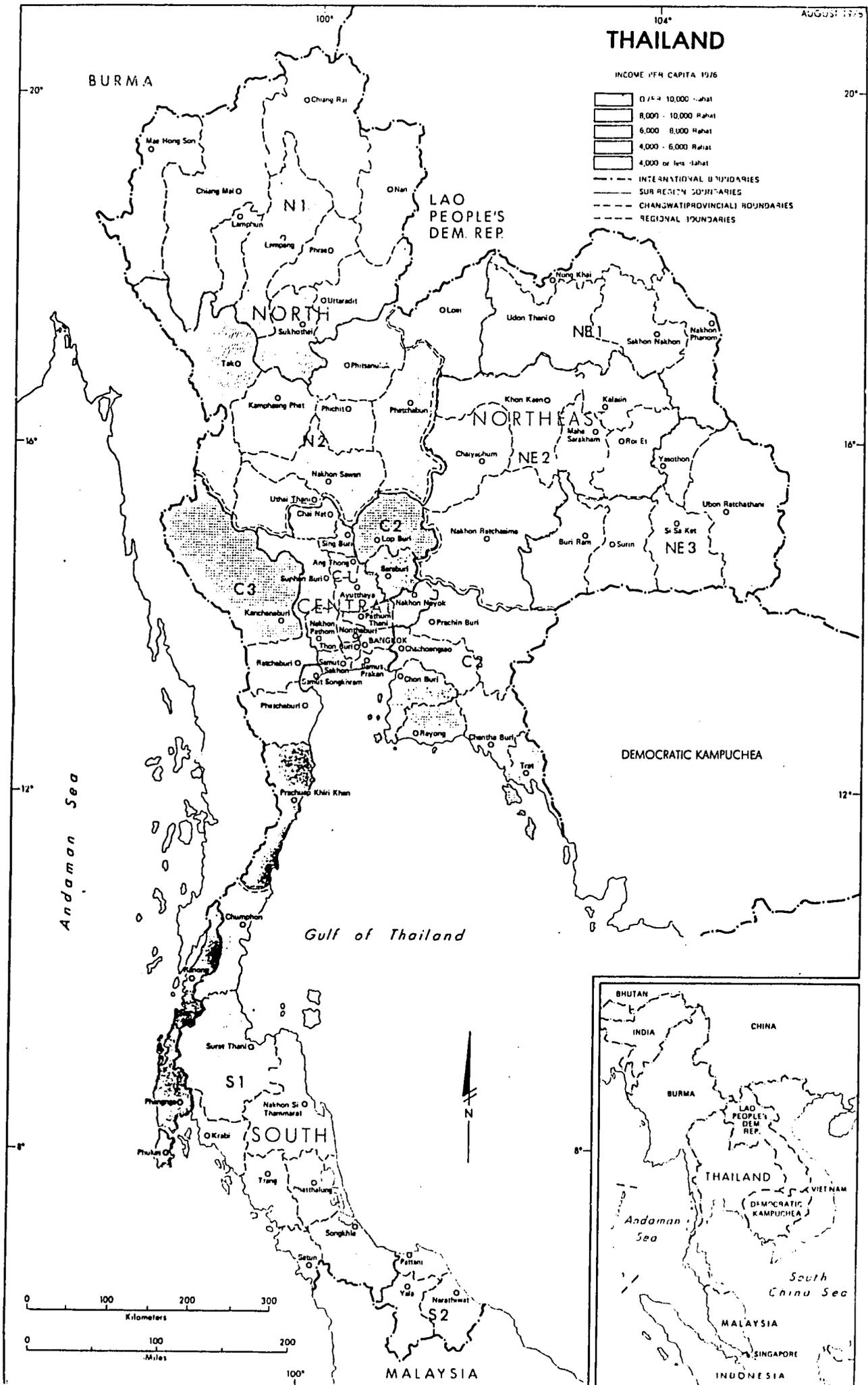


TABLE 1

Locations Studied

Region Province Village/City	Calavan, 1972	Chandrapanond, et al., 1972	Chavalittamrong, et al., 1981	Dhanamitta, et al., 1978	Dhanamitta, et al., 1979	Dhanamitta et al., 1981	Division of Family Health, 1980	Durongdej, et al., n.d.	Gershoff, et al., 1975, 1977	Harinasuta, et al., n.d.	Inst. of Pop. Studies, 1977	Jaisard & Tongsiri, 1980	Khanjanasthiti & Dhanamitta, 1978	Khanjanasthiti, et al., 1977	Khanjanasthiti & Wray, 1974	Khanjanasthiti, et al., 1973	Kietthubhaw, 1980	Knodel & Debavlya, 1980	Lampang Project Personne, 1980	Merrill & Oct, 1980	Mongkolsmai & Limprapat, 1979	O'Sullivan, et al., 1980	Suanwela, et al., 1981	Tomcharoen, et al., 1979	Thamangkul & Amatayakul, 1975	Valyasevi & Dhanamitta, n.d.	Van Esterik, 1980	Van Esterik, 1977	Viravaidhaya, et al., 1981	Viseshakul, 1976	Viseshakul, et al., 1978	Viseshakul, et al., 1977						
Central											X																											
Ayutthaya																																						
Khayai				X																																		
Lumphli				X																																		
Hua Ro Market				X																																		
Chon Buri																																						
Bang Sare				X																																		
Nong Sai				X																																		
Nong Yang				X																																		
Suphan Buri																																						
Bangkok (city)		X	X	X	X																																	
Ban Manangkasila												X	X						X			X					X	X		X								
Klong Toey													X	X																								
Makasan													X	X																								
Premprachon													X	X																								
Wat Lard Bou Kaw													X	X																								
N.A.																																						
Bang Pa-In (3 villages)				X								X	X																									
North											X																											
Chiang Mai																																						
Bantaw								X																														
Buak Khang			X																																			
Chomtong												X																										
Hongdong												X																										
Harn Kaew																																						
Hmong & Karen hill tribes								X																														
On Nua																																						
On Tai			X																																			
Sansai			X																																			
26 villages	X																																					
Chiang Rai																																						
Mae Chan																																						
Lampang																																						
Northeast																																						
Khon Kaen						X					X	X																										
Amphawan			X																																			
Bung Chim																																						
Don Doo																																						
Hong Kua																																						
Hua Fai																																						
Song Puev																																						
Maha Sarakhan																																						
Nakhon Ratchasima																																						
Na-Klang																																						
Ubon Ratchathani																																						
South			X	X																																		

HIGHLIGHTS

1. **NUTRITION AND HEALTH STATUS:** Major nutritional problems of Thai people are protein energy malnutrition, Vitamin A deficiency, beri-beri, riboflavin deficiency, endemic goiter and anemia. PEM is the most widespread nutritional problem, especially for infants and preschool children. The highest prevalences were in the Northeast, although the rates among urban slum children (mainly in Bangkok) have been shown to be three times as high as in rural areas. The most recent national sampling showed 57% of children 0-5 years old were suffering some form of PEM with 16% suffering moderate to severe forms of PEM. Nutritional deficiencies were lowest during the harvest season. No progress in reducing PEM rates was made during the Fourth Five Year Plan (1977-1981) according to government surveys. National infant mortality rates (IMRs) declined from about 79-84 deaths per 1000 live births in 1964-7 to about 56-61 per 1000 in 1974-5. IMRs appear to be highest in the North region and lowest in urban areas. Growth rates for rural infants during the first 6 months of life are normal, whereas poor urban infants show an early pattern of growth failure due in part to improper bottle feedings (e.g. use of sweetened condensed milk). High rates of low birth weight babies and of iron deficiency anemia among pregnant women (reflecting poor maternal status) exist in both urban and rural areas. Poor hygiene is a factor in 80% of all illness and 40% of all deaths.

2. **DIETARY BELIEFS:** Meat preferences in Thailand differ by ethnic group: Chinese people prefer pork and avoid beef; Muslims prefer fish and avoid pork; and Thais prefer fish. Potentially harmful food restrictions are especially aimed at pregnant and lactating women. For pregnant women, meat and eggs are restricted for fear of a large baby and difficult delivery, but coconut was identified often as a special food. More women avoid certain items than eat special foods. During the post-partum period, the ritual "lying by the fire" involves a very restricted intake (mainly salted baked rice and pork skin) in the belief that this protects the health of both the suckling infant and the mother. Only the indigenous granny midwives (mo tam yai) are trained in the techniques necessary for interpreting and guiding the process of childbirth and lactation. Breast feeding is an important part of the traditional belief system; successful breast feeding validates the "merit store" of the women and will be paid back by the child; the initial nursing experience is thought crucial for success; there is recognition that both mother and infant need to "learn" how to nurse; the best teacher is laing di (a successful nourisher herself); a wet nurse may nurse a newborn first to help the infant learn to suck and to allow the mother's milk to come in; colostrum may be thought to set a poor start (e.g. of "bad" color and insufficient amount) for the nursing couple. Rural women have confidence in successful breast feeding and respond to low milk supply by eating Kaeng Leang (a vegetable curry soup), drinking boiled water and nursing more often. Urban elite women expressed much less confidence in breast feeding, suggesting that only exceptionally healthy mothers could succeed, had more negative attitudes toward breast feeding, with some suggesting it was "animal-like" and only done for lack of money, and experienced more problems. Bottle feeding was seen by the urban elite as part of a modern technology "package" that was the most appropriate method for them. Aggressive promotion of infant formula has been found in urban areas and is cited as significant pressure to bottle feed. No special weaning foods

HIGHLIGHTS (Cont.)

were recognized in rural areas, where it was thought that large intakes of rice would lead to faster development, that eggs and sometimes fish should be restricted, and that sick children should receive a restricted diet. In urban slums, mothers misperceived the health of their children as better than it actually was.

3. DIETARY PRACTICES: Bulky glutinous rice (with its low calorie density) is by far the major staple food, accounting for at least 75% of the total calories and the majority of protein in the traditional diet. Highly milled rice is the preferred form (with a loss of nutrient value); brown rice is considered unfit for humans. Fish, beef, pork and eggs are the most common high-protein foods. Vegetables are common, but fat and oil intakes are low. Generally, the quality and diversity of diet varies according to income. Rural pregnant and lactating women eat no special supplemental foods, and are much more likely to restrict their diets, especially in the post-partum period of "lying by the fire." There was a continuous decline among both urban and rural women in breast feeding initiation and duration from 1969 to 1979; rural mothers still breast feed at higher rates and for longer periods than urban mothers; the highest rates and duration are found in the rural Northeast and North. Generally, supplemental feeding of infants starts early (within the first month). Glutinous rice and bananas are the staple weaning foods for infants in rural areas. There is a growing trend towards the use of sweetened condensed milk instead of breast milk in urban and semi-urban areas. Infant formula is the method of choice for elite Bangkok women. Infant formula companies advertise aggressively in urban areas. Rice, fish and vegetables are the main foods eaten by preschool children, although little attention is given to insuring that they eat foods other than rice. The post weaning diet is bulky and monotonous.

4. NUTRITION STATUS CORRELATIONS: The two major causes of PEM among children were lack of breast feeding in urban areas and insufficient supplementary foods in rural areas. PEM was correlated with lower family income and lower calorie intakes. Families that introduce glutinous rice feedings to infants during the first week of life have a prevalence rate of bladder stone disease twice that of families supplementing after this time. Lower proportions of women breast fed their most recent child if they had more than a primary education or if their husbands were more highly educated, in both rural and urban areas. Breast feeding measures were highest among women who wanted no more children and who did not use contraception; and were lowest among contraceptive users who wanted more children. In rural areas, breast feeding was more common among lower socioeconomic status women than higher SES women, women who were either self or family employed, those who were engaged in farm work, those delivering their infants at home and those with the least contact with urban areas. In the urban areas, the best breast feeding performance was related to women with lower socioeconomic status, with 1 to 7 years of schooling, who were not working, had home delivery, and were of rural origin.

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS: The Fifth Five Year Plan (1982-6) states that economic growth alone cannot overcome absolute poverty among the Thai people. Thirty-six provinces have been identified as "backward areas" to be targeted for intensified efforts to meet basic human needs. The Fourth Five Year Plan (1977-1981) was the first to emphasize nutrition.

Currently, a National Food and Nutrition Committee (an interministerial body chaired by the Ministry of Health) is responsible for developing and implementing the Five Year Food and Nutrition Policies. The major objective of the first Food and Nutrition Policy was to improve the nutritional status of 30% of target population (i.e., 3 million infants, preschool children and pregnant and lactating mothers). Nutrition programs included programs to promote breast feeding, to provide supplementary foods, to construct more child nutrition centers, to use mobile units for nutrition education and to train more health personnel in nutrition as part of larger, integrated health care programs. The major international agencies working on aspects of these Thai policies and programs are UNICEF, WHO, FAO, USAID and the Governments of Australia, Canada, Japan, New Zealand, Norway and the United Kingdom. A special breast feeding promotion program will begin in 1982 in the Northeast region. Many governmental and voluntary agencies have organized special feeding programs for refugees on the Thai/Kampuchea border.

1. NUTRITION AND HEALTH STATUS

1.1 NUTRITION AND HEALTH STATUS, GENERAL

NATIONAL

NUTRITION PROBLEMS: The seven most important nutrition problems include protein energy malnutrition, iron deficiency anemia, vitamin A deficiency, simple goiter, beri-beri, urinary bladder stone disease and riboflavin deficiency. Among these, PEM is the most widespread. (Valyasevi, 1978)

NUTRITION PROBLEMS: The major nutrition problems affecting the Thai people, especially infants and preschool children, are protein-energy malnutrition, vitamin A deficiency, beri-beri, riboflavin deficiency, endemic goiter due to iodine deficiency, anemia due to iron deficiency, and urinary bladder stone disease. (Dhanamitta et al., 1978)

MALNUTRITION: A 1975 Division of Nutrition, MOPH survey revealed that 53% of the surveyed population in the Central province of Suphan Buri were malnourished in some degree (using Gomez's classification of weight for age), 61.5% of the sampled population in the Southern province of Nakhon Si Thammarat were malnourished, 65% of the Chiang Mai, North Region population suffered some degree of malnutrition, and 73% of the sample from the Northeast province of Nakhon Rajsima were malnourished. (UNICEF, 1979)

RIBOFLAVIN (VITAMIN B₂) DEFICIENCY: Riboflavin deficiency is often found among preschool and school aged children and pregnant and lactating women, especially in rural areas during the summer. (Mongkolmai and Limprapat, 1979)

GOITER: The goiter belt covers 30 provinces in the North and Northeast where about 45% of the population lives. A deficiency of iodine in foods was found to be a major cause of goiter. (Mongkolmai and Limprapat, 1979)

IRON DEFICIENCY ANEMIA: The incidence of iron deficiency anemia in the Northeast was 11.43%; in the South, 7.84%; and in the North, 6.24%, according to a 1975 survey. Food consumption surveys, including a 1960 national survey, have shown that the average Thai consumed more than 18 mg of iron per day. This suggests that the problem is due to maldistribution, malabsorption and/or parasites. (Mongkolmai and Limprapat, 1979)

ANEMIA: Anemia is a major health problem. Iron deficiency appears to be the primary cause. (Valyasevi and Dhanamitta, n.d.)

BLADDER STONE: Bladder stone disease is prominent in the Northeast and North where up to 40% of the people have been operated on or have shown symptoms. A majority of cases (61%) are children under 10 years of age, with a male:female ratio of 7:1. The major cause of the disease is an

1.1 NUTRITION AND HEALTH STATUS, GENERAL (Cont.)

inadequate intake of phosphorus. (Mongkolsmai and Limprapat, 1979)

INDIRECT MALNUTRITION MEASURES: 31% of the Thai population was estimated to be malnourished according to 1975 calculations of household food expenditures and of minimum nutritional requirements. The extent of malnutrition was calculated to be much more pronounced in the Northeast (42%) and in the North (38%). The Bangkok area showed the lowest rate of malnutrition (10%). (Mongkolsmai and Limprapat, 1979)

INPATIENT MALNUTRITION: In 1970, a survey of the occurrence of nutritional deficiency among patients attending 62 hospitals in 57 provinces yielded 1,194 cases of hospitalized protein calorie malnutrition and 5,846 cases of vitamin deficiency diseases. (Woolley, 1974)

INCIDENCE OF NUTRITION-RELATED DISEASES: Among the outpatient admissions recorded by the Health Department in 1970 were 144,192 cases of parasitic infections, 142,267 cases of skin disease, 130,212 cases of diarrhea, 87,734 cases of eye disease, 79,130 cases of beri-beri and 3,511 goiter cases. (Woolley, 1974)

PARASITIC DISEASES: Among 23,642 people in the Northeast examined for parasitic diseases, 14,493 (61%) were found positive. Sample surveys showed an average prevalence of 75% in two villages in the Central Region; 87% in the South; 70% in the North; and 68% in the Northeast. These diseases are most common in young children. (UNICEF, 1979)

MAJOR DISEASES: The most serious diseases in Thailand, according to the Royal Thai Government's Fourth Five Year Public Health Development Plan, include food and water-borne diseases, insect and animal-borne diseases, dysentery, diarrhea, intestinal parasites, typhoid, cholera, malaria, and hemorrhagic fever. (Merrill and Oot, 1980)

DISEASES RELATED TO POOR HYGIENE PRACTICES: 80% of all illness and 40% of all deaths have been attributed to diseases related to poor hygiene practices. (Woolley, 1974)

CAUSES OF MORTALITY AND MORBIDITY: The leading causes of mortality and morbidity are gastroenteritis, respiratory tract infections, tuberculosis and accidents. (Valyasevi, 1978)

RURAL

IRON DEFICIENCIES: In a 1971 study of 928 village mothers from the Chiang Mai area, hemoglobin levels were deficient (less than 10 g./100 ml.) in 10% of the women and low (between 10 g. and 20.9 g./100 ml.) in another 13%. Hematocrit values were deficient (less than 30%) in 2% of the women and low (between 30 and 37%) in 21% of the cases. (Gershoff et al., 1975)

SEASONAL DIFFERENCES: Nutritional deficiencies varied by season; during the harvest season, food was plentiful, and the nutritional status of the

people was better than at other times of the year. (Suwanwela et al., 1981)

1.2 NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

NATIONAL

MATERNAL MORTALITY RATE: A 1970 estimate for the maternal mortality rate was 4 per 1000 live births. (Burintratikul and Samaniego, 1980)

IRON DEFICIENCY ANEMIA: 50 to 70% of pregnant and lactating women are estimated to be iron deficient. The four surveys cited showed a range of 21% to 39% of pregnant women with iron deficiency anemia. (Mongkolsmai and Limprapat, 1979)

ANEMIA: An estimated 30% of pregnant women are anemic. Anemia in pregnant women is related to low birth weight or prematurity of infants. (UNICEF, 1979)

RIBOFLAVIN (VITAMIN B₂) DEFICIENCY: Angular lesions, symptoms of riboflavin deficiency, were found in 3% of the pregnant women studied, according to a 1975 report. (Mongkolsmai and Limprapat, 1979)

RURAL

MATERNAL NUTRITION STATUS: The average birth weight of newborn infants was 2.7 kg compared to an average of 3.0 kg among newborns of well-nourished mothers in a 1961 rural study. (Valyasevi, 1978)

URBAN

MATERNAL NUTRITION STATUS INDICATOR: A 1979 report from the Faculty of Medicine at Maludol University documented high rates of low birth weight infants in three hospital surveys. In a Bangkok sample of 1372 low socioeconomic class women, 12.3% of the birth weights were 2500 grams or less. In two Khon Kaen Province hospital surveys, 15.3% of 1175 low socioeconomic status women and 14.2% of 397 women of both low and middle classes gave birth to infants weighing 2500 grams or less. (Division of Family Health, WHO, 1980)

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

NATIONAL

RIBOFLAVIN (VITAMIN B₂) DEFICIENCY: Angular lesions, a symptom of riboflavin deficiency, were found in 4.2% of the lactating women sampled according to a 1975 report. (Mongkolsmai and Limprapat, 1979)

BERI-BERI (VITAMIN B₁ OR THIAMINE DEFICIENCY): Beri-beri is mainly found in the North and Northeast, especially in women who, after giving birth, restrict their diet according to traditional practices. Lactating mothers who receive insufficient Vitamin B₁ will produce inadequate milk

1.3 NUTRITION AND HEALTH STATUS, WOMEN, LACTATING (Cont.)

which can cause beri-beri in infants. Incidence is seasonal; November is the peak period. Since World War II, the use of rice hullers in small mills to produce white milled rice has made beri-beri a health problem. (Mongkolksmai and Limprapat, 1979)

RURAL

ANTHROPOMETRIC MEASURES: The mean weight of 64 lactating women from the hill-tribes in Chiang Rai province was 38.2 kg, 80% of the 1966 WHO reference standard. The mean height of these women was 145.8 cm; 146 cm is the standard. The average arm circumference was 24.4 cm and the average triceps skin fold was 10.6 cm, compared with the 1960-61 U.S. National Health Survey reference standards of 28 cm and 22 cm respectively. (Viseshakul et al., 1978)

1.4 NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

NATIONAL

PERCENTAGE OF MALNUTRITION DEATHS: The percentage of malnutrition deaths occurring in children under one year of age increased from 13% of all malnutrition deaths in 1961 to 18% of all malnutrition deaths in 1975, indicating that this age group has become more vulnerable to malnutrition relative to the rest of the population. (Mongkolksmai and Limprapat, 1979)

MALNUTRITION DEATH RATE: The rate of infant deaths caused by malnutrition declined from 0.5 per 1000 live births in 1967 to 0.2 per 1000 live births in 1975 according to public health statistics provided by the Ministry of Public Health. (Mongkolksmai and Limprapat, 1979)

INFANT MORTALITY RATE: The infant mortality rate was estimated to be 50 to 69 deaths per 1,000 live births. (Khanjanasthiti et al., 1977)

INFANT MORTALITY RATE: The infant mortality rate was reported to be 38 deaths per 1000 live births, but was probably higher. 17% of all reported deaths occurred in infants one year and under. (Woolley, 1974)

INFANT MORTALITY RATE: The official national infant mortality rate from reported deaths was 25 per 1000 live births, although the independent estimates from the Survey of Population Change suggested a more accurate rate of 75 to 80 deaths per 1000 live births. (Lampang Project Personnel, 1980)

INFANT MORTALITY RATE: The 1970 infant mortality rate was estimated at 85 per 1000 live births (from World Bank 1977 working paper). (Burintratikul and Samaniego, 1980)

INFANT MORTALITY RATE - TRENDS: Infant mortality rates from 1967 to 1975 remained roughly the same, at about 23 to 28 deaths per 1000 live births, according to Ministry of Public Health statistics. (Mongkolksmai and Limprapat, 1979)

INFANT MORTALITY RATE - TRENDS: Using indirect statistical techniques, there appeared to be a drop in the infant mortality rate from an estimated 79-84 deaths per 1000 live births in 1964-7 to approximately 56-61 per 1000 in 1974-5. (Knodel and Chamratrithirong, 1978)

INFANT MORTALITY RATES - REGIONAL DIFFERENCES: Using 1974-5 data, direct and indirect estimates of infant mortality rates showed the North with the highest rate, between 77 and 96 deaths per 1000 live births. In the Northeast, the rate was 54 to 69/1000. The South showed a rate of 60/1000 on both direct and indirect measures. The Central region (excluding Bangkok) showed the lowest rate, 39 to 50/1000. (Knodel and Chamratrithirong, 1978)

RURAL

INFANT MORTALITY RATE: An infant mortality rate of 53.6 deaths per 1000 live births was calculated from pregnancy history data in Hang Chat district of Lampang Province. A rate of 74.2 was found in Mae Tah district in Lampang Province. (Lampang Project Personnel, 1980)

INFANT MORTALITY RATES - TRENDS: There appears to have been a 20% decline in rural infant mortality rates since the 1970 calculation of 74 deaths per 1000 live births. 1978-9 figures suggest a rate of 59/1000 using indirect estimation techniques. (Knodel and Chamratrithirong, 1978)

INFANT MORTALITY RATE: In hill tribe areas of the North, available figures suggest an infant mortality rate as high as 687.5 deaths per 1000 live births. (UNICEF, 1979)

BIRTH WEIGHTS: The average birth weight of newborn infants was 2.7 kg compared to an average birth weight of 3.0 kg. among newborns of well-nourished mothers in a 1961 rural area study. (Valyasevi, 1978)

GROWTH PATTERNS: Rural infants showed normal growth curves during the first six months of life as compared with North American standards. (Wray, n.d.)

PROTEIN ENERGY MALNUTRITION: In the semi-rural and rural areas of Bang Pa-In, the percent of 0-5 month old children who were nutritionally normal was 78%, indicating the relative adequacy of breast feeding. Among the remaining 22%, 10% were classified as first degree PCM and 12% as second degree. There were no cases of severe, third degree, PCM among the sample. (Khanjanasthiti and Dhanamitta, 1978)

PEM-WEIGHT FOR AGE: Among a sample of 51 Mae Chan District hill tribe infants less than a year old, 84% were above 90% of the Bangkok weight reference standard and 16% were 70-89% of the weight standard (first degree malnutrition using Gomez classifications). (Viseshakul et al., 1978)

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

ANEMIA: 31% and 38% respectively of Ubol and Bang-Pa-In area village infants 1 to 6 months old were found to be anemic (hematocrit less than 33%) in a 1969-1972 study of 71 infants. (Valyasev and Dhanamitta, n.d.)

URBAN

INFANT MORTALITY RATE: In 1974-75 the infant mortality rate in Bangkok was 31 deaths per 1000 live births, which equaled 7,824 deaths. (Durongdej et al., n.d.)

INFANT MORTALITY RATES - TRENDS: Infant mortality rates have dropped 19% from the 31 deaths per 1000 live births estimated in 1970 to 25/1000 in 1978-9 according to indirect estimation techniques. (Knodel and Chamratrithirong, 1978)

BIRTH WEIGHTS BY SEX: Among a sample of infants from professional and middle class families, the mean birth weight was 3.12 kg. for boys and 3.01 kg for girls; both these means are below the fiftieth percentile of a North American standard. (Khanjanasthiti et al., 1973)

REFERENCE GROWTH CURVES-WEIGHT FOR AGE: Mean birth weights of boys and girls born to professional and middle-class households were below the fiftieth percentile, but between the ages of 1.5 months and 6.5 months both sexes showed rapid catch-up growth (740 g weight gain per month in boys and 630 g for girls) and reached the 50th percentile. (Khanjanasthiti et al., 1973)

REFERENCE GROWTH CURVES-HEIGHT FOR AGE: The mean height at birth (49.7 cm for males and 49.5 cm for females) was below the 50th percentile of a North American Standard, among a sample of infants from middle and professional class Bangkok families. Increments in height were 3 cm per month for both sexes during the first six months of life. At several ages the mean height had reached the 50th percentile of the reference. (Khanjanasthiti et al., 1973)

GROWTH PATTERNS: Bangkok slum infants showed a pattern of early growth failure (i.e. before six months of age) whereas middle class urban infants showed normal growth curves during the first six months of life as compared with North American standards. (Wray, n.d.)

