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# *Maternal and Infant Nutrition Reviews*

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*an International Nutrition Communication Service publication*

**MATERNAL AND INFANT NUTRITION REVIEWS**

**NEPAL**

*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 Nepal. 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 and viii present the highlights of our findings. Pages 1 to 38 contain the data categorized according to the MINR classification system with boldface titles within each category to describe specific listings.

Pages 39 to 49 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.

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 Mr. Ganesh Ram Shrestha for reviewing and commenting on this report, and to Mana L. Ranjitkar, who helped review the documents.

Ron Israel  
INCS Project Manager

# MATERNAL AND INFANT NUTRITION REVIEWS

## CLASSIFICATION SYSTEM

1. Nutrition and Health Status
  - 1.1 General
  - 1.2 Women, Pregnant
  - 1.3 Women, Lactating
  - 1.4 Infants 0-6 Months
  - 1.5 Infants 6-24 Months
  
2. Dietary Beliefs
  - 2.1 General
  - 2.2 About Pregnancy
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  - 2.4 About Breast Milk Substitutes (including bottle feeding)
  - 2.5 About Weaning
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3. Dietary Practices
  - 3.1 General
  - 3.2 Women
    - 3.2.1 During Pregnancy
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  - 5.1 Policies
  - 5.2 Programs
  
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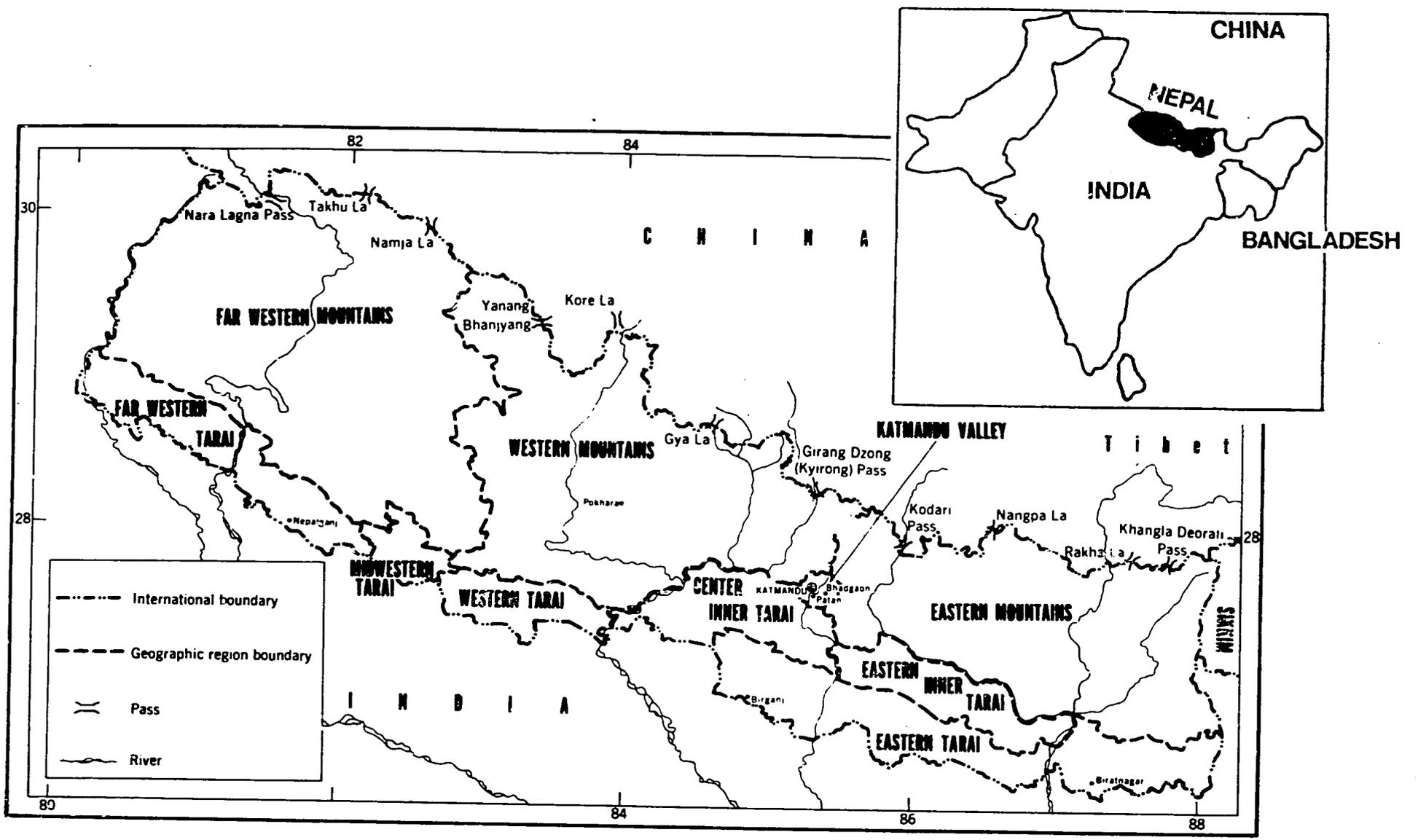


TABLE I  
LOCATIONS STUDIED

	BENNETT, 1976	BLUSTAIN, 1976	BRINK, 1976	BROWN, 1968	GRAVES, 1978	NEPAL NUTRITION STATUS SURVEY, 1975	SHRESTHA, 1979	STONE, 1976	VAIDYA, 1979	WAKE, 1976	WORLD FERTILITY SURVEY, 1978	WORLD FERTILITY SURVEY, 1977
NATIONAL SAMPLE									X		X	X
KATHMANDU VALLEY	X											
URBAN KATHMANDU					X							
WESTERN GORKHA DISTRICT CENTRAL NEPAL		X										
NUWAKOT DISTRICT								X				
SOLUKHUMBU, DHANKUTA, JHAPA AND DHANUSHA DISTRICTS										X		
HILL AND VALLEY REGIONS							X					
RURAL NEPAL PLUS SMALL URBAN GROUP			X	X		X						

## NEPAL HIGHLIGHTS

**1. TARGET GROUP NUTRITION AND HEALTH STATUS:** The prevalence of goiter in 1976 was 55.3%. Over 60% of rural children 12 to 23 months old were malnourished. Between 1960 and 1977, infant mortality rates declined from 200 to 154 per thousand; highest infant mortality rates are in rural areas; in urban areas, the rate was only 52.8 per thousand as of 1976. Two-fifths of all children die before five years of age. The Eastern Terai is the area of greatest acute undernutrition, and the Hill Terrain is the area of greatest chronic undernutrition.

**2. DIETARY BELIEFS:** Particular foods are placed in categories of "hot" and "cold;" ideally one maintains a balance of hot and cold food intake; if one consumes food of either category in excess, illness results which can be cured by consuming a food which balances. Most green leafy vegetables are taboo for new mothers. Symptoms of undernutrition are associated with a condition known as "runche." Local treatment for this condition includes early morning baths, and seems to be rarely, if ever, associated with food intake.

**3. DIETARY PRACTICES:** Approximately 81% of all calories are supplied by cereal grains; rice is the major staple; rice, maize millet, barley, and potatoes are the major food crops; agricultural production has failed to keep up with population growth; more than 90% of the population is directly dependent on agriculture; nearly 75% are small farmers. Average consumption is 2442 calories per capita per day. There is little information on the dietary practices of pregnant and lactating women. Prolonged lactation of infants is customary. In rural areas, babies often are given rice flour or ghee (congealed with sugar or cow's milk) before mothers' milk comes in. There are no special weaning foods; 85% of urban children 7 to 18 months have diets combining breastfeeding and daily feedings of adult food. In rural areas, children are always fed first. Diarrhea is treated by restricting water and milk intake in the belief that if the liquid intake is reduced, the child's stools will be less liquid; diarrhea is also treated with Agni Kumari, a sweet halva-like medicine, which children like and which is thought to warm the stomach.

**4. NUTRITION STATUS CORRELATIONS:** An inverse correlation exists between education and length of breastfeeding; in urban areas, parents of undernourished children had less education than parents of a well nourished group. Undernourished children had reduced levels of exploratory and attachment behavior, and a heightened need for physical closeness with the mother.

**5. NUTRITION AND HEALTH POLICIES AND PROGRAMS:** The sixth national health plan (1981-86) includes the development of nutrition improvement programs in twelve needy districts; 54% of the villages will be provided with safe drinking water. Currently, only 40% of the population is within a half day's walk of public health services. The National Nutrition Coordinating Committee, under the National Planning Commission, coordinates nutrition activities of different organizations. Paropakar is an indigenous organization which has been operating village health programs for over 20 years in the Kathmandu Valley; the Lalitpur District Health Programme is a comprehensive health program in 24 village pauchayats in the southern part of the Kathmandu Valley, run by the United Missions to Nepal. The Government of

## **NEPAL HIGHLIGHTS (Cont.)**

Nepal's Small Farmers Development Program, which operates in 31 districts, has nutrition improvement as a goal. Twelve nutrition education radio messages were developed by a multisectoral committee under the Ministry of Health in 1975.

6. **COMMENTARIES:** The basic nutrition-related need at the moment is food availability; food and nutrition policies and programs should be aimed at increasing the food grain productivity of the countless small farmers in both the Hills and Terai. A mechanism should be developed for referrals between the traditional health care and modern medical systems. Education programs geared to village lifestyles should be considered.

## 1. TARGET GROUP NUTRITION AND HEALTH STATUS

### 1.1 TARGET GROUP NUTRITION AND HEALTH STATUS, GENERAL

#### NATIONAL

**CAUSES OF BLINDNESS:** A major cause of blindness is xerophthalmia (due to vitamin A and protein deficiency), which mainly affects children under five years of age. Cataract and trachoma are also major causes. Agricultural trauma which may lead to loss of an eye following infection is a common cause of blindness in rural areas. (Madeley, 1981)

**GOITER:** Nepal has a high incidence of goiter. In a study of Micha Village, Jumla, 87% of the population suffered from goiter. In Khumbu region 90% of the population have palpable thyroids, with 60% thyroid enlargement. (Pahari, 1979)

**GOITER AND CRETINISM:** A 1976 survey found prevalence of goiter to be 55.3% and prevalence of cretinism to be 5.1% of the population. (Anonymous, n.d.)

**VITAMIN B DEFICIENCY:** About three years ago in the southern Kathmandu Valley, there was a remarkable increase in complaints of thiamine and riboflavin deficiency symptoms at MCH clinics. This problem appeared some months after electricity, and subsequently small rice mills, had come into use. (Krantz, 1978)

**IODINE DEFICIENCY:** As much as 50% of the Nepalese population suffer moderate or severe iodine deficiency, and in some areas (principally mountainous areas) the prevalence is 80 to 100%. (Huang, 1979)

**SANITATION AND DISEASE:** Since sanitation is poor and potable water virtually non-existent, gastrointestinal diseases are endemic, and hepatitis, amoebiasis cholera, tuberculosis and typhoid are widespread. (Evaluation Technologies, Inc., 1978)

**MALARIA:** Malaria was almost under control after the 1960s eradication program, but there was a serious recurrence in the Terai lowlands in 1975. (Evaluation Technologies, Inc., 1978)

### 1.2 TARGET GROUP NUTRITION AND HEALTH STATUS, WOMEN, PREGNANT

### 1.3 TARGET GROUP NUTRITION AND HEALTH STATUS, WOMEN, LACTATING

### 1.4 TARGET GROUP NUTRITION AND HEALTH STATUS, INFANTS 0-6 MONTHS

#### NATIONAL

**INFANT DEATHS:** 27% of all live births recorded in the Nepal Fertility Survey had died by the time their mothers were interviewed. (World Fertility Survey, 1978)

**DECLINING INFANT MORTALITY RATE:** Between 1960 and 1977 infant mortality rates declined from 200 to 154 per thousand. (Huang, 1979)

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

**INFANT MORTALITY RATE:** The infant mortality rate in 1976 was 152 per 1000 live births (a rank of 113 among the countries of the world). (Sivard, 1979)

**INFANT MORTALITY RATE:** One fifth of all infants born do not live to one year of age. The infant death rate in the 1971 census was 172 per thousand; in the national fertility survey, 152 per thousand; and in the 1974 demographic sample survey, 135.5 per thousand. (Khatri, 1979)

**INFANT MORTALITY RATE:** In 1974-75 the infant mortality rate was 132.5 per thousand per year. In 1976 the infant mortality rate was 133.6 per thousand per year. (Acharya, 1979)

**INFANT MORTALITY RATE:** The infant mortality rate was approximately 152 infant deaths per 1000 live births. (World Fertility Survey, 1977)

**INFANT MORTALITY RATE:** The infant mortality rate is 150 deaths per 1000 live births. (Brown, 1968)

**CAUSES OF DEATH:** 27.2% of children under age one year who died in ten hospitals in 1974-75 died of pneumonia; 22.2% died of enteritis and other diarrheal diseases; 6.2% of avitaminoses and other nutritional diseases; 6.2% of meningitis; 4.9% of respiratory infections; and 3.7% of bronchitis, emphysema and asthma (remainder not specified). (Khatri, 1979)

#### RURAL

**INFANT MORTALITY RATES:** In 1974-75 the infant mortality rate in rural areas was 132.5 per thousand per year. In 1976 the rate was 136.1 per 1000. (Acharya, 1979)

#### URBAN

**INFANT MORTALITY RATES:** In 1974-75 the urban infant mortality rate was 57.1 per thousand per year. In 1976 the rate was 52.8 per thousand. (Acharya, 1979)

#### 1.5 TARGET GROUP NUTRITION AND HEALTH STATUS, INFANTS 6-24 MONTHS

##### NATIONAL

**CHILD DEATHS:** Preschool children (0-5 years) made up 14% of the population and accounted for 55.5% of all deaths. (Thapa, n.d.)

