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Malnutrition and Food Aid Programs: A Case Study from Guatemala

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FOREWORD

The research upon which this report is based was supported under a contract with Food for Peace, AID, and employed personnel who had conducted the National Science Foundation supported Guatemalan Earthquake Study. The research was conducted through the Instituto de Nutricion de Centro America Y Panama who employed and managed the interviewers and the coding and punching of data for the study and supplied other valuable data and advice. The principal investigators responsible for the conduct of both studies were as follows:

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The sample design, interview instrument and field work techniques employed were designed and supervised by the principal investigators for the project.

Daniel G. Rodeheaver was serving as a Peace Corps volunteer in Guatemala during the time period in which this study was conducted. He later returned to the University of Georgia to complete work on his masters degree and this report was his masters thesis. In the analysis and writing processes he worked in close collaboration with Dr. Frederick L. Bates and Dr. Arthur D. Murphy. Dr. Michael D. Olien served as an advisor on his masters thesis committee and also offered assistance.

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Frederick L. Bates

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This thesis is dedicated to my son, Kyle Aaron Rodeheaver.

Daniel G. Rodeheaver

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PREFACE

This investigation originally developed out of the Guatemalan Earthquake Study which was supported by the National Science Foundation (NSF). It was during the course of this research that financial support was requested and received from the Agency for International Development (AID) in order to continue research of the problem central to this investigation. Even though there were numerous scientists involved in this study, the analyses of the data and the resulting interpretations, as well as any miscalculations, are my sole responsibility.

One final comment in prefacing the following manuscript is that much of the ethnographic observation referred to throughout the text was the result of my experience as a Peace Corps volunteer in Patzite, El Quiche, Guatemala from 1978 to 1980. While there, I was involved in projects of nutritional program, agricultural and community development, which were aimed at the improvement of the nutritional status of children and the general overall quality of life. During the course of my Peace Corps service, I had the opportunity of working in both of the towns under investigation in this study, San Martin Jilotepeque and San Lucas Toliman. It was with this background that I undertook the following research.

CHAPTER I

INTRODUCTION

Hunger and malnutrition present serious global problems that significantly affect at least two-thirds, or approximately 1.3 billion, of the total world population (Christenson 1978). The traditional response to hunger problems by the international community, particularly by the more affluent and resource-rich nations, has been either in the form of food aid programs or more recently, agricultural development. The primary instrument of the United States for the allocation of food aid to the rest of the world has been Public Law 480 (Food For Peace).

The primary justification for the implementation of food aid programs is that they are intended to help alleviate hunger and malnutrition. However, as best can be ascertained, there has been no systematic scientific treatment of the impact of food aid on the nutritional status of its recipients. The majority of the literature which deals with food aid in general, and with PL-480 food aid in particular, focuses on its social, political and/or economic impact or on such topics as dependency, disincentives to agricultural production and agricultural price supports.

The Statement of the Problem and Objectives

The purpose of this study is to examine the impact of food aid and/or food aid programs on the nutritional status of its recipients in two regions of Guatemala. From this investigation, empirically-based programmatic statements as to the role of food aid and its impact on human society will be presented. In order to deal with these objectives, there are two basic questions arising from the controversy over food aid which are of primary concern here:

1. Does food aid reach its target population and what factors determine who will receive it?
2. What effect and/or impact do food aid and food aid programs have on the nutritional status of their recipients?

One argument against food aid has been that all too often the foodstuffs provided as part of the food aid package end up in the wrong hands and then are sold on the black market by profiteers. It is also argued that, generally, food aid is benefiting most those people who already have more than adequate economic resources. This criticism has been made particularly with respect to emergency relief, as demonstrated by the case of Nicaragua after the 1972 earthquake. There is an even more basic and important issue at stake with respect to the first question presented above, than whether profiteering exists, however. That question is: Does food reach its target population? In terms of this study this question may be expanded as follows: Given the social, political and economic context of Guatemala, are the food supplements getting to those groups or strata which need it most? What are the factors which determine who receives assistance?

And, finally, what are those people like who are involved in food programs? The ethnographic and empirical data used in this study are designed specifically to deal with these issues.[1]

This study will also examine the following question: When food aid does reach its target population, what effect or impact does it have on the nutritional status of its recipients? Once food supplements reach the needy, the primary and more important issue is whether or not food aid and food aid programs are doing what they are supposed to do, feed the undernourished, and, thus, improve their quality of life. This question becomes particularly relevant when considering the social, political and economic context of Guatemala and its various regions,because it is with this context that food aid programs have to contend in order to deal successfully with the problems of hunger and malnutrition.

Furthermore, this question as to the impact of food aid on the nutritional status of its recipients is relevant at another level of inquiry. From a theoretical perspective, this study represents a partial test of the theory of "biocultural disequilibrium" and eventual biocultural breakdown and the contention that external inputs are necessary to impede its progress, as proposed originally by Johnston and Selby (1978) in their: Anthropology: the Biocultural View. Briefly, this theory holds that there is a "biocultural system" which is comprised of three clusters: biology, culture and ecology. The way these clusters integrate so as to provide solutions to the various problems faced by each society is referred to as the "mode of biocultural integration." Johnston and Selby propose three modes of biocultural

integration: 1) biocultural equilibrium, a relatively stable state in which there are no major disruptions or fluctuations with respect to either of the individual clusters, 2) unstable biocultural equilibrium, in which the system eventually goes askew as the result of some imbalance in at least one of the clusters, but eventually is brought back into a proper adjustment by a "reshuffling" in the system, and, 3) biocultural disequilibrium.

The major differences between the first two modes of biocultural integration and that of biocultural disequilibrium is that they have built-in mechanisms for restoring the system to equilibrium but a system that is in the state of disequilibrium does not. Johnston and Selby (1978: 580) state:

> ...sometimes systems get out of equilibrium to such an extent that they cannot restore themselves by available control mechanisms. They go into a "downward spiral." Two things can happen. First, the system may change to such an extent that it is no longer recognizable as the system it was. Second, the system may destroy itself.

According to Johnston and Selby, this biocultural disequilibrium resulting in the downward spiraling system is especially evident in the traditional Mesoamerican village as exemplified in Guatemala. These villages are kept going only by external forces and/or inputs. Furthermore, this breakdown becomes most significantly exhibited in the nutritional and health state of the people involved and, in particular, their children, resulting in a "spiraling effect" in malnutrition as well.[2] The end result of this biocultural and, specifically, nutritional breakdown is what Bryan Roberts (1973) refers to as the "rural collapse" in which, as Johnston and Selby (1978: 593) so aptly put it,

"People are voting with their feet against the unhealthy poverty of the traditional village" by moving to the city, creating rapid urbanization.

This investigation represents a partial test of the hypothesis of biocultural disequilibrium as proposed by Johnston and Selby. The data to be examined during the course of this study should provide at least a rudimentary test of this theory since they were collected with the intent to investigate and evaluate a form of social, economic and nutritional intervention--an external input (food aid programs)--which are designed to reverse or impede this "downward spiral" in nutritional status in the underdeveloped world. The second question, presented earlier, that is, how the nutritional status of recipients is affected by food aid and food aid programs, in essence establishes the basis for an important and relevant additional hypothesis to be considered here: Food aid and food aid programs act to impede the "spiraling effect" in malnutrition and, thus, the "downward spiral" of the biocultural system (i.e. biocultural disequilibrium).

Guatemala, located in Central America, was the country selected for investigation partially because of the previous experience of the researchers involved with that country, but also because it provides an excellent case in point since it has long established food programs in operation. Furthermore, Guatemala is host to a nutrition research institute, Instituto de Nutricion de Centro America y Panama (INCAP), thus, adding to the availability of relevant data. INCAP is not only committed to studying and evaluating the nutritional and health conditions and situation in Central America and Panama, but also the

development of programs designed to combat malnutrition. In Guatemala, the result of this has been numerous studies on growth, genetics and nutrition and their interactions. (For examples, see INCAP 1969, 1971a, 1971b and 1978; Malina et al. 1974; Habicht et al. 1974; Russell 1976; Teller et al. 1977; and, Martorell et al. 1979.)

Finally, there are several other aspects of Guatemala which make it especially interesting as a site of investigation. Guatemala provides a classic example of a "pluralistic" society, being made up of two ethnic groups, Indians and Ladinos (Colby and van den Berghe 1969).[3] Socioeconomically, there are distinct strata or classes, ranging from the very wealthy to the poorest of the poor. Also, in Guatemala, there are significant differences regionally which are exhibited in different economic, sociocultural, religious and political systems.

The Organization of the Remaining Chapters

Chapter II briefly examines the nature of nutrition and nutritional status and their relationship to human growth. It discusses the basic measures of nutritional status being used in this study to construct a framework for measuring the impact of food aid and food aid programs. The literature reviewed in this section outlines some of the variables affecting and/or determining the nutritional and health status of the people of the underdeveloped world.

The other major point of interest, food aid, is reviewed in Chapter III. An inquiry into the nature of food aid is conducted, emphasizing in particular the various criticisms leveled at it, using Public Law 480 as a case in point. This chapter goes much further than simply outlining these criticisms which involve the nutritional aspects

of food aid. It is intended to provide a better understanding as to the entire set of consequences resulting from food aid and food aid programs.