GROWTH CURVE: The growth curve of impoverished Bangkok children was below standard by the age of 1.5 months and reached the first degree malnutrition criterion by 6 months. (Khanjanasthiti and Dhanamitta, 1978)

HEIGHT AND WEIGHT FOR AGE: Preschool children from the slums of Bangkok were already well below the 50th percentile of North American reference charts in both height and weight for age within the first six months of life, and fell below the third percentile levels in the second six months in a study of 1,154 children. (Khanjanasthiti and Wray, 1974)

WEIGHT FOR AGE: In three of four slum areas of Bangkok, the malnutrition rates using weight for age standards were 73 to 79% of the 86 children 0-5 months old. In the other area, only 10% of the 30 children were classed as having some degree of PCM. (Khanjanasthiti and Wray, 1974)

WEIGHT FOR AGE: In three urban impoverished areas of Bangkok, the rates of PEM among children 0-5 months of age were 73%, 79% and 74% respectively. First degree malnutrition (Gomez classification) was apparent in 33%, 29% and 23% of these children and severe third degree PCM was diagnosed in 13%, 0% and 17.5% respectively in the areas of Prempracha, Wat Lard Bou Kaw, and Makkasan. Improper bottle feeding had replaced breast feeding. (Khanjanasthiti and Dhanamitta, 1978)

WEIGHT AND TYPE OF MILK FEEDING: The mean weight of 52 infants age 6 months seen in a Bangkok out-patient clinic was 7.3 kgs, comparable to the 50th percentile of the Harvard Standard but the 12% of infants who received sweetened condensed milk had an average weight of 6.8 kgs. Those breast fed and those fed powdered milk had average weights of 7.3 kgs. and 7.4 kgs. respectively. (Viseshakul, 1976)

1.5 NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

NATIONAL

CHILD MORTALITY RATE: The preschool child mortality rate was estimated to be 20 per 1000. (Khanjanasthiti et al., 1977)

MALNUTRITION AS A CAUSE OF DEATH: Of an estimated 111,280 children 0-5 years of age who died in 1974, 55,000 died of malnutrition and related causes. (UNICEF, 1979)

DIARRHEAL DISEASES: Based upon 1974 figures, diarrheal diseases caused 18.6 deaths per 100,000 young children. (UNICEF, 1979)

PEM TRENDS: No progress has been made in reducing protein-energy malnutrition during the Fourth Five Year Plan period, according to a comparison of 1977 malnutrition data with the recently completed (February 1980) sampling of 250,000 infants and preschool children by the Nutrition Division. (Viravaidhya et al., 1981)

PEM PREVALENCE-WEIGHT FOR AGE: According to a 1980 Ministry of Public Health (Nutrition Division) survey, 57% of Thai preschool children are malnourished: 41% suffer first degree malnutrition; 14% second degree malnutrition; and 2% third degree malnutrition (Gomez classification). (Merrill and Oot, 1980)

PEM (WEIGHT FOR AGE): 56% (79,764 of 142,334) of preschool age children (0-5 years) in 57 provinces were found to suffer from some degree of malnutrition by the Nutrition Division, Department of Health. 15% (21,472) of these children were classified as having second or third degree malnutrition (less than 75% of standard weight for age). (Mongkolsmai and Limprapat, 1979)

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

PEM (WEIGHT FOR AGE): Of the country's seven million preschool children, approximately two million (29%) suffer first degree malnutrition (75%-85% of mean reference weight for age), another two million (29%) suffer second degree malnutrition (60%-74% weight for age) and 200,000 children (3%) suffer third degree, severe, malnutrition (less than 60% of reference weight for age). (Valyasevi, 1978)

PEM (WEIGHT FOR AGE): Among five studies carried out from 1969 to 1978, 38% of the total sample of 4543 children under 6 years old had first degree malnutrition (75%-84% of mean reference weight for age), 33% had second degree malnutrition (60%-74% of reference weight for age), and 2.7% had third degree, severe, malnutrition. Therefore, a total of 73.7% of the sample was considered malnourished to some degree. (Valyasevi, 1978)

PEM (WEIGHT FOR AGE) BY REGION: The highest rate of malnutrition among preschool children was found in the Northeast: 60%, according to a 1980 survey, with 15.5% suffering second degree malnutrition and 2.3%, third degree malnutrition. In the Northern region the overall prevalence was 54%, including 12.3% with second degree and 2.3% with third degree malnutrition. In the South 52% had some degree of malnutrition, 12.3% with second degree malnutrition and 1.8% with third degree malnutrition. In the Central region, excluding Bangkok, 46% of the preschool children sampled had some degree of malnutrition (9.2% had second degree malnutrition and 1.4% had third degree malnutrition). The lowest prevalence was in the East where 44% were malnourished, 8.7% with second degree and 1.6% with third degree malnutrition (Gomez classification; sample and methodology not presented). (Merrill and Oot, 1980)

PEM (WEIGHT FOR AGE) BY REGION: The highest prevalence of protein energy malnutrition among preschool age children (0-5 years) was 59% (57,486 of 97,344) in the Northeast region according to a 1979 government survey. The North region had a rate of 53%; the South, 50%; the Central, 47%; and the East-Central region, 42%. (Mongkolsmai and Limprapat, 1979)

PEM (WEIGHT FOR AGE) BY REGION: According to 1976 calculations, 1.3 million or about 67% of children (0-6 years old) in the Northeast had some degree of PEM (weight for age reference), with 34% having second or third degree malnutrition. In the South, the calculated percentage with PEM was 65% or about .5 million, with only 20% having second degree malnutrition and 0% with third degree. In the North, 63% (900,000) young children were thought to have PEM, 33% suffered second and third degree PEM. In the Central region (excluding Bangkok), 59% was the PEM prevalence rate (1.1 million), again with 33% second and third degree classification. The highest rates were calculated for Bangkok slums: 82% PEM prevalence with 46% second degree and 7% third degree PCM. (Mongkolsmai and Limprapat, 1979)

URBAN-RURAL MALNUTRITION DIFFERENCES: According to data from the early 1970s, malnutrition rates were three times as high among children in

urban slum areas as among children from rural areas. (Austin and Mock, 1981)

RIBOFLAVIN (VITAMIN B₂) DEFICIENCY: A 1975 report indicated that 3% of boys and 4.5% of girls 0-4 years of age showed angular lesions, a symptom of riboflavin deficiency. (Mongkolsmai and Limprapat, 1979)

RIBOFLAVIN DEFICIENCY: Riboflavin deficiency is common among children. (Muangman et al., 1977)

ANEMIA: According to 1972 figures, 33% of preschool children were anemic. (UNICEF, 1978)

MAJOR DISEASES: The major diseases causing mortality among young children in 1974 were, in order of prevalence: 1) diseases of early infancy under 1 year old (19.2/100,000); 2) diarrheal diseases (18.6/100,000); 3) pneumonia (18.1/100,000) 4) tuberculosis of the respiratory system (17.4/100,000); 5) malaria and dengue hemorrhagic fever (15.8/100,000); 6) diseases of stomach and duodenum (7.2/100,000); and 7) avitaminosis and nutritional maladjustment (5.3/100,000). (UNICEF, 1978)

MAJOR DISEASES CAUSING INFANT MORTALITY: In 1971 the major diseases causing infant mortality were diarrhea, pneumonia, convulsions, upper respiratory tract infection, vitamin deficiencies and diphtheria, according to the 1973 Young Child Study Survey by the National Economic and Social Development Board. (Family Health Division, n.d.)

RURAL

PEM IMPROVEMENTS IN URBON PROVINCE PROJECT: 55% of preschool children (N=202) from Nong-Hai village were malnourished according to a March 1979 baseline survey. Using a modified Gomez classification of weight for age, 38% of the children had first degree PEM, 16% second degree PEM and 1% third degree. After the implementation of an integrated health, nutrition and rural development project which included nutrition education and locally based supplementary infant food packages, the percentage of PEM preschool children in September 1980 had significantly dropped ($p < .01$) to 21%. No children were reported with third degree PEM, 6% with second degree PEM and 15% with first degree PEM (N=183). (Dhanamitta et al., 1981)

PEM (WEIGHT FOR AGE): 43% of the 149 Mae Chan District hill tribe children under 6 years old suffered some degree of malnutrition. 36% were classified having first degree malnutrition (Gomez classification: 75-89% of standard). 6% and 1% respectively were classed as having second and third degree malnutrition. (Viseshakul et al., 1978)

PEM (WEIGHT FOR AGE): Among 46 hill tribe infants between one and two years of age, 48% were classed as normal according to Gomez classifications of ranges of weight for age (90-100% of Bangkok reference standard weight for age), 50% had first degree malnutrition (70-89% of

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

standard), and 2%, second degree malnutrition. (Viseshakul et al., 1978)

PEM (WEIGHT FOR AGE): A 1977 follow-up nutrition survey in one area of the Lampang Health Development Project estimated that 2% of Hang Chat children under 6 years of age were severely (third degree) malnourished. (Lampang Project Personnel, 1980)

PEM (WEIGHT FOR AGE): A 1975 survey of two districts in Lampang Province indicated that 11 to 15% of children under six years old may be suffering second or third degree (Gomez classification) malnutrition against a Thai weight for age standard. An additional 31 to 44% of children had first degree malnutrition. (Lampang Project Personnel, 1980)

PEM (WEIGHT FOR HEIGHT): 10 to 11% of the 329 preschool children examined in Khon Kaen province had weights for height less than 80% of the Harvard Standards. Children in non-irrigated areas appeared to have slightly worse growth than those from irrigated villages. (Harinasuta et al., 1976)

PEM (ARM CIRCUMFERENCE): Of 2152 1-5 year old children in the Ubon Refugee Camp, 165 (7.5%) were probably suffering from malnutrition as determined by arm circumference measurements (less than 12.5 cm), but 22% of these 165 children had weights for age in the normal range. (O'Sullivan et al., 1980)

PROTEIN AND CALORIE DEFICITS: Arm muscle area and arm fat area, calculated on the basis of arm circumference and triceps skinfold measures, confirmed that protein and calorie intakes were inadequate among 149 Mae Chan hill tribe children under 6 years old. (Viseshakul et al., 1978)

MALNUTRITION (ANTHROPOMETRY): On all anthropometric measures taken in 1971, the 292 under two year old village children of the Chiang Mai area were consistently lower than the comparison middle class Bangkok children (including equivalent bone age; length; weight; and head, chest and arm circumferences). By the second year of life, the village children were 3.7 cm. shorter and 1.5 kg. lighter than the comparison children. Among the total 6 month to 4.5 year old village sample, average yearly growth was approximately 6.7 cm. compared to about 8.6 cm. per year in North American children. (Gershoff et al., 1975)

SECULAR CHANGES IN GROWTH: There was a significant secular change in the lengths and weights of the study population from January 1971 to January 1975 in children 1 to 5 years of age. Children 6 months to one year old measured in 1975 were 1.5 cm. longer and 300 grams heavier than their equivalents measured in 1971. Children one to two years old measured in 1975 were 0.9 cm. longer and 100 grams heavier than those measured in 1971. (Gershoff et al., 1977)

NUTRITIONAL DEFICIENCIES: Among 329 preschool children in irrigated and non-irrigated villages around Khon Kaen City, there were no obvious clinical signs and symptoms of nutritional deficiencies. However, the

growth curves of these children were lower than those of the children in the Khon Kaen urban area or in Bangkok. (Harinasuta et al., 1976)

PROTEIN LEVELS: Biochemical studies among 300 preschool children of Khon Kaen province, Northeast, showed that serum total protein, albumin and globulin levels of all children were within normal values. Urinary urea nitrogen-creatinine ratios were also within normal values, indicating that protein intakes were adequate. (Harinasuta et al., 1976)

CLINICAL SIGNS OF MALNUTRITION: In a 1971 study of 1265 preschool children 6 months to 5 years of age from 29 villages around Chiang Mai, the most common clinical findings of malnutrition were angular lesions on the lips, observed in 2.5% of children examined in the winter and 4.2% in the summer; and filiform papillary atrophy of the tongue, seen in 1.5% and 3.2% of the children in the two examinations. (Gershoff et al., 1975)

CLINICAL SIGNS OF MALNUTRITION: In a 1974 follow-up study of 1,163 preschool children carried out at the end of the year, 7.6% had angular lesions on their lips, a clinical sign of malnutrition. (Gershoff et al., 1977)

ANEMIA: 20.8% of preschool children had anemia (hemoglobin of less than 10 gm%) in two rainfed farming villages, while only 8.3% of the children in 4 irrigated villages had anemia in Khon Kaen province, Northeast Region. Using a criterion of less than 12 gm% of hemoglobin, 79.2% of the preschool children in the non-irrigated villages and 50.3% of children in the irrigated villages were considered to have slight anemia or anemia. (Harinasuta et al., 1976)

ANEMIA: Among the 1971 sample of one to two year olds from Chiang Mai area villages, hemoglobin levels were deficient (less than 10 g/100 ml) in 20% of the children and low (between 10 g and 10.9 g/100 ml) in an additional 27%. Hematocrit values were deficient (less than 30%) in 2% of the subjects and low (30 to 34%) in 13%. (Gershoff et al., 1975)

RIBOFLAVIN DEFICIENCY: 13.3% of the 150 children (preschool and school age) examined in two non-irrigated villages had angular stomatitis, a sign of riboflavin deficiency. 6.7% of the 477 children in four irrigated villages also showed this symptom. (Harinasuta et al., 1976)

RIBOFLAVIN DEFICIENCY: A large number of children in the Chiang Mai area showed clinical signs consistent with riboflavin deficiency, as well as low levels of riboflavin in the urine and serum. The villagers' diets contained low levels of riboflavin. (Gershoff et al., 1975)

BERI BERI: 33% of infant deaths among the Mae Chan hill tribe people studied were suspected to have been caused by beri beri. (Viseshakul et al., 1978)

MORBIDITY: Among the preschool children (1-5 years) studied in 1973-4 in 29 Chiang Mai area villages, there was surprisingly little illness and

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

diarrhea, with more than 50% of the days of illness due to respiratory illness. (Gershoff et al., 1977)

PARASITES: The major parasitic diseases found in children in irrigated and non-irrigated areas outside Khon Kaen City were hookworm infection (13%-55%), giardiasis infections (19%-24%), strongyloidiasis (5%-10%) and liver fluke infection (1%-14%). 2.8% of preschool children in irrigated villages were found to have liver fluke infection. (Harinsuta et al., 1976)

INTESTINAL PARASITES: More than 90% of the 44 Sansai village children (one to seven years of age) tested had one or more parasites. More than 60% had two or more parasites. By far the most common infestation was *Ascaris* (large roundworm), but whipworm, hookworm and *Giardia* were also common. (Calavan, 1972)

URBAN

REFERENCE GROWTH CURVES (WEIGHT FOR AGE): The weight-based growth curves of both sexes of Bangkok infants from middle and professional families gradually fall off the 50th percentile of the North American Standard after the sixth month of age to mid-way between the 50th and 3rd percentiles during the next 5 1/2 years. (Khanjanasthiti et al., 1973)

REFERENCE GROWTH CURVES (HEIGHT FOR AGE): Increments in height during the second six months of life were 1.5 cm per month among both sexes of Bangkok infants of middle and professional class families. By 7 to 10 months these infants' growth rates began to fall off the 50th percentile of the North American Standard. (Khanjanasthiti et al., 1973)

REFERENCE GROWTH CURVES: A pattern of growth similar to those for height and weight was found using mid-arm circumference, triceps skinfold and head circumference among a sample of infants from middle and professional class Bangkok families. Thai infants were smaller at birth, had rapid growth in the first six months of life, catching up to the reference standards on most parameters, but gradually fall off the 50th percentile after 6 months. (Khanjanasthiti et al., 1973)

PEM (WEIGHT FOR AGE): In the 6 to 24 month old sample from four Bangkok slum areas, 70% (207 of 295) were classified as suffering some form of malnutrition, with the peak at 12 to 17 months old. 46% (135 of 295) had second or third degree malnutrition. (Khanjanasthiti and Wray, 1974)

PEM (WEIGHT FOR AGE): The highest prevalence and severity of PEM recorded in the 1979 national nutrition status survey was in the Bangkok slum areas. 82% of the children age 0-6 years living in these areas had PEM, with 45% classified as second degree malnutrition and 7% classed as third degree (using weight for age reference standards). (Mongkolmai and Limprapat, 1979)

PEM (WEIGHT FOR AGE): 79% of the children admitted to Chiang Mai Hospital had first degree PCM (Gomez classification, 75-85% of reference

standard weight for age) according to a 1975 report by Dr. Thanangkul. (Mongkolsmai and Limprapat, 1979)

PEM: The most severe nutrition problem is PEM among infants and preschool children. Approximately 52-76% of preschool children 6 months to 5 years old living in slums of Bangkok are suffering from malnutrition. (Dhanamitta et al., 1978)

WEIGHT AND TYPE OF MILK FEEDING: Among a group of 56 one year old infants studied in an out-patient clinic in Bangkok, the average weight was 8.4 kgs. The 36% who were breast fed had the highest average weight, 9 kgs, and the 30% who were fed powdered milk weighed 8.8 kgs on average. The 1.5% fed sweetened condensed milk weighed an average of 8 kgs which put them at the third percentile of the Harvard Standard (equivalent to first degree malnutrition in Gomez classification). (Viseshakul, 1978)

HEAD CIRCUMFERENCE AND TYPE OF FEEDING: The mean head circumference growth curves of infants under two years old visiting Childrens' Hospital in Bangkok showed serious flattening after six months of age, falling below the 50th percentile (Neilhaus international and interracial values, 1968) after six months. The average head circumference of infants on sweetened condensed milk was less than that of those on breast milk or powdered milk. (Viseshakul, 1976)

2. DIETARY BELIEFS

2.1 DIETARY BELIEFS, GENERAL

NATIONAL

PROTEIN PREFERENCES BY ETHNIC GROUP: Muslims prefer fish, beef and chicken in that order. The Chinese, on the other hand, prefer pork, chicken, fish and beef in that order, and the Thais prefer fish, beef and chicken in that order. (Dhanamitta et al., 1978)

RURAL

BEEF CONSUMPTION RESTRICTION: Chinese in the North and in the Central regions believe that beef is poisonous and may cause rashes. Beef is avoided for health reasons, and pork is preferred. (Dhanamitta et al., 1978)

PORK CONSUMPTION RESTRICTIONS: Among Muslim communities in the South and Central regions, pork is not consumed. (Dhanamitta et al., 1978)

2.2 DIETARY BELIEFS ABOUT PREGNANCY

NATIONAL

PROHIBITED FOODS: During pregnancy, meat and eggs are restricted because they are believed to cause the baby to grow too big and cause a difficult delivery. No supplementary or special foods are recommended. (Dhanamitta et al., 1978)

"LYING BY THE FIRE": Seven or nine days is the most common duration for the ritual of "lying by the fire" after childbirth in rural villages. It is believed to complete the birth experience and to dry out the uterus. Even among elite urban women, most extend their hospital stay for seven or nine days. (Van Esterik, 1980)

RURAL

SPECIAL FOODS: Coconut was the only food item identified often as a special food by pregnant women surveyed. Thai people believe that coconut milk will clean the fetus in the womb and the infant will be nice and clean when born. However, a majority of surveyed people (55%) did not mention special food items for pregnant women. Only 1% identified meat and eggs as special foods. Other food categories mentioned as special foods by at least some women were fruits, milk, vegetables, and soup. More women will avoid certain items than will eat special foods. (Dhanamitta et al., 1978)

BEEF CONSUMPTION RESTRICTION: In the North, the preference for pork over beef is due largely to the belief that beef is poisonous and may cause rashes. Beef consumption is restricted, especially among pregnant women. (Dhanamitta et al., 1978)

2.2 DIETARY BELIEFS ABOUT PREGNANCY (Cont.)

MIDWIVES: Only the indigenous granny midwives (mo tam yai) are trained in the techniques necessary for interpreting and guiding the processes of childbirth and lactation in accordance with both natural and supernatural laws. She should be chosen with care; ideally, she is related to the family, skillfull and successful in past deliveries, and a successful "nourisher" (liang di) herself. (Van Esterik, 1977)

URBAN

MIDWIVES: The indigenous granny midwives (mo tam yai) in Thailand are not the preferred practitioners in the urban setting, where their knowledge and experience are derided. (Van Esterik, 1980)

2.3 DIETARY BELIEFS ABOUT LACTATION

NATIONAL

FOOD RESTRICTIONS: In the postpartum period, many mothers do not eat meat, eggs, fish and certain vegetables because of the belief that eating these foods will result in abnormal blood circulation, illness, severe diarrhea, or death. (Dhanamitta et al., 1978)

FOOD RESTRICTIONS: It is widely believed that the new mother should refrain from eating a variety of foods (frequently nutritious) in the belief that the practice will protect the health of suckling infants. Salted baked rice and pork skin are the main foods permitted. Even younger mothers usually practice some food restrictions in this postpartum period (about a month after birth). (Lampang Project Personnel, 1980)

RURAL

ATTITUDE TOWARD BREAST FEEDING: The feeling about breast feeding commonly expressed in a rural village in Central Thailand was that if a mother nurses a baby, the baby will love the mother, think like the mother, and will be of one mind with the mother. (Van Esterik, 1977)

ATTITUDE TOWARD BREAST FEEDING: The belief in breast feeding in the rural community is based on traditional behavior rather than belief in its value and thus is subject to change. (Khanjanasthiti and Dhanamitta, 1978)

BREAST FEEDING INSTRUCTION: Rural women recognize that new babies and mothers need to be "taught" how to manage nursing in the first few days after birth. An experienced female relative who is a successful "nourisher" (laing di) herself instructs the new mother on what to eat and how to behave immediately after the birth. (Van Esterik, 1977)

COLOSIRUM: Colostrum is a "bad" color and insufficient in amount, and thus if used would set a bad habit for nursing according to traditional notions. (Van Esterik, 1977)

WET NURSES: A woman may nurse another woman's newborn out of loving-kindness (*metta-karuna*) which makes "merit" for her and confirms her status for the survival of the child in case of the mother's illness or death. Such nursing is done to guarantee the success of the mother-child bond, and in no way is seen as usurping the mother's position. (Van Esterik, 1977)

BREAST FEEDING SUCCESS: Successful prolonged breast feeding validates the "merit store" or "karmic status" of a woman within the traditional Thai belief system. The death of an infant is an indication of lack of merit by the mother or baby. The first nursing experience of mother and child determines the establishment of prolonged nursing in the infant and even subsequent infants. (Van Esterik, 1977)

CONFIDENCE AND MILK SUPPLY: Rural women have confidence in prolonged breast feeding. If one day their milk supply is down, they eat a certain vegetable curry, drink boiled water and nurse the baby more often. (Van Esterik, 1977)

MOTHER-INFANT BOND: In rural communities, breast feeding is seen as critical for creating a reciprocal relationship between mother and child. The child will repay his/her mother for her milk as an adult. For example, a son will become a monk and transfer the "merit" he makes to his mother in repayment. A daughter will repay her mother's milk by attending sermons and making "merit" for her mother in later life. If she is the last child, she repays her debt by looking after the parents in their old age (patterns of inheritance confirm this). (Van Esterik, 1977)

REASONS FOR BREAST FEEDING: 59% of breast feeding mothers cited economic and convenience considerations as the main reasons for breast feeding their infants according to a 1974 Mae Klong River survey. Other reasons given for their feeding choice included: mother stays at home (22%), advice from elderly persons (9%), and baby denied other milks (6%). Advice from health professionals was not mentioned by mothers. (Dhanamitta et al., 1979)

RESTRICTED DIET: 60 women from Sansai expressed the belief that a special restricted diet during the first month after giving birth protected them from the disease lom phid dyan characterized by general faintness, weakness and inability to do heavy work. For the first part of the restricted period, only rice and salt, and later a few other items, are added, including some, but not all, of the following: roast fish or pork, dried fish, fried chicken, eggs, roasted chilies, and boiled cabbage or green beans. (Calavan, 1972)

URBAN

POSITIVE ATTITUDE TOWARD BREAST FEEDING: The average attitude score of 210 women on a 36 question breast feeding attitude rating scale was 138

2.3 DIETARY BELIEFS ABOUT LACTATION (Cont.)

of 180, which indicated a favorable attitude toward breast feeding. (Temcharoen et al., 1979)

SOURCE OF ADVICE: 18% of mothers who breast fed their infants obtained information on feeding practices from physicians and nurses, according to a study of 585 Bangkok women. (Durongdej et al., n.d.)

ATTITUDES TOWARD BREAST FEEDING: Of 12 female university students at Thammasat University (Bangkok), 5 expressed a good knowledge of the health and other benefits of breast feeding. Their comments stressed the emotional benefits over the economic, although both were recognized. Two other students doubted their own health and whether their milk would lack nutrients available in formula. (Van Esterik, 1980)

NEGATIVE ATTITUDES TOWARD BREAST FEEDING: In Bangkok, professional women who expressed their repugnance to breast feeding rejected it because it was "animal-like." (Van Esterik, 1977)

REASONS FOR NOT BREAST FEEDING: The major reasons given by 585 Bangkok mothers for not breast feeding at discharge from hospital or clinic were: "want to return to work" (56%); "not enough milk" (13%); and infant "could not suck" (5%). (Durongdej et al., n.d.)

HEALTH OF THE MOTHER: A very common idea among the 37 elite Bangkok women studied was that only exceptionally health women can breast feed and that they themselves were not well enough to breast feed. (Van Esterik, 1980)

INFANT FEEDING CHOICES: 30 of 37 Bangkok professional women (81%) reported making their decision about how to feed their infants before the baby's birth, usually during pregnancy. 21 of the women (57%) stated that they decided independently without advice from others. 26 of the mothers (70%) did not recall any pressure to change their decision once it was made. (Van Esterik, 1980)

PROBLEMS OF BREAST FEEDING: Although 8 of the 37 urban professional women reported no problems with their breast feeding, 19 mothers (51%) reported problems. The most common problem cited was insufficient milk or no milk at all (which is understandable given the introduction of infant formula from the first day). Other problems mentioned included pain, cracked nipples, too much milk, or the wrong shaped nipples. In addition, problems of clothing and modesty were raised regarding nursing in public. (Van Esterik, 1980)

SPECIAL FOOD: In Bangkok, mothers believe that "Kaeng Jeang," a special soup made of fish or shrimp and vegetables, stimulates lactation. (Dhanamitta et al., 1978)

FOOD AVOIDANCES: Among a group of elite Bangkok women, many specified a need to avoid hot, spicy, pickled, strong-tasting foods, and alcohol. One woman mentioned that the "old women" forbid ice and fruits. (Van Esterik, 1980)

ICE AND FRUITS RESTRICTED: In the traditional belief system, ice is thought to overheat or over cool the body and is thus dangerous at certain times. Fruits are not believed to give strength and many are considered to have cooling properties. Both foods were mentioned as foods the "old women" forbid during lactation. (Van Esterik, 1980)

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

NATIONAL

PROMOTION OF INFANT FORMULA: In a review of 19 Thailand publications (with mainly low-income audiences), 52 of 258 issues during the 1968-1974 period contained infant food ads. (Greiner, 1975)

SNOW BRAND MASS MEDIA ADVERTISING: Full page ads for Snow Brand baby milk product, P7A, appeared regularly, July through September 1980, in various magazines aimed at mothers: Na Ruk, Moe-Chao-Ban, Mae Dek, Kusang-Kusom, Pattaya, Look Ruk, Mae Ban, and/or Mae Qua. (IBFAN, 1981)

INFANT FORMULA ADVERTISING: The infant food companies' use of salesgirls dressed as nurses, offering free samples, bottles and other enticements at Public Health clinics, and their suggestions that breast feeding mothers drink two glasses of warm formula before each feeding have successfully encouraged many Thai women to accept artificial formula as the modern, healthy way to feed infants. (Van Esterik, 1977)

NESTLE BEAR BRAND ADVERTISING: The label on a tin of Nestle's Bear Brand sweetened condensed milk purchased in October 1980 implied its use as a food for infants with a picture of a mother bear bottle feeding her young cub. The written instructions were confusing as to whether it should be used for infant feeding. This violates the WHO/UNICEF recommendations of 1979 and 1981. (IBFAN, 1981)

INAPPROPRIATE LABELS: In January 1981, the labels on Carnation's whole milk powder had a large picture of a baby, suggesting that it was appropriate for infant feeding, but made no mention of the superiority of breast milk. (IBFAN, 1981)

RURAL

ATTITUDES TOWARD ARTIFICIAL FEEDING: Rural women's view on bottle feeding with artificial milk was that if you feed the baby with a bottle, the baby will love the bottle rather than you. In addition, village women claimed that artificial milk feeding caused the child to have a mind like a cow, and be a stupid, clumsy, dull person. (Van Esterik, 1977)

2.4 DIETARY BELIEFS ABOUT BREAST MILK SUBSTITUTES (Cont.)

URBAN

BOTTLE FEEDING: Suggestions from neighbors and attractive advertisements of bottle feeding pressure women to use bottles, even those who do not work. (Khanjanasthiti and Dhanamitta, 1978)

SOURCE OF ADVICE ON BOTILE FEEDING: 25% of bottle feeding mothers reported receiving information on feeding practices from physicians and nurses in a study of 585 Bangkok mothers. (Durongdej et al., n.d.)