**CHILD DEATHS:** 52% of all fertile women had experienced the death of at least one child. This proportion rose to 69% for women age 35 or over. (World Fertility Survey, 1978)

**CHILD DEATHS:** Approximately one of every four children born will die before reaching the age of five years. (Vaidya, 1979)

**CAUSES OF MORTALITY:** The main causes of the high child mortality rate are diarrhea followed by severe dehydration, malnutrition (which may lower a child's resistance in coping with infectious diseases such as measles and tuberculosis, and also may follow severe illnesses and diarrhea), and other communicable diseases, such as tetanus, diphtheria, pertussis, and tuberculosis. (Vaidya, 1979)

**MORTALITY RATE:** Two fifths of all children die before five years of age. The age-specific death rate for one-to-four year olds was 34.6 per thousand in 1974 and 34.9 per thousand in 1976. (Khatri, 1979)

**MORTALITY RATE:** The mortality rate among children age 1 to 4 years is 39 deaths per 1000 children per year. About 56% of all deaths occur among children under 5 years old. (Brown, 1968)

**WEIGHT FOR AGE:** 70% of preschool children were found to be malnourished, according to the Gomez classifications. 15.6% were suffering third degree malnutrition (below 60% reference median weight for age); 25.4% second degree malnutrition (61-70% of reference median); and 29% first degree (71-80% of reference median). (Shrestha, 1979)

**WEIGHT FOR HEIGHT:** 31% of children suffered first degree malnutrition, 37.6% second degree and 19.3% third degree malnutrition (criteria not specified), as measured by weight for height. (Shrestha, 1979)

**WEIGHT FOR HEIGHT:** Most wasted children (falling below 80% of the reference median weight for height) weighed 75 to 79% of the median. In the privileged group no children were found to be less than 70% of the reference median. (Nepal Nutrition Status Survey, 1975)

**WASTING AND STUNTING:** A survey carried out in early 1978 in Surkhet District found 43.4% of the children were wasted or stunted in this west Nepal area. (Krantz, 1978)

**ARM CIRCUMFERENCE:** Among 786 children between the ages of 1 and 5 years, 91% had an upper arm circumference measurement indicating normal nutrition status, 8% were borderline and 1% were severely malnourished. (Krantz, 1979a)

**ARM CIRCUMFERENCE:** Among 256 children attending a Maternal Child Health Clinic in Chapagaon Panchayat, 42.6% had an upper arm circumference measurement in the green, well nourished, zone, 48% were in the yellow or borderline zone and 9.4% were in the red or severely undernourished zone. (Krantz, 1979a)

**DIARRHEA:** A household health survey found that 39.6% of children under five years of age were reported to have diarrhea. (Baral, 1979)

**DIARRHEA:** Diarrheal diseases accounted for 26% of all admissions to Kanti Children's Hospital over a 16-month period; 9% of the cases ended in death. (Baral, 1979)

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

**PREVALENCE OF PCM:** Overall prevalence of clinical PCM was 5.2%. (Pahari, 1979)

**CAUSES OF DEATH:** 21.6% of deaths of children aged 1 to 4 years in 10 hospitals in 1974-75 were due to enteritis and other diarrheal disease; 16.8% were due to ill-defined conditions; 11.2% to pneumonia; 8% to meningitis; 4.8% to measles; and 3.2% to tetanus; the remainder were not specified. (Khatri, 1979)

### RURAL

**CHILD MORTALITY:** In 1974 the death rate for rural children was 35.3 per thousand per year among children 1 to 4 years of age. In 1976 the rate was 35.4 per thousand. (Khatri, 1979)

**MORTALITY RATES:** 21.5% of the children in Asrang Panchayat died before 5 years of age, a figure much lower than the national one. Some reasons for this decreased mortality may be that Asrang is a food deficit area where people eat wild roots and tubers, forage leaves and wild plants and are not as particular about observing the taboos on food for new mothers. (Krantz, 1979a)

**PREVALENCE OF PEM BY AREA:** 10.9% of children in the West mountain area were found to have clinical PEM, as were 7.4% in the Kathmandu valley, 6.7% in the East Hills, and 3.2% in the East Terai rural areas. (Pahari, 1979)

**RATE OF PEM:** 15 to 40% of children from 1 to 3 years of age were measurably malnourished as compared to height and weight standards in a longitudinal study of 200 children. (Bongaars, 1974)

**KWASHIORKOR:** Clinical examination for bilateral pedal edema disclosed an overall rate of 4.6/1000 among children 6 to 72 months. (Nepal Nutrition Status Survey, 1975)

**WEIGHT FOR AGE:** Nearly half of the rural Nepal survey children age 6-71 months were below 75% of the reference median for weight for age (combined second and third degree Gomez classification). The Far West Development Region showed the greatest deficit. Less than 1% of the privileged children were in this category. (Nepal Nutrition Status Survey, 1975)

**WEIGHT FOR AGE:** 48.6% of infants 6-11 months of age and 60.9% of children 12-23 months of age were below 75% of reference median weight for age (combined Gomez classes 2 and 3). (Nepal Nutrition Status Survey, 1975)

**WEIGHT FOR HEIGHT:** 6.8% of the rural children age 6-71 months surveyed were wasted (less than 80% of the reference median weight for height). In the Far West and Central Development regions, 7.1 and 7.7% respectively were wasted. The Terai Terrain had an 8.6% rate of wasting

and the Far West Hills Subregion had a 7.6% rate of wasting. (Nepal Nutrition Status Survey, 1975)

**WEIGHT FOR HEIGHT:** Only 12.5% of the total rural survey population were greater than 100% of the reference median weight for height. (Nepal Nutrition Status Survey, 1975)

**HEIGHT FOR AGE:** In the Hill Terrain, 55.5% of children 6-71 months old and in the Terai Terrain, 45.1%, were below 90% of reference median for height for age. (Nepal Nutrition Status Survey, 1975)

**HEIGHT FOR AGE:** 51.9% of the rural children age 6-71 months were classified as stunted (below 90% of the reference median height for age). The most severely affected geopolitical areas were the West Development Region (55.3% stunted), and the Far West Subregion (56.8% stunted). In the privileged group 18.8% of the children were less than 90% of the median height for age. (Nepal Nutrition Status Survey, 1975)

**WEIGHT, HEIGHT AND AGE:** 3.8% of children were both wasted (below 80% of reference median weight for height) and stunted (below 90% of reference median height for age). (Nepal Nutrition Status Survey, 1975)

**WEIGHT, HEIGHT AND AGE:** Among children 6 to 11 months, 20.6% were stunted (below 90% of reference median height for age), 6.9% were wasted (below 80% of reference median for weight for height), and 2.2% were both stunted and wasted. In the privileged group age 6-11 months, 16.7% were stunted and none were wasted. Among children 12-23 months, 38.8% were stunted, 6.5% were wasted, and 8.8% were both stunted and wasted. In the privileged group, age 12-23 months, 10.6% were stunted, 1.5% were wasted, and 1.5% were both stunted and wasted. (Nepal Nutrition Status Survey, 1975)

**NORMAL HEIGHTS AND WEIGHTS AND AGE:** 71.4% of children 6-11 months had normal height and weight; 45.9% of children 12-23 months were in this category. In the privileged group, 83.4% of children 6-11 months were of adequate weight and height. In the group aged 12-23 months, 86.3% were adequate. (Nepal Nutrition Status Survey, 1975)

**ARM CIRCUMFERENCE:** Among children age 1 to 5 years, 97.4% had an upper arm circumference measurement indicating normal nutritional status. (Krantz, 1979a)

**ARM CIRCUMFERENCE:** Of the 150 children in Asran Panchayat between ages 1 and 5 years, 55% had upper arm circumference measurements indicating normal nutritional status, 35% were borderline and 10% were severely malnourished. (Krantz, 1979a)

**AREA AND UNDERNUTRITION:** The Eastern Terai is the area of greatest acute undernutrition and the Hill Terrain is the area of greatest chronic undernutrition. (Nepal Nutrition Status Survey, 1975)

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

**ANEMIA:** 18.6% of children age 6-11 months and 19.9% of children 12-23 months had low hemoglobins (less than 10 gms/100 cc). (Nepal Nutrition Status Survey, 1975)

**ANEMIA AND ANTHROPOMETRY:** 26.8% of children who are chronically undernourished (height for age less than 90% of NAS median) are anemic, compared to 21.9% of those having acceptable anthropometric indices. (Nepal Nutrition Status Survey, 1975)

**MEASLES:** 9.7% of children 6-11 months tested positive for measles antibodies, as did 18.2% of children 12-23 months and 32.4% of children 24-35 months. (Nepal Nutrition Status Survey, 1975)

### URBAN

**CHILD MORTALITY:** The age specific death rate for urban one to four year olds was 12.6 per thousand in 1974 and 18.8 in 1976. (Khatri, 1979)

**PREVALENCE OF PCM BY AREA:** 2.9% of children in the East Terai urban areas were found to have clinical PCM. Prevalence was 1.9% in Kathmandu city and 0% in the East Hill, Ilam-urban area. Overall prevalence was 5.2%. (From Pourbaix) (Pahari, 1979)

**WEIGHT FOR HEIGHT:** Among a group of advantaged children, 18.2% were stunted (below 90% of the reference median height for age), 1.2% were wasted (below 80% of reference standard weight for height) and 0.6% were both wasted and stunted. (Nepal Nutrition Status Survey, 1975)

**WEIGHT FOR HEIGHT:** 22.8% of a special advantaged urban group of children were greater than 100% of the reference median weight for height. (Nepal Nutrition Status Survey, 1975)

**ARM CIRCUMFERENCE:** 83% of children 1 to 5 years of age had upper arm circumference measurements that indicated normal nutrition status. (Krantz, 1979a)

## 2. DIETARY BELIEFS

### 2.1 DIETARY BELIEFS, GENERAL

#### NATIONAL

**MENSTRUATION AND FOOD PREPARATION:** Women with menstrual flow must not carry water or prepare food for others, which is a hardship for a family. Pregnancy and lactation stop menstrual flow, relieving them of this inconvenience. (John Snow, 1981)

**MEAT TABOOS:** Hindus prohibit killing cattle or eating beef. However, other meat (wild game, pigeons, deer, boar, and goat) are eaten when available. Most Newar (except the highest castes) eat buffalo. (Evaluation Technologies, Inc., 1978)

**MEAT TABOOS:** In the Karnali Zone, in the west, caste taboos limit the types of meat consumed, leading to protein deficiency. (Evaluation Technologies, Inc., 1978)

#### RURAL

**HOT/COLD:** Particular foods are placed in categories of "hot" and "cold." Examples of hot foods are meat, eggs, milk and tea. Cold foods include yogurt, mohi (a mixture of yogurt and water), cucumbers and bananas. Some foods, such as rice and other grains, are neither hot nor cold. All cooked food that is eaten while very hot is considered to be transformed to the hot category even if this food is cold in its natural state. (Stone, 1976)

**HOT FOODS:** Hot foods are termed "garmi" and include popped corn, chicken, goat, wheat, mango, chili pepper, eggs, cooked cucumber, lentils, biscuits, sugar, tea, home-made wine, milk, bread, onion, clarified butter, spices, ginger, garlic, turmeric, tobacco, mustard oil, and apple. (Blustain, 1976)

**COLD FOODS:** Cold foods are called "sardi" and include boiled corn, millet, pumpkin, tomatoes, pulse, candy, raw cucumber, rice beer, radish, lime, lemon, tangerine, potato, bean and gourd. (Blustain, 1976)

**RICH FOODS:** The feeding of rich special foods is a sign of affection and concern. This is especially true for children. A fat child or a plump woman is considered healthy, attractive and beloved. Only in cases where sweet rich foods are thought to aggravate a child's illness will they be denied. (Bennett, 1976)

### 2.2 DIETARY BELIEFS ABOUT PREGNANCY

#### RURAL

**MORNING SICKNESS:** Women say that after conception they get thinner for a few months. This initial loss of weight is due to "asani" (nausea and lack of interest in food), which seems similar to the western concept of morning sickness. (Bennett, 1976)

## 2.2 DIETARY BELIEFS ABOUT PREGNANCY (Cont.)

**EXTRA FOODS IN LAST MONTHS:** During the last two months of pregnancy a special effort is made to feed the mother well as it is believed that the unborn child is "eating" more of the mother's food. (Bennett, 1976)

**HOT FOODS:** The development and delivery of a child is conceived of as a process of heating the woman's body. If the body becomes greatly overheated before full term the child could be lost. Eating large amounts of heat-producing "hot" foods, such as honey, may cause miscarriage. (Bennett, 1976)

**FOODS AVOIDED:** It is said that every woman has one particular food which makes her ill during pregnancy. Interestingly it is usually the cheaper, less popular foods like "dhiro" (corn or wheat flour mush), or "gundruk" (dried edible leaves), that tend to be avoided. (Bennett, 1976)

**FOODS AVOIDED:** Sour or tart foods such as pickles and hot and spicy foods should not be given even if the pregnant woman may crave them. One explanation for this avoidance is that the fetus, which is made of blood, is burned by food which is hot and spicy, and becomes restless with pain. (Bennett, 1976)

## 2.3 DIETARY BELIEFS ABOUT LACTATION

### 2.3.1 DIETARY BELIEFS ABOUT LACTATION, MOTHER

#### NATIONAL

**GREEN LEAFY VEGETABLES:** Most green leafy vegetables are taboo for new mothers, but there are certain varieties which health workers and traditional birth attendants can promote for good nutrition. (Krantz, 1979a)

#### RURAL

**FOODS AVOIDED AFTER DELIVERY:** Many women believe that no meat or blood of any kind should be taken during the first three days postpartum because they will make the bleeding increase. Other women recommend taking the blood obtained from a goat after its head has been cut off and the blood allowed to congeal, in order to make their own bleeding stop. (Bennett, 1976)

**DIET FOR LACTATING MOTHERS:** Lactating mothers of infants under six months old must observe prescribed food patterns in order to avoid disturbing the infants' digestive systems. After six months, the child is fed for the first time and the restrictions are lifted. (Pradhan, 1977)

**WASHING THE BREASTS:** Although a woman may be generally unkept after delivery, her breasts are washed with warm water soon after delivery in the belief that this will start the milk flowing. (Bennett, 1976)

**BEGINNING BREASTFEEDING:** Some women nursed immediately after birth. Others said that milk came for them on the third day -- when it is traditionally believed to come. Rich food and soup made from medicinal herbs are said to be effective in bringing in the milk. Another way to make the milk come in is to mix ghee and dried ginger in hot water, add molasses, bring the whole mixture to a boil, and give it hot to the mother to drink. (Bennett, 1976)

### 2.3.2 DIETARY BELIEFS ABOUT LACTATION, INFANT

#### NATIONAL

**BELIEFS ABOUT BREAST MILK:** Traditionally, breast milk has been prescribed by religious scripture as the "Heavenly Nectar" for babies. Women practice breastfeeding in public with no inhibitions. The idea that pregnant and lactating mothers need twice the usual amount of food is part of the socio-religious code. (Thapa, n.d.)