Chapter IV presents the ethnographic setting under which the conditions of malnutrition occur in Guatemala and discusses the particular communities and regions being used as sites of investigation. The first section briefly describes the various aspects of Guatemala as a nation, whereas the remaining two sections are intended to examine more closely the two different regions under study.

The research design, sampling procedures, methodology and strategies of analyses are discussed in Chapter V. Chapter VI examines the data within the context of the aforementioned constraints and, then, proceeds to look critically at these data using univariate and bivariate tests of significance. As this is done, basic statistics demonstrating the nutritional status of the sample population in comparison with the Guatemalan national population are presented. Next, Chapter VI answers the two primary questions presented earlier by close examination of the results of both the bivariate and multivariate analyses.

Finally, in Chapter VII, the preceding work is briefly reviewed and, then, the hypothesis dealing with the spiraling effect in malnutrition with respect to this investigation is discussed in light of the results. Chapter VII is concluded by "empirically-based programmatic statements" as to the role of food aid and food aid programs as solutions to the problems of hunger and malnutrition.

FOOTNOTES

[1]It is important to note here that in Guatemala all Public Law 480 food falls under Title II, distributed by private voluntary organizations (PVO's). This aid seems to be generally less subject to corruption than emergency relief which is coordinated by the recipient governments.

[2]This concept of the "spiraling effect" in malnutrition was coined by Joaquin Cravioto, resulting from his studies dealing with nutrition in Mexican communities (Cravioto et al. 1969, Johnston and Selby 1978).

[3]The term "pluralistic" is generally used in reference to Guatemala's ethnic composition, although the dicotomy is more frequently recognized as existing between Indians and Ladinos. There is, however, some validity for the use of the adjective, "pluralistic," rather than "dualistic" to describe Guatemalan ethnicity since there are at least 17 different Indian cultures, black Caribs and Europeans. In order to maintain a certain amount of consistency, "pluralistic" will be used throughout this text.

CHAPTER II

A BRIEF OVERVIEW OF HUMAN GROWTH AND NUTRITION

The purpose of this chapter is to discuss nutrition and the measurement of nutritional status as it applies to human populations in order that the later analyses can be better understood. However, before discussing nutrition and nutritional status, it is first necessary to define growth, since nutritional status is measured in terms of growth.

Malina (1975: 1) defines growth as:

> ...a geometric process of self-multiplication of living substance, involving primarily hyperplasia (increase in cell number), hypertrophy (increase in cell size), and accretion (increase in intercellular materials).

More simply put, growth refers to the processes by which the body enlarges or increases in size, utilizing the substrates provided by nutrient intake (diet) (Robinow 1979). Growth is further delineated by specific "stages" which are characterized by different rates of growth and, thus, different nutritional needs. These stages extend usually through the first twenty years of life and include both prenatal and postnatal growth. The fetal stage involves an interval of growth extending some 38 to 40 weeks during which the individual develops from an ovum weighing approximately 5×10^{-9} kilograms to a newborn averaging 3.3 kilograms (Cameron and Hofvander 1976).

The primary concern of this study is with the period of growth referred to as "postnatal", specifically those stages designated as neonatal (birth to one month), infancy (one month to one year) and early childhood (one to six years). Most of the current growth and nutrition literature term this period the "preschool" age. The remainder of the postnatal growth period is referred to as middle childhood (six years until adolescence) and adolescence, ranging from about 10 until 20 years, depending upon sex (Malina 1975).

Growth is most often defined and measured in terms of height, weight and skeletal maturation, to name a few parameters. Generally, the techniques for measuring growth are referred to as anthropometry. Malina (1975: 10) defines it as "systematized measurement techniques which involve the use of carefully defined landmarks for measurements and specific procedures." Though the two most common measurements of growth are height and weight, other indicators would include sitting height, leg length, breadth measurements (bicromial, bicristal, bicondylar and biepicondylar), head circumference and bone (skeletal) maturation (Malina 1975; Krogman 1972).

Before one can begin to understand the influence that the socioeconomic environment has on growth and nutritional status, all of the potential influences must first be considered and, then, either ruled out or accounted for. Garn et al. (1979) point out that there are three determinants for growth: the genetic effect, uterine effect and nutritional effect. The genetic effect refers to the maximum amount of growth which can be potentially attained (genetic potential); and this growth potential is coded into the genes (heredity) of the

individual. It is within this framework that the other two effects operate.

It is interesting to note that there is some evidence that the genetic effect is less important in certain age groups, specifically the preschool age group. Habicht et al. (1974), Johnston et al. (1976), Martorell et al. (1975) and Neumann (1979) argue that the genetic effect on the growth of preschool children is relatively small, especially when compared to environmental influences (i.e. nutrition and disease). Furthermore, genetics becomes expressed more strongly after the onset of adolescence (Johnston et al. 1976). With respect to ethnic differences exhibited in preschool growth, Martorell et al. (1975: 527) states:

> The data in the literature indicate that the marked differences that exist in growth between populations of the Third World and those of developed countries, are due principally to environmental factors--poor nutrition and illness--and not to genetic factors.

Johnston et al. (1976) examined and compared two ethnic groups: United States born (living in the U.S.), United States born (living in Guatemala) and Guatemalan born (living in Guatemala); all from the same socioeconomic level. They found that, in preadolescent children, there were no ethnic and/or genetic differences in growth. By comparing the two American groups under different environmental conditions, there were discrepancies noted in growth; even though they exhibited the same blood group frequencies, which denote the same ethnic group. Also, the Americans living in Guatemala were very similar in growth to the native Guatemalans, though, based on their blood group frequencies, they were markedly different ethnically. On the basis of

such data, Neumann (1979), Habicht et al. (1974) and others argue that international reference data (i.e. growth standards) can be used in evaluating the nutritional status of most preschool populations throughout the world. Usually, if there is significant variation in growth, it is the result of uterine or environmental influences (Guzman 1968).

At the population level, the only possible effective way to measure the genetic effect is through quantifying the genetic potential for growth (Pryor and Thelander 1972). This can be achieved by measuring variability in height, weight and so on of a given ethnic group or population (the same gene pool) under optimal environmental conditions, having accounted for any or all abnormalities and individual deviation. It should be noted that there is always some individual variation in growth potential and growth rate; therefore, this variability must be considered. After doing this, a sample of malnourished children (from the same population) can be compared to the above population which is assumed to have reached maximum growth potential and, then, the degrees of malnutrition can be established.

Another approach to measuring the genetic effect on growth involves heritability (H^2) estimates (Jelliffe and Jelliffe 1979; Malina 1975). These estimates are based on height/stature correlations between parents and offspring, and siblings. Given the adult height of the parents, the children should attain specific heights at certain ages. One problem is especially inherent in this technique, though. Many times, parents of the undernourished children were also malnourished during their periods of growth and development, thus producing an unreliable correlation. Furthermore, unless one is able to study

identical twins, Pryor and Thelander (1972) state that H^2 estimates are not useful as indicators of optimal growth across populations. Garn et al. (1979) state that in human populations this technique is suspect since evidence has demonstrated that children raised under more environmentally optimal conditions will show an increase in height, considerably higher than predicted by the correlations. As a result, heritability estimates are not as reliable as the previously mentioned method (Pryor and Thelander 1972).

The uterine or maternal effect can be exhibited not only in the size of the fertilized ovum and eventual birth size, but may influence growth and body size well after birth and even into the second and third generations. Tanner (1978) notes that the cause for a below normal size lies in defects in either the fertilized ovum or the placenta, or is attributable to starvation or disease (i.e. environmental conditions) in the mother. He also notes that those small-for-term rarely fulfill their genetic potential, but do reach "normal centiles"; that is, they maintain a consistent rate of growth within the normal (statistical) range. However, this is not generally a major influence even in the Third World populations (Jelliffe 1966).

In order to account for the uterine effect on the attained growth of an individual, two steps must be taken: 1) measurements of heritability estimates must be made (though with caution) and 2) life histories on the mother and infant must be acquired. The heritability estimates will provide some notions as to what a given individual's stature should be at a given age based on the biological parents' and siblings' heights. The life histories should provide some insight

into the conditions of the pregnancy and delivery with respect to the infant under question. Except in cases of mass, severe malnutrition in adults, uterine effects are rarely exhibited across populations, but rather in specific instances, therefore, it is generally not necessary to take these into account (Jelliffe 1966).

With the understanding that growth potential, or how much an individual is able to grow, is predetermined by genetics and somewhat by uterine influences, attention must then turn more specifically to nutrition. Growth, being one of the most, if not the most, plastic processes in the human body, is primarily and directly affected by nutrition, in that the adequacy of the diet determines how much of the growth potential is realized. Furthermore, it is interaction between nutrition and genotype which influences the rate of growth, body size and gross morphology (Malina 1975). Therefore, in order to understand growth, nutrition, nutrients and nutritional status need to be further defined. Robinow (1979: 65) states that:

> Nutrition is the process of assimilating substrate into body tissues and stores. Nutrients are the metabolically active constituents of food. Substrates are the metabolites required for energy, growth, maintenance, and storage. Nutritional status designates success in accomplishing this process in relation to norms.