PROMOTION OF INFANT FORMULA: In 1974, ads for infant formula were found in movie theaters and newspapers, and on billboards, radio and T.V. (Van Esterik, 1980)

NESTLE MASS MEDIA ADVERTISING: Nestle advertised on TV during peak evening viewing time for Nespray full cream milk on January 4, 1981. The label on a tin of Nespray purchased in Bangkok the following day included infant feeding tables and the words "Breast feeding is natural and normal but when breast feeding is not possible or is insufficient you could use whole milk powder according to the feeding table which could be altered on medical advise." The label did not contain instructions for safe preparation. Such advertising is not in agreement with the WHO/UNICEF recommendations of 1979 and 1981. (IBFAN, 1981)

PROMOTIONAL DISTRIBUTION OF FREE SAMPLES: Nestle, Snow Brand, and Wyeth were involved in a rotation scheme in a Bangkok hospital which allowed the distribution of 30 sample cans of infant formula per month by each company. (IBFAN, 1981)

ADVERTISING ARTIFICIAL FEEDING IN HEALTH FACILITIES: Posters advertising three brands of baby milk and infant formula were found in hospitals in December 1980, which is not in compliance with the WHO/UNICEF recommendations of 1979 and 1981. The three brands were Nestle Nan infant formula in four Bangkok hospitals; Snow Brand's P7A in four Bangkok hospitals; and Meiji baby milk in two Bangkok hospitals. Nestle baby care booklets advertising infant formula were also distributed through clinics and hospitals in Bangkok in October and December 1980. (IBFAN, 1981)

SWEETENED CONDENSED MILK ADVERTISING: Two popular sweetened condensed milks are available in Thailand: Bear Brand (produced by a Nestle subsidiary) and Alaska brand. Bear Brand has a picture of a mother bear feeding a baby bear with a large feeding bottle and a warning not to give this milk to infants written in thin letters on the side of the tin. The warning on the Alaska brand is written vertically up the side of a striped tin almost invisible to the naked eye. (Van Esterik, 1980)

HEALTH PERSONNEL: Often, the Western-trained Thai doctors have been "converted" to the infant formula company products, partially through the use of free samples, posters and stationery advertising the formula. (Van Esterik, 1977)

ATTITUDES ON INFANT FEEDING: Most of the 37 upper and middle class Bangkok career women questioned regarded bottle feeding with infant formula as part of a "package" of modern technology unavailable to peasants and urban poor mothers who breast fed because they could not afford more appropriate foods. Infant formula was regarded as the appropriate method for upper and middle class women. Most of these women (25) felt that low income mothers should breast feed, although 18 women felt that sweetened condensed milk was an appropriate infant food for the "low income group." (Van Esterik, 1980)

INFANT FORMULA FEEDING: The infant feeding preferences of the urban professionals have become the ideal model after which urban slum dwellers pattern themselves. (Van Esterik, 1977)

INFANT FORMULA VALUED: The elite Bangkok women using infant formula reported that feeding a baby with formula is valuable for the child. Over half stated that they believed the formula they chose provided the best possible nutrition for the child. Regularly scheduled feedings were also considered an important and integral part of infant feeding. (Van Esterik, 1980)

INFANT FORMULA PREFERENCES: Most of the 37 elite Bangkok mothers asked used infant formula and extolled the virtues of the brand they chose, often noting that it would protect their baby against infection. (Van Esterik, 1980)

INFANT FORMULA FOR WORKING WOMEN: Most of the 37 career civil servant women studied viewed infant formula feeding as the only possible answer for working mothers. They expressed pride in their careers and felt that advancement and even seniority would be hard to achieve and maintain if they took off more than the normal 45 day maternity leave. (Van Esterik, 1980)

2.5 DIETARY BELIEFS ABOUT WEANING

NATIONAL

WEANING: The Thai term for weaning refers to the end of the nursing relationship between mother and child. (Van Esterik, 1980)

RURAL

NO SPECIAL WEANING FOOD: There was no recognition that preschool children have special dietary needs among the families studied in a village of northeast Thailand. (Chandrapanond et al., 1972)

RICE: It is generally believed that the child will develop faster if he eats a large quantity of rice. (Chandrapanond et al., 1972)

EGG RESTRICTION: Eggs were considered by mothers in 6 Northeast villages to be an unsuitable food for young children. They were prohibited when children had fever or other simple ailments. (Harinasuta et al., 1976)

2.5 DIETARY BELIEFS ABOUT WEANING (Cont.)

FISH RESTRICTION: In two villages in Bang Pa-In, mothers expressed a belief that children should not eat fish until they could say "fish."
(Khanjanasthiti et al., 1977)

2.6 DIETARY BELIEFS ABOUT ILLNESS AND CURE

RURAL

RESTRICTED DIETS FOR SICK CHILDREN: Respondents in all 61 Sansai households expressed the belief that sick children should be given a special restricted diet, usually limited to rice, pork, fish and little else. (Calavan, 1972)

URBAN

MISPERCEIVED HEALTH STATUS: In a survey of the Bangkok slums, 96% of mothers perceived their children as being in good health, whereas in fact 44% of the children were suffering from mild to severe malnutrition.
(Austin and Mock, 1981)

3. DIETARY PRACTICES

3.1 DIETARY PRACTICES, GENERAL

NATIONAL

STAPLE FOOD: Rice, the staple food, contributes two thirds of the total calories, and is also the main source of protein. Two varieties of rice are consumed: in Central and South regions, ordinary white rice; and in the North and Northeast Regions, glutinous (sticky) white rice. The nutritive values of the two varieties are approximately equal. (Dhanamitta et al., 1978)

RICE PREPARATION: Highly milled rice is the most acceptable form, although home pounding practices still exist in a few localities. In general, brown rice is considered an animal food, unfit for humans. The traditional method of cooking sticky rice consists of soaking the rice overnight and washing it before steaming it (rather than boiling). Ordinary rice is washed two or three times and the boiled water is discarded. (Dhanamitta et al., 1978)

CALORIE INTAKE: The average per capita calorie intake was 1,770 calories per day according to a 1973 report. (Austin and Mock, 1981)

CALORIE INTAKE: The 1972 Food Balance Sheet showed an average daily per capita consumption of 2,580 calories; well above the recommended 2100 calories. (Welsch et al., 1979)

SWEETENED CONDENSED MILK: Despite a widespread dislike of milk, lactose intolerance, and its low nutritional value, sweetened condensed milk use has spread throughout Thailand. The main uses are in coffee and tea (at coffee shops), in tonic drinks (seen as patent medicine), as an infant formula, as an ingredient in traditional recipes, and in religious contexts (as an elixir of life). (Van Esterik, 1979)

MILK AND LACTOSE INTOLERANCE: Milk is generally not a popular drink in Thailand, where a large part of the adult population cannot digest lactose. (Van Esterik, 1980)

RURAL

EATING PATTERNS: In typical low income rural communities, family members generally share three meals together each day. Food is prepared twice daily with no difference in the kinds of foods served at each meal. Eating between meals is rare. No additional protein or other essential nutrients are provided for children or pregnant or lactating mothers. (Dhanamitta et al., 1978)

MEAL PATTERN: Typical meals consist of cooked rice consumed with "Kaeng" (curry) or "Nam Prich" (peppers in fish sauce). Small amounts of protein food are sometimes included, but for rural Thais, Nam Prich is almost the only source of protein. In the Northeast, it usually consists of

3.1 DIETARY PRACTICES, GENERAL (Cont.)

fermented fish and chili peppers; in the North, fermented soybeans, meat or fish and vegetables; and in the South, particularly in Muslim communities, fermented fish. Vegetables are usually consumed fresh. (Dhanamitta et al., 1978)

EATING PATTERNS: Among a study of 6 Northeast villages, there were no special dishes for young children. All members in the household ate food at the same time, 3 times a day, and shared food from the same dishes. (Harinasuta et al., 1976)

FAMILY MEAL PATTERNS: Meals were taken by the family sitting in a circle. Meal times were occasionally irregular. (Chandrapanond et al., 1972)

MEAL PATTERNS: At meal times men eat first and women eat after the men complete their meal among rural families in the Northeast. (Chutikul, n.d.)

STANDARD DIET: The diet of Chiang Mai area villagers is characterized by its low caloric density; usually less than 10% of its calories are provided by fat and most calories are supplied by bulky glutinous rice containing about 80% water. It is very monotonous as well, and small children may not find it palatable. (Gershoff et al., 1977)

FOOD PREPARATION METHODS: In the village of Sansai, at least a dozen locally distinct food preparation procedures were identified in a 1970 survey: 1) Kaeng - foods briefly cooked in oil and then boiled in a little water with chilies; 2) Phad - chopped foods stir-fried with pork oil; 3) Toom - foods boiled in large quantities of water without chilies; 4) Thaud - foods deep fried in pork oil; 5) Ping - foods roasted over a fire; 6) Cau - vegetables (two types) boiled in large quantities of water with dried tamarind; 7) Nyaam - fruits and vegetables are mixed with naamphik (chili sauce) and either fried phad method or eaten as is; 8) Ciaw - boiling with very little water; 9) Ob - fish are either roasted in a closed pot or prepared in a crude double boiler and steamed; 10) Nyng - foods are steamed; 11) Daung - foods are pickled; and 12) Cinsoom - "sour meat" sausage of pork or buffalo. Other food preparations used often were purchased and included Kapii (a paste of pounded freshwater shrimp, garlic and other ingredients), naampaa (a salted fish sauce), and paalaa (a sauce or paste made from small fish fermented with salt). (Calavan, 1972)

SEASONAL FOODS: While many foods were available throughout the year in Sansai village markets, several food types were only available during certain seasonal periods. Non-glutinous rice was available for several months after the June-July harvest. Most fruits were only available during limited seasons except bananas (e.g. mangoes in March-May, pineapples in June-July, and pummelos in November). Freshwater shrimp and caktaen (an insect), were available during the monsoon season. Many vegetables are seasonal, including bamboo shoots, bean sprouts and mushrooms. (Calavan, 1972)

CALORIE SOURCES: In the average Sansai village household, 85% or more of the total calories were derived from rice, and if rice flour is included, the average approaches 90%. The percent of calories derived from protein was 9%. Only about 7.5% of the total calories were derived from dietary fats. (Calavan, 1972)

FAT AND OIL INTAKE: Among the rural population, the fat and oil intake is extremely low, only one gram per person per day. (Dhanamitta et al., 1978)

GLUTINOUS RICE: About 90% of villagers preferred to eat glutinous rice rather than white rice because it kept the farmers from being hungry for a longer period of time, according to a study in the Northeast. (Harinasuta et al., 1976)

RICE PREFERENCE: Northern Thais prefer highly milled rice. Milling ratios of 60-65% are typical. Most rice consumed at Sansai village, Chiang Mai was custom-milled locally by small gasoline operated milling machines. Glutinous rice is steamed, a method that preserves the water-soluble vitamins. (Calavan, 1972)

RICE MILLING: Approximately 90% of the rice consumed in Thai villages is milled by small village mills that crack a very high percentage of the rice grains. This process destroys some of the nutrient value, especially the water-soluble vitamins. (Gershoff et al., 1975)

LOW-PROTEIN FOOD CONSUMPTION BY REGION: Other sources of low-protein foods (excluding rice) in order of frequency of consumption by region are: in the North, animal fat, fruits, melons, beans/peas and roots; in the Northeast, melons, beans/peas, fruits and animal fat; in the East, melons, beans/peas, fruits, coconut juice and animal fat; in the Central (rural), beans/peas, melons, coconut juice, fruits and vegetable fat; and in the South, fruits, coconut juice, beans/peas, melons, vegetable fats and roots. (Dhanamitta et al., 1978)

ANIMAL PROTEIN INTAKE: Animal protein constitutes 31% of the total protein intake in the average rural diet. (Dhanamitta et al., 1978)

FOOD PRESERVATION: Beef or buffalo meat is cut into pieces, salted and dried. Thai rural women preserve very few vegetables and fruits, but Chinese and Vietnamese women in Thailand preserve vegetables. (Chutikul, n.d.)

EGG CONSUMPTION BY REGION: Overall, eggs were the most common source of protein consumed throughout the 13 study villages: 92% of people surveyed in the South region, 91% of people in the East and in the rural Central regions, 88% of the Northerners, and 71% of the Northeasterners had eggs at least once a week. Eggs are easily accessible due to the raising of chickens and ducks, except in the Northeast, where chicken raising is less popular. (Dhanamitta et al., 1978)

3.1 DIETARY PRACTICES, GENERAL (Cont.)

FISH CONSUMPTION BY REGION: Fish was the second most common source of protein consumed at high percentages: 96% of the surveyed people in the South region consumed fish 1 to 7 times a week, as did 87% in the rural Central region, 86% in the Northeast, 85% in the East, and 73% in the North. Fish sources included fresh water fish, and pla too and dried squids from the Gulf of Thailand, which were preserved by salting, drying or steaming. For the Northeasterners, the fish sources were the main protein source with very few other sources of protein. (Dhanamitta et al., 1978)

FISH CONSUMPTION IN THE NORTHEAST: Per capita fish consumption in Northeast Thailand is approximately 11.5 kgs per person per year compared to the national average of 21 kgs per person per year. At least 50% of the average dietary animal protein is derived from fish. These averages mask the unequal distribution of fish consumption due to income and geographic access. (USAID, 1979b)

RAW FISH: The practice of eating raw fish, raw crabs and raw snails is common among the people in Northeast Thailand. This leads to a high incidence of liver and lung-fluke infections, other parasitic diseases, and thiamine deficiency. (Harinasuta et al., 1976)

ANIMAL PROTEIN CONSUMPTION BY REGION: Pork consumption was highest in the Northern region, where 97% of the rural sample reported eating pork at least once a week. Beef was reported consumed by 86% of rural Central region people and 71% of South region people. In the Northeast and East regions, beef and pork consumption were about even, but at much lower rates. Chicken was consumed at very low rates in all regions: the North reported 62% of the sample population eating chicken 1-7 times a week; the East, 59%; and the other regions, less than 40%. (Dhanamitta et al., 1978)

MILK: Drinking milk is an uncommon practice for rural Thai people in the Northeast; thus milk is not a common food. (Harinasuta et al., 1976)

HOME-GROWN AND GATHERED ITEMS: Residents of the Chiang Mai province village Sansai acquired some food from kitchen gardens, gathering and fishing on an average of three times over the three day food intake survey. These items do not add significant calories, but they occasionally add a significant portion of protein and thiamine to the diet. (Calavan, 1972)

SNACKS: Dozens of snack foods add taste variety to the local Sansai diet. They were purchased on average 3 times during the three day food survey. However, given that these items are based on rice flour or granular rice, they do not add significantly to the nutritional variety of the diet. (Calavan, 1972)

SANITATION AND EATING HABITS: A survey of two Northeast villages showed that less than half of the households washed their hands before or after going to the toilet, that nearly all the drinking water came from public shallow wells, and that the majority of the people eat meals with their

hands and eat raw or uncooked meat. (Woolley, 1974)

CEREMONY - NEW YEAR FESTIVAL: During the new year festival, the hill tribe people of the remote north customarily slaughtered their pigs and chickens for religious rites and celebrations. Protein was then in good supply for at least a couple of weeks. (Suwanwela et al., 1981)

TIME ALLOCATION BY AGRICULTURAL SEASONS: In two villages of Chiang Mai, the amount of time spent by women in child care and home making activities (including food preparation, cooking, feeding, etc.) was lowest during the planting and harvesting seasons and highest in the periods of land preparation and care of crops. The low time allocation averaged about 4-5 hours per day and the high averaged about 5-6 hours per day. (Jaisaard and Tongsiri, 1980)

FOOD EXPENDITURES: In a poor village of the Northeast, women claimed that husbands usually gave their cash income to their wives, who spent most of it on family food. In more prosperous villages the men are more likely to keep and spend much more of the cash income themselves. (Chutikul, n.d.)

EXPENSIVE FOODS: Meats, including pork, beef, and poultry, were considered expensive foods by rural Thais in Khon Kaen province villages; therefore, they were eaten only by higher income families. Meat was consumed more often by children in irrigated villages than non-irrigated ones. (Harinasuta et al., 1976)

FREQUENCY OF PROTEIN CONSUMPTION BY INCOME: It appears that the percentage of households that consume animal protein increases with increasing food expenditures in the case of eggs, chicken and fish, but not for beef or pork which are determined by ethnic differences. (Dhanamitta et al., 1978)

REGION, INCOME AND FOOD EXPENSE: More than 80% of the villagers in the North and Northeast spend less than 700 baht per month (approximately \$35) on food (including food bought and food gathered) whereas in the South, East and Central regions, 23%, 34%, and 51% of the villages spend less than 700 baht per month. The differences may be due in large part to extra income generated through subsidiary occupations in the latter areas. (Dhanamitta et al., 1978)

HOUSEHOLD DIETS AND SOCIOECONOMIC GROUPS: Among the 18 dietary items measured in Sansai villages in 1970, five showed significant differences among the three socioeconomic groups (ranked households divided into thirds). The highest-ranked socioeconomic group (26 households) had substantially more varied diets and higher thiamine intakes, as well as a significantly lower percent of total calories provided by rice than the other 56 households, but their calcium intakes were lower and the middle group had a significantly higher calorie intake. (Calavan, 1972)

HOUSEHOLD DIETS AND SOCIOECONOMIC GROUPS: Comparing the Sansai village educational, political and economic "elite" (the top sixth of ranked

3.1 DIETARY PRACTICES, GENERAL (Cont.)

households) to the rest of the households, the following significant differences appeared in a 1970 survey: their diets were more varied; reflected more cash expenditures and less gardening, fishing and gathering; iron and thiamine intakes were higher; they were less dependent on rice for their calories, protein and thiamine; their diets were higher in fat and protein and lower in carbohydrates; and they had higher intakes of animal protein. (Calavan, 1972)

NUTRIENT INTAKE: The diets of rural Ubol province adults consisted of 14% protein, 78% carbohydrates and 8% fat in a study of 42 subjects. Intake for the twenty one men was 1462 calories, 53 grams protein, and 13 grams fat. For the 21 women, it was 1292 calories, 46 grams protein and 11 grams fat. (Dhanamitta et al., 1978)

ADEQUATE NUTRIENT INTAKES: Average calorie, iron and Vitamin A intakes were adequate in a 1970 survey of 82 households in Sansai village, Chiang Mai. (Calavan, 1972)

CALORIE INTAKE: Average calorie intake was 1821 calories per day among rural residents in a survey of eating habits of heads of households in 1972-73. (Welsch et al., 1979)

PROTEIN INTAKE: In a one-day food consumption survey of 29 Chiang Mai area village families, 74% of the protein eaten came from glutinous rice. Lysine and threonine were the limiting amino acids in the protein of the diets of the children, but not the adults of the study. (Gershoff et al., 1977)

PROTEIN INTAKE: Average protein intakes were 87% of the 1966 Indian Medical Research Council recommended allowance (55g for adult males and 45g for adult females) in the northern village of Sansai. (Calavan, 1972)

THIAMINE INTAKES: Diets of the Sansai village people were generally "marginal" in thiamine content, especially given the high-carbohydrate diet, containing only 90% of the 1966 recommended allowance. Pork is the best source of thiamine in their diets, but is not eaten in sufficient quantities. (Calavan, 1972)

CALCIUM INTAKES: Calcium intakes in Sansai village were uniformly low, reflecting the lack of milk and dairy products in the diet. Thais in the village were receiving 300-450 mg. per day. The recommended allowance (IMRC) is 1 gram. However, absorption of calcium seemed to be much higher than in Western countries. (Calavan, 1972)

URBAN

EATING PATTERNS: The eating pattern of low income families in Bangkok is different from that in rural communities. The quality of the diet is usually dependent upon income. The families prepare breakfast and

dinner, and the lunch is purchased outside the home. Eating between meals is common, and is directly related to economic status. (Dhanamitta et al., 1978)

DIETARY INTAKE: The average per capita intake of 15 Bangkok men was 2013 calories, and of 15 Bangkok women, 1547 calories. Protein made up 13% and 15% respectively of the total calories (63 and 57 grams); carbohydrates, 57% and 55% respectively; and 30% of both the men's and women's calories were obtained from fats. (Dhanamitta et al., 1978)

CALORIE INTAKE: Average intake was 1504 calories per day among urban residents in a survey of eating habits of heads of households in Bangkok slums in 1972-73. (Welsch et al., 1979)

ANIMAL PROTEIN INTAKE: Animal protein constitutes 40% of the protein in the average diet of Bangkok slum dwellers and 50% of the total protein in the typical Bangkok diet. (Dhanamitta et al., 1978)

FAT AND OIL INTAKE: Among the Bangkok population, the fat and oil intake is about 28-30 grams per person per day. (Dhanamitta et al., 1978)

NAM PRICH: In Bangkok, "Nam Prich" is usually consumed with mackerel or other fresh water fish, egg or vegetables, thus contributing substantial animal protein to the diet. (Dhanamitta et al., 1978)

3.2 DIETARY PRACTICES, WOMEN

3.2.1 DIETARY PRACTICES, WOMEN, DURING PREGNANCY

RURAL

DIETS: The average diet of 11 pregnant women consisted mainly of rice and rice products (475 grams), non-leafy vegetables (152 grams), meat and fish (36 grams), fruits (36 grams), leafy vegetables (33 grams), seasonings made of fish sauce, salt and MSG (15 grams), eggs (15 grams), and coconut milk (14 grams) as well as pulses, lard, meat products, and sugar and syrups. (Chandrapanond et al., 1972)

SUPPLEMENTAL DIETS: Pregnant women in rural Thailand do not receive any supplementation of their normal diets. (Dhanamitta et al., 1978)

SPECIAL FOODS: 60 women from Sansai village were asked whether they ate any special foods or changed their diets while pregnant. They expressed amusement at this "strange" idea. The author thus assumed that pregnant women in Sansai follow the usual adult female diet. (Calavan, 1972)

VITAMIN SUPPLEMENTS: 40% of pregnant women surveyed in 13 villages throughout the five regions said they took vitamins and/or medicine for their health and the babies. 83% of these women identified the source of advice as doctors and health personnel. (Dhanamitta et al., 1978)

3.2.1 DIETARY PRACTICES, WOMEN, DURING PREGNANCY (Cont.)

NUTRIENT INTAKES: In a three day dietary survey of 11 pregnant women, the average energy intake was 1980 calories—far below the recommended daily allowance. Carbohydrates made up 85% of the total calories, protein 8% (39.4 grams) and fat 7%. Several mineral and vitamin intakes were also well below the RDAs: calcium, iron, and Vitamins A, C, B₁ and B₂. (Chandrapanond et al., 1972)

NUTRIENT INTAKES: Intakes during pregnancy are about 70 to 80 percent of recommended intakes of calories, protein and other nutrients. (Valyasevi, 1978)

NUTRIENT INTAKES: The daily intake of Thai pregnant women was found to be generally low in total calories (1,980 kcals), protein (40 gms), calcium (0.5 gm), iron and Vitamins A₁, B₂, niacin and C. The predominant source of calories was carbohydrate and thus there may also have been a relative thiamine deficiency. (Thanangkul and Amatayakul, 1975)

3.2.2 DIETARY PRACTICES, WOMEN, DURING LACTATION

NATIONAL

FOOD RESTRICTION: During the two weeks after delivery, mothers usually restrict their diets to rice, salt, and sometimes a little dried or salted fish. (Dhanamitta et al., 1978)

RURAL

SPECIAL DIETS: Of 60 Sansai village women interviewed, all claimed to follow a special diet for a month or more after giving birth as a prophylactic against a much-feared disease called lom phid dyan (symptoms of general faintness, weakness and inability to do heavy work). For 5 to 15 days, all mothers ate only rice and salt. Then a few foods were added, according to family tradition, usually pork, fish or chicken, and sometimes one or more vegetables. The ordinary diet is again taken up after this period. (Calavan, 1972)

FOOD RESTRICTIONS: A 1975 Community Health Survey in Lampang Province showed that 60% of mothers giving birth underwent the traditional practice of post-partum "roasting," or lying by the fire, including going without vegetables or meat during the first month. (Lampang Project Personnel, 1980)

TRADITIONAL PRACTICES: According to the 1973 Young Child Study undertaken by the National Economic and Social Development Board, 82% of rural women practiced food restrictions and taboos during the puerperium and lactating periods. 92% of rural women also used traditional practices, such as "lying by the fire" and "staying in heated enclosures." 39% of women used indigenous medicines, 31% used modern medicines, and 26% used both. (UNICEF, 1979)

BREAST FEEDING INSTRUCTION: Traditional midwives or experienced female relatives who are successful "nourishers" (liang di) instruct the new mother on what to eat and how to behave in the crucial first days after birth. The mother does not feed her own child until about the third day when her milk has come in fully. The baby is often nursed by a close relative with a full milk supply in order to let the baby learn to suck efficiently. Thus a good nursing pattern between the new mother and the experienced baby is established. (Van Esterik, 1977)

POST-PARTUM REST: In the northern hill tribe village of Hmong, mothers are exempted from farm work for one month following childbirth. They stay in the house near the fire, and during this period consume chicken every day, or at least every other day. (Suwarwela et al., 1981)

URBAN

INCREASED INTAKES AND SPECIAL FOODS: Among 37 elite Bangkok mothers, most reported eating their normal meals while breast feeding plus increasing their intakes of meat, vegetables, eggs, and fruit and supplementing their diets with extra vitamins, minerals and tonics. Six women drank milk (generally not a popular drink) and two women mentioned traditional Thai foods recommended for nursing mothers: a vegetable soup, kaeng liang, made from ginger root, and banana flowers. (Van Esterik, 1980)

SPECIAL FOOD: In Bangkok, postpartum mothers consume a special soup called kaeng leang which is a combination of fish or shrimp and vegetables, in the belief that it stimulates lactation. (Dhanamitta et al., 1978)

FOODS AVOIDED: Among 37 elite Bangkok mothers, 12 reported abstaining from none of the foods normally in their diets. Other women reported attempting to avoid hot, spicy, pickled, strong-tasting foods, and alcohol. One woman mentioned avoiding all foods that the "old women" forbid, such as ice and fruits. (Van Esterik, 1980)

3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS

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

NATIONAL

TRENDS IN BREAST FEEDING: Data from the series of surveys conducted in the decade between 1969 and 1979 indicate that a moderate and generally continuous decline in the practice and duration of breast feeding has occurred. Throughout this period, rural mothers breast fed far more extensively than urban mothers and a clear educational differential persisted, with mothers from less educated groups breast feeding longer. (Knodel and Debavalya, 1980)

TRENDS IN BREAST FEEDING: In 1971 the Young Child Study Survey indicated that 88.4% of all mothers in rural and urban areas breast fed their

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

infants. A 1975 survey by the Nutrition Division of the Thai Ministry of Public Health showed only 69.6% of all rural and urban area mothers breast fed their babies. Comparability of the samples and methods was not discussed. (Family Health Division, n.d.)