#### RURAL

**THE PURITY OF BREAST MILK:** Mother's milk is a pure food. Infant defecation and urine does not pollute as much as that of adults because an infant's only food is mother's milk. Women often explain that mothers give milk because God would not create a child without providing his food. (Bennett, 1976)

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

### 2.5 DIETARY BELIEFS ABOUT WEANING

### 2.6 DIETARY BELIEFS ABOUT ILLNESS AND CURE

#### NATIONAL

**AYURVEDIC MEDICINE:** Ayurvedic medicine has been the basic form of medical practice in parts of Nepal for over 2,000 years. It contains an enormous body of theoretical and empirical knowledge with respect to disease causation, imbalance in body humors, diets, herbal medications and health maintenance. Rather than being a body of technology separate from personal and community culture, as western medicine tends to be, ayurvedic is an inextricable part of the sub-continent culture. (John Snow, 1981)

**CAUSES OF MALNUTRITION:** When asked why their children were ill, mothers of severely malnourished children explained that the problem was caused by a child being touched by a pregnant women, or by a woman whose child had just died, or because a child with marasmus had eaten food from the same plate as her child. (Krantz, 1979a)

**BELIEFS ABOUT DIARRHEA:** According to the traditional point of view, a child with diarrhea has an imbalance of fluids, and nothing should be given by mouth because it will increase the imbalance. Yet experience

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

indicates that once a mother sees how oral rehydration makes her child feel and look better (even if diarrhea continues) she is likely to accept the new treatment. (John Snow, 1981)

**RICE BRAN:** Rice bran is the main ingredient of a local ayurvedic medicine which is prescribed for digestive disorders and loss of appetite. (Krantz, 1978)

**ILLNESS:** Illness is believed to be due to imbalance or misalignment of a person with a planet, or "hot or cold" food and air. It may be due to malicious spirits; fate or God's will may also determine health and illness. Only trauma is seen as external. (John Snow, 1981)

**CASTE AND HEALTH CARE:** In the traditional view of health care, it is undesirable to be treated by a person of another caste, especially by a person of lower caste. (John Snow, 1981)

**WESTERN MEDICINE:** Western medicine is seen as reserved for the elite or politically favored. (John Snow, 1981)

**CHOOSING A HEALER:** The choice of a healer is partly dependent on perceptions of the origin of the illness. The healer may be an exorcist, astrologer, ayurvedic vaidya or western style health worker. Access may also be an issue; traditional healers are more readily available. Choosing several types of healers in sequence is common and accepted. Western medicine is seen as one mode among several. Further, health care is seen as a cooperative, even a family venture, with a practitioner who is a member of the community and who is acceptable to the community; therefore, service is personal. (John Snow, 1981)

**SELECTING A HEALTH WORKER:** Detailed observation suggests that for illnesses that tradition suggests are demonic in origin, Jhankris, Dhamnis or lamas (spiritual healers) will be sought. For illnesses that tradition suggests arise out of the classical cold/hot imbalance, for dietary advice or for medicines to rebalance the humors, a vaidya is sought. For acute infections, trauma, and specific conditions such as family planning, western medicine is sought. (John Snow, 1981)

### **RURAL**

**RUNCHE AND PEM:** Symptoms of undernutrition (PEM) are closely connected with a condition known as "runche." A child with symptoms of "runche" is irritable, crying, and miserable. This problem is thought to be caused by a spell produced by being touched by an unknown but pregnant woman. The local treatment for this condition includes early morning baths and seems to be rarely, if ever, associated with food intake. Village leaders recognize this condition as common, stating that 15 to 50 out of 100 children have the condition. This is not unlike the estimate given for measurably malnourished children. (Bomgaars, 1974)

**HOT AND COLD:** Many beliefs about illness and cure center on food and theories of internal heating and cooling properties of various foods.

For example, it is common for boiled water, which a doctor or health worker might recommend giving to a sick child, to be equated with hot water. Villagers are apt to think that the temperature of the water, rather than the fact that the amoebic impurities have been killed, is the significant factor. (Bennett, 1976)

**HOT AND COLD:** While there appear to be no conscious criteria governing the classification of foods as hot or cold there is almost universal agreement among independently interviewed informants on which foods belong in each category. (Bennett, 1976)

**HOT/COLD BALANCE:** Ideally one maintains a balance of hot and cold in food intake. If one consumes foods of either category in excess, illness results. This is expressed as a feeling of either hotness or coldness. The most common cure for hotness or coldness is consumption of foods in the opposite category. Herbal and other remedies are also available for these conditions. (Stone, 1976)

**HOT/COLD:** Eating too many "cold" foods may result in such illnesses as the common cold, pneumonia, upper respiratory infection, aches and swelling. Consumption of many "hot" foods might result in illnesses such as constipation, heartburn, itching rash, boils, nosebleed, burning sensations in the abdomen and discomfort in the body. (Ranjitkar, 1980)

**DIAGNOSIS:** One way of finding out whether an illness is hot or cold is to ask the patient what he has been eating. Too much chicken the night before (a hot food) might demand a diet of tomatoes (a cold food) as a remedy. (Blustain, 1976)

**TAGATILO:** The term "tagatilo" is applied to any food thought to help develop a state of good health or recover from a condition involving thinness or weakness. Tagatilo foods give strength and include meat, eggs and foods rich in ghee. These foods are generally considered heavy and more difficult to digest than light foods such as fried corn, skinned peanuts and yogurt. Vitamin tablets are considered tagatilo and are called "nutritious medicine." (Stone, 1976)

**NUTRITIOUS FOODS AND CONTRACEPTIVES:** Chhetri and Brahmin women believe that contraception is debilitating. Various birth control methods were considered good for women only if they could get nutritious foods along with the contraceptives. (Bennett, 1976)

**FOOD IMAGERY:** The idea of victimization by illness is expressed, but the counter idea of one's potential control over illness is not. The notion of man being helplessly preyed upon is expressed with the imagery of food and eating. Diseases and ailments become like personified forces that feed upon man. For example, a word for heart attack is literally "heart eating." Malignant supernatural forces attack from a state of hunger and inflict illness as a means of being fed by their victims. There is also the notion that some of these spirits are attempting to eat the body of the victim. (Stone, 1976)

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

**COLD OR COUGH:** Sour, hot and spicy foods are not given to children with colds or coughs. Sweet foods, if hot and cooked like tea, are beneficial. Uncooked sweet foods, such as hard candies, are not good. Black lentils are excellent for colds because of their heating properties. Sugar and peanuts are to be avoided when one has a cough. (Bennett, 1976)

**FEVER:** Fever is treated by giving the child only rice and milk. Black lentils must be avoided. Eggs should not be given and sour, hot, spicy and sweet foods are also avoided as they all have heating properties. A little hot water or milk may be given. (Bennett, 1976)

**STOMACH TROUBLES:** Food is related to a variety of stomach troubles. Food that has "gone bad" or has been tampered with by a witch is considered an obvious source of stomach pain. Hot-cold imbalances are also considered a source of stomach discomfort. Corn is believed to cause upset stomach. (Stone, 1976)

**CONSTIPATION:** Constipation is believed to occur because the child's internal system is too hot. Cooling foods such as pumpkin, amala (a green berry), and wet and juicy fruits are given. Cool water and glucose are also given. (Bennett, 1976)

**INABILITY TO URINATE:** Inability to urinate is treated by putting an onion on the child's navel and feeding glucose water to the child. (Bennett, 1976)

**MEASLES:** When a child has measles it is important to avoid giving the child any oily foods. The child is given a mixture of goat's milk, raisins and the inside of a particular berry. A lentil called gadh may also be fed to the child with measles. (Bennett, 1976)

**RASHES:** Rashes, pimples, sores and infected cuts are treated by refraining from giving the child soy beans, yellow lentils, meat and any foods which are hot, spicy or sour unless one wishes to make the pus come so that it can be more easily removed. (Bennett, 1976)

**WITCHCRAFT AND EATING OUTSIDE THE HOME:** A common technique of witchcraft involves transmission of harm to a person through his food. A witch may deliberately transmit this harm by ritually blowing a mantra onto the food that the victim will eat. Villagers say that for this reason it is dangerous to eat outside one's own home. (Stone, 1976)

**BLOOD:** Limes are believed to be good because they "clean the blood." (Blustain, 1976)

**WATER:** People avoid pond water. They feel running water is safe to drink but avoid drinking running water if it came through the village. It is also believed that copper vessels can clear polluted water. (Pradhan, 1977)

**PERCEPTIONS OF WESTERN HEALTH CARE:** Hospital expenses which are minimal by western standards seem quite high to village people. Cures at the hospital are often not immediate, and hospitals only get credit for improvement which occurs right after "eating the medicine." Western health workers take the pulse in only one wrist and this seems incomplete in a culture where it is traditional to read both wrists. Villagers believe that the stethoscope should be placed on the stomach and not the heart. (Blustain, 1976)

**ATTITUDES TOWARD WESTERN MEDICINE:** Villagers display a high regard for Western medicines (pills, ointment, injections, etc.) but are less enthusiastic about institutions of Western medicine such as hospitals. The hospital is used infrequently or as a last resort. Problems include the fact that hospital services vary according to one's wealth and status. Doctors are felt to give only cursory examinations. Distributed medicines are old and provisions for observation of local caste restrictions are not made. (Stone, 1976)

### 3. DIETARY PRACTICES

#### 3.1 DIETARY PRACTICES, GENERAL

##### NATIONAL

**BASIC FOODS:** Rice is usually accompanied by dal, lentils cooked with salt and saffron, and sometimes onions fried in ghee. Chapatis are made from millet; other grains are made into porridge. Onions, beans, radishes and other vegetables and fruits are eaten when available. Milk, cheese, and ghee are a regular part of the overall diet but meat, fish, poultry and eggs are luxuries. Tea is the most common beverage. (Evaluation Technologies, Inc., 1978)

**BASIC FOODS:** Rice, maize, millet, barley and potatoes are major food crops. (Acharya, 1979)

**GENERAL DIET:** The usual diet consists of rice, dal (a legume), corn, and wheat supplemented by small amounts of milk and, occasionally, vegetables and fruits. (Graves, 1978)

**GRAINS AND ENERGY:** Approximately 81% of all calories were supplied by cereal grains. Rice is the major staple but corn is used in some areas. (Brown, 1968)

**LOCAL CONSUMPTION OF GRAIN:** About 70% of the grain produced does not enter trade channels and is consumed locally. (Bhalla, 1981)

**ENERGY SOURCES:** 76% of all calories are obtained from carbohydrates, 11% from protein (largely vegetable protein), and 13% from fats. (Brown, 1968)

**ANIMAL PROTEIN SOURCES:** Milk curd and muscle meats (except pork and beef) are more common sources of animal protein than are poultry, fish, or eggs. (Brown, 1968)

**PLANTS RICH IN VITAMIN A:** In some areas, there is virtually no xerophthalmia. Plants rich in vitamin A are a normal part of the diet in such areas. Some traditional foods are so rich in vitamin A that just one leaf, for example, can provide a child with enough vitamin A for the day. (Madeley, 1981)

**COOKING:** Among the Limbus in the Hill area cooking is done by women at home. On the trail men do most of the cooking, claiming that women tire too easily after long hiking. Women carry most of the load on trail, especially if accompanied by infants. Men also help prepare food at festivals when there is a large crowd to be fed. (Acharya, 1979)

**NUMBER OF MEALS:** In some Gurung households the mother prepares a mid-afternoon snack for members of the family who are around the house, including young children. Preparations for the evening meal begin around 5:30 or 6:00 and the meal is usually eaten by 8:00. Breakfast is also eaten. (Acharya, 1979)

### 3.1 DIETARY PRACTICES, GENERAL (Cont.)

**NUMBER OF MEALS:** Most families had two meals a day, morning and evening. There was also a snack, called *khanjaa*, in the afternoon. (Shrestha, 1979)

**NUTRITION AND AGRICULTURAL PRODUCTIVITY:** Per capita production in the hills has declined in absolute terms, reducing income and adversely affecting the dangerously low nutrition levels in these areas. (Huang, 1979)

**FOOD SUPPLY AND WOMEN:** Women's agricultural responsibilities in a middle class Brahmin-Chhetri community included raising animals, harvesting and carrying rice, growing vegetables, shucking corn, planting seeds, transplanting, weeding, fertilizing, threshing millet, harvesting corn, and carrying corn and millet after harvest. Women also haul water, care for children, gather wood and do housework. (Acharya, 1979)