The nutritional effect simply refers to the impact of nutrient intake with respect to the level of nutrients expended, and dates from _in utero_ (conception) until long after the growth processes have been completed. It is here that environment primarily expresses itself. According to Jelliffe and Jelliffe (1979), whether or not an individual can realize his genetic potential for growth is determined by environment. In the broadest sense, environment includes everything that

is not genetically or uterinely oriented or controlled for, encompassing not only the physical conditions such as temperature and climate, but also the sociocultural system vis-a-vis such phenomena as socioeconomics and cultural-ethnic-group membership. Since growth is determined by environment, primarily by its nutritional component, then fluctuations, changes or persistence in environmental conditions will express themselves in the attained growth of the individual (Rowell 1979; Gopalan and Srikantia 1979).

There is a current expression which seems most appropriate here: "What we are is what we eat." Dietary patterns usually imply a level of consistency in the use of certain food staples. For example, what is usually referred to as the typical Mesoamerican diet consists of corn tortillas and black beans, a diet which is a significant part of the daily routine, almost to the point that there is little or no variation (Mendez et al. 1962). The only variation in diets generally involves supplements, such as meats, vegetables, etc. However, it is the nutrients received from such supplementary foods which are most important.

The nutrients, derived from food, are converted by the body into energy and other specialized constituents which are required in order to maintain growth and development, maintain basal metabolic states (homeostasis), repair tissues and permit physical activity. The quantity of nutrients necessary to support these activities varies, being influenced by the age, sex, body size and the stage of growth of the individual (Passmore et al. 1974). These nutrients providing the necessary material for growth and development are ingested in the form

of proteins, carbohydrates and fats, and vitamins and minerals, comprising what are more commonly referred to as the "three (or four) basic food groups" or components of the diet.

While the details of nutrient utilization are complex, a short overview would be expedient at this point since nutritional state is one of the central issues of this study. Briefly, proteins are broken down into amino acids, the basic building blocks necessary for the development (and repair) of different tissues, which then reform into the necessary proteins for tissues and other specialized proteins in the body. A consistent lack of dietary protein can result in muscle wasting, friable hair, etc., symptoms of severely retarded growth. Eventually, protein dificiency can even lead to malfunctions of the internal organs. Carbohydrates are the "fuel" for converting nutrients into base chemicals which are needed for basal metabolism, growth, all decomposition and building (synthesis), physical activity and so on. The primary product of carbohydrate breakdown is energy for conversion into activity. A carbohydrate deficiency is usually accompanied by a lack of energy or listlessness and internally by a slowing of the basal metabolic rate. Fats provide a means for a more efficient storage of fuel, forming an energy reserve and also providing more energy than carbohydrates when decomposed after ingestion. In the body, extra energy is not wasted, but rather is stored as fats. Furthermore, surplus fat-soluable vitamins are also stored in the body fat. Fats in the diet are also necessary for the maintenance of certain metabolic reactions, as well as for intercellular transport of nutrients, and, are further important in the prevention

of heat loss. Deficiencies can result in symptoms similar to those exhibited by carbohydrate deficiences, but the primary symptom is dry, patchy skin.

Vitamins are essential in the formation of many body tissues and materials, especially enzymes which are essential for all of the body's chemical reactions, including protein decomposition. They also enable the body to absorb and utilize more efficiently minerals from the gastrointestinal tract. For example, in order for calcium to be absorbed and utilized in the development of bone tissue, vitamin D is necessary. Vitamin deficiencies can be numerous, but some of the primary and most common deficiencies include those of vitamin A (which can lead to poor vision and even blindness), vitamin B complex (which can result in a less efficient metabolism, beriberi and/or pellagra), vitamin C (which leads to metabolic failure, inefficient mineral intake and utilization, and scurvy) and vitamin D (which influences bone and tooth structure and can cause rickets). However, an individual can survive short-term deficiencies in fat-soluable vitamins better than water-soluable vitamin deficiencies, so that the latter can be more serious.

Minerals are important in most metabolic enzyme reactions, where, if present in adequate quantities, they help to produce the necessary materials for growth. The primary deficiencies in minerals include calcium, which is necessary for bone and tooth structure (though an excess can result in calcification in the connective tissue); iron deficiency, which can result in anemia; and iodine, resulting in the malfunctioning of the thyroid gland (which normally helps regulate

growth hormones). There are numerous discussions on the interaction between nutrition and growth; see Rechcigl (1979), Passmore et al. (1974), de Ville de Goyet et al. (1978) and Cameron and Hofvander (1976).

Usually these deficiencies do not occur alone, but rather in combinations which often complicate diagnosis. For example, kwashiorkor and marasmus are the result of both protein and calorie malnutrition (also referred to as PCM or PEM). Kwashiorkor, a nutritional disorder resulting primarily from a deficiency in protein, is characterized by the presence of distended stomachs, withered arms and edema in the extremities. The distended stomach and swollen hands and feet are the result of fluids collecting in those tissues. Sometimes, kwashiorkor is also associated with the "moon" shaped face in which the facial tissues collect fluids. Marasmus is the severest type of protein-calorie undernutrition in which the body appears skeleton-like with very wrinkled skin and what has been described as the "old man" face. This is the result of the depletion of the fat stores and wasting of the muscle tissues. However, marasmus is less common than kwashiorkor because usually there are dietary starches available which provide minimal caloric intake, except in cases of severe disruptions such as that caused by natural catastrophy (i.e. droughts, earthquakes and war). The PCM form of malnutrition is the most common nutritional problem throughout the world (Malina 1975; Cameron and Hofvander 1976; Rechcigl 1979), but is complicated by the widely varying combinations of their symptoms.

The quantity and quality of the diet is very important in understanding nutrition and the process of growth and the success in

assimilating the nutritional intake necessary for growth to occur (i.e. nutritional status). Therefore, in order to measure nutrition, it is important to measure the quantity and quality of the ingested nutrients. Generally, this is accomplished by conducting a twenty-four hour dietary recall; that is, a record of what was eaten and how much. The nutrient value of foods can be relatively determined from tables constructed through chemical assessment of locally available foods. For example, INCAP has developed tables of the nutrient values for foods common to Central America (Flores et al. 1971). From the tables, the amount of a nutrient per gram of a particular food item is determined for each item listed in the recall and, then, a total value of the daily intake is calculated for each nutrient. This daily value of total nutrient intake is then compared to the minimal RDA (Recommended Daily Allowance) which is applicable to nearly all persons and/or populations (Passmore et al. 1974). This is done in order to determine the percent of the adequacy of the diet. Knowledge of the daily nutrient intake provides some insight as to the level of nutrition and, thus, points out what types of deficiencies are occurring. This is helpful, as many times marginal deficiencies do not produce overt clinical symptoms.

Once the level of nutrition has been examined, one must examine how well the nutrients are being utilized; that is, the nutritional status of the individual. Basically, there are five types of measurements of nutritional status which involve measures of height, weight, arm circumference, subcutaneous fat and blood profiles, as well as the more common form, clinical assessment (i.e. "eye-balling"). Height, referring more appropriately to stature, best reflects the long-term

nutritional state of an individual, whereas weight, arm circumference and fat-fold thickness represent more accurately the present nutritional state. (See Jelliffe 1966; de Ville de Goyet et al. 1978; and Jelliffe and Jelliffe 1979.) Also, fat-fold measures help point out in particular any calorie deficiency. Blood profiles present accurately the nutritional content and utilization at a given point in time, thus, describing the present nutritional state as well.

There are four major nutritional parameters or measures which utilize the height, weight and age data in order to evaluate the nutritional level of the measured children. These indices, in descriptive terms, include: 1) weight-for-height-for-age, 2) weight-for-height-excluding age, 3) weight-for-age, and 4) height-for-age. All of these measures involve standardized heights and weights, either for age or without respect to age. These standardized heights and weights are based on extensive, world-wide data compiled by the National Center for Health Statistics (NCHS 1976) and are widely accepted, currently being used by INCAP and others (Habicht et al. 1974) for Guatemalan populations. The following is a brief description of each of these nutritional measures, particularly those most commonly used in the field, and their overall advantages and disadvantages and how each index is calculated.

Weight-For-Height-For-Age

This index of nutritional status is used for measuring both acute and chronic malnutrition; acute referring to short-term (severe) changes in nutritional status and chronic, long-term (persistent) undernutrition. An excellent discussion of this measure,

weight-for-height-for-age, can be found in Jelliffe (1966). One major advantage of this measure is that it reveals chronic malnutrition (stunting) which is masked by other measures of the acute nutritional state. Since it examines both weight and height in the context of age, this allows the investigator to view the experimental population in a global perspective. It is criticized, though, for being age dependent, as the stated age of the informant is often inaccurate enough to give a false measurement of the actual nutritional status. It is calculated by dividing the observed weight (wt_{obs}) by the observed height (ht_{obs}) of the individual and, then, dividing the result of the observed measurements by the ratio of the standardized weight (wt_{std}) to the standardized height (ht_{std}), both corresponding to the specific age of that individual. This result is then multiplied by 100 in order to give the "percent normal," with 100% being equal to normal nutritional status. The formula is:

$[(wt_{obs}/ht_{obs}) / (wt_{std}/ht_{std})$ according to age $] \times 100$ = percent normal. (See the appendices for the remaining percent normal classifications according to the particular nutritional parameter.)