RURAL-URBAN DIFFERENCES IN DURATION OF BREAST FEEDING: For four survey periods over the last decade, rural mothers breast fed their most recent born child for a substantially longer duration than urban mothers: in 1969-70, the rural-urban difference was 9.5 months; in 1972-3 the differential was 12.1 months; in 1975, 11.2 months and in 1979, 9.1 months. Data was calculated from non-pregnant mothers' current breast feeding status. (Knodel and Debavalya, 1980)

DURATION OF BREAST FEEDING: Among the sample of 1265 women from the Survey of Fertility in Thailand, (SOFT), 51% claimed to have breast fed their next to last child 24 months or more, another 33% breast fed for a year or more, 5% breast fed between 7 and 11 months, 5% between 1 and 6 months, and only 6% did not breast feed at all. (Institute of Population Studies and National Statistical Office, 1977)

REGIONAL BREAST FEEDING PATTERNS: Throughout the 1969-1979 period, four national surveys consistently indicated that the most extensive rates of breast feeding for both urban and rural women were in the Northeastern region (with the average duration recorded in the four surveys ranging from 14-23 months and the percentage still breast feeding ranging from 26%-90%) compared with the South (average duration range 11-19 months, percent still breast feeding ranging from 19%-71%), the Central region (8-16 month average duration, 38%-60% still breast feeding) and the North region (7-14 month average duration, 36%-76% still breast feeding). (Knodel and Debavalya, 1980)

BREAST FEEDING DURATION BY REGION: According to the 1975 SOFT, women in the Northeast region breast fed the most: 99% breast fed for some period with 76% doing so for more than 2 years and an additional 18% for one to two years. In the North region, 96% of women breast fed their next to last child with 29% doing so for more than 2 years and 52% for one to two years. In the Central region (excluding Bangkok), 94% breast fed the index child, 45% for 24 months or more, and 41% for one to two years. In the South region, 90% initiated breast feeding with 54% continuing for at least 24 months and 25% for one to two years. (Institute of Population Studies and National Statistical Office, 1977)

RURAL

EXCLUSIVE BREAST FEEDING: 58% of rural and 47% of semi-rural mothers sampled were exclusively breast feeding their infants under 24 months of age, according to a 1974 study in the Mai Klong River area of Central Thailand. (Dhanamitta et al., 1979)

DECLINE IN INITIATION OF BREAST FEEDING: 6.4% of rural mothers did not breast feed their most recent child in the 1975 Survey of Fertility in Thailand; 9.6% of the rural mothers in the 1979 National Survey reported

not breast feeding the most recent child at all, according to analyses of comparable samples. (Knodel and Debavalya, 1980)

BREAST FEEDING PATTERN: About 94% of rural mothers breast fed their next-to-last infant among the surveyed populations of both the 1975 World Fertility country survey and the 1979 national survey. (Knodel and Debavalya, 1980)

BREAST FEEDING PATTERNS: Hill-tribe infants are bound on their mothers' backs all of the time (even during farm work) and are breast fed on demand as often as they want. Breast milk is the exclusive feed for up to one year, then rice is the only supplemental food given until the age of three when the child begins to share the family meal. (Viseshakul et al., 1978)

BREAST FEEDING PATTERNS: 76% of rural mothers and 61% of semi-rural mothers breast fed their infants under 24 months of age, according to a 1974 study in the Mai Klong River area of Central Thailand. (Dhanamitta et al., 1979)

BREAST FEEDING PREVALENCE: 99% of the 179 mothers in a Central Thai village breast feed their children for 2 to 10 years according to a 1971-3 study. (Van Esterik, 1977)

SATISFACTORY GROWTH AND BREAST FEEDING: The nutritional status of Mae Chan hill tribe infants, as determined by anthropometry, indicated that their malnourished mothers could provide an adequate amount of breast milk for satisfactory growth up to the age of one year. Traditional child-rearing practices limit the child's activity and thus partially protect it from malnutrition. (Viseshakul et al., 1978)

PROLONGED BREAST FEEDING: In general, rural infants are breast fed until two or three years of age, or until the mother becomes pregnant again. (Dhanamitta et al., 1978)

INFANT FEEDING PATTERNS: Among the overall sample of 654 mothers in 13 villages throughout all five regions, 58% of mothers were breast feeding, 25% were feeding formula or canned milk, and 17% were giving a combination of both. (Dhanamitta et al., 1978)

INFANT FEEDING PATTERNS BY REGION: In the Northeast region, 90% of mothers surveyed were breast feeding, 2% were using formula or canned milk and 8% were combining the two. In the North region, the percentages of breast feeding, formula/canned milk feeding and combined feeding were 85%, 12% and 4% respectively. These figures dropped to 57%, 31% and 18% respectively in the East region; 50%, 15% and 35% in the South region, and 44%, 31%, and 25% in the rural area of the Central region. Data was from a small survey of 13 villages from the five regions. (Dhanamita et al., 1978)

LOWEST REGIONAL RATES OF BREAST FEEDING: The lowest rate of breast feeding for rural women was consistently found among those living in the

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

Bangkok vicinity, in four national surveys of 1969-1979. (Knodel and Debavalya, 1980)

TREND IN BREAST FEEDING RATES: In 1969, 72.4% of rural non-pregnant women who had a child within three years prior to the interview were still breast feeding their most recent child; in 1972, this figure was 71%; in 1975, it had slipped to 67.2%; and by 1979, only 55.6% of the surveyed mothers were currently breast feeding. The trend held for each of the three years since the last birth. The trend also was present for all rural women (pregnant and non-pregnant) in the 1975 and 1979 data. (Knodel and Debavalya, 1980)

DURATION OF BREAST FEEDING: The mean age at weaning of the next-to-last birth children was 18 months in the rural samples of both the 1975 and 1979 national surveys. (Knodel and Debavalya, 1980)

DURATION OF BREAST FEEDING: In the 1979 national survey, two thirds of the rural women sampled reported breast feeding their most recent child for at least one year. (Knodel and Debavalya, 1980)

DURATION OF BREAST FEEDING: 1975-6 surveys showed that 95% of 1-6 month old infants were breast fed; 81% of 7-12 month olds; 45% of 13-18 month olds and 37% of 19-24 month olds, in the rural communities of six provinces of the Mai Klong River area. (Dhanamitta et al., 1979)

DURATION OF BREAST FEEDING: Among the rural sample in the 1975 SOFT survey, 96% of women breast fed their next to last child. 56% of the total sample breast fed over 2 years, 32% over one year, 4% over 6 months, and only 4% less than six months. (Institute of Population Studies and National Statistical Office, 1977)

DURATION OF BREAST FEEDING: In a 1972 survey, 62% of 0-6 month old infants were breast fed, 44% of 7-12 month olds, 42% of 13-18 month olds, and 17% of the 19-24 month olds in a semi-rural area of Bang Pa-In district. (Dhanamitta et al., 1979)

TREND IN DURATION OF BREAST FEEDING: A 5 month decrease in the mean age at weaning, from 22.4 months in 1969 to 17.5 months in 1979, was recorded using calculations on current breast feeding status (most recent child) data from surveys over the time period. The largest drop occurred between 1975 and 1979. (Knodel and Debavalya, 1980)

TREND IN DURATION OF BREAST FEEDING: The median duration of breast feeding the next-to-last child decreased slightly from 16.6 months in the 1975 World Fertility country survey to 16.2 months in a 1979 national survey. (Knodel and Debavalya, 1980)

MILK QUANTITY: Practically all village infants under six months of age were breast fed in a Ubol Province, Northeast Thailand study. However, the amount of breast milk secreted was about two thirds of the normal amount in most mothers, due to their poor nutritional status. In the 8-18 month age group, breast feeding was still common among the village

infants. The amount consumed ranged from 400 to 700 ml per day. (Valyasevi, 1978)

BREAST FEEDING CESSATION: About 75% of Sansai village infants were weaned from the breast between the ages of 12 and 20 months. No single pattern was followed, although the infants weaned as early as eight or nine months were from the wealthiest households. Occasionally, a youngest child was allowed to nurse to the third or fourth year. (Calavan, 1972)

STRATEGIES FOR ENDING BREAST FEEDING: The three basic strategies used by Sansai village women in northern Thailand were (1) applying bitter medicine to the nipples to discourage the child, (2) feeding large quantities of rice cakes so that the child was too full to nurse, and (3) sending the child to sleep in another bed, another room or another home so that she was unable to nurse at night. (Calavan, 1972)

SEASONAL INFLUENCES ON WEANING: Although 90% of rural mothers breast feed initially, early weaning is common, especially during the farming and harvesting seasons. The food supplements given are usually inappropriate. (Dhanamitta et al., 1979)

URBAN

EXCLUSIVE BREAST FEEDING: In a sample of 154 children under 2 years old, 67% of the one month olds were exclusively breast fed, 50% of the 3 month olds were exclusively breast fed, 55% of the 6 month olds, 52% of the 9 month olds, 30% of the 12 month olds, 32% of the 18 month olds and 7% of the 24 month olds were breast fed exclusively. In an additional sample of 45 children from a second urban slum area, only 43% of one month olds and 50% of 6 month olds were exclusively breast fed, and no infants in any of the other age groups were exclusively breast fed. (Viseshakul et al., 1977)

EXCLUSIVE BREAST FEEDING: 27% of the urban mothers of infants under 24 months old sampled in a 1974 study conducted in the Mae Klong River area of Central Thailand were exclusively breast feeding their infants. (Dhanamitta et al., 1979)

BREAST FEEDING PATTERNS: Among the 1975 World Fertility country survey sample, 79% of urban mothers had breast fed their next-to-last child. In the 1979 national survey, 82% of sampled urban mothers had breast fed their next-to-last child. (Knodel and Debavalya, 1980)

BREAST FEEDING PATTERN: Among the 1975 SOFT survey sample, only 17% of the urban women sampled breast fed over 24 months. This figure dropped to 10% in the Bangkok metropolis. 38% of the national urban sample breast fed over one year (32% in the Bangkok area). 22% breast fed less than one year and 23% did not breast feed at all. In the Bangkok area, the respective figures were 28% and 30%. (Institute of Population Studies and National Statistical Office, 1977)

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

BREAST FEEDING PREVALENCE BY AGE: 78% of 197 infants attending a Bangkok outpatient hospital clinic had a history of breast feeding at least up to one month of age. Among the 52 age 4.5 to 7.5 months old 44% were breast fed. 36% of the 56 10.5 to 13.5 month old infants were breast fed, 25% of the 18 month old infants (44 infants, 16.5 to 19.5 months old) and only 9% of the 24 month old infants (45 infants, 22.5 to 25.5 months old) were breast fed. (Viseshakul, 1976)

BREAST FEEDING PREVALENCE: 39% of the urban mothers sampled were breast feeding their infants under 24 months old, in a 1974 study in the Mai Klong River area of Central Thailand. (Dhanamitta et al., 1979)

BREAST FEEDING PATTERNS: In four slums of Bangkok, 22% of the 1154 children sampled were never breast fed, 11% were breast fed less than one month and another 12% were weaned within the first six months of life. (Khanjanasthiti and Wray, 1974)

DECLINE IN BREAST FEEDING: In 1970, 41.6% of urban non-pregnant mothers who had a child within three years prior to being interviewed were "currently breast feeding their most recent child"; in 1973, the figure was 30.9%; in 1975 it was 31.3%; and by 1979 it had dipped to 25.8% (controlling for length of time since their most recent delivery). This almost continuous decline in the number of current breast feeding mothers held for all urban mothers (pregnant and non-pregnant) over the 1973, 1975, and 1979 survey data as well. (Knodel and Debavalya, 1980)

BREAST FEEDING AND GROWTH CURVES: According to a Bangkok study of 197 Thai infants under 2 years of age from low income families, breast feeding provided for a satisfactory growth rate up to the age of twelve months. (Viseshakul, 1976)

INFANT FEEDING PATTERNS: In a 1976 study, 35% of the 585 mothers sampled were exclusively breast feeding at discharge from the hospital or clinic, 50% gave mixed breast and bottle feedings and 15% were bottle feeding alone. (Durongdej et al., n.d.)

INFANT FEEDING PATTERNS: Only 9 of the 72 infants raised by 37 elite professional women of Bangkok were nursed without supplements of infant formula. For an additional 40 of the infants, breast feeding was combined with formula feeding. The remaining 23 infants received only infant formula. (Van Esterik, 1980)

INFANT FEEDING PATTERNS: Only 7% of a small sample of urban Central region mothers were exclusively breast feeding, 56% were using formula or canned milk, and 27% were combining both sources. (Dhanamitta et al., 1978)

INFANT FEEDING PATTERNS: A 1971 study of four impoverished areas of Bangkok showed that before the end of the first month, only 46% of mothers surveyed were still exclusively breast feeding, 18% were giving mixed feedings and 36% were bottle feeding. The percent exclusively breast feeding declined constantly with age to 34% of 1-6 month olds, 26%

of 7-12 month olds and 6% of 13-24 month olds. (Khanjanasthiti and Dhanamitta, 1978)

INFANT FEEDING PRACTICES: In a 1970 study of four Bangkok slum areas, 22% of the children sampled were never breast fed, another 11% were breast fed less than one month, and 12% more were weaned within the first six months of life. Diluted sweetened condensed milk is often used in this setting. Although women in such areas often contribute to family income, most of them work in cottage industries in or near their homes. (Van Esterik, 1977)

DURATION OF BREAST FEEDING: In the 1979 national survey, 29% of all urban women sampled reported breast feeding their most recent child for at least one year. (Knodel and Debavalya, 1980)

BREAST FEEDING DURATION: Among the 49 infants of elite professional women who received breast milk, only 1 was breast fed over a year. 6 were breast fed 3 months to a year and 14 received breast milk for 2-3 months. Over half (57%) the infants were breast fed for 45 days or less: 17 for 45 days, 5 for less than a month, and 6 for only 2-3 days. (Van Esterik, 1980)

REGIONAL DIFFERENCES IN DURATION: In Bangkok, which exceeds the population of the largest provincial town by a factor of 30, women consistently breast fed less than their provincial urban counterparts in each of the four 1969-1979 surveys. In the 1979 national sample, for example, 57.6% and 27% of the Bangkok women breast fed for more than four months and more than one year respectively compared with 62.4% and 31.4% in provincial urban areas. The average duration of breast feeding was 9.1 months in Bangkok and 11.3 months in provincial urban areas. (Knodel and Debavalya, 1980)

REGIONAL DIFFERENCES IN BREAST FEEDING: Among provincial urban (excluding Bangkok) women sampled during the 1969-1979 survey period, those living in towns in the South frequently ranked lowest in terms of breast feeding (on 6 of 10 measures); those in the North region also ranked low (lowest on 3 of the 10 measures). Women from the provincial towns of the Northeast consistently ranked highest among the urban women in terms of duration and percentage breast feeding. (Knodel and Debavalya, 1980)

AGE AT WEANING: The mean age at weaning of the next-to-last child was 10 months among the urban samples of both the 1975 and 1979 national surveys. (Knodel and Debavalya, 1980)

AGE AT WEANING: Among 37 elite professional women of Bangkok, the most usual time for weaning babies was at 45 days of age, when the maternity leave for civil servants ends. For most of these mothers, weaning was not difficult because they were already supplementing their breast milk with infant formula. (Van Esterik, 1980)

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

EARLY WEANING: In low income areas of Bangkok, children are usually weaned at 6 months to one year of age. (Dhanamitta et al., 1978)

AGE AT WEANING - TREND: A 4.5 month drop in the mean age at weaning, from 12.9 months in 1969 to 8.4 months in 1979, was recorded for the most recently born child of urban non-pregnant women, as calculated from current breast feeding status data collected in four surveys over the last decade. (Knodel and Debavalya, 1980)

AGE AT WEANING - TREND: The median duration of breast feeding the next-to-last child decreased from 9.8 months in the 1975 World Fertility country survey to 7.4 months in a 1979 national survey. (Knodel and Debavalya, 1980)

REASONS FOR BREAST FEEDING: According to a 1974 Mae Klong River survey, 47% of the breast feeding urban mothers sampled cited economic and convenience considerations as the main reasons for their feeding choice. Other reasons cited often included: mother stays at home (10%), baby refused other milk (7%), and advice from elderly persons (3%). Advice from health professionals was not mentioned by the mothers. (Dhanamitta et al., 1979)

RESPONSES TO INSUFFICIENT MILK: In response to the perceived problem of an insufficient supply of breast milk by 19 elite professional women, 15 of these mothers gave their infants more infant formula. 4 mothers reported drinking more liquids, eating a special vegetable soup (kaeng liang, a rural lactation stimulant) and letting the baby nurse longer and more often. Other solutions included going to the doctor for advice and using a breast pump. (Van Esterik, 1980)

BREAST MILK PROTEIN: The protein concentration in breast milk declined with length of lactation up to 270 days from 1.6% during the first week to 0.8% at 3 to 6 months and 0.6% at 6 to 9 months before increasing again. Most texts give a static protein content of 1.1% to 1.2%. The authors' calculations using recommended standards suggest that at least 1000 ml of milk daily would be required for a three month old infant. (Chavalittamrong et al., 1981)

3.3.2 DIETARY PRACTICES, INFANTS 0-24 MONTHS, WEANING FOODS

NATIONAL

EARLY SUPPLEMENTARY FEEDING: Generally, supplementary feeding starts as early as two or three days after birth in the Northeast and during the first month in the North. (Muangman et al., 1977)

WEANING FOODS: Rice and bananas were the main food items fed in significant amounts to infants according to a survey of 13 villages throughout the five regions of Thailand. Oranges and starch were also mentioned as other "non-protein" foods. Among the high protein foods mentioned were pork, eggs, fish and beef. (Dhanamitta et al., 1978)

WEANING FOODS: Most children are never given supplementary milk after cessation of breast feeding. Rice diets are begun in infancy, and special weaning diets are largely unknown. (Austin and Mock, 1981)

PROTEIN INTAKE: Data from the early 1970s suggest that up to 80% of all diets of preschool age children and pregnant and lactating women are protein deficient (relative to standards). Preschoolers were estimated to consume about 1.2 grams of protein per kilogram of body weight. (Austin and Mock, 1981)

VITAMIN SUPPLEMENTS BY REGIONS: 11% of a small sample of mothers in 13 areas throughout Thailand said they gave their infants vitamin supplements. The villages in the East region had the highest percentages (17%) with the Central urban area and the South region villages next with 16% each. In the rural villages of the North, Northeast and Central, about 6-7% gave supplements. (Dhanamitta et al., 1978)

REASONS FOR USING SWEETENED CONDENSED MILK: 41% of urban and semi-rural mothers gave low cost and availability as their reasons for using sweetened condensed milk instead of breast milk in feeding infants under 24 months old; 13% cited advertising, mothers' health or baby not allergic; 10% cited work; 7% inadequate milk secretion; and 28% cited other reasons in a 1974 Mae Klong River survey. (Dhanamitta et al., 1979)

REASONS FOR USING POWDERED MILK: 27% of semi-rural and urban Mae Klong River area mothers who used powdered milk instead of breast milk to feed their infants cited convenience as the reason, 20% cited advice from health personnel, 13% cited work, 13% cited economics, and 27% other reasons in a 1974 survey. (Dhanamitta et al., 1979)

RURAL

SUPPLEMENTARY FOODS: The most common supplementary foods are glutinous and starchy rice; banana is added occasionally. The rice is chewed by the mother, or roasted. Fish, meat, and animal milk are rarely given during the first year. (Dhanamitta et al., 1978)

SUPPLEMENTARY FEEDING PRACTICE: Rice is the usual supplementary food given to infants. It is usually combined with a little meat and vegetables. In the Northeast, the mother prepares it by chewing it, and in other parts of the country, mothers usually grind it. Milk supplementation is very rare in the rural areas due to the high costs. (Muangman et al., 1977)

WEANING FOODS IN THE NORTHEAST REGION: In the Northeastern Khon Kaen province, 86% of the 100 mothers questioned stated that they fed their babies rice, 46% fed bananas, 9% fed fish, and eggs, starch and beef were mentioned by a few. (Dhanamitta et al., 1978)

EARLY INTRODUCTION OF SUPPLEMENTARY FOODS: About 60% of the village mothers in the Northeast introduced their babies to glutinous rice

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

feedings during the first week of life; about 85% did so during the first month. The amount of rice ranged from 47 to 60 grams per day, which supplied about 50 to 60 calories per kilogram of body weight per day. In the North, supplementation is initiated in the first month. In the South and Central regions, supplementation also starts early. Ordinary rice is given as a paste or gruel; often banana is added. (Dhanamitta et al., 1978)

SUPPLEMENTARY FEEDINGS: Mothers of infants under 6 months of age in Ubol Province, Northeast region, usually supplemented the breast milk diet with substantial amounts of steamed glutinous rice. For the 14 study infants 8-18 months old, supplemental feedings consisted mainly of rice and, in most cases, additional foods such as fish and fish products, meat, bananas and vegetables. Carbohydrates, mainly from the rice, constitute 80% to 90% of the energy intake, protein 8-12%, and fat 4 to 8%. Because of the bulkiness of the diet, the caloric intake is often inadequate. (Valyasevi, 1978)

WEANING FOODS: Most infants under one year of age were given rice-paste mixed with banana within seven days after birth, in addition to breast milk, in 6 villages of Khon Kaen province, Northeast region. Supplements of tinned condensed milk were given from time to time depending on the family income. Usually fermented fish and roasted fish were started by 1 to 3 months and vegetables were added 1 to 2 months later. (Harinasuta et al., 1976)

MIXED FEEDING: In the semi-rural areas of Bang Pa-In and six provinces of Mai Klong River areas, approximately 30% of surveyed mothers were feeding their infants both breast milk and supplements. (Khanjanasthiti and Dhanamitta, 1978)

MILKS USED: In Mae Klong River semi-rural areas, 9% of mothers with infants under 24 months of age used powdered milk instead of breast feeding, 20% used sweetened condensed milk and 10% used other or mixed non-breast milk replacements, according to a 1974 survey. (Dhanamitta et al., 1979)

MILKS USED: In Mae Kong River rural areas, 3% of mothers used powdered milk to feed their infants under 24 months old, 13% used sweetened condensed milk and 7% used other or mixed non-breast milks in place of breast feeding, according to a 1974 survey. (Dhanamitta et al., 1979)

REASONS FOR USING POWDERED MILK: Mothers who used powdered milk instead of breast milk cited convenience (29%), inadequate milk secretion (29%), and advice from health personnel (14%) as reasons for their choice in a 1974 Mai Klong River survey. (Dhanamitta et al., 1979)

REASONS FOR USING SWEETENED CONDENSED MILK: 41% of mothers who used sweetened condensed milk instead of breast milk to feed their infants claimed they did so because of the low cost and availability; 28% cited work as the reason; 17%, inadequate milk secretion; 10%, advertising, mothers' health, or baby not allergic; and 4% cited other reasons, in a

1974 Mai Klong River survey. (Dhanamitta et al., 1979)

RAW FISH: In many families among 6 Northeast Region villages, mothers fed their young infants raw fish as early as 1 to 3 months of age. (Harinasuta et al., 1976)

WEANING FOODS IN THE NORTH REGION: 93% of the 150 mothers surveyed in Chiang Mai Province stated that they were feeding their infants rice; 82%, bananas; 31%, pork; 30%, oranges; 19%, eggs; 13%, beef; and 11%, fish. Adult foods were fed to babies, resulting in high percentages of many food items. (Dhanamitta et al., 1978)

WEANING AGE: Hill tribe children from the Mae Chan District, Chiang Rai Province, North Region, were weaned when the next child was born, at an average of 2 years of age. (Viseshakul et al., 1978)

AGE OF SOLID FOOD INTRODUCTION: In Sansai village, Chiang Mai Province, North region, solid foods were introduced into the infants' diets at varying ages from one day to more than one year. About 75% of the children were on solid food by the age of two months. (Calavan, 1972)

SOLID FOODS: If the infant was under six months when solid foods were introduced, the first food was ordinarily a combination of glutinous rice and bananas that were either mashed or pre-chewed by the mother. If over six months, the child usually began with steamed glutinous rice, roast pork, and roast fish, according to an anthropological survey of Sansai. Other meats, fish and eggs usually entered the diet between 12 to 18 months, and vegetables and fruits even later (usually 18 months to five years). (Calavan, 1972)

WEANING FOODS: Rural mothers in a central Thai village weaned children onto rice, milk and solid foods. A small percent of the younger, wealthier women supplemented this with sweetened condensed milk or a tonic such as Ovaltine. (Van Esterik, 1977)

WEANING FOODS IN THE CENTRAL REGION: Among a small sample of rural women from Ayutthaya province, Central Region, the foods fed to infants most frequently were rice (78% of the women mentioned feeding rice), bananas (55%), pork (14%), oranges (13%) and eggs (8%). (Dhanamitta et al., 1978)

WEANING FOODS IN THE EAST REGION: In the East Chonburi province, about 150 mothers identified the following foods fed to infants: bananas (81% of sampled mothers mentioned); rice (78%); pork (15%); oranges (12%); starch (12%); and eggs (6%). (Dhanamitta et al., 1978)

WEANING FOODS IN THE SOUTH REGION: In the South region, Songkhla province, a small sample of about 100 mothers questioned on weaning practices stated that the main foods fed to babies included rice (given by 68% of mothers), bananas (32%), starch (31%), oranges (19%), beef (4%), and eggs (3%). (Dhanamitta et al., 1978)

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

URBAN

INFANT FORMULA PURCHASES: Most mothers among a group of 37 elite Bangkok women purchased infant formula. 19 women chose S26, an expensive American Home Products brand (Wyeth Laboratories). 13 women chose one of two Nestle Corporation products, Lactogen Full Protein and Bear Brand formula. Similac (Ross Labs), Carnation, SMA (another AHP product) and Klim were also mentioned as preferred brands. (Van Esterik, 1980)

INFANT FORMULA COMPANIES: In decisions to change brands or questions about formulas, 24 of 37 professional Bangkok women relied on instruction booklets received from the infant formula companies. (Van Esterik, 1980)

BOTTLE FEEDING: In an unpublished study of 359 mothers from the Bangkok slum, Klong Toey, Worthington found that 66% of the mothers, many lonely and bored at home, chose to bottle feed full or part time. The majority used diluted sweetened condensed milk. (Van Esterik, 1979)

SCHEDULED FEEDING: Urban elite mothers reported that their babies were fed infant formula on a regular schedule 5-6 times a day. (Van Esterik, 1980)

MILKS USED: In urban Mae Klong River areas, 19% of mothers replaced breast milk with powdered milk, 23% with sweetened condensed milk and 19% with other or mixed non-breast milk replacements, in feeding infants under 24 months of age according to a 1974 survey. (Dhanamitta et al., 1979)

SWEETENED CONDENSED MILK: Sweetened condensed milk is commonly used when breast milk is discontinued. (Dhanamitta et al., 1978)

SWEETENED CONDENSED MILK: Sweetened condensed milk is popular as a breast milk substitute, and in urban areas as a substitute for the more expensive infant formula. In an unpublished study, Worthington found that 162 of 359 mothers (45%) from the urban slums of Klong Toey fed their infants with diluted sweetened condensed milk. 23 claimed that their newborns were given this milk in Bangkok hospitals. (Van Esterik, 1979)

USE OF SWEETENED CONDENSED MILK: A 1975 study of Bangkok infants showed that 12% of 6 month old infants (6/52) 15% of 12 month old infants (8/56), 45% of 18 month olds (20/44) and 44% of the 2 year olds (20/45) were fed sweetened condensed milk. (Viseshakul, 1976)

USE OF POWDERED MILK: The percentage of infants who were fed powdered milk declined from 44% (23 of 52) of the six month olds to 30% (17 of 56) of the twelve month olds, 18% (8 of 44) of the eighteen month olds, and 14% (6 of 44) of the two year olds among a sample of 197 Bangkok infants from low income families. (Viseshakul, 1976)