**WOMEN AND FOOD PRODUCTION:** Women are responsible for several aspects of food production, including care and weeding of basic food crops (grains and potatoes) and kitchen gardening, which supplies the vegetables which contain most of the family's vitamin intake. (Acharya, 1979)

**FOOD SUPPLY AND MIGRATION:** Decreases in the grain supply in the Hills are increasing the number of people forced to migrate to the Terai on both a seasonal and permanent basis. (Huang, 1979)

**POPULATION GROWTH:** The rate of population growth, estimated at 2.6% per annum, exceeds those of Pakistan, Bangladesh and India. Nepal's current total fertility rate of 6.5 was the highest in the recent World Fertility Survey. Nepal was the only country in the survey for which there had been no reduction in total fertility over the past several decades. Food supplies are declining, so inadequacy of intake may be increasing. (Huang, 1979)

**FOOD SUPPLY AND POPULATION:** Agricultural production has failed to keep up with population growth. Unless this can be reversed, Nepal, which once had a substantial food surplus, will become a food importer within a decade. The food problem is most critical in the Hills and Mountains where current production meets only about 2/3 of subsistence needs. (Huang, 1979)

**FOOD PRODUCTION:** In all Nepal, 2,493,000 tons of cereals and potatoes are needed for minimum subsistence. 2,729,000 tons were produced, providing a surplus of 236,000 tons in 1976/77. (Huang, 1979)

**FOOD PRODUCTION AND POPULATION:** The country is divided from north to south into a sparsely populated mountain area, a hill region where approximately two thirds of the population live and produce one third of the total food, and a flat terai region on the Ganges River plain where one third of the people live and two thirds of the food is grown. Combined with transportation problems, this leads to inadequate supplies in the hills. (Brink, 1976)

**FOOD PRODUCTION, WEATHER AND POPULATION GROWTH:** Between 1975 and 1980, agricultural productivity decreased by 16%. The decrease was caused primarily by a drought in the Far Western Region and other weather problems. During this period, the population increased by 2 million. (Anonymous, n.d.)

**FOOD PRODUCTION AND REGION:** Two thirds of the population, which live in the Hills, maintain and produce only 1/3 of Nepal's food. One third of the population of Nepal, which lives in the Terai, produce 2/3 of Nepal's food. (Anonymous, n.d.)

**FOOD PRODUCTION AND LAND:** The average farmer in the hills cultivates 0.4 hectare of land, which is able to provide the average family with food for only 225 days per year. (Anonymous, n.d.)

**AGRICULTURE AND FUELS:** Rural areas depend on fuel wood for energy. Pressures from the growing population may lead to disappearance of accessible forests in the hills by 1990 and will contribute to soil erosion. If plant and animal wastes are used for fuel, they will not be used as fertilizer. Destruction of forest and loss of fertilizer can lead to a serious loss of agricultural productivity. (Huang, 1979)

**CALORIES AND PROTEIN:** Calorie intake meets 95% of requirements. Protein intake is 50 grams per capita per day. (Huang, 1979)

**AVERAGE NUTRIENT INTAKES:** Average consumption was 2442 calories per capita per day. Average intake of protein was 66.3 grams, fat 35.0 grams, carbohydrate 463 grams, calcium 357 mg, iron 12.6 mg, vitamin A 1957 I.U., thiamine 2.1 mg, riboflavin 0.7 mg, niacin 22 mg, and ascorbic acid 5 mg per capita per day. (Brown, 1968)

**CALORIE AND PROTEIN INTAKE:** 2070 calories were available per person per day (ranking 108 among the countries of the world) and 50 grams of protein per person per day (a rank of 109 among the countries of the world) in 1976. (Sivard, 1979)

**RIBOFLAVIN INTAKES:** 100% of the villages included in the Worth and Shah survey had a per capita intake of riboflavin below recommended levels. (Krantz, 1978)

## **RURAL**

**SALT:** People living at high altitudes, 10,000 feet and over, drink their tea with salt in order to be physically fit. As a preventive measure for high altitude they also use salt and pepper with their food. (Pradhan, 1977)

## **URBAN**

**GENERAL DIET:** In urban Kathmandu the average daily diet included 418 grams of rice; 81 grams of grains; 9 grams nuts and beans; 5 grams green and yellow vegetables; 104 grams other vegetables; 0.6 grams ghee; 12.3

### 3.1 DIETARY PRACTICES, GENERAL (Cont.)

grams other fats; 13.6 grams meat, fish, or poultry; 27 grams milk products; and 62.9 grams wine. (Brown, 1968)

### 3.2 DIETARY PRACTICES, WOMEN

#### 3.2.1 DIETARY PRACTICES, WOMEN, DURING PREGNANCY

##### RURAL

**FOODS GOOD FOR PREGNANT WOMEN:** To the limit of their financial ability, the family, neighboring friends, and members of the pregnant woman's natal family will try to feed her rich, nourishing foods during and after pregnancy. Ghee, meat, liver, milk, fish, eggs, curds and a syrup-filled sweet called "jeri" are favored. There are many variations, and some will not give meat or eggs for religious reasons. (Bennett, 1976)

#### 3.2.2 DIETARY PRACTICES, WOMEN, DURING LACTATION

##### RURAL

**FEEDING MOTHER AFTER THE DELIVERY:** During the first month postpartum the mother is fed rice three times a day instead of the usual two and is given as much goat or fish as can be afforded. She is also given gundpac (a special rich sweet), and sutkeri ko ausadi (a special mixture of spices, herbs, ghee, and milk). (Bennett, 1976)

### 3.3 DIETARY PRACTICES, INFANTS 0-24 MONTHS

#### 3.3.1 DIETARY PRACTICES, INFANTS 0-24 MONTHS, BREASTFEEDING

##### NATIONAL

**DURATION OF BREASTFEEDING:** Prolonged lactation is customary. 54% of women interviewed reported that they had breastfed an infant for more than 2 years. 28% reported a duration of exactly 2 years, and only 18% reported a duration of less than 2 years. (World Fertility Survey, 1978)

**LACTATION AND REGION:** Prolonged lactation is slightly more common in the Hills than in other regions. (World Fertility Survey, 1978)

**LACTATION AND REGION:** 87% of mothers in the Hill region breastfed their infants for 24 months or more. 78% of Terai and mountain mothers breastfed 24 months or longer. (Thapa, n.d.)

**LACTATION AND NUMBER OF CHILDREN:** 87.5% of mothers with fewer than 3 children breastfed 24 months or more. 79.6% of mothers with five or more children breastfed 24 months or more. (Thapa, n.d.)

**LACTATION AND AGE OF MOTHER:** The absence of differences in breastfeeding practices of various age groups lends support to the view that breastfeeding is not declining in popularity. (World Fertility Survey, 1978)

**LACTATION AND AGE OF MOTHER:** 19.7% of women 15-24 years breastfed at least 24 months. 88% of women 45-49 breastfed 24 months. (Thapa, n.d.)

## **RURAL**

**PRELACTAL FEEDS:** Until the milk comes in, the infant is given ghee, either hot or congealed with sugar or cow's milk. Buffalo milk is thought to induce diarrhea because it is too rich. Babies may also be given rice flour and ghee paste mixed with hot water or milk. The preparation and storage of this initial food is rather casual and this interval before breast milk comes may be a dangerous one for the newborn. (Bennett, 1976)

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

#### **NATIONAL**

**INTRODUCTION OF FOODS:** Supplementary food is introduced before 6 months of age. The main supplemental food is rice. (Graves, 1978)

**INTRODUCTION OF RICE:** Breast milk is the primary source of food for most babies up to the age of 5-6 months, which is marked by a local rice feeding ceremony. (Thapa, n.d.)

**NO SPECIAL FOODS:** There were no special weaning foods. Children were given maize flour paste or rice gruel. Some children received tea and bread, tea and rice, mixtures of grain and small amounts of pulses, or a corn-soy mixture. Meat, eggs and fish were rarely eaten. Milk is the staple protein source for many but might be sold by very poor families. Oils were used sparingly. Fruits and vegetables were used rarely in the families of malnourished children. (Shrestha, 1979)

**FOODS FOR CHILDREN:** A survey carried out in 1973 in two villages among well-nourished and undernourished children found that even the poorest homes had sufficient local food (corn, soybean, rice, wheat) to make foods suitable for children. In terms of nutrient intake, it was found that children were not fed often enough or were given foods too coarse for them to utilize properly. (Krantz, 1979)

**PROTEIN UTILIZATION:** Although protein requirements were met, the protein was not being properly utilized due to the poor absorption of pulses eaten in coarse form and because protein was diverted to help make up the calorie deficit. (Krantz, 1978)

**SUPER FLOUR (SARBOTTAM PITHO):** Super flour (Sarbotam Pitho) can be made by roasting two parts soybean with one part corn and one part wheat. This mixture is ground fine, mixed with boiling water and cooked for one or two minutes. This food is given to children five to six months old, and was shown to be superior in nutrient content to imported foods formerly used for weaning and to be about one tenth the cost. (Krantz, 1979b)

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

**SARBOTTAM PITHO:** Sarbottam pitho ("super flour") is a nutritious, locally-developed weaning food. The basic formula includes an equal mixture of any two locally-available food grains (wheat, rice, maize, millet, etc.) mixed with an equivalent of soybeans, dal or other protein-rich legume. After roasting and grinding, it is fed as a porridge to weanlings and malnourished children. (Vaidya, 1979)

**NUTRIENTS IN SARBOTTAM PITHO:** 100 grams of sarbottam pitho, a nutritious weaning food composed of soy, wheat and corn, has 21.87 grams of protein, 3.28 grams of fat, 421 mg of calcium and 12 mg of iron. (Bomgaars, 1976)

**AWARENESS OF SARBOTTAM PITHO:** Awareness of sarbottam pitho (a nutritious, high-protein weaning food and dietary supplement) was about five times greater than the actual preparation and usage rates. 27% of households were aware of this food in areas with a family planning clinic, 16% in areas with a panchayat-based worker, 24% in areas with a village health worker, and 16% in areas with no health services or health workers. (Vaidya, 1979)

**SARBOTTAM PITHO AND HEALTH CARE:** 5% of households prepared and used sarbottam pitho (a nutritious, high-protein weaning food and dietary supplement) in areas served by family planning clinics; 3% prepared this food in areas served by a panchayat-based worker; 5% in areas served by a village health worker; and 3% in areas with no health services. (Vaidya, 1979)

**USE OF SARBOTTAM PITHO:** Only 17 to 21% of households who were aware of sarbottam pitho (a nutritious, high-protein weaning food) had actually prepared it. This may be because community use is restrained by resource availability, or because the aware population, often of higher education and socioeconomic status, may feel that their children get adequate nutrition without needing a special, high-protein food. (Vaidya, 1979)

**KNOWLEDGE OF SARBOTTAM PITHO:** The source of knowledge about sarbottam pitho (a nutritious, high-protein weaning food) was the radio in 16% of households in areas served by family planning clinics, in 8% of households in areas with a panchayat-based worker, in 5% of households in areas served by a village health worker, and 9% of households in areas with no health services. The source of knowledge was friends in 3 to 8% of households, and was health workers in 1 to 6% of households (depending on type of health service area). (Vaidya, 1979)

**ADDING VEGETABLES:** Mothers will add green, leafy vegetables to unsweetened children's foods such as Super Flour (a mixture of corn, soy and wheat) but no mother will ever add vegetables to sweetened foods. (Krantz, 1978)

## **RURAL**

**BOTTLE FEEDING:** Bottle feeding, a new but harmful practice originating in Kathmandu, is discouraged by the Lalitpur District Health Programme. (Bomgaars, 1974)

**RICE CEREMONY:** A special ceremony, pasne, marks the first feeding with rice. For girls this usually occurs at 5 months of age; for boys, at 6 months. After the rice ceremony the child's diet is supplemented with rice, cow or buffalo milk, and vegetables. (Bennett, 1976)

## **URBAN**

**ANIMAL PROTEIN:** The diets of well nourished children studied included a wider range of foods containing animal protein than did diets of undernourished children, and their previous day's diet tended to include eggs, fish or meat more frequently. (Graves, 1978)

**ADULT FOOD:** 85% of children age 7 to 18 months had diets combining breastfeeding and daily feedings of adult food. (Graves, 1978)

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

#### **RURAL**

**CHILDREN FIRST:** Children are fed before adults, who eat in strict order or rank. (Bennett, 1976)

**CHILD FEEDING:** Up to 3 or 4 years children are fed by their mothers or other adult women. When old enough to sit properly the child is given a wooden plank seat and eats his meal in a special place by the fire. Small children are fed on their mothers' laps. The mothers first knead the food to produce small particles, and then blow on it to cool it. (Bennett, 1976)

**CHILD PREFERENCES:** If the family can afford it the child is usually asked what food he prefers -- usually the choice is rice and milk or legumes. The child is coaxed to take some of both but never forced to eat what he doesn't want. (Bennett, 1976)

**EATING AND CLEANLINESS:** If food falls on the floor in the house or on the ground outside, children pick it up and continue eating. Children are allowed to eat the bits of fruits or sweet breads left as offerings for the gods at indoor and outdoor shrines. Flies are tolerated or swept away ineffectually when they cluster on the sweet which the child is eating. Children also eat unripe fruits and berries and overripe fruits which have fallen on the ground. Parents show little sympathy when the child complains of stomach ache after eating these fruits. (Bennett, 1976)

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

**SNACKS:** Whenever the family has a special food, a generous portion goes to children. When relatives come to visit they often bring biscuits, fruits or sweets to the children. (Bennett, 1976)