Weight-For-Height-Excluding Age

Age-exclusive weight-for-height is designed to measure acute malnutrition (wasting). Descriptions of this index of nutritional status can be found in Tanner et al. (1966) and National Center for Health Statistics (NCHS 1976). Since it is age independent, it ignores past stunting and emphasizes the present nutritional state of the individual, thus, differentiating acute changes. As a result, age-exclusive weight-for-height provides insight into the nutritional and health

nature of the population under examination; that is, an "intra-population" measure is involved. If it is the only parameter being utilized, then, it tends to mask chronic malnutrition. It is calculated by dividing the observed weight of the measured individual by the standardized weight for the observed height corresponding to the standardized height, and, the result is then multiplied by 100 in order to give the percent normal:

$[\ wt_{obs}/wt_{std}(\text{according to } ht_{obs}\ ht_{std})\ ] \times 100 = \text{percent normal.}$

Weight-For-Age

Weight-for-age, designed to measure acute malnutrition (wasting), is a well known and frequently used nutritional parameter for which there are extensive references and studies for comparison. For field use, it provides immediate determination of present nutritional status. However, the weight-for-age index is associated with two problems: 1) it is age dependent and 2) it tends to classify nutritionally stunted and/or genetically short children as acutely malnourished. Gomez et al (1955) adjusted the Harvard standards (Harvard 1946) of weight according to age for Mexico, specifically. The Gomez standards are probably the most widely used, but the more recent (and more accurately adjusted) NCHS's standards (NCHS 1976) are replacing them in use in the Third World. The formula for the weight-for-age index is as follows:

$[\ wt_{obs}/wt_{std}\ (\text{according to age})\ ] \times 100 = \text{percent normal.}$

That is, the observed weight of the measured individual is divided by the standardized weight according to the specific age of the measured

individual. This number is then multiplied by 100 in order to give the percent normal.

Height-For-Age

This index is the best method by which to measure chronic malnutrition, particularly in a more global context. Jelliffe and Jelliffe (1979) consider height-for-age to be the most reliable and dependable indicator of nutritional status. Habicht and Butz (1979) state that height is also the most sensitive to improvement in nutritional status, producing the most statistically significant results. However, it is age dependent and, if used alone, does not differentiate between distant past and more recent episodes of chronic malnutrition. Another good discussion can be found in Tanner (1966). It is calculated by dividing the observed height of the measured individual by the height which is standardized according to age, and, then, the result is multiplied by 100, giving the percent normal of the individual's nutritional status:

$[\ ht_{obs}/ht_{std}(\text{according to age})\ ] \times 100 = \text{percent normal.}$

It has been argued by many (Waterlow 1972; Seonane and Latham 1971) that in order to obtain a more accurate perspective as to the state of nutritional well-being of a given person or population, weight-for-age, weight-for-height-for-age, weight-for-height-excluding age and height-for-age should be considered in conjunction. The first three parameters provide insight into the presence of acute malnutrition, whereas height-for-age reveals the nature of chronic malnutrition. Since the growth, or nutritional, standards to be used in this study are those developed by the National Center for Health

Statistics and used extensively by the Instituto de Nutricion de Centro America y Panama (INCAP) with confidence for Guatemala, this all-inclusive approach then becomes even more relevant and important in a national and international context.

As a final note, by implementing the age independent weight-for-height index, no assumptions as to the universality of growth rates are made, and, thus, an intra-population comparison can be made strictly on the basis of body ratio. This becomes particularly important when examining populations which are constantly exposed to chronic malnutrition. Stini (1971) and others contend that individuals within populations adjust to chronic malnutrition by slowing down their rates of growth, thus, minimizing their nutrient-intake requirements. Therefore, an intra-population parameter permits insight into this "adjustment."

Arm circumference (AC) refers to a measurement which is taken at the midpoint between the acromial process (shoulder) and olecranon process (elbow), usually on the left arm so as to avoid differential arm muscle development (de Ville de Goyet et al. 1978). Basically, it is used to measure the degree of wasting (acute malnutrition) with respect to muscle tissue and fat reserves (subcutaneous deposits). Briefly, a pre-calibrated tape is used which indicates the current nutritional status, according to standards created by Wolanski (1961) on the basis of a Polish population. The primary concern with this measurement is that it is not reliable in that repeated measurements on the same individual by the same examiner can show significant variation.

With respect to subcutaneous fat measurements, Malina (1975) and Jelliffe (1966) provide excellent descriptions. Though there are

numerous measurements, the two most common are triceps skinfold and subscapular skinfold. They measure the thickness of the fat tissue, providing insight into the degree of calorie deficiency. With calipers, the triceps skinfold is taken at the same point as the arm circumference (described above), whereas the subscapular is taken at a point beneath the inferior angle of the scapula (on the back). Through a simple adjustment, the lean muscle circumference can be calculated, thus indicating the level of protein sufficiency. (Multiply the triceps skinfold measurement by pi and, then, subtract the product from the arm circumference value; the result is the adjusted lean muscle circumference.) Jelliffe and Jelliffe (1979) note that because there is such a good correlation between AC and muscle circumference there is no need to calculate the muscle circumference, particularly for field purposes.

Though blood profiles are used primarily to determine the adequacy of nutritional intake, they also point out certain aspects of nutritional status. The most common blood test examines hemoglobin content which, if found below the normal range, reveals iron deficiencies in the diet. There is also an assay for blood protein albumin which is a simple and effective means for estimating protein intake, and, an estimate of the level of dietary carbohydrates can be made through quantitating the blood sugar level. While these tests are best used to give a general idea of the level of nutrient intake, they also can be used as general indicators of nutritional status in that they reflect chronic malnutrition. Since, given nutrient intake deficiencies, the body will draw on reserves until depletion, lowered blood indicator levels reflect a nutritional state that is chronically taxed. However, the degree or

"grade" of malnutrition is not evident from the results. As a field method in developing countries, there are basically two problems: refrigeration and, usually, inability to get samples. Generally, refrigeration, necessary to store the blood samples, is simply not available and, even if it were, most people are not willing to allow someone to extract blood from their bodies.

At this point in the discussion, it should be noted that when describing the nutritional state there are basically five different levels. These include the "normal" nutritional state, as well as the obese,mild, moderate and severe malnutritional states. The normal nutritional state results from a nutritional state of equilibrium in which the body ingests sufficiently, and in proper proportions, the required nutrients needed to maintain a healthful state of being (denoted as Grade-0). Obesity, a nutritional disorder, refers to the over-consumption of nutrients and subsequent excess weight; this nutritional state is also termed Grade-4 malnutrition. The states of mild (Grade-1), moderate (Grade-2) and severe (Grade-3) malnutrition are precipitated by the insufficient intake in quantity and quality of nutrients (i.e. "undernutrition"). These different levels of nutritional status are defined by the degree of phenotypic expression in growth, as measured by growth parameters.

Furthermore, throughout much of the literature, the terms "malnutrition" and "undernutrition" are used interchangeably; however, it should be noted that malnutrition refers specifically to the physical state of being which results from a poor or improper diet whereas undernutrition denotes an inadequate dietary intake. Finally, when

discussing malnutrition particularly, two forms are recognized: chronic and acute. Chronic malnutrition, reflected best in height, results from persistent, long-term deprivation of adequate nutritional intake. On the other hand, an abrupt short-term disruption in the level of nutrition is referred to as acute malnutrition, this being especially sensitive in weight. (Generally, illness or natural catastrophe are the primary influences in acute states.) As discussed earlier, certain growth, or nutritional, parameters are designed to measure both chronic and acute malnutrition.

In summation, the above description defines the different methods for measuring nutritional status which are most commonly used, particularly in the field. These measurements and indices are designed to identify either chronic or acute problems in the nutritional state, and the realization of growth potential, of the individual or population under investigation.

This discussion has pointed out briefly some of the complex interactions of uterine influences, nutrition and genetics; interactions which must be fully understood before one can separate out environmental effects on growth in conducting an analysis. Finally, by measuring growth in a given population according to suitable growth standards which account for genetic potential, the investigator should be able to demonstrate the extent to which the genetic potential for growth at a given point in time has been realized; that is to say, how much growth has been affected by the environment. In essence, the genetic and uterine effects must be ruled out or accounted for, before it can be assumed that environment (nutrition) is at play in the rate of growth.

However, the genetic, uterine and nutritional effects as defined by Garn et al. (1979) and Chen (1979) are only a part of a broader biological picture. Other processes such as disease and the endocrine influences must be considered; these acting directly on or indirectly through a synergistic action with nutrition. Therefore, the following is a brief discussion of these two factors.