PROTEIN INTAKE AND TYPES OF MILK FEEDING: Total daily protein intake (g/kg of body weight) was higher for Thai infants less than two years old

who were fed powdered milk than for those fed sweetened condensed milk in each of the age groups studied: 2.4 vs. 2.1 g/kg for 6 month olds; 2.9 vs. 2.5 g/kg for 12 month olds; 2.6 vs. 2.3 g/kg for 24 month olds. The only group receiving less than the 1965 FAO/WHO recommended intake of protein was the 6 month old infants fed sweetened condensed milk. (Viseshakul, 1976)

ENERGY INTAKE AND TYPE OF MILK FEEDING: Total daily energy intake (kcal/kg of body weight) was higher for Thai infants fed sweetened condensed milk than for those fed powdered milk in each of the age groups studied: 110.3 vs. 87.1 kcal/kg among 6 month olds; 104.6 vs. 96.3 kcal/kg for 12 month olds; 83 vs. 82.2 kcal/kg for 18 month olds; and 80.2 vs. 73.1 kcal/kg for 24 month olds. The deficiency of energy intake for both feeding types reached about 20% compared with 1965 FAO/WHO reference standards. (Viseshakul, 1976)

SUPPLEMENTARY FEEDING: City mothers usually begin supplementary feedings of their infants after 3 months of age. (Dhanamitta et al., 1978)

WEANING FOODS IN THE CENTRAL REGION: Among a small urban sample of women from the Ayutthaya province, Central Region, the main foods fed to infants included rice (mentioned by 61% of mothers), bananas (52%), oranges (36%), pork (21%), and beef, chicken, eggs and liver (all mentioned by less than 10% of the sample). (Dhanamitta et al., 1978)

HOSPITAL FORMULA FEEDING: The policy of feeding all newborn infants with formula at Phramongkutklao Hospital was shown to influence mothers' subsequent feeding practices. More mothers were bottle feeding at follow-up than had originally intended. More mothers who were undecided prenatally were influenced to bottle feed than mothers who had already decided. In addition, formula brand preference was also influenced by the hospital policy. (Kietthubthew, 1980)

HOSPITAL PRACTICES: A high proportion (21%) of births among elite Bangkok women were by Caesarean section. Only a few women recalled being given injections to "dry up" their milk supply. However, most babies were fed infant formula during the first 2-3 days, before the mother's milk came in, regardless of whether the mother intended to breast feed. Mothers also reported water or glucose bottle feeds were given to their babies in the hospital nursery. Advice from doctors was given on formula, but was limited regarding breast feeding to "curing" abscesses according to mothers' reports. (Van Esterik, 1980)

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

RURAL

BASIC FOODS: The four main foods eaten by 130 preschool children 1-5 years old in Khon Kaen province Northeast were glutinous rice, fermented fish (pla-ra), fish, and vegetables. Fruits, pork, peanuts and beans, beef, sweets and lard are other frequently eaten foods. (Harinasuta et al., 1976)

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

CHILDREN'S FEEDING PATTERNS: Parents' primary concern was that the children (1.5 years to 6 years) eat rice; not much attention was given to insuring children ate other foods. The children made their own choices in taking whatever they liked from the prepared dish and often did not eat their share of non-rice foods. Children usually took a long time finishing their meals because they stopped eating to play and resumed eating when they wished. Leftovers were often served again as snacks. (Chandrapanond et al., 1972)

INTRODUCTION TO FULL ADULT DIET: Children were introduced to the full adult cuisine only when they began to eat phed (hot, spicy) foods, which occurred in 55% of the Sansai village households when they were four years old or older. Some children continued on a restricted diet until their tenth or twelfth year. (Calavan, 1972)

DIETARY DIVERSITY: Preschool children in Harnkaew village, Chiang Mai province, North region, (a village population with a relatively high nutritional status) ate 30% more rice and consumed more fat and vegetables than children from two other villages (whose populations had relatively low nutritional status). The total amounts of meat, fish, eggs and pulses did not vary significantly between the villages, according to a 3 day food consumption survey of 24 children. The additional fat and vegetables may have made the Harnkaew diet more tasty and thus led to increased rice consumption by the preschool children. (Gershoff et al., 1977)

RICE CONSUMPTION: A 3 day food consumption survey of 8 preschool children in each of three villages showed that in Harnkaew village (higher nutritional status) the children ate about 30% more rice than children from Sansai and Bantawi villages (lower nutritional status), so the children of Harnkaew obtained the recommended allowances for calories but the others received only about 64% of their caloric needs. Rice appeared to be adequately available in all three villages. (Gershoff et al., 1977)

NUTRIENT INTAKE: Among 20 young children 1.5 to 2.4 years old, the average energy intake per day was 544 calories with carbohydrates making up 84% of the calories, protein 8% and fat 8%. The average diet consisted mainly of rice and rice products (112 grams), meat and fish (17 grams), fruit (16 grams), sweetened condensed milk (14 grams), eggs (12.5 grams) and sugar and syrups (10 grams) as well as desserts and sweets, leafy vegetables, seasonings, meat products and non-leafy vegetables. (Chandrapanond et al., 1972)

3.4 DIETARY PRACTICES, HEALTH AND MEDICINE

NATIONAL.

TRADITIONAL THERAPY: Traditional methods of therapy include many home remedies, favored foods and herbal mixtures that may be known generally or only by a single family, and that are taken without ritual or thought

of spiritual intervention. Medicines of the Chinese pharmacist are also popular and include traditional Chinese medicaments, modern patent medicines, and a few modern drugs such as aspirin, quinine, and sulfanilamide. (Woolley, 1974)

4. NUTRITION STATUS CORRELATIONS

NATIONAL

PROXIMAL CAUSES OF PEM IN CHILDREN: The two major causes of PEM in children identified were lack of breast feeding from the mother and insufficient supplementary foods. The first cause of PEM is often found in Bangkok slum areas where mothers lack knowledge and equipment for proper artificial feeding and preparation. Insufficient supplementary food is often found among rural children after the weaning period. (Mongkolmai and Limprapat, 1979)

PEM AND INCOME: 67% of the malnourished children identified came from families with monthly incomes of less than \$15 and only 3% came from families with monthly incomes greater than \$30, according to a 1975 report. 55% of the malnourished children came from farm families and another 35% came from laborers' families. (Mongkolmai and Limprapat, 1979)

BREAST FEEDING AND EDUCATION: In each of four surveys from 1969 to 1979, trends in breast feeding by years of schooling showed consistently lower proportions of women still breast feeding the most recent child if they had more than a primary education or if their husbands were more highly educated, in both rural and urban areas. (Knodel and Debavalya, 1980)

BREAST FEEDING AND CONTRACEPTIVE USE: Data from three national surveys in the last decade all indicate a consistent pattern of less breast feeding among contraceptive users than among women not using contraception in both rural and urban areas, and both before and after adjustments for region and education are made. Among users, those using birth control pills generally breast fed less than users of other methods. (Knodel and Debavalya, 1980)

BREAST FEEDING, DESIRE FOR MORE CHILDREN AND CONTRACEPTIVE USE: Data from the three national surveys over the last decade was analyzed to indirectly test whether Thai women consciously used breast feeding as a fertility-depressing device. Generally the hypothesis was supported. Especially among noncontraceptive users, women who indicated they wanted no more children reported more breast feeding than women who wished to continue childbearing. For most of the breast feeding measure comparisons, contraceptive users who wanted more children ranked lowest in breast feeding, while nonusers who wished no more children ranked highest. (Knodel and Debavalya, 1980)

BREAST FEEDING, EDUCATION, AGE AND PARITY: Breast feeding was found to be much less common and to be for much shorter periods among the small number of women with five or more years of schooling compared to those with less education among the 1975 SOFT sample of 1265 women. Age and parity variables showed a very slight positive association with breast feeding initiation and duration. (Institute of Population Studies and National Statistical Office, 1977)

4. NUTRITION STATUS CORRELATIONS (Cont.)

RURAL

PEM AND INFECTION: Children classified as malnourished according to arm circumference measurements (less than 12.5 cm) experienced far more episodes of acute illness than control children in the Ubon Refugee Camp. (O'Sullivan et al., 1980)

MALNUTRITION AND MORBIDITY: Among a sample of 1163 preschool children studied in 1974, there did not appear to be more illness in children with angular lesions (clinical sign of malnutrition) or hookworm than in the population as a whole. (Gershoff et al., 1977)

NUTRITION STATUS AND FORTIFICATION: No significant differences were found between children who had consumed fortified rice and those who had not. Rice was fortified with lysine, threonine, thiamine, riboflavin, vitamin A, and iron. Status was measured by anthropometric measures, hemoglobin and hematocrit levels, and morbidity measures. (Gershoff et al., 1977)

POOR GROWTH AND LOW CALORIE INTAKES: The most likely cause of the poor growth among 2250 Chiang Mai area village children who participated in a rice fortification field study was low calorie intake, even though there was an abundance of traditional foods (e.g. rice). (Gershoff et al., 1977)

PER CAPITA FOOD EXPENDITURE AND DIETARY DIVERSITY: Diets of the top third socioeconomic households in Sansai villages were more varied than the other households. At the same time, per capita food expenditure for this top economic group was 830 baht compared to 640 baht and 590 baht for the two other socioeconomic household groups. This is a 40% difference between the top and bottom groups. (Calavan, 1972)

BREAST FEEDING AND SOCIOECONOMIC STATUS: Among rural women sampled in the 1969 and 1972 surveys, there appeared to be a weak inverse association between measures of socioeconomic status (both subjective judgements and household material possession scores) and breast feeding; that is, women of lower socioeconomic status breast fed considerably more than women in the higher SES groups. (Knodel and Debavalya, 1980)

BREAST FEEDING AND EMPLOYMENT STATUS: Analysis of data from the 1979 national survey regarding women's work in rural areas indicate that women who were either self or family employed breast fed more than women who were either not working or employed by someone else. The average duration for breast feeding for self or family employed women was 19.6 months compared with 15.3 and 14.1 months for women not working and employed by someone outside the family respectively. Even after controlling for rural region and educational level, this relationship held. There was no consistent relationship between breast feeding patterns of women who were not working and those who were employed by someone else. (Knodel and Debavalya, 1980)

BREAST FEEDING AND EMPLOYMENT STATUS: Among rural women surveyed in the 1979 national sample, women engaged in non-farm work (with or without wages) consistently breast fed less than other rural women on three measures of breast feeding. Only 29% of non-farm women workers were still breast feeding their most recent child compared with 47% of non-working women, 59% of farm laborers and 62% of women working on family farms. The percentages in each category who breast fed their most recent child over one year were 39%, 48%, 64% and 74% of women engaged in non-farm work, no work, farm labor, and the family farm, respectively. The average duration of breast feeding among the women in these employment categories was 12.7 months, 15.3 months, 14.4 months and 20.5 months respectively. (Knodel and Debavalya, 1980)

BREAST FEEDING AND EMPLOYMENT STATUS: According to the data from the 1975 World Fertility survey, 47% of rural women engaged in non-farm work (for wages or not) breast fed their most recent child more than one year, while 77% of women farm workers and 59% of non-workers did so. The data on average breast feeding duration showed the same pattern, with non-farm workers breast feeding for 14.9 months, farm workers for 20.6 months, and women not working since their most recent birth for 16.8 months. (Knodel and Debavalya, 1980)

BREAST FEEDING AND WAGE EMPLOYMENT: Among rural women, 66% of those involved in non-farm wage work were still breast feeding their under three year olds, whereas 82% of those involved in farm wage work were still breast feeding and 77% of women who had never worked for wages were still breast feeding according to a 1969 survey. In a 1979 national survey, the percentages of women in these three categories (non-farm, farm and never worked) who had breast fed their most recent child over one year were 43%, 64% and 68% respectively. The average duration of breast feeding in the 1979 survey among these groups was 13.9 months, 14.4 months, and 19.2 months, respectively. (Knodel and Debavalya, 1980)

BREAST FEEDING AND PLACE OF DELIVERY: The results of the 1979 national survey show a consistent negative association between measures of breast feeding and delivery in modern medical facilities for rural women. Only 51% of mothers who delivered in medical facilities were still breast feeding their last child at the time of the survey compared to 59% of those with home deliveries. The percent of rural women who breast fed their last child over one year was 57% for those with medical facility deliveries and 69% for home deliveries. The average duration of breast feeding among the two groups showed the same pattern (16.8 months vs. 19.2 months). Results from the 1969 and 1972 rural surveys did not show a consistent pattern. The percentage of women still breast feeding was higher among those giving birth in medical facilities than among those having home births (74-85% vs. 65-76%). However, the percentage of women who intend to or usually breast feed at least one year was higher among those with home deliveries. (Knodel and Debavalya, 1980)

BREAST FEEDING AND CONTACT WITH URBAN AREAS: In the 1972 rural survey, women who had ever lived in a municipal area were less likely to still be breast feeding the last child than those who had not (48% vs. 67%).

4. NUTRITION STATUS CORRELATIONS (Cont.)

Similar results were found for the frequency of urban center visits: 47% for those who often visited, 64% for those who seldom visited and 67% for those who never visited were still breast feeding at the time of the survey. The frequency of visits to the provincial capital was similarly related to breast feeding although not as clearly. (Knodel and Debavalya, 1980)

DIET AND BLADDER STONE DISEASE: Families that introduce glutinous rice feedings to infants during the first week of life have a prevalence rate of bladder stone disease twice that of families supplementing after this time. (Dhanamitta et al., 1978)

URBAN

BREAST FEEDING AND SOCIOECONOMIC STATUS: For urban women in the 1970 and 1973 surveys, a consistent inverse relationship was apparent between breast feeding performance and socioeconomic status (four categories subjectively applied). Poor urban women tended to breast feed far more than those judged well off. (Knodel and Debavalya, 1980)

BREAST FEEDING, MOTHERS' AGE AND FAMILY INCOME: Breast feeding at discharge from the hospital or clinic was significantly and positively related to both younger age and lower income among a sample of 585 primiparous mothers. A majority of older mothers were in a higher income level and favored bottle feeding. (Durongdej et al., n.d.)

BREAST FEEDING AND EDUCATIONAL LEVEL: Mothers with 1 to 7 years of schooling were exclusively breast feeding at discharge from the hospital or clinic at a significantly higher rate (41%) than those mothers with no schooling (14%), those with 8-14 years (23%) or those with over 14 years (7%) among a sample of 585 Bangkok women. (Durongdej et al., n.d.)

BREAST FEEDING ATTITUDE AND AGE: There was a significant positive relationship ($p < .05$) between mothers' ages and favorable attitudes toward breast feeding; that is, older women felt more favorable toward breast feeding than younger women in a sample of 210 women. (Temcharoen et al., 1979)

BREAST FEEDING ATTITUDE AND DEMOGRAPHIC FACTORS: In a sample of 210 women, there were no significant relationships between attitudes toward breast feeding and hometown, educational level, occupation or economic status. (Temcharoen et al., 1979)

BREAST FEEDING AND MOTHERS' OCCUPATIONS: Breast feeding practices at hospital or clinic discharge were significantly associated with mothers' occupations among a sample of Bangkok women. Those working in civil service were exclusively breast feeding least (6%) and those in farming most (50%). (Durongdej et al., n.d.)

BREAST FEEDING AND EMPLOYER: Unadjusted data from the 1979 National Survey showed a consistent trend of decreasing breast feeding from women not currently working through those working for themselves or family to

those working for someone else. The percent still breast feeding among these three categories were 34%, 25% and 20% respectively. The percents breast feeding at least four months were: 65%, 60% and 52% respectively. The average duration of breast feeding among these groups was 10.8 months, 10.1 months and 8.3 months respectively. However, once region of residence and level of educational attainment were controlled for, these trends were not apparent. (Knodel and Debavalya, 1980)

BREAST FEEDING AND EMPLOYMENT STATUS: Adjusted data from the 1975 Survey of Fertility, Thailand (i.e., controlling for region and education level), showed a mixed influence of work on breast feeding. The percent of women still breast feeding at the time of the survey was 38-39% for women currently not working and 19% for women working, either for wages or not. However, the average duration of breast feeding of the next to last child was longer among the working women, 11.8 months, than for not working ones, 9.8 to 10.7 months. (Knodel and Debavalya, 1980)

BREAST FEEDING AND EMPLOYMENT STATUS: From the 1970 national urban survey, calculations show a negative association between women's present work status and breast feeding. Whereas 39-48% of women currently not working (controlling for region and education) were still breast feeding, only 29-31% of women currently working for wages were still breast feeding. The percent of women who intended to or usually breast fed for more than four months ranged from 65-74% among currently non-working women and from 46-64% for currently wage earning women. (Knodel and Debavalya, 1980)

BREAST FEEDING, PLACE OF WORK AND EMPLOYER: Data from the 1975 Survey of Fertility of Thailand fairly consistently showed that the least breast feeding occurred if women worked outside the home and/or for someone else. Generally, the non working women also breast fed more than women working at home and for themselves or their family. However, if one controls for region of residence and level of educational attainment, these relationships no longer consistently hold true, especially for the average duration of breast feeding the next to last child. (Knodel and Debavalya, 1980)

BREAST FEEDING AND PLACE OF WORK: Data from the 1973 national urban survey showed that the percent of women still breast feeding decreased slightly with working status and place of work even after controlling for region and education level: from 34% for not working women, to 33% for women working at home to 32% for those working outside the home. The same trend was apparent in the percent of women who usually breast fed for over seven months: 71%, 70% and 67% respectively. (Knodel and Debavalya, 1980)

BREAST FEEDING, PLACE AND PAY OF CURRENT WORK: Data from the 1973 national urban survey suggested that working away from home for pay is associated with the least breast feeding, although when adjusted for region of residence and educational level the difference is far less pronounced. (Knodel and Debavalya, 1980)

4. NUTRITION STATUS CORRELATIONS (Cont.)

BREAST FEEDING AND WOMEN'S CURRENT OCCUPATION: Results from both the 1970 and 1975 national urban surveys indicated that women engaged in white-collar jobs (mainly professional, clerical and government jobs) breast fed far less than any other occupation group. Only 10% were still breast feeding and only 20% intended to or usually breast fed longer than four months in the 1970 sample. Their lack of breast feeding is likely to be due to their higher social class rather than a direct result of their work. Women classified as engaged in small businesses in the 1970 survey breast fed more than nonworking women even adjusting for region and education level (49% vs. 43% still breast feeding their last child at the time of the survey). However, in both the 1975 and 1979 national surveys, urban women classified as housewives (i.e., not economically engaged) ranked highest on most breast feeding indices even after controlling for region of residence and level of educational attainment. (Knodel and Debavalya, 1980)

BREAST FEEDING AND MOTHERS' WORK: Over 47% of mothers sampled in four Bangkok slums were contributing income to the family, with 7% being the sole support. Almost 25% of the mothers worked full time and approximately 15% worked part time. 45% of the 1,154 children of these mothers were either not breast fed or weaned within the first six months of life. (Khanjanasthiti and Wray, 1974)

BREAST FEEDING AND PLACE OF DELIVERY: Urban women who delivered in modern medical facilities breast fed consistently less than those who delivered at home in three separate surveys (1970, 1973 and 1979) even after adjusting for region of residence and level of educational attainment. The percent still breast feeding for home deliveries ranged from 48-72% versus 34-60% for medical facility deliveries. The average duration of breast feeding for women who delivered at home ranged from 14.8 to 16.4 months while for those with medical facility deliveries, the range was 9 to 11.1 months. (Knodel and Debavalya, 1980)

BREAST FEEDING AND PLACE OF BIRTH: Among urban women, those who were born in rural areas breast fed more extensively than native born urban women, according to both the 1970 and 1973 urban surveys. The percent of women still breast feeding their last child in each study was 42% and 37% among urban-born women and 35% and 30% among rural-born women. (Knodel and Debavalya, 1980)

BREAST FEEDING AND LENGTH OF URBAN RESIDENCE: Unlike place of birth, length of urban residence shows little consistent association with breast feeding. (Knodel and Debavalya, 1980)

5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

5.1 NUTRITION AND HEALTH POLICIES

NATIONAL

FIFTH FIVE YEAR PLAN: In the Fifth Five Year Plan (1982-6), the government has identified 236 poor districts and subdistricts in 36 provinces of the North, Northeast and South as "backward areas" which cannot help themselves, in essentially rainfed agricultural areas and highland agricultural areas. These have been targeted for an intensified effort to meet basic human needs and provide appropriate (simple) agricultural technologies. (U.S. A.I.D., 1981)

FIFTH FIVE YEAR PLAN: The Royal Thai Government has recognized in the Fifth Five Year Plan (1982-6) that economic growth alone cannot overcome absolute poverty among the Thai people. Thus, the objective of the "Decade of Rural Development" is to raise the income and productivity of the farming poor. (U.S. A.I.D., 1981)

NATIONAL DEVELOPMENT PLAN: In the first three National Development Plans, nutrition was not emphasized and was left to the health sector. In the Fourth National Development Plan (1977-1981), a National Food and Nutrition Committee was established to implement the Food and Nutrition Policy presented. (Valyasevi, 1978)

NUTRITION PROGRAM OBJECTIVES OF 4TH PLAN: The objectives of the nutrition programs in the Fourth Plan included providing infant food and protein supplements to children from 6 months to 5 years old in low income families in Bangkok slums and in rural areas; construction of child nutrition centers; providing nutrition education to mothers by using mobile units; promotion of breast feeding; production and distribution of iodized salt; and provision and training of health and nutrition personnel. These nutrition programs have not been evaluated. (Mongkolmai and Limprapat, 1979)

PROPOSED NUTRITION EXPENDITURES FOR THE FOURTH PLAN (1977-1981): The proposed percentage of the government health expenditure allocated to nutrition during the 1977-1981 Fourth Plan period was 2.33%. It increased yearly from 0.88% in 1977-78 to 3.32% in 1980-81. (Mongkolmai and Limprapat, 1979)

FOOD AND NUTRITION POLICY: The National Economic and Social Development Board of Thailand (NESDB) formulated a Food and Nutrition Policy in 1975 which included as the general objectives: to improve the nutritional status of the population through programs within the health care system; to assure adequate food production; to assure adequate food distribution and prices; to increase nutrition knowledge and understanding; and to elevate the socioeconomic status of all segments of the population. A National Food and Nutrition Committee was formulated in 1977 to help carry out these objectives. (Dhanamitta et al., 1978)

5.1 NUTRITION AND HEALTH POLICIES (Cont.)

FOOD AND NUTRITION POLICY: Under the 1977-1981 National Food and Nutrition Policy, twenty nine provinces were selected as the target areas based on several criteria such as high prevalence of PEM, low socioeconomic status and existing community development programs. 16 of the target area provinces are located in the Northeast, 9 in the North, one in the Central region and 3 in the South. The goal is to improve the nutritional status of 30% of the target population, a total of 3 million infants, preschool children, and pregnant and lactating mothers. (Valyasevi, 1978)

ORGANIZATION OF THE FOOD AND NUTRITION COMMITTEE: The Food and Nutrition Committee organized in 1977 is chaired by the Minister of Public Health. Members include the undersecretaries of Health, Agriculture, Interior and Education, and the directors of the Departments of Health and Nutrition, the Institute of Nutrition, and the Institute of Food Research and Product Development. Provincial Food and Nutrition Committees will act as the links between village and subdistrict action plans and programs and the national committee. The nutrition plan will be implemented through the health care network at the village level. (Valyasevi, 1978)

BREAST FEEDING POLICY: The 1977-1981 National Food and Nutrition Policy emphasized breast feeding promotion for infants' health. The 1975-1976 draft of the Fourth National Economic and Social Development Plan also included a concern for the promotion of breast feeding. (Dhanamitta et al., 1979)

BREAST MILK SUBSTITUTES MARKETING CODE: The Royal Thai Government has drafted a marketing code that resembles the WHO Code. However, the Thai code gives responsibility for insuring objective information to the manufacturers (rather than to the government as in the WHO Code, Article 4.1). It also does not include Article 6.4 of the WHO Code which prohibits the use of "mothercraft nurses." (IFBAN News, 1981)

PRICING POLICY: The whole price index of the economy is geared to rice prices; i.e., as rice prices rise, so do all other prices. (Woolley, 1974)

RICE "PREMIUM": The Thai government maintains a "premium" on exports to control rice exports and influence domestic rice supplies and prices. In 1967, the government put an embargo on rice exports in order to stabilize domestic rice prices. (Woolley, 1974)

SUBSIDIZED RICE DISTRIBUTION: Over the past five years (1977-81), a subsidized rice distribution system has been established. Special shops in the urban areas sell "ochaa," a mixture of one-fifth glutinous and four-fifths 15% broken rice perceived as of low quality (although its nutritional equivalent). The ration is seven kilos per person per week (less for children under 5) and the price is \$3.30 per kg. which is about half the price of ordinary rice. Any citizen is eligible. About 20,000 metric tons per week are distributed throughout the country. Shops often report running out of their weekly supply after the first two or three days. (Stewart et al., 1980)

FAIR PRICE SHOPS: Plans are being implemented to establish special stores which will sell rice, sugar and about 18 other consumer items at prices about 25% below open market prices. The government will purchase the goods directly and distribute them to licensed retailers. Initially 150 stores in Bangkok and three in each province are planned. There are no restrictions on who may use the shops. The goal of the project is to dampen open market price increases and provide necessities at a low cost. (Stewart et al., 1980)

PRICE CONTROLS ON BASIC GOODS: There is a price control policy on basic goods including foods such as cooking oil, meat (enforcement intentionally lax), sugar, canned and powdered milk, and wheat flour. Prices are set based on government calculations of the costs of production plus a "reasonable" margin. Most foods are sold at or close to the control price. (Stewart et al., 1980)

GOVERNMENT DISCOUNT BRANDS: Recently, the Royal Thai Government has started to distribute several products, including condensed milk and cooking oil, under its own "Zinthai" brand name at prices below open-market prices. Private manufacturers process and package the products under contract with the government. (Stewart et al., 1980)

WOMEN'S LEGAL STATUS: Legally, Thai women have equal status with men since the Civil and Commercial Code Amendment Act (Number 8) of October 5, 1976. The rights to vote and to run for office have existed for both men and women since before the first constitution in 1932. However, old attitudes and practices still remain among both men and women. (USAID, 1979a)

INTERNATIONAL ORGANIZATIONS: International organizations working in support of aspects of the National Food and Nutrition Policy include UNICEF, WHO, FAO, US AID, and the Governments of New Zealand, Australia, and Japan. (Dhanamitta et al., 1978)

VOLUNTARY ORGANIZATIONS: In-country voluntary organizations that are participating in the National Food and Nutrition Plan include the Thai Social Welfare Council, the National Women's Council, the Thailand Home Economics Association, and the Nutrition Association of Thailand. (Dhanamitta et al., 1978)

HEALTH CARE BUDGET: The Royal Thailand Government health care budget for 1980 was \$227 million, which constituted 4.16% of the total national government budget. Private sector expenditures were estimated at four times those of the government. (Merrill and Oot, 1980)

HEALTH EXPENDITURES: Government expenditures on health have ranged from 4.8% to 7.0% of total expenditures between the fiscal years 1973-1978. It was 5.1% in 1973 and 6.0% in 1978, and per capita expenditures were \$40 and \$105 in 1973 and 1978 respectively. (Mongkolsmai and Limprapat, 1979)

5.2 NUTRITION AND HEALTH PROGRAMS

NATIONAL

NUTRITION INFORMATION, EDUCATION AND COMMUNICATION (IEC): Information, education and communication (IEC) activities in nutrition and mother-child health carried out by the Ministry of Public Health have been limited almost exclusively to face-to-face communication by MOPH field staff, supported by booklets and leaflets. (Population Projects Department, 1978)

BREAST FEEDING PROMOTION: Historically, breast feeding has been promoted in medical schools, nursing schools and colleges as a tradition. Recent promotions of breast feeding have been conducted mainly by the Division of Nutrition, Department of Health. (Dhanamitta et al., 1979)