**SNACKS:** Parents know it is hard for young children to subsist on only two full meals a day as adults do. Rice and other foods from each meal may be set aside in a dish covered and weighted down with a brick so animals won't disturb the food. In the morning food from the previous meal may be heated with milk or leftover legumes and fed to children under four years old. If families can afford it hot milk, milky sweet tea, pounded rice, glucose biscuits, or store-bought bread will be given for snacks. (Bennett, 1976)

### 3.4 DIETARY PRACTICES, HEALTH AND MEDICINE

#### NATIONAL

**SELECTION OF FOOD IN ILLNESS:** Eating the appropriate food for hot-cold balance in the body is taken as the first step in curing illness. When a person falls ill the immediate action taken by his family is the selection of the food to feed him. The sick person must avoid certain foods. For example, in case of fever, rice, meat and spicy food must be avoided. In case of cold, curd, fish, fruits and fatty food are avoided. (Ranjitkar, 1976)

**MALNUTRITION:** When children appear malnourished, mothers may take them to traditional healers. Cures from the traditional healer include forming an image of the child out of cow dung to transfer the child's illness to the image, chanting of mantras, and making offerings of eggs or poultry to gods. (Krantz, 1979a)

**DIARRHEA:** Diarrhea is treated by restricting water and milk intake in the belief that if the liquid intake is reduced the child's stools will be less liquid. Some say they will give hot milkless tea because diarrhea means the child's internal system is too cool. Fruit is also restricted. Diarrhea is also treated with Agni Kumari, a sweet halva-like medicine, which children like and which is thought to warm the stomach, and with a drink made of ground cumin seeds or a plant called Arum colocasia. Severe diarrhea is treated with curds or buttermilk. (Bennett, 1976)

**KNOWLEDGE OF REHYDRATION FLUID:** 80 to 88% of respondents had no understanding of how oral rehydration fluid was prepared and used; 7 to 10% had a little understanding and 5 to 10% had a fair to good understanding. Levels of knowledge were highest in areas served by family planning clinics or by village health workers. (Vaidya, 1979)

**PREPARATION OF ORAL REHYDRATION FLUIDS:** Fewer than 8% of all surveyed households had prepared oral rehydration fluid from sugar, salt and water. Among households who were aware of these preparations, from 19 to 31% (percentage varied according to type of health worker serving the household) had actually prepared oral rehydration fluids. (Vaidya, 1979)

**KNOWLEDGE OF RD-SOL:** 7 to 16% of respondents had seen or heard about RD-Sol, a commercially-prepared oral rehydration fluid. Awareness was about 5 times greater among respondents who had attended school than among uneducated respondents. Among respondents who had heard of RD-Sol, 10 to 18% knew it compensated for fluid loss, 45 to 56% said it stopped diarrhea and 32 to 45% were aware that it existed but had no further understanding of it. (Vaidya, 1979)

**VITAMIN D:** It is common to oil newborn babies and expose them to the sun. This practice promotes synthesis of vitamin D. (Krantz, 1979a)

## **RURAL**

**DIARRHEA:** Local custom prohibits giving water to a person with diarrhea. This may be based on the sound traditional experience that contaminated water is usually the source of the diarrhea. Attempts are now being made to change this belief by the Lalitpur District Health Program, and to advise treatment with oral rehydration for children with diarrhea. (Bomgaars, 1974)

**MEASLES:** Foods allowed to a child who has measles are limited to leavened bread, buffalo milk, and biscuits. These foods are often not available to many people, so the child with measles may be literally starved for five to ten days. (Bomgaars, 1974)

**TETANUS:** Neonatal tetanus appears to be a rare phenomenon in the Lalitpur district. The local Newar tradition which allows the placenta to remain attached to the baby for four to eight days may protect the child from unhygienic cord cutting techniques and the entrance of the tetanus bacillus. (Bomgaars, 1974)

#### 4. NUTRITION STATUS CORRELATIONS

##### NATIONAL

**LACTATION AND EDUCATION:** Prolonged lactation was less common among educated couples than uneducated. (World Fertility Survey, 1978)

**LACTATION AND SCHOOLING:** 83.1% of women with no schooling breastfed 24 months or more; but only 71.9% of women who received some schooling did so. (Thapa, n.d.)

**ORAL REHYDRATION FLUID AND HEALTH WORKER VISITS:** There was a consistent, positive relationship between awareness that oral rehydration fluid could be made at home from sugar, salt and water and increasing number of health worker visits during the previous six months. (Vaidya, 1979)

**ORAL REHYDRATION FLUID AND EDUCATION:** Increasing education was somewhat associated with increased use of oral rehydration fluid prepared from sugar, salt and water. 22% of respondents with no education, 31% with primary school education, 29% with high school education and 44% with university education had used oral rehydration fluids. (Vaidya, 1979)

**PREPARATION OF SARBOTTAM PITHO AND EDUCATION:** 22% of respondents with no education had a fair to good understanding of how to prepare sarbottam pitho (a nutritious, high-protein weaning food), as did 31% of respondents with a primary school education, 41% of those with a high school education, and 43% of those with a university education. (Vaidya, 1979)

**AWARENESS OF SARBOTTAM PITHO AND EDUCATION:** 16% of respondents who had no schooling were aware of sarbottam pitho (a nutritious, high-protein weaning food), as were 34% of respondents with primary school education, 53% of those with secondary school education and 100% of those with a university education. (Vaidya, 1979)

**AWARENESS OF SARBOTTAM PITHO AND HEALTH WORKER:** There was no correlation between the number of village health workers and awareness of sarbottam pitho (a nutritious, protein-rich weaning food). About 1/4 of all households were aware of this food whether they had received 0, 1 to 4, or 5 or more visits in the previous six months. (Vaidya, 1979)

**VITAMIN B DEFICIENCY AND RICE MILLS:** About three years ago in the southern Kathmandu Valley, there was a remarkable increase in complaints of thiamine and riboflavin deficiency symptoms at MCH clinics. This problem appeared some months after electricity, and subsequently small rice mills, had come into use. (Krantz, 1978)

##### RURAL

**WASTING AND CASTE:** The survey found that children in some groups and areas were more likely to be wasted: 10.6% of Brahmin children in the Hills were wasted (below 80% of the reference median weight for height).

#### 4. NUTRITION STATUS CORRELATIONS (Cont.)

In the Terai, 9.2% in the category "other people" (not Brahmin or Chhetri caste) were wasted. In the total rural sample 8.3% of Brahmin children were wasted. (Nepal Nutrition Status Survey, 1975)

**FOOD PRODUCTION AND NUTRITIONAL REQUIREMENTS:** More than 90% of the population is directly dependent on agriculture; nearly 75% are small farmers. Most of the small farmers subsist on marginal sloping land in the hills and their food production is at such a low level that it barely meets minimum nutritional requirements for the underprivileged rural poor and their young children. (Shrestha, 1981)

**LAND HOLDING AND FOOD EXPENDITURE:** A socioeconomic survey found that farmers with 0.5 hectare spent 57% of their income on food but farmers having over 1 hectare spent 33% of income on food. (Bhalla, 1981)

#### URBAN

**CHILD NUTRITION STATUS AND FOOD AVAILABILITY:** Food availability was comparable for undernourished and well nourished childrens' families, based on land and domestic animals owned. (Graves, 1978)

**CHILD NUTRITION STATUS AND EDUCATION:** Comparisons showed that the parents of undernourished children had significantly less education than parents of the well nourished group. (Graves, 1978)

**NURSING TIME AND CHILD NUTRITION STATUS:** Undernourished children spent significantly more time nursing at the breast than did well nourished children. (Graves, 1978)

**CHILD NUTRITION STATUS AND PARENTS' DIETS:** The preceding day's diet among the parents of well nourished children included protein products more frequently than those of parents of undernourished children. (Graves, 1978)

**NUTRITION STATUS AND BEHAVIOR OF CHILDREN:** Reduced exploratory behavior, reduced levels of attachment behavior and heightened need for physical closeness to the mother characterized the behavior of undernourished children when compared to well nourished children. (Graves, 1978)

**NUTRITION STATUS AND SOCIAL BEHAVIOR:** Undernourished children were significantly less active than well nourished. Undernourished children were more likely to stay on their mothers' laps during the whole observation time than were well nourished children. Maternal behavior did not reveal any significant differences between the two nutritional groups. (Graves, 1978)

## 5. NUTRITION AND HEALTH POLICIES AND PROGRAMS

### 5.1 NUTRITION AND HEALTH POLICIES

#### NATIONAL

**SIXTH PLAN HEALTH GOALS:** The principal goal during the sixth plan period (1980/81-1985/86) is to expand health services so that a total of 1050 Health Posts will have been established. In addition there is to be a village health worker in every village, 3000 in total. Nutrition improvement programs will be established in 12 needy districts. Comprehensive environmental health and sanitation programs will cover 21 districts. Fifty-four percent of villages, or 40% of population, is to be provided with safe drinking water. This is a very ambitious plan and will be difficult to achieve. (Huang, 1979)

**GOALS OF SIXTH FIVE YEAR PLAN:** Basic goals of the Sixth Plan are to increase food grain production and to better meet health needs through Integrated Community Health Posts (ICHP). (Huang, 1979)

**FIFTH FIVE YEAR PLAN:** The fifth five year plan projected the establishment of integrated health services. The project formulation for these services was based on the policy of providing a minimum of health care to the maximum number of people. The concept of minimum health includes the use of paramedical staff in health posts with more training than health workers travelling village to village could provide. It also incorporates programs of malaria eradication, family planning and maternity-child health care. (Wake, 1976)

**DIARRHEA PROGRAM:** Diarrhea plays a major role in the high infant mortality rates. Health staff plan to focus on introducing the concept and practice of rehydration in place of the popular but dangerous "drying-out" treatment. This will be augmented by re-emphasis on the importance of breastfeeding, especially in areas of western culture contact where unhygienic bottle feeding is apt to replace mothers' milk. At present health post staff feel impotent to remedy malnutrition cases, except for dispensing vitamins. (Wake, 1976)

### 5.2 NUTRITION AND HEALTH PROGRAMS

#### NATIONAL

**NUTRITION REHABILITATION CENTER:** In 1974 in Chapagaon, a small nutrition rehabilitation center was established to teach mothers to feed small children more frequently, to provide foods appropriate to the age and condition of the child and to supervise the child's meal times. Mothers were taught to use local foods in treating their malnourished children and encouraged to teach other mothers when they returned home. (Krantz, 1979a)

**NUTRITION REHABILITATION:** 167 children (second and third degree malnourished when height and weight measurements were compared to Harvard Standards) were fed a diet of two cereal-based meals with their mothers and three small meals of Super Flour porridge. No animal proteins were

## 5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

given. During an average stay of 10.2 days, 80% of the children gained weight (an average of 500 grams per week) and improved in other ways, e.g. a loss of edema, recovery of appetite, and increased alertness. Average cost was \$.08 per day per child. (Krantz, 1978)

**RUNCHE:** All adults in the community recognize the condition called "runche" (the crying one). These children are usually underweight and not receiving enough food. Programs can use this traditional recognition of symptoms to diagnose and treat underweight children before frank marasmus and kwashiorkor have occurred. Runche has been treated with sarbottam pitho, a nutritious weaning food. (Bomgaars, 1976)

**NUTRITION PROGRAMS:** The Ministry of Health has village health workers and health aides working at the grass root level offering basic health services, family planning services and nutrition surveillance using arm circumference tapes and nutrition education for the mothers. The Home and Panchayat Ministry has women extension workers. These activities are coordinated by the National Nutrition Coordination Committee under the National Planning Commission, to coordinate nutrition activities by different organizations. (Pahari, 1979)

**VILLAGE HEALTH WORKERS:** Village health workers are almost never women because of the stigma attached to an "unprotected" woman walking about. It is possible that an older woman with a completed family would be more effective than a young man in dealing with the issues of family planning and child care. (John Snow, 1981)

**NUTRITION EDUCATION:** 67% of District Health Offices of Family Planning provided nutrition education, as did 62% of Integrated District Health Offices, 100% of District Family Planning Offices, 100% of Integrated Health Posts, 81% of Non-Integrated Health Posts, and 88% of Family Planning Clinics. (Vaidya, 1979)

**NUTRITION EDUCATION:** 77% of village health workers interviewed spontaneously mentioned nutrition education as one of their important activities, and all agreed it was part of their job. Only 30% of panchayat-based workers spontaneously mentioned nutrition education as an important activity, but 94% agreed that it was part of their job. (Vaidya, 1979)

**VILLAGE HEALTH WORKERS AND NUTRITION EDUCATION:** Village health workers are responsible for teaching nutrition at every home visit, encouraging mixed diets, breast feeding, homemade supplementary foods, and use of iron and carotene-rich foods. (Krantz, 1978)

**FOOD DEMONSTRATIONS:** 33% of District Health Offices of Family Planning provided food demonstrations, as did 8% of Integrated District Health Offices, 92% of District Family Planning Offices, 20% of Integrated Health Posts, 13% of Non-Integrated Health Posts and 41% of Family Planning Clinics. (Vaidya, 1979)

**WEANING FOODS EDUCATION:** The community health program of the Shanta Bhawan Hospital has successfully switched from dependency on imported foods to teaching mothers to produce a weaning food from local foods. Two parts soy, one part corn, and one part wheat are roasted, ground, and made into porridge or bread. The principle of teaching mothers wise use of local foods, including breast milk, has been officially recognized and included in health training manuals, posters, and other material used nationwide. (Krantz, 1979b)

**SARBOTTAM PITHO:** During the fifth five year plan (1975-80), sarbottam pitho was introduced on a wide scale, both as a routine nutritional supplement for young children, and as a treatment for malnutrition. Both village health workers and panchayat-based workers have been trained to demonstrate the preparation and use of this weaning food during home visits. Posters regarding its preparation and use have been distributed to health posts and hospitals. Staff at some health posts have included its preparation in food demonstrations at health posts in nearby villages. It has also been promoted on radio. (Vaidya, 1979)