Because of the complex relationship and interaction between disease and growth, it is best considered separately from the other factors. There are two classes of disease which are critical in the growth process: 1) congenital and 2) infectious disease. Within each of these, there are two types of diseases that directly affect growth. One affects growth without regard to nutrition and the other affects it either by acting upon or in concert or synergistically with nutrition (Jelliffe and Jelliffe 1979). Certain congenital diseases, those which are genetically determined, directly shape the growth patterns of their victims, while others impede the nutritional process, for instance, by prohibiting the absorption and/or utilization of certain nutrients. An example of the former is dwarfism and the latter, Phenylketonuria (PKU). On the other hand, an infectious disease such as polio can disrupt the growth process without regard to the nutritional state (Scrimshaw and Gordon 1968), whereas enterocolitis, also an infectious disease, usually alters the nutrition of an individual over time such that it negatively affects growth (Scrimshaw et al. 1968). This points out the complex interaction disease has with growth and nutrition, a relationship complicated by possible synergistic action. For example, measles in a poorly nourished child may result

in severely retarded growth or even death, an effect neither may have produced alone (Scrimshaw et al. 1968). It should be pointed out, though, that the only way to account for past disease effects on growth is through a complete medical history although this is usually not feasible given the conditions in developing nations.

When discussing growth, the chemical nature of the human body must also be dealt with, primarily the endocrine glands that produce certain hormones which influence growth. The primary growth hormone, somatotrophin, is essential to normal growth, particularly during childhood, in that it stimulates linear growth, that is, growth in the length of the long bones. Throxine, produced in the thyroid glands, is very important in basal metabolism. A deficiency in this hormone generally results in retarded growth and an over-production results in overweight. Insulin is necessary to stimulate the growth hormone in order for it to take full effect. It should be pointed out, however, that the proper production of hormones can be affected by either congenital defects or by poor or improper nutrition. For example, a diet devoid of iodine can produce thyroid problems, thus resulting in retarded growth (Passmore et al. 1974; McLaren 1979).

The most direct method of determining the hormonal conditions of a population (or an individual) is to collect blood and urine samples and analyze the hormonal content. However, cultural beliefs, and even plain aversion to pain, usually do not permit the taking of blood samples. In the field, there is also the problem of storage, refrigeration and proper equipment.

Indirectly, hormonal imbalances can be detected by carefully screening the symptoms and then, by examining carefully the nutrient

composition of the local diets, as well as the soil composition. For instance, most salt used in underdeveloped countries is not iodized. The population may demonstrate symptoms of thyroxine deficiency or the presence of goiter. Therefore, given what is known about the salt being consumed and the symptoms of thyroxine deficiency, the cause probably lies in a nutrient deficiency. Thus, a complete survey of the local food resources (and nutrient value) should provide some insight into the hormonal state of a population. Though this method is indirect, it is usually the only viable hormone detection device short of blood sampling.

As mentioned earlier in the context of nutrition, it has been argued by many that the environment is the major influence on the realization of the genetic potential for growth and the resulting nutritional state. In the broadest sense and as defined earlier, environment includes everything that is not genetically or uterinely oriented or controlled for, encompassing not only such physical conditions as temperature and climate, but also the sociocultural system vis-a-vis such phenomena as socioeconomic status and membership in cultural or ethnic groups. However, as already argued, environment primarily influences growth through nutrition or in concert with disease, but not directly.

There is some evidence that climate can directly affect growth. In Little and Hochner's (1973) study, it appears that in the Eskimo the rate of growth seems to slow down in response to constant, extreme cold as a mechanism to preserve and maintain body temperature. The lowered growth rate liberates nutrients for use in basal metabolism. Furthermore, D. F. Roberts (1973) found that there appears to be

a relatively strong correlation between the nature of the climate and the linearity of the physique. Altitude also seems to influence rate of growth as seen in the slower growth rates of children at high altitudes compared to those at sea level. However, as Malina (1975) points out, this is probably due to a more complicated interaction between hypoxia, nutrition and disease. Furthermore, he suggests that nutritional status and socioeconomic background may be the more important factors (Malina 1973; 1975).

At this point, it is necessary to define more specifically the term, socioeconomic factors. Oversimplified, socioeconomic factors form a system in which the social and economic aspects of a particular population or society are involved in a complex interplay. In this system, social, cultural and economic factors cannot really be separated since they are dependent upon one another. Generally, the term socioeconomic status is used as a synonym for income and/or level of living. However income and level of living are simply the measurable or quantifiable results of socioeconomics and the degree of success in a given socioeconomic system is usually defined by the position of a particular individual in the class structure.

As Bates and Killian (1981) and Belcher (1951; 1972) point out, in the Third World socioeconomics is best evaluated in terms of "domestic assets". Such assets amount to household possessions, goods and services accessible to a given individual, household or population. An inventory of domestic economic assets furnishes a better indicator of the socioeconomic level of a household than data more directly related to monetary income. The underlying principle is, basically,

that in the underdeveloped world a "dual economy" exists in which a modern economic sector coexists with a more traditional economic sector between which there is considerable interplay and interdependence. Furthermore, as Conde (1979) notes, income indicators are unreliable in assessing the socioeconomic situation in the underdeveloped world because of the mass underemployment which exists there. What results is a socioeconomic system which employs a combination of income and "domestic assets", and non-money based access to resources, goods and services. Therefore, socioeconomics as defined here is primarily concerned with access to power, income, land, goods and services, as defined by the sociocultural context.

Berg (1973), as did Malina (1973; 1975) and others, argues that the socioeconomic environment is the most important variable indirectly determining how much of the growth potential is realized by an individual or a population group. Though it cannot be applied as an absolute universal, in the modern world, the social, economic and political environments are probably the most important factors indirectly influencing nutritional status. I. Wallerstein (1976) notes that most of the sociopolitical isolates from the world economic system have long since disappeared. With economic structures being what they are, money (currency) is generally required to satisfy the increased demand for services and goods. Chen (1979: 58) states: "The availability of foods is dependent on the purchasing power (of the prospective eater)... as well as (the) capacity to produce food supplies."

Without getting into "class" arguments, roughly, the less access a person has to the basic, necessary resources, the more likely he is to suffer nutritionally. Socioeconomics is further projected as the

primary indirect variable in the determination of nutritional state because of the fact that socioeconomics determines "buffering" capabilities with respect to disease and other environmental stresses such as climate, altitude, etc., through adequate food, clothing and shelter (Berg 1973; Malina 1973). For example, in Guatemala, higher socioeconomic status permits the incorporation of animal proteins, fruits and vegetables as daily staples into a diet which would otherwise consist almost exclusively of corn tortillas and black beans. With improved diet providing a higher quality of nutrition, an individual is able to resist disease or tolerate environmental stresses. That is to say than, if one has access to socioeconomic resources (i.e. money and/or power), one can afford proper health and sanitation facilities, housing and education, as well as food. Considering that socioeconomics has an extensive impact on the adjustments which have to be made to the other environmental variables, it must therefore be considered the primary indirect influence on nutrition and growth.

Johnston et al. (1980) conducted an investigation of environmental variables involved in stunting of growth of children in a Mexican village (Oaxaca). There were seven components used in the analysis which included socioeconomics, demography, maternal mass, paternal mass, maternal linear, paternal linear and morbidity. They found that the environmental variable, socioeconomics, could, in general, explain successfully the population's growth process, and subsequent nutritional status. Their socioeconomic component included data on the mother's and father's educational level, food expenditure per family member, family income, household sanitation and mother's and father's hygiene

score. Though the constituents of their socioeconomic component are somewhat different from that being used in this study, it is still useful as an example of the relationship between the socioeconomic environment and nutritional status.

As a final note on this topic, it should be remembered that Habicht et al. (1974) and Johnston et al. (1976) pointed out the impact of socioeconomics on nutritional status (i.e. growth), as discussed earlier. In discussing the reliability of growth standards, Johnston et al. found that the differences in growth between different ethnic groups in Guatemala were due principally to differences in their socioeconomic levels. Habicht and his fellow researchers, for instance, found that the variation in heights of preschool aged children due to socioeconomic differences was approximately four times as great as the variation due to ethnic differences among this same age group, their conclusions being based on several different studies in different geographic regions. As Immink et al. (1982: 354) state:

> Poor nutritional intake is clearly associated with low socioeconomic status. The impact on physical growth of inadequate nutrient intake, per se, is admittedly difficult to separate from the effect of other factors which are associated with poor living conditions.

Finally, the sociocultural environment should be briefly considered apart from socioeconomics since certain beliefs and practices in a given society will define and govern what, which and how available resources are to be used. In the case of highland Guatemala, for example, the ethnographic evidence indicates that, for sociocultural reasons, it is considered inappropriate to utilize wild edible plants (historically known to have been used and which, incidentally, are of high nutrient value) as food resources (Rodeheaver and Rodeheaver 1980).

The extent of their usage is determined by one's social status, thus, low social status is associated with these wild plants. The result, therefore, is a greater demand for nutritionally inferior, yet more expensive foodstuffs.[1] Also, other variables in the sociocultural environment include education and concepts of sanitation. For instance, Ullrich and Briggs (1973) and Jelliffe (1979) argue that education plays an important role in nutrition and nutritional status, in that there is a general correlation between how educated a person is and his/her nutritional status. As for concepts of sanitation, Johnston and Selby (1978) and Selby and Garretson (1978: 323-324) discuss the general sanitary conditions found in traditional Mesoamerican villages:

> These villages are not healthy places to live and the poorer the village, the poorer the conditions. Your first night in a village will convince you of one thing: you are living in a barnyard. The villages are often nucleated; that is, houses are built close to each other. Animal manure is found in every patio, and, when the rainy season comes, clouds of houseflies descend.