BREAST FEEDING PROMOTION: As part of the "20 Province Health Project," a breast feeding promotion campaign was planned by the Nutrition Education Task Force (members were from the Nutrition Division of the Ministry of Health, the Institute of Nutrition and UNICEF). Breast feeding posters and slogans were pretested and operational strategies for nutrition communication and motivation activities were planned. (Nutrition Education Task Force, 1979)

BREAST FEEDING PROMOTION: In 1978-1979, The Nutrition Association of Thailand organized two contests to generate slogans and pictures to promote breast feeding. (Dhanamitta et al., 1979)

BREAST FEEDING PROMOTION: In 1976, a seminar on breast feeding was organized by the Pediatric Society of Thailand for pediatricians, obstetricians, gynecologists and nurses in an attempt to promote breast feeding. (Dhanamitta et al., 1979)

INTERNATIONAL YEAR OF THE CHILD BREAST FEEDING PROMOTION: Activities in 1979 to promote breast feeding included exhibitions; lectures and group discussions during conferences; lecture tours throughout the country to medical personnel; radio and television programs; songs and newspapers; and distribution of posters, T-shirts and pamphlets. They were carried out by The Nutrition Association of Thailand, The Pediatric Society of Thailand, and The Institute of Nutrition and Division of Nutrition, Department of Health. (Dhanamitta et al., 1979)

INFANT FEEDING PRACTICES SEMINARS: In February and March of 1979, three national seminars were organized by the Subcommittee on Mothers and Child Nutrition and the Subcommittee on Mass Communication of the National Food and Nutrition Committee under UNICEF sponsorship. The first two were attended by physicians, nurses, nutritionists and college teachers. The third seminar was attended by hospital administrators, planners, high ranking officers from the ministries and infant food industry representatives. The objectives were to come up with recommendations on guidelines to overcome problems in breast feeding; to identify the roles of health personnel, teachers, government and industry in promoting

desirable practices; to set up means of cooperation between these groups; and to publicly encourage breast feeding. (Dhanamitta et al., 1979)

INTEGRATED NUTRITION, HEALTH AND COMMUNITY DEVELOPMENT: Three pilot programs to improve nutrition and health have been developed: one in the Nong-Hai subdistrict of Ubon Prvince, Northeast and two in the North, in Lampang and Chiang Mai Provinces. The objective of these pilot programs is to find suitable models for the implementation of nutrition program integration into the existing health care network. (Valyasevi, 1978)

PRIMARY HEALTH CARE SYSTEM: The Royal Thai Government has put in place a first-phase expansion of the primary health care program in 20 rural provinces and is extending paramedical capability to the sub-district level. Over 95,000 government health personnel have been trained and placed through this program. (U.S. A.I.D., 1981)

"20 PROVINCE PROJECT" - PRIMARY HEALTH CARE: The Government of Thailand has recently decided on an ambitious new "20 Province Project" of rural primary health care assisted by the World Bank. The plan calls for: 1) training of 1500 "wechakorn" (clinically trained paraprofessionals) nurse practitioners employing the training methods and materials developed in the Lampang Province Project who will be assigned to provincial and district hospitals (unlike the Lampang project where they were central to the rural health centers); and 2) training enough health volunteers over the next five years to cover all the villages in the new project area. The health centers will be staffed by midwives who receive four months of special training in clinical services. (Lampang Project Personnel, 1980)

INSTITUTE OF NUTRITION: The Mahidol University Institute of Nutrition's responsibilities include: planning, conducting and analyzing nutrition research; promoting education and training in food and nutrition; and providing basic data and recommendations for national food and nutrition planning. (Dhanamitta et al., 1978)

INFANT FOOD SUPPLEMENTS: The Institute of Food Research and Product Development, Kasetsart University (IFRPD) has produced many high protein foods from soybean or mungbean, which are locally available. In 1978, 118 tons of Baby Food, 13 tons of Kaset Protein and 130,000 cans of soybean milk were produced as supplementary foods for infants and children. (Dhanamitta et al., 1978)

PROTEIN RICH FOOD SUPPLEMENTS: The Institute for Food Research and Product Development (IFRPD) of Kasetsart University has been providing its products (mainly Kaset Protein, soybean milk, soy flour cookies and baby food powder) since 1968 to day care centers in forty-five provinces. (Austin and Mock, 1981)

SUPPLEMENTAL FOODS: Kasetsart University makes five different food products at a cost of \$.50 per pound: a rice/soy cereal blend, a rice/soy cookie, soymilk, a fortified popcorn and a mung/soy flour for soups. (Merrill and Oot, 1980)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

SUPPLEMENTAL FOODS: Supplemental foods, produced at Kasetsart University and donated by the Government of Japan, are available at the tambon (sub-district) level, but are supplied in small quantities at the health centers, thus requiring recipients to re-stock often. (Merrill and Oot, 1980)

FOOD SUPPLEMENTS: The primary health care system is being used for the distribution of supplementary foods to at-risk groups. (Merrill and Oot, 1980)

SUPPLEMENTAL FOOD PROGRAM: A Nutrition Division study showed that the supplemental food program reduced the rate of third degree malnutrition from 2.1% to 1.3%, and the rate of second degree malnutrition from 10.6% to 9.2%, but did not reduce the rate of first degree malnutrition. (Merrill and Oot, 1980)

CHILD NUTRITION CENTERS: Child Nutrition Centers at rural health facilities provide day care services, supplemental feeding for children and a focal point for community participation and education. Three ministries offer day care services (Public Health, Education, and Interior). As of early 1977 there were 465 centers in the country, with 166 in the 20 AFPH provinces. The Population Project - 20 Province Project provided building materials, equipment, and minimal salaries for the construction and running of 120 new centers. The local communities were to provide the construction labor. (Population Projects Department, 1978)

CHILD NUTRITION CENTERS AND CHILD DEVELOPMENT CENTERS: In 1976 there were an estimated 627 Child Nutrition Centers (CNCs) in operation serving an average of 40 children per center, and about 385 Child Development Centers (CDCs) serving an average of 50 children each. The two types of centers functioned under separate Ministries and offered different services. The Fourth Five Year Plan (1977-1981) called for an increase of 960 centers per year for the five year period for a total of 4800 new centers. (UNICEF, 1978)

CHILD NUTRITION/DEVELOPMENT CENTER PERSONNEL: Child Nutrition Center (CNC) attendants usually received two weeks' training and Child Development Center (CDC) attendants received three months' training. Some attendants did not receive training. The present curriculum does not place adequate emphasis upon nutrition or physical development. The average CNC attendant received 360 baht per month (180 to 450 baht, approximately \$18). The average pay for CDC attendants was 325 baht. (UNICEF, 1978)

SUPPLEMENTARY FEEDING PROGRAM: As part of the joint RTG and UNICEF country program of 1977-1981, a supplementary feeding program was planned for the 29 malnutrition problem area provinces. Child Nutrition/Child Development Centers were planned for 215 main villages with each main village linked to 3 to 5 satellite villages as central food processing and distribution points as well as demonstration production sites. The supplementary foods will come from locally produced high protein foods.

In the satellite villages, village feeding stations were to be established. These home stations will be used by the Village Health Communicators or other village women to prepare and serve food for children identified through nutrition surveillance and implemented by Village Health Volunteers. (UNICEF, 1979)

THE BABY FOOD CENTER: The Baby Food Center of the Institute of Food Research and Product Development, Kasetsart University has reached a total of 528 health centers and 109 feeding stations in various provinces with supplementary infant foods by a take-home delivery method. It is thought that the coverage is 7,279 malnourished children under two. (Dhanamitta et al., 1978)

HEALTH CARE SYSTEM: The standardized pattern of health delivery in Thailand consists of a hierarchy of facilities: provincial hospitals providing specialized medical care in each province; district hospitals (10-30 beds); subdistrict health centers staffed by two or three paramedics; and village midwifery centers. (Population Projects Department, 1978)

HEALTH DELIVERY SYSTEM: As of November 1979, Thailand had provincial hospitals in all 72 provinces providing complete curative health care facilities; district hospitals in 288 of the 697 districts (621 districts and 76 sub-districts); health centers staffed by a midwife and a sanitarian in 4,165 of 5,745 sub-districts; 1,624 midwifery centers (usually in sub-districts without a health center); and 14,142 village health volunteers (2 weeks' training) and 100,871 village health communicators (5 days' training) for the 51,635 villages. (Merrill and Oot, 1980)

HEALTH SYSTEM COVERAGE: According to 1973 data, 45% of country districts had health center coverage, 57% of the subdistricts were covered, and only 4% of villages were covered. In Lampang Province, the figures were much lower, 23%, 35% and 6% respectively. Staff personnel figures were low as well. (Lampang Project Personnel, 1980)

USE OF HEALTH SERVICES: According to the 1973 Young Child Study undertaken by NESDB, 20% of pregnant women used health services regularly, 37% paid at least 5 visits for prenatal care, and 43% did not receive prenatal care. 75% of rural women did not have a post-natal check-up because it was thought to be unnecessary. (UNICEF, 1979)

USE OF HEALTH SERVICES: A 1970 national survey showed that 51% of the sample surveyed purchased their own medicines, 23% used private hospitals or clinics, 15% used some government health facilities, 8% went to traditional healers and 3% sought no care when they were ill. (Lampang Project Personnel, 1980)

HEALTH FACILITIES USAGE: 35% of the people used the health facilities; 17% of the population used health services once a year. (Woolley, 1974)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

CHILDBIRTH PRACTICES: Childbirth usually takes place at home in the villages and is attended by midwives employing traditional methods or by a close relative. After birth, the mothers stay indoors for six to eight weeks, lying near an open fire. (Woolley, 1974)

GOITER INTERVENTION: The Royal Thai Government has distributed iodized salt in areas where goiter is endemic. (Viravaidhya et al., 1981)

MEDICAL GRADUATES: All medical graduates must serve two years in either the Ministry of Health or other government sectors. (Valyasevi, 1978)

UNICEF: UNICEF nutrition programs support nutrition education, information on breast feeding, production of nutrition education materials, Child Nutrition Center equipment, training, support for appropriate technology interventions in nutrition, nutrition surveillance, and salt fortification with iron in 10 test villages. (Merrill and Oot, 1980)

EDUCATION - ASIA FOUNDATION: The Asia Foundation has provided funds to education and nutrition projects initiated locally by government or voluntary organizations, such as a project in the northeast to provide training for monks to enable them to help the poor, a project to train traditional herbal practitioners in primary health care, and support for the Food and Nutrition Center of Prince of Songkla University, the Institute of Food Research and Product Development, Kasetsart University, and the Institute of Nutrition, Mahidol University. (TAICH, 1981)

CHRISTIAN CHILDREN'S FUND: The Christian Children's Fund supported 53 programs, mainly in the northwest, northeast and the slums of Bangkok, that offer health and nutrition assistance (i.e. income generation or agricultural improvement) to 11,673 children and their parents in 1980. (TAICH, 1981)

REFUGEE RELIEF: Many nongovernmental and voluntary agencies have organized relief programs for refugees on the Thai/Kampuchea border, including the American Baptist Churches of the USA, CARE, Catholic Relief Service, International Red Cross, International Rescue Committee, Inc., Mennonite Central Committee, Oxfam, Tom Dooley Heritage, United Nations High Commission for Refugees, UNICEF, World Food Program, World Vision Relief Organizations, and the governments of Canada, Germany, Thailand and the U.S. (TAICH, 1981)

MINISTRY OF AGRICULTURE: The Ministry of Agriculture's extension program provides for education on nutrition, family planning and other aspects of basic health, especially through women's clubs. (Burintratikul and Samaniego, 1980)

THE ASIAN FOUNDATION: The Asian Foundation has funded two nutrition-related projects in Thailand. \$500,000 was given to the MALAN Institute for a Rural Infant and Child Care Center project which ran from 3/78 to 11/80. \$78,000 was given to the Girl Guides Association of Thailand for

training women in nutrition, health, family planning, and agriculture.
(USAID, 1979a)

RURAL

BREAST FEEDING PROMOTION PROJECT: As a sub-project of the "Expansion of MCH/FP in Rural Areas of Northeastern Provinces Project," the Family Health Division of the Thai Ministry of Public Health undertook a 3 year, \$200,000 project in 1979-1981, entitled "Strengthening Breast Feeding," in 16 Northeast Provinces. In addition to the Royal Thai Government, support for the project came from the U.S. Agency for International Development and from the United Kingdom. The overall objectives included promoting good health in women during pregnancy and lactation and in young children, and strengthening communication and coordination among the many government sectors and private sectors involved. The main activities included orientation and review seminars for health professionals; poster and slogan development competition among the population; knowledge, attitude, and practice surveys (pre and post); radio broadcasts; mobile units; exhibitions; and provision of vitamin and mineral supplements. (Family Health Division, 1979)

NUTRITION SURVEILLANCE AND NUTRITION EDUCATION: A small controlled field test of two nutrition interventions supervised by the Thai Nutrition Division of the Ministry of Public Health and supported by a \$6,250 grant from USAID/Thailand was conducted in Suphan Buri and Maha Sarakhan provinces during the period October 1980 to March 1981. Results after 6 months showed that the experimental villages receiving nutritional surveillance (i.e., use of weight charts and monthly weighings) and a structured program of nutrition education had a 54% reduction in second degree malnutrition and a 100% elimination of third degree malnutrition. The villages receiving only the surveillance also eliminated third degree malnutrition, but had higher rates of first and second degree malnutrition than the control villages. (Viravaidhya et al., 1981)

RICE FORTIFICATION: A four year, controlled rice fortification field study was carried out in 29 Chiang Mai Province villages during 1971 to 1975 by the Division of Nutrition, Department of Health, Thai Ministry of Public Health and the Department of Nutrition, Harvard School of Public Health. No significant differences in anthropometric measurements, hemoglobin and hematocrit levels, or morbidity measures were found between children who consumed rice fortified with lysine, threonine, thiamine, riboflavin, vitamin A and iron two thirds or more of the time, and the rest of the study population or children who ate fortified rice less than 10% of the time. (Gershoff et al., 1977)

INTEGRATED NUTRITION IMPROVEMENT PILOT PROJECT: The Institute of Nutrition, Mahidol University (INMU) implemented an integrated nutrition pilot project during the years 1976-1980 in the village of Nong-Hai, Ubon Province (in the Northeast of Thailand). The objectives of the project were: 1) to establish an integrated nutrition improvement program using a community development model; 2) to integrate the model into the existing health care network; and 3) to find a suitable model for

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

national replication. Nutrition, health and community development were all included in the effort to obtain maximum community participation with existing available resources. The entry point for the intervention project was curative medical services, but expanded to preventive and promotive health and nutrition services as well as agricultural and food production and vocational training. Baseline SES, health and nutrition status data was collected. Nutritionally the goal was to increase the intake of fat and to improve the quality of protein intake. The INMU formulated seven supplementary food mixtures based upon locally available food sources. Mothers of children with second and third degree PEM were given nutrition education (with practice on food preparation) and infant food packages. Evaluation of the effect of the food supplementation showed a significant drop in the percentage of malnourished children from 55% in March 1979 to only 21% in September 1980. Nutritional improvement among children was seen as a result of the sequential implementation of the four components: health care, nutrition education, food supply and income generation. (Dhanamitta et al., 1981)

SUPPLEMENTARY FOODS IN UBON PILOT PROJECT: The Institute of Nutrition, Mahidol University (INMU) developed seven supplementary food mixtures based on the Thai Standard for Infant Foods for use in an integrated nutrition pilot project in Nong-Hai village Ubon Province. Each mixture was prepared from a mixture of locally available carbohydrate, fat and protein food sources. Rice was used as the major ingredient. Protein sources included soybeans, mung beans and fish meal. Groundnuts and sesame were added to provide protein as well as fat. All ingredients are roasted, mixed and then ground. The mixture is then ready for boiling in water (1:6 ratio). Four of the 7 mixtures were tested and shown to have good acceptance and tolerance by infants and children. (Tontisirin et al., 1981)

UBON PROVINCE PILOT PROGRAM: In Ubon Province, Northeast Thailand, a pilot program for the integration of nutrition, health, and community development was developed by the Nutrition Institute to improve the nutrition and health status of village inhabitants by using available local resources. Partial support for the project was furnished by Ford Foundation, Bangkok. The target population was the 3000 inhabitants in Amphur Phibun-Mung-sa-harn. The nutritional interventions included promoting breast feeding, proper additional foods after 6 months of age, local available infant food, and improved pregnant and lactating women's intakes. (Valyasevi, 1978)

UBON PROVINCE PILOT PROJECT: The nutrition interventions headed by Dr. Valyasevi of the Nutrition Institute in two rural areas in Ubon, Northeast Thailand have resulted in significant reductions in preschool child malnutrition, but they have required constant monitoring at the village level and considerable costs. (Merrill and Oot, 1980)

HEALTH DELIVERY - LAMPANG HEALTH DEVELOPMENT PROJECT: Under the initiative of U.S. AID and the American Public Health Association, a plan for the development and evaluation of an integrated health delivery system was developed in conjunction with the Thai Ministry of Health and

the University of Hawaii in 1973, and was submitted, approved and funded in 1974. The project was to be in Lampang Province from 1975-1981. The specific goals were: 1) to expand health care to at least two-thirds of the rural population with an emphasis upon family planning, nutrition and maternal and child health services; 2) to establish an integrated system of curative-preventive-promotive health services at the subdistrict level and preventive-promotive services in every village; and 3) to establish a cost effective system to be replicated nationwide. The major personnel components were the training of 92 "wechakorn" (paraphysicians), at least one village health volunteer per village (about 650), 350 TBAs (traditional birth attendants) and 6000 health communicators, all at the subdistrict and village levels. (Lampang Project Personnel, 1980)

LAMPANG PROJECT EVALUATION: A six month follow-up study of severely malnourished children (third degree) cared for by "wechakorn" and health post volunteers and offered supplemental food showed that 25% (20 of 77 children) clearly improved from the baseline period. Where food supplements were actually received, the child was more likely to improve. (Lampang Project Personnel, 1980)

CHILD NUTRITION CENTERS: The coverage of preschool children by the Child Nutrition Centers in Hang Chat district, Lampang Province, was estimated at less than 5% in 1975-6, and many of the children served may not actually need special nutrition care because of their family's higher economic status. (Lampang Project Personnel, 1980)

POPULATION PROJECT - "20 PROVINCE PROJECT": A three year project (1978-80) to reduce the rate of population growth and to reduce maternal and infant mortality rates has been partially implemented by the Ministry of Public Health, RTG with support from IDA (World Bank), the United States, Canada, Australia, and Norway. This \$69 million project was designed: 1) to expand the rural health infrastructure from about 5,400 service points in 1976 to about 7,000 in 1980; 2) to increase the supply and quality of paramedicals and to add a new cadre of volunteer health and family planning workers at the village level; 3) to stimulate demand for family planning services, and 4) to improve evaluation and research capabilities. The project consisted of two sets of components - national and provincial. The national components are primarily designed to help the MOPH train the additional staff and to ensure availability of supplies and services. The provincial components were designed to accelerate the expansion of family planning and rural health services in 20 selected provinces, called Accelerated Family Planning and Health (AFPH) provinces, characterized by low-to-moderate family planning acceptance, high population densities, and poor health facility coverage. (Population Projects Department, 1978)

INTEGRATED COMMUNITY DEVELOPMENT: A project entitled "Samerng Project," or "Integrated Nutrition, Family Planning and Primary Health Care," was launched in Samerng District, Chiang Mai Province in 1977. Multi-purpose village volunteers and village communicators were used to deliver the integrated services. The general purpose was to integrate health, education, agriculture, and community development. Feeding programs,

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

health education, mother and child health services, sanitation and parasite control, family planning, and extension of food production were to be included. (Vachrotal, 1978)

HEALTH DELIVERY PILOT PROJECT - SARAPHI PROJECT: In 1968-71, the Ministry of Health implemented the Saraphi Project in Chiang Mai Province that emphasized maternal-child health, family planning, nutrition and disease control. The highlight of the project was the training of health post volunteers and health communicators. (Lampang Project Personnel, 1980)

HEALTH DELIVERY PILOT PROJECT - PITSANULOKE PROVINCE: In 1964-68, the Ministry of Health implemented a pilot project in Pitsanuloke Province to strengthen rural health services through construction of centers, integration of services, revised record keeping, recruiting villagers, and retraining. An adequate evaluation was not done. (Lampang Project Personnel, 1980)

INTERNATIONAL HUMAN ASSISTANCE PROGRAMS, INC.: The International Human Assistance Programs, Inc., operates several programs in the northeast to help rural women participate in the village development process, including income earning skills, rural credit and leadership training. Also, the organization is operating a pilot community health service in Kra Nuan District which emphasizes nutrition. (TAICH, 1981)

COMMUNITY DEVELOPMENT - WORLD VISION RELIEF ORGANIZATION, INC.: The World Vision Relief Organization supports several projects in the north and northeast provinces of Thailand that attempt to integrate child care with public health, family planning, agricultural development, water management and income generation. (TAICH, 1981)

HEALTH DELIVERY SYSTEM: The government rural health system in 1974 was inadequate. For example, in the province of Lampang, there was one 300 bed hospital, 3 of 12 districts had small district hospitals (2 with attending physicians, the only two outside the provincial capital), 26 of 75 subdistricts had rural health centers and 33 of the 538 villages had midwifery centers. Only 15 to 17% of the rural people in Lampang province used the systems' facilities. (Lampang Project Personnel, 1980)

HEALTH DELIVERY SYSTEM: By 1976 in the government's rural health system, 53% (300 of 570) districts had district hospitals with an MD, sanitarian, midwife and nurse. 65% (3,500 of 5,349) subdistricts had health centers, and 3.7% (1,800 of 48,847) villages had midwifery centers staffed by a midwife. (Lampang Project Personnel, 1980)

USE OF HEALTH SERVICES: Surveys in 1970 and 1975 showed that rural people chose the following services when ill: 1) 51 to 61% purchased their own medicine; 2) 18 to 27% used some government health facility; 3) 9 to 17% sought out traditional healers; 4) 7 to 9% used private hospitals or clinics and 5) 2 to 5% either sought no care or did not respond. (Lampang Project Personnel, 1980)

EFFECTIVENESS OF MOBILE HEALTH TEAMS: The delivery of integrated health care by a mobile health team from the local health center was shown to reduce the number of new cases of malnutrition among children under 6 years old from 45% to 21% after two years and from 58% to 15% after four years. A four year comparison with control health center care reached statistical significance. In addition, significantly more children with some degree of PCM improved under the experimental health delivery method than under the control method at both the 2 and 4 year follow-ups. (Khanjanasthiti et al., 1977)

HEALTH DELIVERY SYSTEM: The private rural health system, consisting of traditional midwives, herbalists, injectionists and magical and spirit doctors, were more numerous and served far more rural people in Lampang Province than the entire official system. (Lampang Project Personnel, 1980)

HEALTH PERSONNEL: A government attempt to "upgrade" the health care facilities in the rural village studied included construction of a small building for childbirth and provision of a public health nurse to assist. The nurse, trained in Bangkok, carried with her the prevalent medical attitude favoring imported formula. In addition to having a colorful poster advertising infant formula in the "clinic," the nurse had her own store front across the street at which she was the sole retailer of three brands of sweetened condensed milk. These same companies offer free bottles in return for several labels. The health facility was underutilized because the nurse was not viewed as a successful mother herself. (Van Esterik, 1977)

BIRTH DELIVERY ASSISTANCE: The proportion of rural women under age 50 who reported being assisted in their most recent birth by a medical doctor, nurse or government midwife increased from 15% in 1969 to 28% in 1979. (Knodel and Debavalya, 1980)

TRADITIONAL BIRTH ATTENDANTS: Most rural deliveries are performed by traditional birth attendants. In the Lampang project (1975-1981) 350 were trained in more sanitary practices and to recognize conditions requiring more skilled attention. (Lampang Project Personnel, 1980)

URBAN

HEALTH DELIVERY SYSTEM: The urban health system, based upon a network of nearly 100 government-supported modern hospitals in 1973 and staffed by doctors and nurses trained in Thailand's six university-level medical schools, absorbed nearly 90% of the national health budget and resources and served about 10 to 15% of the total population. (Lampang Project Personnel, 1980)

DISTRIBUTION OF HEALTH CARE: Eighty five percent of physicians practice in Bangkok and other urban areas, where fifteen percent of the population live. (Valyasevi, 1978)

5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

BIRTH DELIVERY ASSISTANCE: The proportion of urban women under age 50 who reported being helped in their most recent birth by a medical doctor, nurse or government midwife increased from 75% in a 1970 survey to 95% in a 1979 national survey. (Knodel and Debavalya, 1980)

6. COMMENTARIES

NATIONAL

DECLINE IN BREAST FEEDING AND PCM: The outcome of the decline in breast feeding is retardation of growth and high PEM rates in early infancy. (Khanjanasthiti and Dhanamitta, 1978)

PEM AND THE FOOD DISTRIBUTION SYSTEM: The present structure of food production, trade and export and the present income distribution patterns indicate that the food distribution system is one of the underlying causes of malnutrition. According to the 1972 food balance sheet, the country still produced enough food to satisfy the basic requirements of all the Thai people. (Mongkolsmai and Limprapat, 1979)

PEM AND HARMFUL CULTURAL BELIEFS: Lack of knowledge about nutrition and certain cultural beliefs (e.g. early introduction of rice to 2-3 day old infants, and restrictive diets of women after birth) can be causes of malnutrition. (Mongkolsmai and Kimprapat, 1979)

EDUCATION AND RESOURCE CONSTRAINTS: An important question for all nutrition education programs is whether behavioral change is possible or whether an absolute resource constraint prevents people from altering their child feeding practices and food habits. There is considerable evidence in Thailand that food habits themselves are responsible for much childhood malnutrition and that, in many cases, improved use of existing family resources alone would result in improved diets of infants and children. However, it is easier to promote change in food practices when a family has more food available. Programs should, thus, attempt to promote economic and community development as well. (Stewart et al., 1980)

SIGNIFICANCE OF REDUCED BREAST FEEDING: The significance of reduced breast feeding in Thailand can only be properly assessed within the context of the related socioeconomic and demographic changes that are occurring simultaneously. (Knodel and Debavalya, 1980)

BREAST FEEDING AND INFANT MORTALITY: Infant mortality in Thailand has continued to decline concurrent with a decline in breast feeding. Infant mortality is far lower in urban areas than in rural areas and lowest of all among children of higher social class, i.e. among those same groups breast feeding least. Other factors are apparently more important in determining mortality ratio, however what these are is still not clear. (Knodel and Debavalya, 1980)

BREAST FEEDING AND INFANT MORTALITY: Although breast feeding promotion may help prevent a worsening of infant mortality (or a reduction in the rate of improvement), factors other than reduced breast feeding appear to be the major determinants of the current high levels of rural infant mortality. Significant reduction in the infant mortality rate will require improvements in conditions other than breast feeding, given the high mortality rates in the country side where prolonged breast feeding

6. COMMENTARIES (Cont.)

is common. (Knodel and Debavalya, 1980)

SUPPLEMENTARY FEEDING: The authors suggest that although breast feeding should be encouraged, there is probably a need for supplementation earlier than often realized (i.e. before three months) because of the apparent low protein level found in the samples of "fore-milk" (milk from the early part of the feed) breast milk from the urban women studied. The assumptions inherent in their calculations must be viewed critically. (Chavalittamrong et al., 1981)

INTEGRATED HEALTH SERVICE DELIVERY: In the Lampang Project, integration of services (medical care and public health services) appears to be a viable approach to rural services provided that proper support and supervision is given. The major danger in the training of "wechakorns" (paraphysicians) is that preventive services can easily become secondary to curative care. This is especially true for nutrition. Problems also arose over the supervision, motivation and supplies for the village volunteers and midwives. (Lampang Project Personnel, 1980)