**PREPARATION OF WEANING FOOD:** 82% of respondents in areas with a family planning clinic had no understanding of preparation of sarbottam pitho, a nutritious weaning food, 10% had a little understanding, and 8% had a fair to good understanding; in areas served by a panchayat-based worker, rates of understanding were 88%, 7% and 5% respectively; in areas with a village health worker, 83%, 10% and 6%; and in areas with no health services, 90%, 5% and 5%. (Vaidya, 1979)

**ORAL REHYDRATION EDUCATION:** 100% of District Health Offices, District Family Planning Offices and Integrated Health Posts have oral rehydration education programs, as have 87% of Non-Integrated Health Posts and 88% of Family Planning Clinics. (Vaidya, 1979)

**ORAL REHYDRATION EDUCATION:** 74% of village health workers spontaneously stated that oral rehydration education was an important part of their job and 100% said it was part of their job when asked. 21% of panchayat-based workers spontaneously mentioned this as part of their job and 90% acknowledged responsibility for this when specifically asked. (Vaidya, 1979)

**SOURCES OF INFORMATION ABOUT REHYDRATION FLUIDS:** In areas served by village health workers, 8% of respondents mentioned radio as a source of information about preparing rehydration fluid, 6% mentioned neighbors, and 9% mentioned health workers. In areas served by family planning clinics, 19% mentioned radio as their source of information, 4% mentioned neighbors, and 1% mentioned health workers; in areas served by panchayat-based workers, 8% mentioned radio, 6% mentioned neighbors, and 9% mentioned health workers. (Vaidya, 1979)

**RD-SOL AVAILABILITY:** RD-Sol is a commercial oral rehydration powder containing several salts and dextrose in optimal quantities, prepared and marketed by Royal Drugs Limited, Nepal, and available through health posts and panchayat-based workers. 3% of village health workers surveyed

## 5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

had RD-Sol when questioned, 29% did not have it at the time and 68% had never had this medication. 45% of panchayat-based workers had some on hand, 33% did not currently have any and 21% had never been given RD-Sol. (Vaidya, 1979)

**REHYDRATION FLUIDS (AUSADHI PANI):** 8% of households prepared and used Ausadhi Pani (a salt and sugar solution for prevention of dehydration in persons with diarrhea) in areas served by a family planning clinic, 4% in areas served by a panchayat-based worker, 5% in areas served by a village health worker and 5% in areas with no health services or health workers. (Vaidya, 1979)

**AWARENESS OF AUSADHI PANI:** Awareness and understanding of ausadhi pani (a salt and sugar solution for prevention of dehydration in persons with diarrhea) was several times greater than actual preparation and use. 30% of households were aware of the product in areas served by a family planning clinic, 17% in areas with a panchayat-based worker, 26% in areas with a village health worker, and 17% in areas with no health services. (Vaidya, 1979)

**MID-ARM CIRCUMFERENCE:** Rural health workers have undertaken a regular assessment of the nutritional status of young children by measurement of mid-upper arm circumference. This is intended to be a starting point for discussions about nutrition and child care, as well as a means of identifying children in need of special nutritional care. (Vaidya, 1979)

**USE OF THE ARM CIRCUMFERENCE MEASURING TAPE:** 100% of the District Health Offices of the family planning/maternal child health services reported using the ACMT (arm circumference measuring tape), as did 62% of Non-Integrated District Health Offices, 66% of District Family Planning Offices, 100% of Integrated Health Posts, 25% of Non-Integrated Health Posts, and 41% of Family Planning Clinics. (Vaidya, 1979)

**ARM CIRCUMFERENCE MEASURING TAPE:** When asked if arm circumference measuring tape assessment was supposed to be part of their job, 100% of the village health workers and 63% of panchayat-based workers said yes. When they were asked if they had an arm circumference measuring tape with their supplies, 70% of panchayat-based workers were unaware that they were supposed to have the tape, contrasted with 6% of the village health workers. (Vaidya, 1979)

**RECOGNITION OF ARM CIRCUMFERENCE TAPE:** 5% of households recognized an arm circumference tape in areas served by a family planning clinic, 2% in areas with a panchayat-based worker, 6% in areas with a village health worker and 2% in areas with no health services. 40% of those who recognized the measuring tape could not identify its purpose. (Vaidya, 1979)

**BLINDNESS CONTROL:** A major program of blindness control--initiated by the Government of Nepal, WHO and SEVA--will run from 1980 to 1985. Its goals are to reduce preventable blindness by 90%, to restore sight in cataract cases, and to help the country become self-sufficient in eye

care. When this program is in place, health workers will help people incorporate foods high in vitamin A into children's diets to prevent xerophthalmia. (Madeley, 1981)

**UNICEF ACTIVITIES:** UNICEF assists the Government of Nepal in running the Nutrition and Child Care Program which is available in 75 districts country-wide, through health posts, MCH centers and mother craft centers. This program serves children 1 to 3 years of age and their mothers, providing nutrition education by radio, group talks and demonstrations on topics including weaning, illness, pregnancy, lactation, kitchen gardens and food storage. (Austin, 1978)

**UNICEF ACTIVITIES:** UNICEF is assisting in the production of RD-SOL, Nepal's brand of oral rehydration solution. UNICEF is also active in women's education and as a supplier of FP/MCH medicines. (John Snow, 1981)

**UNICEF WEANING FOOD:** UNICEF has recommended a weaning food of roasted grain and beans which is highly nutritious. In some areas this is considered a low-caste food. (John Snow, 1981)

**ACTIVITIES OF ICHP:** In delivering primary health services, ICHP has committed itself to the following: nutrition monitoring with an arm circumference tape; nutrition education (lessons on preparation of a roasted grain-lentil weaning food); teaching preparation and use of oral rehydration solution for diarrhea; immunization at health posts; sanitation education; training of traditional birth attendants; primary care and first aid; family planning; and recording vital events. In fully integrated districts their activities also include home delivery and malaria surveillance. (John Snow, 1981)

**FAMILY PLANNING/MATERNAL CHILD HEALTH PROJECT:** The panchayat based health worker (PBHW) provides maternal and child care in the form of advice on weaning foods, how to prepare oral rehydration solution, motivation for immunization and treatment of maternal anemia with iron. In terms of awareness and use of MCH messages and services, little progress has been made. The PBHW, intended to make up to 50% of the FP/MCH staff, is an auxiliary worker who visits households in his/her panchayat; 90% are young males. (John Snow, 1981)

**HEALTH EDUCATION SOURCES:** Survey findings suggest that radio has played an important role in achieving the current levels of health knowledge in the areas studied. The role of friends and neighbors in spreading information is also considerable and outweighs that of health workers or health facilities in most cases. (Vaidya, 1979)

**RADIO:** Twelve nutrition education radio messages were developed by a multisectoral committee under the Ministry of Health's 5th five year plan of 1975. They are used in radio broadcasts and by village level health workers. They encourage breastfeeding and promote good weaning practices. (Thapa, n.d.)

## 5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

**RADIO:** Radio should be considered as a method of nutrition and health education. 10% of the population owned radios in 1980. Up to 93% of radio owners listen between 7:00 and 8:00 P.M. The second most popular time is between 7:00 and 8:00 A.M. An average of 6 people listen to each radio. The news and the agriculture program both have a regular audience of a majority of radio owners, occasionally as high as 90%. 60% of listeners report they have tried ideas presented on the radio. (Anonymous, n.d.)

**EDUCATION FOR TRADITIONAL BIRTH ATTENDANTS:** In 1975 the women's organization of Nepal organized a short course for some traditional birth attendants on modern concepts of hygiene and midwifery. (Ranjitkar, 1978)

**BIRTH ATTENDANTS:** When training traditional birth attendants (TBA's), Nepali staff realized that introducing new ideas about nutrition was a sensitive area. In order to avoid offending the TBA's, the staff presented the ideas through skits and role plays during the training course. (Mogedal, 1979)

**INDIGENOUS HEALTH CARE:** Paropakar is an indigenous organization which has been operating village health programs for over 20 years in the Kathmandu Valley, training local midwives and village volunteers in first aid, family planning and preventive health care (including boiling water for drinking, kitchen gardens for improved nutrition, and building of latrines). They are assisted by World Neighbors, Inc. (TAICH, 1978)

**TRADITIONAL MEDICINE:** Practices are based on the widespread belief in ghosts, evil spirits, planetary influence and displeasure of the ancestors. Most villages, especially in the Hill region, have shamans. Illness is cured by incantations recited over the victim. The Ayurvedic system of medicine is widely practiced. The pharmacopoeia of the ayurvedic system is based on herbs, roots and plants. About 140 Ayurvedic physicians (vaid) practice in 34 dispensaries. (Evaluation Technologies, Inc., 1978)

**UTILIZATION OF ALTERNATIVE HEALTH SERVICES:** 80% of respondents reported having ever used Dhami/Jhankri (traditional healers), 48% had used a drug shop, 35% had used a health post, 28% had used a hospital and 4% had used an Ayurvedic Clinic. (Vaidya, 1979)

**HEALTH SYSTEMS:** The modern and traditional health care systems exist side by side. The modern health care system is encouraged through support from the government and international agencies. The traditional system is supported by local people and communities. People use both systems but verbal communication about a patient's health problem is rare between the two systems and formal referrals are non-existent. (Ranjitkar, 1980)

**HEALTH CENTERS:** Even including the village health workers (VHWs), only about 40% of the population is within a half day's walk of public health services. The health system is based on the Integrated Community Health

Program (ICHP), which is organized around Health Posts which cover about 15,000 persons in 3 or 4 village panchayats and are manned by middle-level staff. Each unit employs 3 or 4 VHWs to live in the communities served. In 1978/79, 533 health posts and 68 hospitals had been constructed. The ICHP intends to engage residents within each village to work with the VHW providing health and nutrition education and care. (Huang, 1979)

**MEDICAL SERVICES:** Medical services available include 68 hospitals, 48 district health offices, 583 rural health posts, 450 doctors (150 in Kathmandu), 460 nurses, and 1500 village health workers. There are 31,111 people per physician. Most health system delivery points annually receive medicines sufficient for no more than 3 or 4 months. (Anonymous, n.d.)

**UNITED MISSIONS TO NEPAL:** This is an ecumenical mission with 29 member agencies from 15 countries, operating projects and training Nepalis in health education and economic development. The mission runs several hospitals, rural dispensaries, clinics providing community health and maternal child health services, and health care worker training programs. Their policy is to eventually turn over the work to the government and other Nepali agencies. (TAICH, 1978)

**IMMUNIZATION:** Rates of immunization among children in four types of health service areas (family planning clinic, panchayat-based worker, village health worker, or no health services) were, respectively: 1%, 1%, 0%, and 1% for DPT; 51%, 48%, 30%, and 37% for BCG; and 85%, 84%, 81%, and 85% for smallpox. (Vaidya, 1979)

**PRENATAL CARE:** Family Planning Clinics are the major source of maternal care outside of hospitals and traditional forms of health care. Yet even in family planning clinic areas, only 10% of pregnant women had sought medical care during pregnancy, as had 3% in areas served by a panchayat-based worker, 5% in areas served by a village health worker, and 4% in areas with no health services. (Vaidya, 1979)

**VITAMIN B DEFICIENCY:** About 3 years ago in the southern Kathmandu Valley, there was a remarkable increase in complaints of thiamine and riboflavin deficiency symptoms at MCH clinics. This problem appeared some months after electricity, and subsequently small rice mills, had come into use. Patients were treated with a two week supply of rice bran (about 200 grams). Over 200 patients were treated. Most recovered within two weeks, and were then encouraged to eat unpolished rice or continue to include rice bran in their diets. (Krantz, 1978)

**PREPARATION OF SARBOTTAM PITTHO AND HEALTH WORKER VISITS:** Understanding was influenced by both type of health worker and number of visits. 29% of respondents with no visit by a village health worker in the last six months had a fair to good understanding of the preparation of sarbottam pitho, a nutritious weaning food; 21% of those who had had 1 to 4 visits and 39% of those with 5 or more visits from a village health worker had a good understanding of preparing this food. 24% of respondents with no

## 5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

visit from a panchayat-based worker, 25% with 1 to 4 visits and 34% with 5 or more visits had fair to good understanding of preparing this food. (Vaidya, 1979)

**SARBOTTAM PITHO:** Sarbottam pitho is a nutritious, high-protein weaning food and dietary supplement. The Integrated Community Health Plan (ICHP), Family Planning, and Health Education Projects have been actively promoting this food and ausadhi pani (a salt and a sugar solution for prevention of dehydration in persons with diarrhea) via radio, posters, clinics and field worker home visits. (Vaidya, 1979)

**KNOWLEDGE OF RD-SOL:** 7 to 16% of respondents had seen or heard about RD-Sol, a commercially-prepared oral rehydration fluid. Awareness was about five times greater among respondents who had attended school than among uneducated respondents. Among respondents who had heard of RD-Sol, 10 to 18% knew it compensated for fluid loss, 45 to 56% said it stopped diarrhea, and 32 to 45% were aware that it existed but had no further understanding of it. (Vaidya, 1979)

**LIMITS ON HEALTH SERVICES:** The ability to expand public health services is limited by shortages of trained manpower and by lack of medicines. (Huang, 1979)

**HEALTH WORKERS:** In 1971 Nepal had 225 doctors, 17% of whom were women. There were 345 other health personnel, 28% of whom were women. (Acharya, 1979)

**HEALTH POSTS:** The sixth five year development plan aims to establish health posts in all 75 districts; at present 43 districts have health posts. (Huang, 1979)