Animals, such as pigs, are kept inside the house since they are also financial investments. Also, ethnographic evidence shows that in many households in Guatemala, particularly among the Indians, adequate waste disposal methods and technology are non-existent and, many times, the human and animal wastes are left to decompose in certain parts of the house in order to provide fertilizer for the upcoming planting season (Rodeheaver and Rodeheaver 1980). All of this points out the necessity for careful consideration of the sociocultural and socioeconomic environments, as well as the nutritional and natural conditions so as to arrive at a better understanding of problems, such as hunger and malnutrition, faced by people.

In conclusion, this chapter was intended to provide insight into one of the primary concerns of this investigation, nutritional status, in order that, eventually, a better understanding would be gained as to how food aid and food aid programs might impact on nutritional status. It was necessary to define nutritional status, however, in terms of several key processes, including growth, genetics and disease. Nutritional status was defined as the end result of the process of assimilating the nutrients necessary for energy, growth, maintenance and storage, which results in physical growth. As such, nutritional status is measured in terms of physical growth. There were three primary types of factors involved in growth discussed here: genetic, uterine and environmental. It was noted that, generally, genetics determines the growth potential of a given individual; however, the process of *in utero* development could also determine somewhat the eventual outcome of phenotypic expression as exhibited in growth, during the period from conception until birth. After that, usually the nutritional environment determines how much of that growth potential will actually be realized, although certainly disease and congenital factors play important roles. As noted, there are numerous studies that demonstrate the impact of the socioeconomic and sociocultural systems on the nutritional status of an individual and a population. This chapter merely points out the very complicated nature of nutrition and the resulting nutritional status.

FOOTNOTES

[1]Any malnutrition that might arise from this sociocultural pressure is usually not seen as abnormal in Guatemala. Rather, any malnourishment or illness tends to be viewed as a normal state of health for children and is not associated with the use of inferior foodstuffs. Therefore, the pressure to abandon the use of wild plants continues.

CHAPTER III

AN OVERVIEW OF FOOD AID AND FOOD AID PROGRAMS: PL-480, AN EXAMPLE

The impact of food aid is felt primarily in Third World countries where such aid influences the direction of socioeconomic and political development and affects or shapes development goals, policies and strategies as well as the means by which they are attained. (Manners 1968, and Carnack 1978, support similar views.) It has been argued that the extent of food aid to certain individual countries is such that it is a significant force in the development of recipient nations (Heady 1962). However, the amount of food aid to individual countries varies greatly and, therefore, the degree to which the impact is felt varies also. On the other hand, food aid critics have pointed out that there is a conflict between the short-run nature of food aid and the more pressing long-term strategies of development (Lappé and Collins 1977; Lappé, Collins and Kinley 1981). Furthermore, not only do underdeveloped countries feel the effects or consequences of food aid, but developed countries, typically the donors of such assistance, are also affected both economically and politically by it. The purpose of this chapter is to examine the claims made for and against food aid and food aid programs.

As an introduction to the following discussion of Public Law 480 food programs, some background information on the issues of food and

hunger will be provided. Then, a framework for examining the consequences of food aid will be used to examine the official United States food assistance program, PL-480 (Food For Peace), on the assumption that it is relatively representative of all bilateral food aid programs utilized throughout the world. In order to set PL-480 programs in their proper perspective, a brief historical description of their evolution will be included. Next, a brief synthesis of the literature which criticizes these programs will be presented. This will be followed by an ethnographical description of an on-going food aid program in a developing country, Guatemala, in order to provide some insight into food assistance at the local level. Finally, after having discussed the socioeconomic and political consequences of food aid, its more obvious aspect, nutrition, its policy implications and some related comments will be discussed.

The Hunger Issue

Hunger is probably one of the most serious problems facing mankind presently. The hunger issue has severely threatened global security and is a major factor in much of the civil unrest in the Third World. Nearly all of these people live in the underdeveloped countries of Asia, Africa, Latin America and the Near East (Reutlinger and Selowsky 1976). Though most visible in these countries, hunger is not only an issue in the underdeveloped world; but, if Bread for the World's[1] (BFW 1972) statistics are even nearly correct, then, there are approximately 39 million "hungry" people in the United States alone (almost 16 percent of the entire U. S. population).[2]

The hunger issue came to the forefront of public attention throughout the world during the 1960's and 1970's, particularly with such disasters as the drought in the Sahel, Africa, the cyclone and tidal wave in Bangladesh, civil war in Burundi and so on (Davis 1975). The effect of these disaster situations heightened the already existing food shortages in the Third World. The resulting news coverage, such as the well-advertised photograph of the Bangladesh baby with severe (Grade-3) malnutrition (kwashiorkor), helped create a guilt complex among people in the developed world (Lappe and Collins 1977).

It would be useful in helping to understand food assistance to consider one question: What are the conditions that produce hunger? One immediate response particularly given by the developmentalists is that hunger is caused by unprecedented exponential population increases, especially in the Third World, which, when coupled with the lack of economic growth and development, creates overcompetition for food and economic resources. According to many private political, religious and volunteer organizations, such as BFW and CARE, there are three different causes or "roots" of hunger: poverty is first and foremost; next comes instability of food supplies; and, finally, natural and man-made disasters. Rather than these "roots" being the causes of hunger, however, they merely point out the <u>real</u> source; that is, the social, economic and political structure of the societies having food problems. As Lappe and Collins (1977: 8) note:

> We are not saying merely that the solution to hunger lies in better distribution--getting the food to the hungry instead of the well-fed. We are saying something else: that food distribution only reflects the more fundamental issue of who controls and who participates in the production process.

Social structure is generally recognized as being responsible for the existence and persistence of hunger particularly through fostering poverty and instability of food supplies. In addition, natural and man-made disasters are often seen as causes of hunger and to most people they seem to be caused by natural and/or environmental conditions which are beyond society's control. Nevertheless, it must be pointed out that a society's response to such environmentally created problems, which result in turn in acute food shortages and hunger, is structurally determined. Since culture and social structure are so important in creating and maintaining hunger, the question arises: Outside of social revolution, what can be done to eradicate the problem of hunger, especially in the underdeveloped world? For purposes of this study, there are two types of "solutions" considered: the long-term solution through agricultural development and the short-term solution in the form of food aid. In discussing these two approaches, it should be noted that there will be some repetition of arguments as well as overlapping theories due to the complex nature of the hunger issue.

The Solution: Agricultural Development

Since the late 1960's and early 1970's with the emergence of the Second Development Decade, a term widely used in the World Bank and development literature, and its emphasis on the Green Revolution (Henriot 1979), there has been heated debate on the issues of food, hunger and agricultural development. Within this "food issue", two major arguments have developed as to the nature of agricultural intervention. The developmentalists argue that technology is the solution to the food problem, thus, creating the now well known concept of the

"Green Revolution". Proponents of this view believe that with proper technology, agricultural productivity can be increased in order to deal with the problem of food scarcity in the underdeveloped world.

The other argument holds that because of structural problems, food resources, land tenure and the means of production are improperly distributed in the underdeveloped world. Furthermore, land is tied up in mono-cash crop agriculture at the expense of subsistence agriculture. Both of these arguments are concerned with the long-term solution to the food and hunger issue and it is also interesting to note that both arguments have in common one basic underlying assumption which is best summarized by Lappe and Collins (1977: 7):

> There is no such thing today as an absolute scarcity. Every country in the world has the capacity to feed itself.

However, one serious problem overrides this assumption; not all nations appear actually to have a self-sufficient or self-reliant agricultural capability, given ecological and environmental considerations with respect to geo-political boundaries.

More specifically, with respect to the Green Revolution as a solution to the food and hunger issue, the associated agricultural technology used in a quest for increasing agricultural productivity has been criticized as only furthering the problem of dependency. For instance, it is pointed out that it creates the necessity for such agribusiness products as fertilizers and pesticides which can only be manufactured in countries having that particular industrial and scientific capability. Furthermore, this dependency is even more compounded by the fact that many of these agricultural products are petroleum-based. However, as Cleaver (1972) points out, dependency is not the

only negative effect generated by the Green Revolution. This type of agricultural revolution has historically resulted in uneven regional development within nations, aided in rural-to-urban migration because of capital as opposed to labor-intensive investment, driven prices of agricultural commodities up because it is capital-intensive, and has had severe ecological ramifications in the upsetting of local ecosystems, for example, through residual pesticides.

The redistribution argument, as previously mentioned, states that the problem is not so much one of agricultural productivity, but rather inequitable food distribution. Most argue redistribution at the national level, but as Christenson (1978: 8) points out:

> To eliminate this hunger directly would require substantial, though not unattainable, quantities of food. If grain were delivered directly to the hungry, and only to them, about 35.6 million metric tons would be enough to eliminate hunger. This is less than 3% of the world's 1974 grain production...

However, this just points out that global redistribution would be necessary and this is unrealistic since nations are separate and often competing or conflicting political entities. Food aid is probably the only attempt at global redistribution, though it is a weak attempt and generally has other than altruistic motives.