"20 PROVINCE PROJECT" - PRIMARY HEALTH CARE: The Ministry of Health has included in the 1977-1982 Five Year Plan a program of training nurse practitioners and village health volunteers for 20 provinces, in advance of a clear evaluation of the Lampang experience. Given the Lampang experience, serious difficulties can be expected in the use of village volunteers and midwives. (Lampang Project Personnel, 1980)

20-PROVINCE PROJECT: The "20 Province Project" recently begun by the Thai Government in conjunction with the World Bank is a weakened replicated version of the Lampang Project, reflecting the strong influence of the hospital-centered medical philosophy rather than the more village-oriented perspective inherent in the earlier project. (Lampang Project Personnel, 1980)

MULTICAUSAL NUTRITION PROBLEMS AND POLICY: Since nutrition problems are related to many factors, a set of coordinated government policies and objectives is needed. Policies should include the health, agriculture, education, industry, transportation and trade sectors, and should also provide guidance for food production, distribution and consumption. (Mongkolsmai and Limprapat, 1979)

STRUCTURAL WEAKNESSES OF PRIMARY HEALTH CARE SYSTEM: Three structural features of the primary health care system potentially weaken its effectiveness. These are: 1) the long supervisory chain from the Provincial Health Office to village-level activities; 2) the multiplicity of tasks assigned to subdistrict paramedical workers and village health volunteers; and 3) the sociocultural gap between government health workers and the communities which they serve. (Stewart et al., 1980)

LACK OF COORDINATION IN NUTRITION STRATEGY: In the past, nutrition has been the function of the Ministry of Public Health and the Ministry of Agriculture and Agricultural Cooperatives, each functioning independently and lacking coordination. For example, the Ministry of Agriculture's

emphasis upon production oriented for export competes for limited resources with the Ministry of Health's emphasis on production oriented for domestic consumption. (Mongkolsmai and Limprapat, 1979)

EVALUATION OF NUTRITION PROGRAMS: The nutrition programs of the Thai Ministry of Public Health have failed to reduce the prevalence of protein-energy malnutrition, despite the high priority accorded to nutrition in the Fourth Five Year Plan (1977-1981). Widespread PEM is the result of the low protein and caloric density of the Thai diet, maladaptive food habits and poverty. The problem remains because of the method used to implement the proposed MOPH intervention programs. Coverage is incomplete, supplies are inadequate and the services are not targeted to those who most need them. (Stewart et al., 1980)

COST-EFFECTIVE HEALTH INTERVENTIONS: Preliminary evidence suggests that the most cost-effective health interventions appropriate for the village level are immunizations, health/nutrition education and pre and post-natal care. Less cost-effective are the areas of curative care and distribution of pre-packaged supplemental foods. (U.S. A.I.D., 1981)

COMMITMENT: The Royal Thai Government appears strongly committed to addressing basic poverty problems and disparities in income (within economic and financial constraints) but there remains a serious gap between the expression of will and actual results. (U.S. A.I.D., 1981)

NUTRITION INTERVENTIONS: Even with the Fourth Five Year Plan nutritional objectives, an effective and affordable intervention to reduce the incidence of malnutrition has yet to be developed. Thailand will not realize significant infant and child mortality rate reductions until changes and/or expanded efforts in nutrition are initiated. (Merrill and Oot, 1980)

WEIGHING SURVEILLANCE: Children are weighed in health centers throughout the country, but growth charts are usually not maintained or used for diagnosis and treatment. (Merrill and Oot, 1980)

NUTRITION EDUCATION: Nutrition education is done at the tambon health centers and by village health volunteers, but there are not enough staff and the effort is too formal. The staff responsible for nutrition activities are often burdened with too many tasks and are more highly rewarded for curative interventions. (Merrill and Oot, 1980)

CHILD NUTRITION/DEVELOPMENT CENTERS: The effectiveness of the Child Nutrition Centers (CNCs) is compromised by the lack of emphasis upon nutrition in the training curriculum for attendants, the small entry fee (5-30 baht per month) charged, the lack of regular weight and height records, the inadequacy of sanitary facilities (i.e., water and toilets), and the lack of quality play and learning equipment. (UNICEF, 1978)

PROTEIN-RICH FOOD SUPPLEMENTS: The protein-rich food supplements produced by the Institute for Food Research and Product Development (IFRPD) of Kasetsart University have been produced in small quantities

6. COMMENTARIES (Cont.)

(e.g., only 327,000 lbs. were produced in 1970 to 1972) and thus have had limited distribution. The project has not been taken over by private firms as planned because of high production costs and a poor distribution system. (Austin and Mock, 1981)

PRICE CONTROL AND FOOD DISTRIBUTION SCHEMES: Subsidized rice distribution, price controls on basic goods, fair price shops and government discount brands all have potential nutrition status effects indirectly by increasing households' purchasing power and their access to food. However, none of the programs have an explicit nutrition focus, none are combined with nutrition education, all citizens are eligible, and only the subsidized distribution of low quality "ochaa" rice is targeted toward the poor. Operational and empirical evaluations would be useful in determining which of the projects is most beneficial and whether modifications are required. (Stewart et al., 1980)

ADVERTISING AND BOTTLE FEEDING: Thai government seminars on breast feeding concluded that mass advertising of bottle feeding with infant formulas and powdered milk by large commercial distributors had negatively influenced the rate of breast feeding. (Family Health Division, n.d.)

RURAL

LAMPANG CHILD NUTRITION CENTERS: In Lampang, the Child Nutrition Centers vary greatly in quality from a small thatched open-sided hut, 4 meters square accommodating 20 children (Nong Kham, Hang Chat) to more elaborate "model" centers furnishing day care in a stimulating environment, daily lunches with protein and vegetables, nutrition education, immunizations, parasite treatment, and general health care (Ban San Luang, Pong Yang Kok). Overall, the CNCs currently have little nutrition input either in food supplements or nutrition education. Malnourished children are often not included in the CNCs because their families cannot afford to participate. Most centers prepare lunches only once or twice a week. (Wassenberg, 1978)

LAMPANG NUTRITION SURVEILLANCE AND FOLLOW-UP: The nutrition surveillance program in Lampang Province was effectively detecting malnourished children through weighing by Health Post Volunteers and Health Center Staff, but the curative follow-up program showed that among the 77 Hang Chat district children with third degree malnutrition, 21% improved, 38% remained third degree, 12% were incorrectly measured, 5% died, and 25% had unknown outcomes. (Wassenberg, 1978)

LAMPANG VILLAGE FEEDING STATIONS: There was only one village feeding station in Lampang Province, at Pong Yank Kok village. During the hot season it was functioning sporadically because of insufficient local water for washing utensils and preparing pap, complaints as to the bland taste of the Infant Food, lack of mothers' participation and lack of incentives for the Health Post Volunteers to continue preparing food. (Wassenberg, 1978)

SUPPLEMENTARY FOODS: Distribution of supplementary foods (Textured Mungbean Protein, soy cookies, Infant Food, and canned soybean milk) has been irregular due in part to a limited budget. The Infant Food and the soy cookies are packaged in small daily packets of 45 grams and 55 grams, respectively, which discourages the mothers' use of the supplements for non-targeted children. However, locally produced supplementary foods would be much better than the centrally produced Kasetsart University products because they would be lower in cost and less dependent on the government health system, and participants would have a degree of self-reliance. (Wassenberg, 1978)

NUTRITION INTERVENTION NEEDS: Among the hill tribe peoples of the North, there is an urgent need to improve the nutrition of pregnant and lactating women. The traditional breast feeding and child rearing practices of carrying the infant and feeding on demand need to be preserved. Low cost supplemental foods locally available for infants are also needed. (Viseshakul et al., 1978)

URBAN

PROTEIN AND ENERGY DEFICIENCIES: The assumption that Thai infants under two years old suffered from severe protein deficiency had been made in the past with little supporting evidence. A study of 197 Bangkok infants from low income families showed that the deficiency of energy intake was more severe than that of protein. Protein intake was comparable to or higher than FAO/WHO 1965 standards, but energy intake dropped to about 80% of these standards during the second year. (Viseshakul, 1976)

CAUSES OF INFANT MORTALITY: The Ministry of Health identified unsanitary conditions as a major cause of the high infant mortality rate in Bangkok. Increasing use of artificial feeding was also mentioned as an important contributing cause. (Durongdej et al., n.d.)

BREAST FEEDING AND EMPLOYMENT: Given present working conditions, female career civil servants have limited options with regard to breast feeding. There is a 45 day maternity leave, but there are no provisions for day-care nurseries. Women have expressed little desire for them, partially because of the perception that employers would discriminate against women in hiring if they were required to furnish day-care centers. (Van Esterik, 1980)

BIBLIOGRAPHY

Austin, J.E. and Mock, C.

- 1981 High Protein Product Development in Thailand Case Study 3-3 In: J. Austin (ed.) Nutrition Programs in the Third World, Oelgelschlager Gunn and Hain.

This chapter presents a case study of high protein product development in Thailand, based upon a 1973 team evaluation. The team report is mainly a description of the institutional arrangements for developing, marketing, and distributing the various products developed by the IFRPD at Kasetsart University. Very few evaluative comments are made. A little nutritional background information is offered.

Burintratikul, S. and M.C. Samaniego

- 1980 CBFPS in Thailand: A community-based approach to family planning. Chapter four with introduction by M. Ahmed. In P.H. Combs (ed.), Meeting the Basic Needs of the Rural Poor: The integrated community-based approach. A report of the International Council for Educational Development. New York: Pergamon Press, 195-288.

This case study of the Community Based Family Planning Service (CBFPS) highlights the potential of private voluntary organizations to play a significant role in a national program for family planning. CBFPS' unique contributions include using the family planning services as a springboard to integrate other community services such as primary health care, and the use of community based volunteers as distributors and promoters of family planning. Although the case study offers a detailed description and evaluation, only a small amount of information is given on nutritional status and eating habits.

Calavan, M.

- 1972 Cultural, Environmental and Socioeconomic Factors in Food Use: the Sansai Case. SEADAG Mekong Development Panel Seminar, New York, August 29-31, 1972.

Original data.

Method: Anthropological field study from August 1969 to August 1970; 3 day food intake in 82 households; interview for pregnancy history and mortality statistics; lab analyses of blood samples from 50 village children; anthropometry on more than 500 preschool and school children.

Sample: 186 households, 905 people; 600 pre and school children.

Location: Sansai village, Chiang Mai province 10 miles southwest of Chiangmai.

This paper offers an in-depth report of an anthropologist's year-long study. Three aspects of food-related behavior are studied: 1) cultural background of food use and nutrition; 2) environmental

BIBLIOGRAPHY (Cont.)

factors affecting food supply; and 3) socioeconomic aspects of food use and nutrition. In each of these areas, detailed information on practices and beliefs is presented. For example, the special feeding practices associated with pregnancy, lactation, infancy and illness are reviewed, as well as seasonal food availability (farms and markets) and the socioeconomic influences. An excellent source of micro-village level information.

Chandrapanond, A., Ratchatasilpin, A., and S. Tansuphasiri

- 1972 Dietary Survey of Preschool Children and Expectant Women in Soongnern District, Nakorn Rajsima Province, Thailand, American Journal of Clinical Nutrition, 25: 730-735.

Original data.

Method: complete dietary survey; all food eaten was weighed and recorded for three consecutive days; a sample average daily diet was subjected to laboratory food analysis.

Sample: 25% random sample of 295 village families: from this group, 11 expectant mothers and 78 preschool children 1.5 to 6 years old were studied.

Location: Na-klang village; Soongnern District, Nakorn Rajsima Province.

This report presents the results of a nutrition survey conducted in 1970. The main objectives of the survey were to obtain information concerning the dietary intakes of Thai village preschool children and of women during the latter half of pregnancy, and to provide part of the basis for formulating nutrition programs for the promotion of the health of Thai children.

Chavalitramrong, B., Suanpan, S., Moonvisut, S., Chatranon, W. and Gershofi, S.N.

- 1981 Protein and Amino Acids of Breast Milk from Thai Mothers; American Journal of Clinical Nutrition, 34:1126-1130.

Original data.

Method: One sample of about 15 ml of fore-milk per woman was collected by manual expression in the mornings approximately three hours after nursing at various times during the first 270 days of lactation; lab analysis; brief background interview.

Sample: 135 Thai lactating mothers.

Location: Siriraj Hospital, Bangkok.

The study was carried out to assess the effects of prolonged lactation on the quantity of protein and the pattern of amino acids in breast milk obtained from women at various times during lactation. The authors argue that the quantity of protein in the fore-milk samples suggests that supplementation of breast feeding needs to occur earlier than often recognized. Several methodological issues strongly suggest caution in accepting the authors' conclusions: use of RDA standards

considered too high; exclusion of all non-protein nitrogen from calculations; small sample size in all but the first week; no breast milk quantity measure; use of fore-milk only; and conflict with general anthropometric findings in Thailand.

Chutikul, S.

n.d. "Women in Rural Northeast Society in Thailand." Khon Kaen, Thailand: Khon Kaen University.

This paper is a summary of the author's observations based on interviews with rural women, Thai and foreign educators and community developers in the Northeast region of Thailand. The focus of the observations is the rural women.

Dhanamitta, S., Virojailee, S. and Valyasevi, A.

1981 Implementation of a conceptual scheme for improving the nutritional status of the rural poor in Thailand. Food and Nutrition Bulletin, 3(3).

Original data.

Method: Evaluation research; baseline data on SES, health and nutrition status were collected; nutritional surveillance during and after project implementation.

Subjects: 202 preschool children in March 1979 and 183 preschool children in September 1980. Other data from 236 households, 1,655 people was not presented.

Location: Nong-Hai village, Ubon Province, Northeast Region.

This report summarizes the development, implementation and evaluation of an integrated health, nutrition and community development pilot project undertaken by the Institute of Nutrition in one village of Northeast Thailand. The evaluation of the project emphasized that the documented effectiveness of the project depended upon the proper sequential integration of the four components: health care, nutrition, agricultural and food production, and vocational training. Provision of curative medical services was the entry point that helped develop trust of the project personnel and set the groundwork for the nutrition education and other components. Actual PEM improvements only occurred with the provision of locally based supplementary infant food packages.

Dhanamitta, S., Tontisirin, K., Kanjanasthiti, P., and A. Valyasevi

1979 Report of Thailand Experience in the Promotion of Breast-Feeding, Mahidol University, Institute of Nutrition.

This report, presented at the November 1979 Bangkok Workshop on Breast Feeding and Supplementary Foods, reviewed a series of breast feeding studies carried out by the Department of Pediatrics, Ramathibodi Hospital, during the years 1971-1976 in an impoverished Bangkok urban

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area (1971), a semi-rural area of Bank Pa-In district (1972), and the rural communities of 6 provinces of Mai Klong River areas (1975-1976). The study methodologies are not given. Promotions of breast feeding are also reviewed.

Dhanamitta, S., Suvanun, P., Pongsapich, A., Tankeyara, C., and Nimmannitaya, S.

- 1978 Thailand country report. Presented at the Sixth Asian Workshop on Food Habits and In-field Implementation of Nutrition Problems, Manila, Philippines, November 5-11, 1978.

Original data.

Method: interview; intensive field study of communities; the exact methods and questions were not given but food consumption and demographic information was collected.

Sample: approximately 50 people from each of 13 communities were interviewed for a total of 654.

Location: The 13 villages were: in the North Chiang Mai Province, On Tai, Buak Khan, and On Nua; in the Northeast Khon Kaen Province, Hua Fai and Amphawan; in the East Chonburi province, Bang Sare, Nong Yang and Nong Sai; in the Central Ayutthaya province, Khayai, Lumpfli, and Hua Ro Market; and in the South Songkhla province, Chalung and Khlong Phlu.

This document is a two part report on the food habits of the Thai people. The first part includes a background section on the country's nutritional problems and a section on the government's policies and programs to solve them, as well as a review of existing information on food habits and beliefs. The second part of the report presents a qualitative and quantitative survey of two or three villages from each of the five regions (North, Northeast, East, Central and South). In addition to an ecological description of each village, results of the food consumption interview are broken down by region, ethnic groups, income categories, and age or risk groups. Besides offering a quick review of the current nutritional conditions, this report gives an inside view of village life as revealed by intensive study by the Chulalongkorn University Social Research Institute. The major conclusion drawn for national planners is that nutrition interventions should be tailored to the needs of the regions and specific communities, taking into account the ecological conditions, the occupational opportunities and differences, community size, ethnic group, religious affiliation, availability of food materials, the innovative potential and the leadership in the community.

Division of Family Health, World Health Organization

- 1980 The Incidence of low birth weight: a critical review of available information. World Health Statistics Quarterly, 33(3):197-224.

This document attempts to review the available evidence on the size of the low birth weight problem on a global scale. Not only are regional

estimates presented, but 280 surveys are presented in table form by country. Most information for Thailand comes from a 1979 Faculty of Tropical Medicine, Mahidol University report showing a 12-15% rate of low birth weight babies in three urban hospital settings in Bangkok and Khon Kaen Province.

Durongdej, S., Duangporn, K. and Chularojanamontri, V.

- n.d. Analysis of Ecological Factors Affecting Breast-Feeding Practice in Urban Bangkok, Bangkok, Thailand: Department of Nutrition, Faculty of Public Health, Mahidol University.

Original data.

Method: 1976 cross sectional study; discharge interview of primiparous mothers.

Sample: 586 primiparous mothers who had their babies in the hospitals and clinics located in the Bangkok metropolitan area; most were from families with incomes between \$50-\$100 per month and had 1-7 years of schooling.

Location: Bangkok metropolitan area, Central Region.

The purpose of this study was to examine the ecological factors influencing breast feeding practices in an urban area in Bangkok. The results showed a low level of exclusive breast feeding at hospital delivery discharge among the mainly low income mothers. Maternal age, education level and occupation as well as family income were all significantly related to infant feeding patterns at hospital discharge.

Family Health Division, Department of Health, Ministry of Public Health

- 1979 "Strengthening of Breast Feeding in the North-eastern Provinces, Thailand," Ministry of Public Health, FHD/BF/PP/1/1.

The document describes this three year, \$200,000 project to promote maternal and child health in 16 provinces of the Northeast region. Supported by the RTG, USAID, and the United Kingdom, this project is a sub-component of the Expansion of MCH/FP in Rural Areas of Northeastern Provinces Project. Included in the report are a background justification and a detailed project description.

Family Health Division, Department of Health, Ministry of Public Health

- n.d. "Strengthening of Breast Feeding in the North-eastern Provinces, Thailand," Bangkok, Thailand: Family Health Division, Royal Thai Government.

This document is a sub-project proposal for one part of the "Expansion of MCH/FP in Rural Areas of Northeastern Provinces Project." It offers a background and justification for the "Strengthening of Breast Feeding" project. In addition, it describes the project's objectives, duration, location, scheduled activities, administrative arrangements,

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evaluation component, and budget.

Gershoff, S.N., McGandy, R.B., Suttapreyasri, D., Promkutkao, C., Nondasuta, A., Pisolyabutra, U., Tantiwongse, P., and Viravaidhaya, V.

- 1977 Nutrition studies in Thailand. II. Effects of fortification of rice with lysine, threonine, thiamin, riboflavin, vitamin A, and iron on preschool children. American Journal of Clinical Nutrition, 30:1185-1195.

Original data.

Method: controlled longitudinal large scale rice fortification field study from January 1971 to July 1975; (see Gershoff et al. 1975 for more detail); substudies: 24 hour family food consumption survey with food weighing; 3 day preschool child food consumption survey by a nutritionist.

Sample: approximately 2,250 children ages 1.5 to 9 years in the program for 1 to 4 years; substudies: 29 families (145 people) in one day food survey; 24 preschool children in 3 day food survey.

Location: 29 villages in Chiang Mai province, northern Thailand; substudy of preschool child food consumption was in three villages: Harnkaew, Sansai and Bantawi.

This is the second paper describing this large scale controlled field study designed to measure the health benefits from fortification of rice with lysine, threonine, thiamine, riboflavin, vitamin A and iron. This report presents the anthropometric, biochemical and morbidity data on the entire population from the January-February 1975 measurements. There were no significant group differences due to the rice fortification intervention in the anthropometric measurements or hemoglobin and hematocrit levels over the total 1971 to 1975 study period or over the 1974 to 1975 period. Two smaller food consumption surveys add insight into family and child feeding practices in the study area.

Gershoff, S.N., McGandy, R.B., Suttapreyasri, D., Nondasuta, A., Pisolyabutra, U. and Tantiwongse, P.

- 1975 Amino acid fortification of rice studies in Thailand. I. Background and baseline data. American Journal of Clinical Nutrition. 28:170-182.

Original data.

Method: longitudinal large-scale rice fortification field study from January 1971 to July 1975; five groups with controls for two levels of fortification and day care intervention; physical examinations; histories; anthropometrics; blood samples; hand-wrist X-rays; fecal samples; mortality and morbidity data; birth weights.

Sample: all village children from 6 months to five years of age were identified; 99% were examined; in 1971 there were 1265 preschool children from 985 families and by 1974 there were 2050; blood samples from 928 mothers.

Location: 29 Chiang Mai villages in the valley of the Ping river, Northern Thailand.

This paper describes the organization and methods used in this large scale controlled field study designed to measure the health benefits from the fortification of rice with lysine, threonine, thiamine, riboflavin, vitamin A, and iron. Data presented is baseline data before the fortification began, and identifies the village children as retarded in growth and development in comparison to middle class Bangkok children.

Greiner, T.

- 1975 The Promotion of Bottle Feeding by Multinational Corporations: How Advertising and the health professions have contributed; Cornell International Nutrition Monograph Series No. 2, Ithaca, N.Y.: Division of Nutritional Sciences.

This monograph represents one of the first, albeit preliminary, studies of the nature and consequences of infant formula company advertising and promotion. It includes: 1) a survey of infant food advertising in newspapers and magazines from developing countries that were available at Cornell University; 2) an analysis of advertising in professional journals and of educational publications written by infant food companies for distribution to the public (by health professionals); and 3) data on multinational companies which market infant foods. Samples of ads are presented. Samples of ads from Thailand are discussed.

Harinasuta, C., Sornmani, S., and P. Migasena

- 1976 Studies on nutrition and some related parasitic diseases arising from water resource development in the lower Mekong Basin.

Original data.

Method: baseline data (1974-5) from questionnaire; physical exam, stool examination, blood sample, urine study, anthropometry, and food frequency interview.

Sample: All preschool and school children (P_1 and P_2 class) in 6 villages; total of 433 children under seven years and 256 school children. The irrigated village income was 3259 B per person and in the non-irrigated village income was 1221 B per person. Sample size varied for each measure.

Location: Four irrigated villages, Hong Dua, Song Puey, Bing Chim and Don Doo below the Nong Wai Irrigation Dam, and two non-irrigated villages, Na Lom and Pa San in Khon Kaen province, Northeast Thailand.

This report is the first "baseline" study of a longitudinal "monitoring system" to allow evaluation of the effects of a water resource development project. Data on socioeconomic status, health conditions, food behavior patterns and nutrition status were collected. Overall, the children in the irrigated villages showed

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slightly better growth. Income levels in the irrigated villages were almost 3 times as high as those in the non-irrigated villages, but nutrition status was relatively good in both areas.

IBFAN (International Baby Food Action Network)

1981 Infant Formula Promotion, Minneapolis, Minnesota: IBFAN, May 1981.

This report by the International Baby Food Action Network (IBFAN) exposes the aggressive promotion of powdered milk products for babies. Since the October 1979 WHO/UNICEF meeting on Infant and Young Child Feeding which introduced a series of recommendations to curb the promotion of powdered baby milks, IBFAN has attempted to monitor the practices of the infant food industry. This is the fourth in a series and it documents 365 violations of the October meeting recommendations involving 35 companies in 31 countries. This brings the total number of violations recorded since October 1979 to over 1000. Over 20 violations are documented in Thailand.

IBFAN News

1981 Thailand - Draft Code Contains Major Flaws. IBFAN News, November 1981, p. 2.

The International Baby Food Action Network (IBFAN) publishes the IBFAN News to monitor worldwide progress in curbing aggressive, unethical promotional practices of the infant food industry. This issue includes a critique of the current Royal Thai Government draft code on infant food marketing, and identifies industry lobbying efforts by Nestle.

Institute of Population Studies, Chulalongkorn University, and Population Survey Division, National Statistical Office

1977 The Survey of Fertility in Thailand: Country Report, Vols. I-II. World Fertility Survey/International Statistical Institute, Bangkok, Thailand.

Original data.

Method: cross-sectional; questionnaire interview, World Fertility Survey Core questionnaire.

Sample: 1265 women who 1) experienced at least two live births or were currently pregnant with second child; 2) last closed interval was 33 months or longer; and 3) index child survived two years or more.

Location: representative national sample.

The Survey of Fertility in Thailand was conducted in 1975 as a part of the World Fertility Survey program. Four separate surveys were done: 1) household survey; 2) husbands survey; 3) fertility survey; and 4) community survey. The sample for the fertility survey consisted of about 3,800 females. Within the WFS core questionnaire, several questions concerning lactation are included. Data from 1,265 women

offer information on duration of breast feeding by region and demographic and socioeconomic variables.

Jaisaard, P. and B. Tongsiri

- 1980 "The Allocation of Mothers' Time to Household and Economic Activities and Its Effects on Fertility." Chiang Mai, Thailand: Faculty of Agriculture.

Original data.

Method: Phase I: survey questionnaire on demographics. Phase II used a "recall sequential technique" questionnaire at four points in time during the dry season, January, February, March, and April (with direct observation as a check).

Sample: 120 randomly selected households in each village were surveyed in phase I; 60 randomly chosen households from each village for phase II.

Location: Chomtong and Hangdong villages in the Chiang Mai valley, North region.

The purpose of this study was to observe rural households in detail, with an emphasis upon how women spent their time, in order to test the hypotheses that as rural modernization occurs, mothers tend to participate more in economic activities, children tend to represent higher opportunity costs to a household, and fertility rates decline. Chomtong (intensive agricultural production) and Hangdong (less intensive agriculture, more small-scale handicrafts) villages in the Chiang Mai province were studied. The results showed that, on the average, females work more hours per day than males and that their economic activities account for a major proportion of the family income. Child care and home making activities were discussed in light of agricultural activities.

Khanjanasthiti, P. and S. Dhanamitta

- 1978 Breast Feeding Practice and Growth of Infants in Thailand, Journal of the Medical Association of Thailand, 61: 340-344.

This review article presents partial data from three breast feeding studies: (1) a 1971 study of breast feeding in four impoverished areas of Bangkok (Ban Manangkasila, Premprachoa, Wat Lard Bou Kaw and Makasan); (2) a 1972 study in the semi-rural areas of Bang Pa-In; and (3) a 1975 study of six provinces of Mai Klong River rural areas. The authors conclude that breast feeding declines constantly from the rural villages to semi-rural and urban poor areas of Bangkok. This decline in breast feeding is related to an increase in the amount and severity of PEM in early infancy. Some of the related factors are discussed.

BIBLIOGRAPHY (Cont.)

Khanjanasthiti, P., Nanna, P., Sakdisawat, O., Palpai, P., and P. Kes-Kasem-
sook

- 1977 Health care delivery method for infants and preschool children, Journal of the Medical Association of Thailand, 60(4):177-183

Original data.

Method: 4 1/2 year longitudinal study; village-wide health care delivery experimental trial with two experimental and one control village; weight and height, percent of coverage and immunization measures.

Sample: all children under 6 years old and their mothers were invited to participate; approximately 170 children.

Location: Three villages at Ban-Pang subdistrict, Bang Pa-In district, Central Region.

The objective of this study was to test a new approach to the health problems and the health delivery method for preschool children. The effectiveness of a mobile health team from the local health center offering integrated health care was compared with that of a normal control village with only a local health center. Follow-up evaluations at 2 and 4 years showed significant health improvements in the experimental villages. The presentation is somewhat confusing.