### RURAL

**UNITED MISSION TO NEPAL:** The United Mission to Nepal is about to begin a nutrition program in 5 rural districts serving 50 villages through health centers. This program will provide nutrition education on weaning, illness, hygiene, diet, pregnancy, lactation, and using a weight chart. Local foods will be used to prepare supplementary foods on the "super porridge" model using 2 grains and a legume. (Austin, 1978)

**IMPROVED NUTRITION-APPROPRIATE TECHNOLOGY:** One aim of the Small Farmers Development Programme is to introduce nutrition-appropriate technology to the small farmer. Some improvements already introduced include improved water mills which work as rice hullers, grinders, oil extractors, and paddy and wheat threshers; a community bio-gas plant supplying methane gas for cooking and lighting; an improved smokeless "chulo" which is built with local materials and can save more than 50% of the normal wood consumption required for traditional chulo; improved storage bins to avoid post-harvest loss; and solar driers to preserve green leafy vegetables. (Shrestha, 1981)

**SMALL FARMERS DEVELOPMENT PROGRAM:** The Small Farmers Development Programme began in 1975 to bring development to small farmers. Besides income-raising activity, the objective of SFDP was also to provide socioeconomic services such as health, sanitation, nutrition, drinking water, adult education and family planning. (Acharya, 1980)

**SMALL FARMERS DEVELOPMENT PROGRAM:** The Small Farmers Development Programme emphasizes economic and social development of small farmers. The program began in 1975 and has expanded to 31 districts (14 in the Hills and 17 in the Terai) covering about 7800 farm families in 42 panchayats. Expansion is planned so a total of 54 districts will be covered by 1985 and include a total of 50,000 households. Nutrition improvement is an integral part of the program. The major objectives of the program are increased income and standard of living for the small farmer and activities to improve nutrition, health, sanitation, literacy, etc. for the small farmers and their young children. (Shrestha, 1981)

**INCREASED CEREAL CONSUMPTION:** Evaluation of the Small Farmers Development Program indicated that participants had a per capita grain consumption of 173 kg and non-participants consumed 151 kg. Improvements were also demonstrated in literacy, school enrollment, family planning and sanitation. (Shrestha, 1981)

**HEALTH CENTERS:** The Fifth Development Plan (1975/76-1979/80) had hoped to bring 459 new health posts and fifteen new hospitals to the rural population. Progress to date indicates only 182 new health posts and 9 new hospitals. (Shrestha, 1981)

**ACCESS TO HEALTH SERVICES:** Modern medicine and health services reach only 5% of the population. It is difficult to reach the 96% of the population who live in rural areas, in scattered settlements. The rugged terrain, high mountains, and valleys also make access to health care difficult. (Pradhan, 1977)

**LALITPUR DISTRICT HEALTH PROGRAMME:** This program is involved in 24 village panchayats in the southern part of the Kathmandu valley. In each of these villages the panchayat is involved in a health program involving a woman volunteer health worker and a weekly maternal child health clinic located in the panchayat house and supervised by a community health nurse who lives in the area. Mothers with malnourished children are encouraged to feed home-produced weaning food composed of corn, soy and wheat, and produced using local food preparation methods. Bottle feeding, a new but harmful practice originating in Kathmandu, is discouraged. (Bomgaars, 1974)

**LALITPUR COMMUNITY HEALTH PROGRAM:** This development project includes a "super flour" porridge which has been developed which mothers can make themselves. Also, rice bran is being used instead of B-complex tablets. Other work in the program includes pit latrines, clean water supplies, kitchen gardens, composting, fertilizer and multiple cropping. Evaluation of this program has suggested that "super flour" has brought about a reduction of PEM in the area; vitamin B deficiencies have

## 5.2 NUTRITION AND HEALTH PROGRAMS (Cont.)

decreased; and mothers are feeding their children green leafy vegetables on a regular basis. (Israel, 1981)

**SAVE THE GRAIN PROGRAMME:** The object of this program is to reduce post-harvest loss through control of insects by spraying and fumigation, low cost storage structures and metal bins. (Israel, 1981)

**SAVE THE GRAIN PROGRAMME:** The Rural Save the Grain Programme is attached to the Ministry of Food and Agriculture which will ensure coordination and planning of post harvest activities, in order to achieve the objective of reducing post-harvest losses in the rural sector. (Bhalla, 1981)

**SELECTION OF HEALTH CARE:** Even though a Western hospital may be less than one hour away, a visit is still a much longer process than going to a local healer, who may take only 5 or 10 minutes, and therefore represents much more time lost from work. (Blustain, 1976)

**SELECTING A HEALTH PRACTITIONER:** If an illness persists uncured, specialists are consulted: first, a "janne manche" local healer who works with mantras and amulets; next an astrologer or priest; and finally a doctor. The janne manche is easily available and the least expensive. Doctors are generally called when an illness is acknowledged to be quite serious. (Stone, 1976)

### URBAN

**HOSPITAL-BASED DISTRIBUTION:** At a children's hospital in Kathmandu, free food is distributed once weekly to families with children under 5 years of age, regardless of family's socioeconomic condition. (Graves, 1978)

## 6. COMMENTARIES

### NATIONAL

**DIETARY CHANGES:** Excellent traditional dietary practices are being lost to inferior and/or prestigious substitutes, e.g. breast feeding to bottle feeding, mixed cereal diets to polished rice and highly-refined flour product-based diets, and homemade snacks to sweet biscuits. (Krantz, 1978)

**LACK OF KNOWLEDGE:** Lack of knowledge, rather than lack of food, has had an adverse effect on child nutrition. Children who are fed frequently with appropriately-prepared, locally-available foods will be less likely to succumb to childhood illnesses and will demonstrate good health in all its aspects. (Krantz, 1978)

**NUTRITION AND HEALTH EDUCATION:** Radio and neighbors are more widely cited sources of information than health workers in activities concerning family planning and maternal and child health. Therefore, there should be an increase in quality and extent of radio use for health education, and a study of ways to use informal communication networks more effectively within the community and between field staff and households for health messages. (Vaidya, 1979)

**FOOD AVAILABILITY:** The basic need at present is food and the best means of ensuring its availability, in view of the marketing difficulties, is to increase food grain productivity of the countless small farmers in both the Hills and Terai. (Huang, 1979)

**AGRICULTURE:** Agriculture is the foundation of the Nepalese economy, providing employment to 90% of the labor force and it is the source of about 80% of exports. Agriculture must also meet the pressing food needs of the population and stabilize the uncontrolled migration from the Hills to Terai. (Huang, 1979)

**INCREASE FOOD PRODUCTION:** The authors consider increasing food production the most pressing basic need at this time. (Huang, 1979)

**ELIMINATE POST HARVEST LOSS:** The Food and Marketing Services Department estimated Nepal's per capita cereal consumption in 1971-72 at 143 kilograms. A calculation made by the Ministry of Finance had indicated that families in the hill and mountain regions can sustain themselves from their own production at a minimum subsistence level for only 225 days in the hill areas and for 191 days in the mountain areas. The capacity to purchase supplementary grains, if available, is limited or nonexistent. Moreover, there are difficulties in moving supplementary grains into many of the areas involved. Therefore, all-out efforts are required to reduce losses in the country. (Bhalla, 1981)

**HOSPITALS AND NUTRITIONAL SURVEILLANCE:** District hospitals should institute routine nutritional surveillance within their maternal and child health care activities. (Vaidya, 1979)

## 6. COMMENTARIES (Cont.)

**TRADITIONAL HEALTH WORKERS:** The extensive and widespread use of traditional medical practitioners, especially in areas without health posts, indicates the importance of a feasibility study for utilizing traditional medical practitioners to provide information and services on priority health problems. (Vaidya, 1979)

**POOR DISTRIBUTION OF HEALTH PERSONNEL:** Shortage and maldistribution of modern health manpower are acute problems. 96% of the population live in rural areas which hold no attraction for educated and trained modern healers. 96% of medical doctors work in urban settings. 50% of other trained health care providers, including auxiliary staff posted for rural areas by the government, either quit or take leaves of absence from their jobs and go to urban areas. (Ranjitkar, 1980)

### URBAN

**PARENT EDUCATION:** Infant undernutrition may stem from parental ignorance of children's health and nutritional needs and perhaps from adherence to traditional beliefs and customs discordant with the child's needs. Education programs on infant care and nutrition, geared to the village life style, should be considered. (Graves, 1978)

## BIBLIOGRAPHY

Acharya, P.P.

- 1980 Small Farmers Development Programme: An Experience in Rural Development, Nepal, presented at Seamaul Undong Study Seminar (June 9-21, 1980 at South Korea), organised by UNICEF, East Asia and Pakistan Regional Office Bangkok, Thailand and Government, Republic of Korea, Office of Saemaul Undong, Suwan.

This paper describes the organization of the Small Farmers Development Programme which was organized to bring development to small farmers in Nepal. As well as working in the area of agriculture, this program included efforts to improve water and sanitation, adult education, nutrition and health education, family planning, veterinary services, and special programs for women.

Acharya, M.

- 1979 The Status of Women in Nepal: Volume I: Background Report, "Part I. Statistical Profile of Nepalese Women: A Critical Review." Kathmandu, Nepal: Centre for Economic Development and Administration, Tribhuvan University; and Washington, D.C.: Agency for International Development, Office of Women in Development.

This review provides statistics on Nepalese women's fertility, mortality, politics, labor, economic activity, and education. The author believes that Nepalese women marry early, have many children, are over-burdened and have lower life expectancy than men.

Anonymous

- n.d. Nepal profile sheets.

These sheets provide statistical information on demographics, migration, economics, status of women, nutrition, health, water supply and sanitation, education and literacy, and communication.

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

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

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

## BIBLIOGRAPHY (Cont.)

Baral, M.R.

- 1979 "Diarrhoea-killer number one of Nepalese children." in Baral, M.R. (ed.), The Child in Nepal. Kathmandu, Nepal: Nepal Medical Association, Nepal Medical Association-International Year of the Child Seminar, Dec. 14-15, 1979.

In this article the author dramatically presents the extent of the problem of diarrhea in children in Nepal. He discusses areas which are important in controlling diarrhea: nutrition, health education, safe water, immunization, simple treatment, health care, and environmental sanitation.

Bennett, Lynn

- 1976 "Sex and motherhood among the Brahmins and Chhetris of east-central Nepal." Journal of the Institute of Nepal and Asian Studies, Tribhuvan University, Vol. 3. Special Issue: Contributions to Nepalese Studies Anthropology, Health, and Development.

Original data.

Method: Participant observation, open-ended interview.

Sample: 48 Chhetri and Brahmin women.

Geographic location: Kathmandu Valley.

This article describes the work of an anthropologist in a Brahmin and Chhetri village. The author discusses the beliefs of women concerning sex and reproduction, childbirth and child feeding. The author sets these beliefs into the larger matrix of cultural beliefs in the village. Beliefs about illness and cure are also described.

Bhalla, S.K.

- 1981 "Rural Save the Grain Programme" in the Proceedings First Asian Household Nutrition Appropriate Technology Conference sponsored by Ministry of Colombo Health and Family Hospitals, International Union of Nutritional Sciences, United States Agency for International Development, UNICEF, and International Nutrition Communication Service.

This paper describes the Rural Save the Grain Programme. The purpose of this program is to help farmers minimize post-harvest loss and to make available additional quantities of food grain to the farmers.

Blustain, Harvey S.

- 1976 "Levels of medicine in a central Nepali village." Journal of the Institute of Nepal and Asian Studies, Tribhuvan University, Vol. 3. Special Issue: Contribution to Nepalese Studies: Anthropology, Health and Development.

Method: Not directly stated, assumed to be participant observation and open-ended interview.

Sample: A village of 430 people divided into five caste groupings: 141 Chhetris, 77 Damais, 24 Kamis, 40 Sarkis, and 148 Muslims.

Geographic location: A village in the western Gorkha district in central Nepal.

Different forms of medical care are available in a rural village in central Nepal. When a villager falls ill he has a choice of several different indigenous health practitioners as well as a western hospital about an hour away. Choices made about medical care in terms of the existing cultural milieu are examined.

Bomgaars, M.R.

- 1976 Undernutrition: Cultural Diagnosis and Treatment of "Runche" Journal of the American Medical Association, 236(22):2513.

A syndrome termed "runche" (the crying one), found in many young children, was easily recognized by all adults and was traditionally interpreted to be a spell placed on a child after being touched by a pregnant woman. Traditional treatment included a series of early morning baths. The runche child was a miserable, whining child who was hard to live with and refused to eat and cooperate with family activities. Deeper study revealed that all these children were underweight and not receiving enough food for adequate growth.

Bomgaars, M.R.

- 1974 Common Problems of children as seen in rural clinics--and how they are managed: Lalitpur experience. Kathmandu, Shanta Hospital, Unpublished document.

The high child mortality rate in Lalitpur, Nepal is largely a result of malnutrition and gastroenteritis. Although adequate quantities of nutritious foods are available, local customs do not encourage their use and the symptoms of malnutrition are attributed to a spell cast by contact with an unknown pregnant woman. Hygiene is inadequate and diarrheal disease is treated by starvation and deprivation of water. The staff in the health service are well aware of these customs and consider education an essential part of their program. Mothers are encouraged to use a weaning food composed of readily available local ingredients as a supplement to prolonged breast feeding. Gastroenteritis is treated with a simple home-produced rehydration solution. Other priorities of the health program are immunizations, early treatment of infections, and early referral of more serious cases. The success of the service depends on village women volunteers and medical staff who together staff the weekly maternal child health clinics held in each village.

## BIBLIOGRAPHY (Cont.)

Brink, E.W., Khan, I.H., Splitter, J.L., Staehling, N.W., Lane, J.M., and M.Z. Nichaman

- 1976 "Nutritional status of children in Nepal, 1975" Bulletin of the World Health Organization, 54: 311-318.