It appears that a development strategy (or program) designed to cope with the hunger issue which solely employs either changes in agricultural technology or redistribution cannot effectively work to feed hungry people much less create agricultural self-reliance and self-sufficiency. If we assume that geopolitical boundaries are maintained (and a single world government is not created), then, most likely a given ecology and environment delineated by political borders can

shape, or even prevent the development of this self-reliance in many countries. At best, most underdeveloped nations might respond with a strategy that employs a more realistic "appropriate" agricultural technology which can be locally manufactured and is ecologically sensitive and which is designed to deal with social and economic problems. Furthermore, this strategy might require complete restructuring of the national land tenure systems. Unfortunately, in most underdeveloped countries the concern for the hungry does not extend to the point of considering significant change or modification in the social, economic and political system.

It should be noted that the arguments discussed here have been somewhat over-simplified since they are not the issues of most concern in this study. However, they do provide important background information and set the stage for a discussion of the second, and most important, alternative to the hunger issue--food aid.

The Solution: Food Aid

Food aid has been considered a viable tool in dealing with the food and hunger issue since the early part of this century, particularly as a short-term solution (M. Wallerstein 1980). In pointing to the moral issue of hunger, private voluntary and religious organizations as well as governmental policy makers strongly feel that, hunger being a global issue (of justice), it is "the responsibility of ... the agriculturally affluent nation(s) to assist in meeting the food needs of the world's poorer nations" (Brown and Shue 1977: 1).

One particular religious (and political) organization, BFW, recently stated in one of its publications that there are at least three

major reasons why the United States has an international responsibility of providing food assistance: 1) it has a moral obligation to provide for the world's hungry, 2) its national security is endangered by the existence of poor and hungry, and 3) it is in its own economic interest that a healthy international economy be maintained, since it exports a great deal of commodities. These reasons can probably be applied to all donor countries. Furthermore, as these last two points demonstrate, recipient countries are not the sole "beneficiaries" of food assistance. Chafkin (1978: 253) notes that there are three primary objectives of most food aid programs with respect to the donor's domestic policy, and

> All nations, whether developed or underdeveloped, must deal with the same three conflicting objectives:
>
> (1) to meet balance of payment requirements, which means increasing exports;
> (2) to meet the domestic pressure for lower food prices; and,
> (3) to provide incentives for farmers by keeping food prices high (through subsidy) in order to maximize production.

This discussion of food aid is designed not so much to explore all of the issues raised in its justification, as it is to point out its confusing and very complex nature. As is to be demonstrated in this study (and as noted by many such as Manners 1968), the moral and/or humanitarian question constitutes only a part of this picture with respect to the socio-economic and political consequences of food aid. For example, as pointed out by Mitchel B. Wallerstein (1980), approximately 28 percent of the total United States Official Development Assistance between 1946 and 1976 was provided in the form of food assistance. This figure represents more than 20 billion dollars which is 80 percent of the total global food aid (Bard 1972). Even with respect to the

U. S. government budget, food aid represents a considerable proportion of the agricultural appropriations. In 1977, for instance, 14 percent of the entire agricultural budget was earmarked for PL-480 food aid programs. The magnitude of this act alone implies significant social, economic and political impact of food aid on the world system and hunger. Therefore, in order to further examine these consequences, a review of the official U. S. food aid program and its criticisms will provide some valuable insight.

Food For Peace (PL-480)

Since World War I, the United States has maintained at least an incipient food assistance program which was originally designed to aid the reconstruction process in Europe, with its goals being primarily humanitarian in nature. However, in 1947, the Marshall Plan was initiated in response to Soviet expansionism after World War II, significantly setting precedent and determining the direction of all foreign assistance from then until the present time.

In 1954, after an agricultural boom in the United States, Public Law 480 legislation was enacted in order to deal primarily with agricultural surplus disposal (Congressional Quarterly Almanac 1954). PL-480 legislation was passed by the 83rd Congress on June 30, 1954 and signed by President Eisenhower on July 10, 1954 under the title of Public Law 480, the Agricultural Trade Development and Assistance Act of 1954. The aims specified in the bill are: "to improve the foreign relations of the United States, to facilitate the convertibility of currency, and to promote the economic stability of American agriculture and the national welfare" (C.Q.A. 1954: 120). The forerunner

to PL83-480 was PL74-320, an amendment passed in 1935 of the Agricultural Adjustment Act of 1933 (Wallerstein 1980; Haroldsen 1962), which was designed to deal with famine and disaster. In 1949, this was further modified,authorizing the Commodity Credit Corporation (CCC) to "make available ... food commodities...to private welfare organizations for the assistance of needy persons outside the United States" (Agency for International Development 1979: 5).

Public Law 480 is (and has since been) the primary instrument by which the United States government has allocated fo d aid to the rest of the world, primarily the Third World. The policy goals and administration, as well as the structure of the Act, have undergone numerous changes and/or modifications over the last 27 years. In 1961, at the insistence of Senator Hubert H. Humphrey and President Eisenhower, PL-480 was officially renamed "Food for Peace." Also, the previously significant humanitarian aims were conspicuously omitted from the 1954 legislation (see the above description), and, they wre not written into the bill until 1966.

In 1966, under the Johnson administration, PL-480 underwent a major facelift in which the surplus disposal concept was eliminated and "self-help" with respect to recipient countries was emphasized. This probably resulted because the quantities of available agricultural commodities were significantly lower than in previous years due to a greater demand for these goods in competitive commercial markets. Originally, there were four different "titles" which were rewritten in 1966 and combined into only two. Title I (I and IV), very briefly, can be summarized as "sales"; that is, certain agricultural commodities,

products and technology can be sold on credit at very low interest rates and at subsidized prices. Between two-thirds and three-fourths of all of the assistance provided under PL-480 falls under this title. For example, 1.9 billion dollars of aid was budgeted for Title I in 1966.[3]

Title II denotes food and agricultural commodities to private volunteer organizations such as CARE and Catholic Relief Services (CRS) in order to deal with chronic hunger (C.Q.A. 1966). It also provides assistance for emergency relief. This title incorporates the original Titles II and III, and in 1966 was supported by appropriations of 600 million dollars. Ultimately, according to some (Steiner and Marouser 1967), this 1966 revision of the Food For Peace Act was a movement, at least in part, toward dealing with the issue of hunger and agricultural development,more so than the original version.

A majority of food aid provided under Food For Peace (primarily under Title I) has gone to support the national security of the United States in the form of indirect military aid. For instance, the Nixon-Ford administration earmarked almost half of the aid available under Title I in the 1975 budget to South Vietnam and Cambodia, with the expressed purpose of generating capital for military expenditures. This aid purportedly generated some $6 billion through resale in the recipient country. In reaction to public pressure, Congress passed an amended bill in 1975 which required "that 80 percent of all P.L. 480 commodities must go to countries with per capita incomes of less than $250" (Lappe and Collins 1977: 341). Also, in its more direct concern with hunger, Congress raised the ceiling of Title II from $600 million to $750 million, with a guaranteed minimum of one million tons of food.

For the purposes of this study, the features and organization of PL-480 should be restated in order to provide the framework for examining the consequences of food aid. As previously mentioned, the Food For Peace Act contains two titles: Title I and Title II. Title I involves the sale of agricultural commodities for local currencies and dollars under long-term credit arrangements. Title II provides donations of food distributed to recipient countries through international agencies, particularly private volunteer organizations. These donations fall into two categories: "regular" food aid programs and emergency relief programs. Regular food aid programs involve day-to-day food assistance which attempts to deal with the problems of chronic food shortages and malnutrition. These regular food aid programs include three types: 1) Maternal/Child health programs, 2) school lunch programs and 3) Food For Work programs, all of which fall under Title II. Emergency relief programs are designed to cope with acute food shortages and related problems which result from disaster situations.

It should be noted here that PL-480 is managed by three different agencies which include the Department of State, the Department of Agriculture and the Agency for International Development (AID). Each of these agencies are responsible for the different concerns with regard to Food For Peace that fall under their respective jurisdictions. For example, the State Department is in charge of the foreign policy aspect, while the Agriculture Department is involved in the domestic (agriculture) policy decision-making and AID, with foreign economic development (Bard 1972).

There are several criticisms which have been leveled at the United States food aid programs, and, they can probably be applied to all

bilateral food aid programs. Therefore, the following section will review and discuss these criticisms in an attempt to examine the question: What are the socioeconomic and political consequences of food aid?

Criticisms of Food Aid

As best can be ascertained from the literature dealing with food aid, seven major criticisms can be identified: 1) food aid can be and is used as a political tool and/or weapon; 2) food aid is a disincentive to agricultural production and productivity; 3) food aid creates an unfavorable balance of payments and an unequal transfer of currencies; 4) food aid is used to create both markets and dependency; 5) food aid is mismanaged; 6) the foodstuffs provided by food aid programs are inappropriate and, 7) food provided by food aid programs is insufficient. Each one of these criticisms will be discussed separately below. Afterwards, some attention will be given to the positive aspect(s) of food assistance.

Food Aid as a Political Tool

Wiseberg (1976) notes that appropriations of food assistance to recipient countries are not always based on need, but rather on the basis of U. S. national security. As noted earlier, one of the expressend aims in the original version was the "improvement of foreign relations." However, as not mentioned previously, food aid was also intentionally directed at "friendly" nations on a priority basis (C.G.A. 1954). As D. H. Jacobsen in 1967, then Assistant Secretary of Agriculture, states, one of the goals of PL-480 historically was to "avoid political unrest" (Steiner and Marouser 1967: 12).