Khanjanasthiti, P. and Wray, J.

- 1974 Early protein-calorie malnutrition (PCM) in slum areas of Bangkok municipality 1970-71; J. Med. Assoc. Thailand, 57(7):357-366.

Original data.

Method: cross-sectional; anthropometry of children; interview of mothers; comparison to a middle-class Bangkok sample and a rural sample.

Sample: 1,154 preschool (1-5 years old) children and their mothers.

Location: four slum districts of Bangkok.

This study was part of a larger study of families in marginal and slum areas of Bangkok in 1970-1. The purpose of this portion of the study, carried out under the direction of the Pediatrics Department of Ramathbodi Hospital, was to provide data about the health and nutritional status of preschool children and information about family attitudes and practices in regard to health issues. High rates of malnutrition are documented. Low frequency and duration of lactation among women who had migrated to the city were implicated as the major factors.

Khanjanasthiti, P., Supachaturas, P., Mekanandha, P., Srimusikapodh, V.,
Choopanya, K., and Leesuan, V.

- 1973 Growth of infants and preschool children. Journal of the Medical Association of Thailand, 56(2):88-100.

Original data.

Method: cross-sectional; anthropometry of a selected group of well-off children.

Sample: 2026 children from birth to 6 years old from well baby clinics and kindergartens in Bangkok; babies with congenital malformation, sickness, low birth weight, physical or mental handicap, and nutritional deficiencies were excluded.

Location: Duang-thawin, Boop-panukul, Tang-Ma-Ha-Mek, Thai Women Association, Sudarak and Ukonthorn schools in Bangkok.

The purpose of this study was to collect growth data on infants and pre-school children of middle and professional class families in Bangkok in order to establish a reference standard for Thai children's growth. Parameters used were weight, height, head circumference, chest circumference, midarm circumference and triceps skinfold thickness. The authors assume that Thai children are more or less equal to North American and European children in their potential for growth.

Kietthubthew, P.

1980 "The Effects of Artificial Feeding in a Hospital Newborn Nursery on Infant Feeding Practice: A Case Study at Phramongkutklao Hospital." Thesis Abstract, Medical Social Sciences, Mahadol University, Bangkok.

Method: longitudinal study (approximately 8 weeks); questionnaire.

Sample: 225 women attending Phramongkutklao Hospital for pre- and post-natal care.

Location: Bangkok.

This thesis abstract presents a brief review of the study objectives, methods, and results. The main objective of the research was to determine whether the hospital's policy of feeding all newborns infant formula had an impact on mothers' subsequent feeding practices and to see if brand preferences were established. The results showed on follow-up that more mothers were bottle feeding than had originally intended, and that those who were undecided before delivery were influenced by the hospital bottle feeding practices more than women who had already decided on how to feed their infants. Brand preference showed similar influences.

Knodel, J. and N. Debavalya

1980 Breastfeeding in Thailand: Trends and Differentials, 1969-79, Studies in Family Planning 11(12): 355-377.

Data for this comprehensive review and analysis come from a series of surveys conducted by Chulalongkorn University's Institute of Population Studies (Bangkok) between 1969 and 1979: the four surveys (1969-1973) of the National Longitudinal Study of Social, Economic and Demographic Change; the 1975 Survey of Fertility in Thailand; and the National Survey of Family Planning Practices, Fertility and Mortality

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(1979). There are some limits to the comparability between surveys in the sample selection, questions asked and the method of coding responses. The surveys were primarily intended to gather information on fertility and contraceptive practices and related socioeconomic characteristics. Breast feeding questions, however, were included, even though no specific definition of breast feeding was given in the questions. The authors assume that respondents interpreted breast feeding to include both partial and exclusive breast feeding. Data analyzed from the surveys are of two types: (1) age of weaning, from questions on how long the woman breast fed; and (2) whether the woman was currently breast feeding. Most of the fieldwork for each survey was conducted in April and May.

Knodel, J. and Chamratrithirong, A.

- 1978 Infant and child mortality in Thailand: levels, trends, and differentials as derived through indirect estimation techniques; Papers of the East-West Population Institute, No. 57. Hawaii: East-West Population Institute.

This document uses survey and census data on the proportion dead among children ever born, to indirectly estimate the levels of infant and child mortality. Results from these analyses confirm a trend of declining infant and child mortality over the last decade, moderate regional mortality differences, a substantial urban-rural mortality differential, and a large socioeconomic differential in mortality rates.

Lampang Project Personnel

- 1980 The Lampang Health Development Project: Thailand's fresh approach to rural primary health care. Chapter three with introduction by P.H. Coombs. In P.H. Coombs (ed.), Meeting the Basic Needs of the Rural Poor: The integrated community-based approach. A report of the International Council for Educational Development. New York: Pergamon Press, 103-194.

This case study of the Lampang Health Development Project presents a detailed background description and evaluation of the project written by members of the project team. An introduction written by P.H. Coombs, ICED staff, offers a useful outside perspective. This experimental project of the Ministry of Health, started in 1974 with the assistance of U.S. AID, American Public Health Association and the School of Public Health, University of Hawaii, will run through 1981 and cover the entire Lampang Province which has about 600,000 people. It represents one of the first large scale attempts to apply the concept of integrated primary health care in the rural areas of a developing country. Included in the services were preventive, promotive and curative services, nutrition, maternal and child care and family planning. The major component of the project was the use of community-based personnel. Rural health workers were trained as "wechakorn" (paraphysicians) to expand their roles to include simple

curative services; health post volunteers and health communicators were also recruited at the village level to promote preventive services. A very candid mid-course assessment of the project's progress, impact and problems is offered. Baseline and follow up nutrition status surveys were also done in two project areas.

Merrill, H. and Oot, D.

1980 Health, Population and Nutrition Needs Assessment, Thailand; U.S. AID.

This U.S. AID sponsored report presents a health population and nutrition needs assessment for Thailand. Government policies, priorities and programs for the health care delivery system are presented. Nutrition is subsumed in the health care system. This is a useful overview document.

Mongkolsmai, D. and Limprapat, P.

1979 Trends in Malnutrition in Thailand. A report prepared for U.S.A.I.D./Thailand, Thai University Research Association; Research Report No. 1, Bangkok, Thailand.

This paper compiles the results of relevant research and studies of malnutrition in Thailand in an attempt to present a comprehensive picture. National food expenditure data, vital statistics and nutrition surveys (including a 1979 Nutrition Division, MOPH, national survey) are used to give a description of the incidence, severity, and location of malnutrition. An analysis of the economic, social, and other causes and consequences is offered. A review of the Royal Thai Government programs and policies dealing with the nutritional problems is also included. Although the document offers a useful source of information and analysis, data for a comprehensive picture is not available.

Nutrition Education Task Force

1979 Proposed Operational Strategies for Nutrition Communication and Motivation Activities, UNICEF.

This is a preliminary "draft for discussion" document outlining the strategies to define audiences and messages for future breast feeding nutrition education efforts in the "20 province project." This mimeo is accompanied by two reports of pretesting of breast feeding pictures and slogans.

O'Sullivan, G., Ebrahim, S., O'Sullivan, J. and Tafts, C.

1980 Nutritional Status of Laotian refugee children in Ubon camp, Thailand; J. Epidemiology and Community Health, 34, 83-86.

Original data.

Method: community-based nutrition status survey: mid arm

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circumference (< 12.5 cm) was used to indicate nutrition status; weight for age and morbidity rates (retrospective) were also used. Sample: 2152 children age 1-5. Location: Ubon Refugee Camp, Ubon Ratchathani province, Northeast.

This nutritional status survey was part of the work of assessing the degree of malnutrition in the refugee camp. Arm circumference measurements were used because of their ease. Data showed that nearly all the "malnourished" children had been identified by the infant welfare clinic staff. The report was used to make recommendations on the feeding centers in the camp.

Population Projects Department

- 1978 Thailand: Appraisal of a Population Project, Report No. 1663-TH, New York, NY: World Bank, January 18, 1978.

This report appraises a three year population project (1978-1980) estimated to cost \$68.6 million, with a foreign exchange component of \$22.2 million or 32% of the total cost. The main objective of the project was to assist the Royal Thai Government (RTG) in reducing the rate of population growth. A related objective was to assist the Government in reducing maternal and infant mortality rates. Both objectives were to be pursued through a substantial extension of the rural health delivery system. Financing of the project was through the IDA (\$30 million), the RTG (\$20.7 million), the Canadian International Development Agency (\$6.3 million), U.S.A.I.D. (\$5.5 million), and Norway (\$3.1 million). The document reviews present family planning and health policies and practices. It describes in detail the objectives, strategies, components, costs, financing, and administrative aspects of the project. In addition to the national component, a provincial component, geared to the needs of 20 targeted provinces, was called the 20 accelerated family planning and health (AFPH) provinces.

Stewart, M.M., Dworkin, D. and Rogers, B.L.

- 1980 A Review of Health, Population, and Nutrition Activities in Thailand. Washington, D.C. International Health Programs, American Public Health Association supported by the U.S. Agency for International Development (ADSS) AID/DSPE-C-0053, December 1980.

This report is an assessment of the validity and potential effectiveness of the proposed FY 82 project activities included in the USAID/Thailand Health Population and Nutrition Needs Assessment of May 1980 (Merrill and Oot, 1980). This previous document, using Royal Thai Government data, attempted to assess the effectiveness of existing delivery mechanisms for health, population and nutrition activities. The authors of the present report concur with the USAID Mission decision to emphasize as priorities in FY 1982 rural water supply and the alleviation of childhood malnutrition. Existing deficiencies in the delivery of primary health care (coverage and

targeting) are discussed. Recommendations for improving health, nutrition and population programs are also discussed. Suggestions for improvements included better information management, nutrition surveillance with growth charts, limited and clearly defined responsibilities for village health volunteers, nutrition education based on behavioral objectives, less reliance upon food supplements, and targeted education and supplements to already malnourished and those at greatest risk.

Suwanwela, C., Poshyachinda, V., Thasanapradit, P. and Ayut Dharmkrong-At

- 1981 Assessing health status in remote villages in Thailand, World Health Forum, 2(2):222-224.

This is a brief report on the experiences of a survey team among the hill tribe people of the North (including the Hmong and the Karen tribes). The team set up a health examination and care service in selected villages. Findings from the actual survey and interviews are not given; only a brief description of the areas and lessons learned are presented. They concluded that a people's culture must be considered as an important component in measuring their health and that "health by the people" means allowing them to choose for themselves among alternatives.

TAICH

- 1981 TAICH Country Report: Development Assistance Programs for Thailand; New York: American Council of Voluntary Agencies for Foreign Service, Inc., Technical Assistance Information Clearing House.

This report summarizes the assistance projects of American voluntary non-profit organizations operating in Thailand. The brief information is furnished by the listing organization.

Temcharoen, P., Temcharoen, P., and P. Sirivunaboot

- 1979 Mother Attitude Toward Breast Feeding. Journal of the Medical Association of Thailand, 62(2):70-73.

Original data.

Method: Interview questionnaire with general demographic queries and an attitude rating using a five point scale.

Sample: Two hundred and ten mothers who brought their children to the well baby clinic of Children's Hospital and Ramathibodi Hospital from February 1977 to August 1977.

Location: Bangkok.

The authors studied mothers' attitudes toward breast feeding in relation to age, hometown, educational level, occupation and economic status. Attitudes were highly favorable towards breastfeeding in the total sample, and younger age was the only significant variable that showed a less favorable attitude. No data was collected to test

BIBLIOGRAPHY (Cont.)

whether attitudes were related to actual practices. The fact that better educated women had slightly more favorable attitudes than less educated women suggests a possible test bias.

Thanangkul, O., and K. Amatayakul

- 1975 Nutrition of Pregnant Women in a Developing Country - Thailand, American Journal of Diseases of Childhood 129(4):422-4.

This short article reviewed the authors' studies in Chiang Mai, Thailand. They were designed to assess the nutritional pattern of pregnant women. Only summary data was presented.

Tontisirin, K., Moaleekoonpairroj, B. Dhanamitta, S. and Vlayasevi, A.

- 1981 Formulation of Supplementary Infant Foods at the Home and Village Level in Thailand. Food and Nutrition Bulletin, 3(3):11-15.

This brief report describes the development and testing of seven supplementary food mixtures for infants and children by the Institute of Nutrition, Mahidol University. The mixtures are low cost, high protein, and energy supplementary foods which are based on locally available carbohydrate, fat and protein food sources and are easily prepared at the village level. Rice is the main ingredient but soybeans, mung beans, fish meal, groundnuts and sesame are also used in seven combinations. Preliminary tests showed good acceptability and tolerance.

UNICEF

- 1979 Thailand: Master Plan of Operations for Services for Children, Mid 1979-Mid 1982. Bangkok, Thailand: United Nations Children's Fund, Thailand Programme Office.

This document reviews the Thai country program to provide basic social services to the target population groups (children 0-6 years, children 7-13 years, and women). This Royal Thai Government and UNICEF cooperative project will focus upon 29 provinces identified as malnutrition problem areas (MPAs). A general review of health and nutrition problems is presented as a background. Five separate sectional components of the country program are presented: 1) Plan of Action for Health Services; 2) Plan of Action for Formal Education; 3) Plan of Action for Non-Formal Education; 4) Plan of Action for Services for Children in Special Areas; and 5) Plan of Action for Provincial Level Planning. Full cost estimates and program objectives and activities are presented.

UNICEF

- 1978 Recommendation for UNICEF Assistance to Thailand, Mid 1979-Mid 1982 for Submission to the 1979 UNICEF Executive Board (DRAFT). Bangkok, Thailand: United Nations Children's Fund, November 1978.

This document reviews the health and nutrition status of the Thai people and the ongoing response of the Royal Thai Government to alleviate the major problems identified. A RTG and UNICEF cooperative country program is proposed for the 1979-1982 period building upon the RTG's Fourth Five Year Development Plan.

United States Agency for International Development

- 1981 Thailand: Country Development Strategy Statement, F.Y.'83. Washington, D.C.: U.S.A.I.D., February 1981.

This is a cogent assessment of Thailand's developmental status and governmental strategies. Rural poverty is the focus. Influences upon the Royal Thai Government and its responses are reviewed; nutritional concerns are briefly summarized. U.S.A.I.D. plans and policies with regard to the RTG programs to alleviate rural poverty are outlined.

United States Agency for International Development

- 1979a PVO Co-financing: Thailand. U.S.A.I.D. Project Paper, Washington, D.C.: Department of State, U.S.A.I.D.

This project paper describes a six-year project proposal for \$5 million to multiply and improve local level development efforts in Thailand by supporting private voluntary organizations (PVOs). It includes a background section on voluntarism in Thailand and details 18 U.S.A.I.D.-sponsored PVO activities from 1976 to 1979.

United States Agency for International Development

- 1979b Thailand: Village Fish Pond Development Project. U.S.A.I.D. Project Paper, Washington, D.C.: Department of State, U.S.A.I.D.

This U.S.A.I.D. project paper recommends a \$442,000 assistance package (1979-1981) to the Royal Thai Government to help in the provision of year-round access to supplemental water supplies and fish protein to 14 disadvantaged rural communities in the Northeast. The project will provide water storage tanks, village seed fish and supplies, nursery pond development and extension services in more productive fish culture practices. The target population will be 3,000 families comprising about 20,000 people. A detailed summary of the project is presented. The project lacks a nutrition education component to target the newly generated fish protein to the "at-risk" populations, young preschool children and pregnant and lactating women.

Vachrotal, S.

- 1978 "Thailand: Samerng Project, Chiangmai," in Community Action - Family Nutrition Programmes, ed. by Jelliffe and Jelliffe, New Delhi, India: Aruna Printing Press, pp. 201-206.

BIBLIOGRAPHY (Cont.)

This paper was presented at a joint IUNS/UNICES/ICMR Working Conference held at Hyderabad, India in October, 1977. It presents an outline of the "Samerng Project" which was to run from 1977 to 1980. Five experimental and three control villages will participate in this attempt to develop an effective health delivery system at the village level which integrates health, education, agriculture and community development.

Valyasevi, A.

- 1978 Public Health Program to Promote Nutrition, Rural Areas: Thailand Experience. Presented at "Nutrition Intervention Programs for the Rural Poor" Workshop at XI International Congress of Nutrition in Rio de Janeiro, Brazil.

This presentation briefly reviews available nutrition status and dietary intake information. The document consists primarily of descriptions of the national nutrition policy and one pilot program of its implementation.

Valyasevi, A. and S. Dhanamitta

- n.d. Nutritional Anemia in Various Areas of Thailand, unpublished.

This report reviews available information regarding anemia, and its possible etiological factors in various areas of Thailand.

Van Esterik, P.

- 1980 "Infant feeding options for Bangkok professional women;" unpublished manuscript.

Original data.

Method: Cross-sectional; questionnaire on childbirth and infant feeding practices; participant observation and informal interviewing.
Sample: Non-random group of 50 professional career women in Bangkok; 37 of 50 returned questionnaire; several professional women and their servants were also informally interviewed.
Location: Urban Bangkok.

This small study offers an in-depth view of the infant feeding practices of a seldom studied group, urban professional women. The questionnaire and participant observation methods combined to uncover not only the actual practices of these women but also the beliefs, influences and constraints upon their choices among feeding options. Several of the constraints to breast feeding that are discussed include hospital practices, lack of extended family, promotion of infant formula, women's employment arrangements, and the image of the bottle as a status symbol. Insights on the dangerous effects of bottle feeding by lower income groups and on means of promoting breast feeding are sprinkled throughout.

Van Esterik, P.

- 1979 Sweetened Condensed Soma: Dietary Innovation in Southeast Asia. Columbus, Ohio: Symposium on Food in Southeast Asia, Midwest Conference for Asian Affairs, November 1979.

This short paper offers a unique description and analysis of the widespread use of sweetened condensed milk in Southeast Asia generally, and Thailand in particular. It highlights its destructive use as a substitute for breast milk or more expensive infant formulas, using evidence from urban slums.

Van Esterik, P.

- 1977 "Lactation, nutrition and changing cultural values: Infant feeding practice in rural and urban Thailand." In: Proceedings of the Canadian Council on the Southeast Asian Studies, York University, Toronto.

Original data.

Method: 6 months' field work in the village in 1971-2 and short visits during 1973; interviews and participant observation on "female culture" and infant feeding practices; comparison with data reported in Van Esterik, 1980.

Sample: 179 village women.

Location: large prosperous village in Suphan Buri province, Central Region.

In this article, the author puts together the data gathered from her studies of infant feeding practices among the women of a rural Thai village and among the professional women of Bangkok. Information concerning women in urban slums is also incorporated. An insightful picture of the traditional practices and the forces changing them is presented. She highlights that both the knowledge and support system necessary for successful nursing are available in the rural areas, but that major forces are at work undermining them. The roles of medical personnel, company advertising and exposure to new "modern" images are discussed.

Viravaidhya, K.V., Tima, K.N., and Merrill, H.

- 1981 "Impact of Age/Weight Charts Maintained in the Home and Nutrition Education on Nutritional Status of Infants and Pre-School Children," Bangkok: U.S.A.I.D./Thailand and Nutrition Division, Ministry of Public Health, Royal Thai Government.

Original data.

Method: longitudinal (6 month) experimental nutrition intervention with controls; anthropometry - weighing; nutritional surveillance (growth charts) and nutrition education.

Sample: all village infants and pre-school children up to five years old.

BIBLIOGRAPHY (Cont.)

Location: 7 villages each in Suphan Buri and Maha Sarakham provinces.

This report documents the results of a 6 month controlled field test of two nutritional interventions supported by a \$6250 grant from U.S.A.I.D./Thailand. One group of six villages received nutritional surveillance of infants and pre-school children through the use of weight charts and monthly weighings, as well as a structured program of nutrition education. Another group of four villages received nutrition surveillance activities only, while four control villages retained their normal health care system. No supplemental foods were made available to any of the villages. The intervention was carried out by village health volunteers and village health communicators. The project clearly showed a reduction in malnutrition rates, particularly in the incidence of second and third degree cases. The most dramatic results occurred in the villages receiving both surveillance and education. However, surveillance in the home was much more effective than having the recipients come to a central location. In addition, the nutrition education material consisted mainly of information on food values and proper dietary balance. Use of educational materials with a more direct behavioral change message, i.e., feed your child more food, should be tried.

Viseshakul, D., Premwatana, P. and Kewsiri, D.

- 1978 "The Nutritional Status of Hill-Tribe Children and Their Lactating Mothers," Journal of the Medical Association of Thailand, 61(1): 26-32.

Original data.

Method: cross-sectional study conducted during April to July, 1976; anthropometrics of children, using Gomez classification based on a Bangkok children reference standard; interviews of mothers.

Sample: 149 pre-school children under 6 years old and 64 lactating women from three hill tribes: Akkar, Yao, and Mosur.

Location: Mae Chan District, Chiang Rai Province.

The hill tribe people of Northern Thailand number about 500,000 and live in relative isolation from the rest of the world. There had been no previous study of their state of health and nutrition. This report presents baseline data on their nutritional status and will serve to help set up nutrition programs for the vulnerable groups.

Viseshakul, D., D. Techakaisaya, et al.

- 1977 Growth Rate, Feeding Practices, Dietary Intake of Thai Infants Under Three Years Old and of Two Bangkok Slum Areas, Journal of the Medical Association of Thailand, 60(11) 551-558.

Original data.

Method: Cross-sectional; anthropometry and physical exams; 24 hour maternal recall of dietary consumption by children; food weighing of display foods; and protein and energy lab analysis.

Sample: 178 children under three years old in Area I and 46 in Area II; 5 and 24 percent of the under-three populations in the two areas respectively.

Location: Klong Toey and Wat Lad Bua Kao slum areas of Bangkok.

The purpose of the study was to assess the protein and energy consumption of children under three years old to reveal existing deficiencies, to compare the incidence of protein calorie malnutrition among slum children in this 1975 study with a previous report done in 1970-1 and to indicate a simplified formula for satisfactory supplementary foods.

Viseshakul, D.

1976 Growth rate, feeding practices, and dietary intake of Thai infants under two years old in central Bangkok. J. Hum. Nutr., 30(2):71-78.

Original data.

Method: Cross-sectional; anthropometry; dietary and socio-economic interviews with mothers; 24 hour recall; sample foods analysed for contents.

Sample: 200 infants with an age range of 4.5 months to 25.5 months; all infants who came to the outpatient department of the Children's Hospital from January 1 to March 31, 1975 (excluding those acutely sick). Socioeconomic status was low; average family income was \$516/year.

Location: Children's Hospital, Bangkok, Central Region.

The purpose of the study was to observe infant feeding practices, to compare growth rates in relation to feeding, and to assess the protein and energy consumption in order to reveal existing deficiencies and appropriate supplements. In comparing three patterns of infant feeding, it appeared that infants fed sweetened condensed milk were at the highest risk for malnutrition. Although the infants came from relatively poor Bangkok families, breast feeding provided for satisfactory growth up to 12 months of age. The data also pointed to a greater deficiency of energy than of protein in the diets of infants under two years of age.

Wassenberg, R.E.

1978 Consultant Report to the University of Hawaii School of Public Health on the Community Nutrition Component of the Lampang Health Development Project. Ministry of Health, Kingdom of Thailand; under terms of Contract No. HC 1932, Lampang Health Development Project.

This consultant report evaluated the Community Nutrition Component of the Lampang Health Development Project. The major focus was upon problems and weaknesses in nutrition surveillance, supplementary feeding, and nutrition education activities. Useful recommendations are offered for future improvements.

BIBLIOGRAPHY (Cont.)

Welsh, D., Tongpan, S., Mock, C., Kennedy, E. and Austin, J.

- 1979 Case Study: Thailand. In Global Malnutrition and Cereal Fortification, edited by J.E. Austin, N.Y.: Ballinger Publ. Co., pp. 237-268.

This chapter explores each of five barriers - nutritional need, commodity system structure, technology, consumer acceptability and intervention economics - that must be addressed in considering a fortification program for Thailand. Special emphasis is given to rice milling and the unique set of problems it presents for nutrition intervention. Fortification was not an "invisible" intervention and costs for making the fortified granules was high. There is no discussion of the overall "appropriateness" of the fortification project as a priority intervention in Thailand.

Woolley, P.O.

- 1974 Synthesis The dynamics of health XII: Thailand. Rockville, MD: Public Health Service, Office of International Health, DHEW/PUB/OS-74/50008.

This country case-study of the relationship between health and socioeconomic development was prepared at the request of and made possible through the support of the Agency for International Development and the Office of International Health, USDHEW. The purpose of these country reports is to assist international agencies and AID in the identification of the relationship of health to socioeconomic development, and of the important problem areas amenable to change. A review of existing information is used to describe the overall health care structure and the nutrition and health status within Thailand.

Wray, Joe P.

- n.d. Growth and Nutrition in Thai Preschool Children: A Graphic Review, unpublished.

This document, which summarizes the growth and nutritional status of Thai preschool children, consists of growth curves and charts. Data from several sources was used: village children of Amphur Bang Pa-In, Central Thailand; middle class and slum children of Bangkok; village children in Changwat Ubol, Northeastern Thailand; and village children in Changwat Khon Kaen, Northeastern Thailand.

REFERENCES OF INTEREST

Arnold, F.; Retherford, R.D., and A. Wanglee

- 1977 The demographic situation in Thailand. Papers of the East-West Population Institute, No. 45. Honolulu, Hawaii: East-West Center, July, 1977.

Baer, E.

- 1978 Infant formula promotion and infant health in Thailand. New York: ICCR.

Benedict, Ruth

- 1952 Thai Culture and Behavior; an unpublished wartime study, September 1943, Ithaca, N.Y.: Cornell University, Southeast Asia Program.

Bunge, F.M. (ed.)

- 1981 Thailand - A country study. Washington, D.C.: Foreign Area Studies, American University.

Dagostar, B., Ellingson, W.D., Heady, E.O., and R.A. Hoffmann

- 1978 Consumer Demand for Food Commodities in Thailand. DAE-CARD Sector Analysis Series, No. 10; Contract AID/CM/SA-C-73-19 and Grant AID/CSD-V2824. Ames, Iowa, U.S.A.: Division of Agricultural Economics, Royal Thai Government and Center for Agricultural and Rural Development, Iowa State University. March 1978.

DeYoung, J.

- 1955 Village Life in Modern Thailand. Berkley and Los Angeles, University of California Press.

GAITHER International, Inc.

- 1980 A Study of Infant Feeding in Thailand. (Bangkok/Thonburi Metropolitan Area and Rural Villages of the Central Region), Summary of Findings prepared for Bristol-Myers, Inc., Ross Laboratories and Wyeth International Limited.

Hanks, J.

- 1963 Maternity and its Rituals in Bang Chan. Data paper 51, Southeast Asia Program, Cornell University, Ithaca, NY.

Kingshill, K.

- 1960 Ku Daeng--the red tomb: a village study in Northern Thailand, Chiangmai, Thailand, Prince Royal's College.

Knodel, J. and Debavalya, N.

- 1981 Breastfeeding Trends in Thailand and Their Demographic Impact; Intercom, 9(3):8-10.

Meesook, O.A.

BIBLIOGRAPHY (Cont.)

1976 Working Women in Thailand, paper presented at Conference on Woman and Development at Wellesley College, June 2-6, 1976.

Morell, Susan and David

1972 Six Slums in Bangkok, Problems of life and options for action, UNICEF.

Piboonniyom, S.

1979 Breast Feeding Promotion in Thailand, Bangkok, Thailand.

Thanangkul, O., Whiter, J., and E. Fort

1966 Malnutrition in Northern Thailand, American Journal of Clinical Nutrition 9(5).

World Bank

1978 Thailand: Toward a Development Strategy of Full Participation; Washington, D.C.: East Asia and Pacific Regional Office, World Bank.