Original data.

Method: Cross sectional sample. Height, weight, arm circumference, and age obtained. Random start fixed interval method of population proportionate sampling.

Sample: 6501 randomly selected rural children; and urban elite group of 486 well nourished children from wealthier Kathmandu and Pata families. All children from 6-71 months of age.

Geographic location: 219 rural Nepalese villages and an urban elite group.

A survey team visited villages to collect data on height, weight, and age of preschool children. Prevalence of chronic undernutrition was 52%, and was significantly higher in the hilly areas. An urban elite group was measured for comparison. This article is a brief report of the main results of the national nutrition survey.

Brown, M.L., Worth, R.M., and N.K. Shah

- 1968 "Health Survey of Nepal: Diet and Nutritional Status of Nepalese People." American Journal of Clinical Nutrition, 21: 876-81.

Original data.

Method: Cross sectional baseline data on nutrition and health. Data included food frequency and 24 hour recall. All nutrient values calculated as village means.

Sample: Random sample. 24 villages randomly selected, 18 visited (study terminated due to illness), and 1 urban site. 957 households: 6321 people; 5011 examined by physician.

Geographic location: 18 villages, 1 urban site in Katmandu.

The diet was found generally lacking in sufficient high quality protein, calcium, vitamin A, riboflavin, and ascorbic acid. Iron, thiamine, and niacin intakes were adequate to high due to consumption of large amounts of unmilled rice. The high mortality rate among children under 5 years suggests that marginal malnutrition exists, which, coupled with constant exposure to a contaminated environment, is a major factor implicated in child deaths in Nepal.

Evaluation Technologies, Inc.

- 1978 Nepal: A Country Profile, prepared for the Office of U.S. Foreign Disaster Assistance, Bureau for Private and Development Cooperation, Agency for International Development, Department of State, Washington, D.C.

This document summarizes information concerning geography, missions, travel, religion, languages and ethnic groups, governmental structure, disaster preparedness, population, health and nutrition, economy, agriculture, transportation, and communication.

Graves, P.L.

- 1978 "Nutrition and infant behavior: a replication study in the Katmandu Valley, Nepal." American Journal of Clinical Nutrition, 31(3): 541-551.

Original data.

Method: Observation of non-random mother-child pairs. Data also collected on socioeconomic status of family and food eaten the day before.

Sample: 36 well nourished children and 38 undernourished children (nutritional status determined by weight/age, weight/height, midarm and head circumferences) age 7-18 months selected from the supplementary food program at a hospital and outpatient services of a maternal child clinic.

Geographic location: Kathmandu.

Undernourished children showed lowered levels of exploratory activity and attachment behavior, as well as a heightened need for physical closeness to the mother. Among undernourished children the development of intellectual performance and the overall time spent in play were decreased, while time spent nursing at the breast was increased.

Huang, Y., Borthwick, J., Jamison, D., Kandel, S., Roy, S., and J. Tillman

- 1979 Nepal Development Performance and Prospects, International Bank for Reconstruction and Development. Washington, D.C.: World Bank.

This report was prepared as a background document for a meeting of the Nepal Aid Group in January, 1980. It reviews Nepal's development performance and prospects in the areas of agriculture, industry, tourism, energy, transport, population, health, and education.

Israel, R.

- 1981 "Background Paper for First Asian Household Nutrition Appropriate Technology Conference" in Proceedings First Asian Household Nutrition Appropriate Technology Conference, sponsored by Ministry of Colombo Health and Family Hospitals, International Union of Nutritional Sciences, United States Agency for International Development, UNICEF, and International Nutrition Communication Services.

This document reviews some programs which have used nutrition appropriate technology. This term refers to "improved" methods for growing, handling and using food in the home. The paper includes techniques for small scale food production, household storage, food

## BIBLIOGRAPHY (Cont.)

processing and preparation, culinary technology, serving and nutritional sanitation.

John Snow Public Health Group Inc.

- 1981 Technical Proposal: Integrated Rural Health/Family Planning Services Project - Nepal

This document presents a discussion of previous and on-going health and development efforts in Nepal, including the Integrated Rural Health and Family Planning Services Project. The major goal of this project is to increase the well being of the rural poor in Nepal by improving their overall level of health and by reducing their fertility rate.

Khatri, I.B.

- 1979 "The child in Nepal." in Baral, M.R. (ed.), The Child in Nepal, Kathmandu, Nepal: Nepal Medical Association, Nepal Medical Association-International Year of the Child Seminar, Dec. 14-15, 1979.

In this article the author reviews the infant and child mortality rates found by various studies. He reviews hospital records showing the major causes of death of children in hospitals and discusses health, nutrition and geographic factors which affect the well being of children in Nepal.

Krantz, M.E.

- 1979a The Relationship of Children's Circumstances to Nutritional Problems as Observed in Lalitpur District, Nepal Community Health Program, Lalitpur, November 1979. Presented: NMA International Year of the Child Seminar on "The child in Nepal." Kathmandu, December 1979. Published: The Child in Nepal M.R. Baral (ed) Nepal Medical Association, Chamundra Press, Yetkha, Kathmandu.

This article describes some problems in child feeding in Lalitpur District as observed by the author. A number of vignettes are presented to illustrate the problems of bottle feeding, inappropriate weaning methods, and lack of knowledge to deal with common health problems. A nutrition rehabilitation program is described, and case studies from the program are presented.

Krantz, M.E.

- 1979b A Case History: Replacing Imported Foods with Local Foods, League for International Food Education Newsletter, March 1979.

In 1972, the Community Health Program of the Shanta Bhawan Hospital began. Supplies of powdered milk and corn-soy milk (CSM) were donated for use with undernourished children. Problems arose when mothers wanted healthy children to receive these foods, and there was no way

to know if the intended undernourished child was receiving the donated food. The program then switched its focus to education; mothers were taught to make a food by roasting two parts soybean, one part corn, and one part wheat, grinding this mixture, and cooking it briefly. This program has been successful in switching from imported to locally-available foods.

Krantz, M.

- 1978 Nutrition Problems and Programs in Nepal, Free communication paper, XI International Congress of Nutrition, August 27-September 1, 1978, Rio de Janeiro, Brazil.

Village health workers trained in simple methods of PCM detection initiated home-based teaching of mothers, reinforced by other education in the community and mass communication. It has been shown that calories, not protein, are the primary deficiency in children under age five. Children suffering PCM who regularly eat a supplementary food made in their own homes from roasted and ground cereals and pulses recovered in 2 to 5 weeks. Use of unsweetened foods favored the addition of carotene-rich food in children's diets. Rice bran was used to treat vitamin B deficiency.

Madeley, J.

- 1981 A Programme with a vision, World Health, The Magazine of the World Health Organization, July 1981.

This article describes a program being carried out by the government of Nepal, WHO, and SEVA to prevent and control blindness. A feasibility study had showed that 90% of blindness could be prevented or cured and the Government of Nepal committed itself to a major program of blindness prevention and control.

Mogedal, S. and B. Budhathoki

- 1979 "The traditional birth attendant in the health care system, experience with simple training, Lalitpur District, Nepal." In Baral, M.R. (ed.), The Child in Nepal, Kathmandu, Nepal: Nepal Medical Association, Nepal Medical Association-International Year of the Child Seminar, Dec. 14-15, 1979.

This paper summarizes the author's experiences in training traditional birth attendants.

Nepal Nutrition Status Survey, January-May, 1975

- 1975 Nepal Nutrition Status Survey, January-May 1975, U.S. Department for Health, Education, and Welfare, Public Health Service; and USAID.

Original data.

Method: Random sample, fixed interval method of population

## BIBLIOGRAPHY (Cont.)

proportionate sample, cluster sample. Cross sectional.  
Anthropometric measures collected included height, weight, age, arm circumference. Bloods taken from a subsample of children.  
Sample: 6578 children six to 71 months old, and a special group of 486 from Kathmandu and Patan families who could afford to provide adequate nutrition.  
Geographic location: Rural, all Nepal.

A nutrition status survey was carried out in January and May 1975 in rural Nepal to ascertain the extent of protein-calorie malnutrition and anemia.

Pahari, S.

- 1979 "Nutritional problems and programme." In Baral, M.R. (ed.), The Child in Nepal, Kathmandu, Nepal, Nepal Medical Association, Nepal Medical Association-International Year of the Child Seminar, Dec. 14-15, 1979.

This paper summarizes the nutrition status surveys done by Pourbaix and the Government of Nepal/USAID. It briefly discusses some of the reasons for the nutrition problems found and some of the responses to them.

Pradhan, P.

- 1977 Rural Health technology inventory in NEPAL, Development Research and consulting group, Katmandu.

The author proposes to survey the health technologies of 12 different ethnic groups in Nepal to compile an inventory of existing traditional health care practices. Because these practices develop over generations among rural populations who have to maintain their own health, the author believes they must have a scientific basis and that these people are not without health resources.

Ranjitkar, M.L.

- 1980 "Impact of traditional healers on the Health Care System of Nepal." Boston University School of Nursing Thesis.

Review - Not original data.

This thesis discusses traditional medicine and healers in Nepal. The relationship of traditional and modern medicine is explored as well as the implications of these two systems for the present and future health care needs of the country.

Shrestha, G.R.

- 1981 Nutrition Improvement Activities in the Small Farmers Development Programme in Nepal. Prepared for the "Asian Household Nutrition Appropriate Technology" Conference held at Colombo, Sri Lanka 13-18 July, 1981.

This document describes the activities of the Small Farmers Development Programme in Nepal. The object of this program is economic and social development of small farmers.

Shrestha, Y.B.

- 1979 "Malnutrition in Nepali children." In Baral, M.R. (ed.), The Child in Nepal, Kathmandu, Nepal, Nepal Medical Association, Nepal Medical Association-International Year of the Child Seminar, Dec. 14-15, 1979.

Original data (plus review).

Method: Not clearly specified.

Sample: 200 malnourished children.

Geographic location: Primarily the hills and valley region (this information was presented informally).

This paper briefly describes a study done of 200 malnourished children and their families' eating patterns, and reviews other nutrition studies done in Nepal.

Sivard, R.L.

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

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

Stone, Linda

- 1976 "Concepts of illness and curing in a central Nepal village." Journal of the Institute of Nepal and Asian Studies. Tribhuvan University, Vol. 3. Special Issue: Contributions to Nepalese Studies: Anthropology, Health and Development.

Method: Not specified, apparently participant observation and open-ended interview.

Sample: Mainly Brahmin and Chhetris; sample size not specified.

Geographic location: Village of 2000 people 50 miles northwest of Kathmandu in Nuwakot District.

## BIBLIOGRAPHY (Cont.)

This article discusses concepts of illness causation and the principles behind curing. Herbs, mantras, amulets, local medical specialists, and cultural patterns of illness and curing are considered.

### TAICH

- 1978 "TAICH Country Report: Development Assistance Programs for NEPAL." New York: American Council of Voluntary Agencies for Foreign Service, Inc., Technical Assistance Information Clearing House.

This report describes the programs of 24 private, non-profit U.S. organizations which provide the people of Nepal with development assistance and material aid.

### Thapa, R.

- n.d. "A country report on breastfeeding practices in Nepal." Unpublished.

This report describes the traditions of breastfeeding in Nepal, its demography, the results of the World Fertility Survey on breastfeeding, and interventions in breastfeeding through the media.

### Vaidya, B.N.

- 1979 Mid Term Health Review 2035: Research and Evaluation of Health and Health Services Mid Fifth Plan Period (2031-2036). His Majesty's Government, Ministry of Health, Kathmandu, June 1979.

Original data.

Method: cross sectional, questionnaire

Sample: 3,691 households selected on the basis of available health services: one group with access to a family planning clinic, another with a panchayat-based worker, another with a village health worker, and a final group with no health facilities and no regular health workers. The sample was deliberately biased toward areas where health care was available.

Location: national

A midterm review was undertaken halfway through the five year plan (1975-1980) to examine how resources were being put into service and how these services were being made available to the community. One purpose of the review was to examine the extent to which health services had been successful in affecting morbidity, mortality, fertility and health behavior.

### Wake, E.J.

- 1976 "Health Services and some cultural factors in Eastern Nepal." Journal of the Institute of Nepal and Asian Studies, Tribhuvan University, Vol. 3. Special Issue: Contributions to Nepalese Studies: Anthropology, Health and Development.

Original data.

Method: Interviews and observation.

Sample: Not specified.

Geographic location: Solukhumbu, Dhankuta, Jhapa and Dhanusha Districts.

This paper describes certain aspects of illness and health care facilities, comparing facilities between geographic regions in East Nepal. The impact of health services as they presently exist is presented from the points of view of doctors, administrators, health workers, and villagers.

#### World Fertility Survey

- 1978 The Nepal Fertility Survey 1976: A Summary of Findings, Voorburg, Netherlands: International Statistical Institute; and London, England: World Fertility Survey.

Original data.

Method: Three stage cluster sample of district, random sample, representative of the population. Cross sectional. Questionnaire.

Sample: 5940 women.

Geographic location: National.

This large-scale national survey was undertaken to obtain information on fertility, contraception, marriage, and reproductive patterns.

#### World Fertility Survey

- 1977 Nepal Fertility Survey 1976: First Report, Kathmandu, Nepal: His Majesty's Government Health Ministry, Nepal Family Planning and Maternal Child Health Project.

Original data.

Method: Random sample; multistage area sampling design; clusters were selected randomly; questionnaire.

Sample: 5976 households, of which 94.8% were interviewed successfully. 5940 women were interviewed.

Geographic location: All Nepal. Only 132 women came from urban areas.

This survey was undertaken to get reliable data on fertility which could be used for development and family planning programs. Data was collected on family planning knowledge and practices, marital history, breastfeeding, and family size preferences.