The Food For Peace program has been accused of being not only a political tool or weapon in foreign countries, but also here in the United States as well. Bard (1972) notes that because it was used for surplus disposal of domestic agricultural commodities, it had significant political and eocnomic impact in the United States. He says:

> A good case may be made for the proposition that United States food aid programs have reduced domestic opposition to existing farm programs and the highly controlled agricultural trade that must result from national agricultural support policies that raise domestic prices above international levels. ...without the outlet provided by food aid, this country would have been forced to make fundamental changes in an essentially irrational farm policy. (Bard 1972: 48-49)

As noted here, then, PL-480 is very beneficial, as a domestic policy, in that it provides a "market" for surplus agricultural commodities of U. S. farmers; that market being the United States government.

Since the primary interest of this study is the socioeconomic and political consequences of food aid on underdeveloped nations, therefore, of greater concern are the criticisms leveled at Food For Peace with respect to its effect(s) internationally. In general, these criticisms are valid, but one major problem with them is that they do not distinguish between Title I and II. They fail to point out that the political nature of PL-480 is essentially limited to Title I, since Title II food is donated to and distributed by non-committed private volunteer organizations. Also, with respect to the more recent restrictions placed on Title I assistance by the 1975 and 1977 amendments, this powerful political weapon has been weakened. However, the ultimate decision either to appropriate food or not, based on the political ideology of the recipient, is perhaps the

Food Aid as a Disincentive to Agricultural Production

Another important criticism to be considered in evaluating the effects of PL-480 on the development process is the criticism that it acts as a disincentive or deterrant to agricultural production in recipient nations. In a report to Congress in 1975, J. K. Fasik of the General Accounting Office stated that food aid acts as a disincentive "by allowing the (recipient) governments to 1) postpone essential agricultural reforms, 2) fail to give agricultural investment sufficient priority, and 3) maintain a pricing system which gave farmers an inadequate incentive to increase production" (Fasik/GAO 1975: 27). However, the problem with this criticism is that it assumes that a laissez-faire agricultural policy based on supply and demand will, through its desire to maximize profits and/or profit rates, provide the basic foodstuffs for general consumption. Ceiling prices on food, much to Fasik's (and others) dislike, are humanitarian in that they allow poor people to eat less expensively than otherwise.

There is ethnographical evidence that removing ceiling prices does not necessarily encourage the agricultural production of foodstuffs for domestic consumption (Rodeheaver and Rodeheaver 1980). For example, in Guatemala, particularly in areas where agricultural conditions are especially conducive, coffee for export is grown instead of domestic grains, primarily because the world price of coffee is more profitable than the domestic price of grain. While higher prices result in more production, they may result in the production of non-food products which are sold outside the country, thus not increasing the domestic food supply.

In reaction to the report by Fasik and the GAO, AID (the Agency for International Development) responded in a letter dated July 15, 1975:

> The report reflects a strong "free market" orientation. Especially in regard to pricing, the report should recognize that there is an inherent problem of production variation and consequent price instability in food commodity markets. It is unrealistic to expect an unregulated free market to work satisfactorily in the context of instability and scarcity.

The primary question arising from this discussion by AID, as to the GAO's recommendations, is: What guarantees that the hungry will have better access to food? It is doubtful that an agricultural policy which involves higher prices will solve the hunger problem in an economic system that, in general, shows signs of increasing inequality--that is, in a society where the poor are getting poorer.

Unequal Transfer of Currencies and the Balance of Payments

There are various arguments concerning food aid with respect to the transfer of currencies and the balance of payments, as noted by Bard (1972) and others. The complexity of this issue is further compounded by the "terms of agreement" between the donor and recipient nations. Furthermore, these terms vary greatly from one country to another. Therefore, with this in mind, the following is an attempt to deal, at least briefly, with each of the three major aspects.

First, it is argued that generally certain conditions are tagged to food aid (PL-480) which include the transfer of donor's (U. S. dollars in this case), local and other foreign currencies from recipient to donor nations which, in turn, are used to pay off the donor's

international debts--i.e. 'balance of payments' (Lappe and Collins 1977, 1980). One negative effect of this currency transfer on the recipient's balance of payments is that it drains off foreign currency needed for purchases of foreign (non-agricultural) commodities, as well as other agricultural products (not provided by PL-480). More specifically, this aspect of currency transfer in PL-480 is especially valid under Title I, since it is directly written into the legislation. However, whether the effect of food aid has a positive or negative consequence on the recipient's balance of payments, with respect to the transfer of currency, will depend on the terms of the individual agreement.

On the other hand, this transfer aspect of Title I is particularly beneficial to the United States (as is the case in similar instances for all donors). Bard (1972) points out that, first, PL-480 is a means of supporting the U. S. agricultural system by relieving a potential glut of American agricultural commodities, avoiding storage problems, and generating a nominal return on investment. He notes that the U. S. government can purchase local agricultural commodities at well below the going world market price. Then, it can provide them at a very attractive price to recipient nations, and, still pay off overhead costs. Witt (1977: 82) states:

> Shipping the grain to another country in exchange for local currency could realize 20 to 60 cents on the dollar, under Title I, the largest component of P.L. 480 shipments. (The terms were stiffer after 1967, so that more return was realized on each dollar).

However, emergency relief, which is administered under Title II, demonstrates a different "transfer" problem; that is, the "transfer of payments." Wiseberg (1976) in her evaluation of the relief effort in

the Sahel during the early 1970's noted several problems. Transportation, administration and overhead costs were included as part of the donated aid, and, since the aid had to be transported in American ships and the money went toward the purchase of American commodities and to pay American salaries, most of the aid (monetarily), therefore, actually remained in the United States. The food products, however, were delivered to a country in need and to say that most of the "aid remained" in the U. S. is not to recognize that food was actually transferred under extremely favorable economic conditions.

As can be seen in the above discussion, the economic issues described are very complicated and interrelated. In essence, the outcome of the impact of food aid in terms of payment and currency transfers and the balance of payments are strongly influenced by the terms of agreement between donor and recipient. It should be recognized, however, that the terms of food aid are sometimes more favorable to the donor than to the recipient.

Market Creation and Dependency

In the 1975 version of the Food For Peace Act under the title of "Food Aid to Poor Countries," the bill reads:

> In furnishing food aid under this Act, the President shall...assure that allocation of commodities or concessinal financing is based upon the potential for expanding markets for America's abundance abroad.

This clearly points out that one of its objectives is to create new markets for American agricultural commodities (Lappe and Collins 1977).

Furthermore, Cleaver (1972) states that food aid creates a dependency relationship between the recipient country and the donor in at

least three ways: first, by the conditions attached to the aid; second, by the aid being tied to purchases (of food) from the donor country; and, third, through the creation of markets in recipient countries. Also, according to the GAO report, food aid creates a chronic dependency on the donor country for supply, since it lowers agricultural prices and therefore, creates a disincentive to agricultural production in recipient nations.

This criticism has pointed out some serious potential consequences of food aid in recipient countries. As Destler (1978) argues, there is an external dependency (primarily political) created between the developed and underdeveloped nations as the result of this exchange of food aid. It should be noted here that there is another level of dependency which should be considered: regional and/or individual dependency which includes local or individual dependency on food aid as a food source. Ethnographic evidence, however, shows that by the time food aid reaches the individual it is usually in insufficient amounts to create a local dependency (Rodeheaver and Rodeheaver 1980). (Of course, when there are no other food resources, a dependency situation is present.) Also, food provided is often unacceptable, given local dietary habits. In most cases of food programs at the household level, the foods received from food donations are used as a supplement to other food sources.

Food Aid Mismanagement

The mismanagement of food aid presents a very serious problem, especially with respect to emergency relief, when organized and effective coordination of foreign assistance is vital. In Glantz's

(1976) study of the disaster relief effort in the Sahel, Africa, (which included PL-480 aid) four major criticisms were leveled:

1. The distribution of food and supplies generally takes place well after the problem has subsided. That is to say, when the food does arrive, it is usually too late. Also, there is the problem of insufficient quantities and unacceptable foodstuffs.

2. Because there is generally a lack of coordination and organization of the relief effort by numerous groups there results an overlapping of programs which become too difficult to manage.

3. Because of delays and misunderstandings (caused by mismanagement and competition), much of the food aid ends up in the black market with the result being profiteering.

4. These problems are further compounded by the fact that the relief programs, being foreign-based (and uncoordinated), are externally controlled and, thus disregard the specific recipient's historical, cultural and present socioeconomic and political conditions.

Many of these problems are inherent to disaster situations due to their chaotic nature. However, there are ethnographic examples of black marketing and profiteering associated with regular or chronic food aid programs, for instance. Though probably more manageable at the regional and national level, these problems are unavoidable at the local level. The Sahel case merely points out the need for international cooperation and co-dialogue between the international community and the recipient nation and to the need for better management of food distribution systems rather than to the need to abandon attempts at disaster relief.

Inappropriate Food Aid

Probably the most frequent criticism of food aid deals with its insensitivity to local food habits; this resulting from the fact that

most foods included in the programs reflect the dietary habits (aside from agricultural surpluses) of the donor country. Three aspects of unacceptable food aid have been identified in the literature, and, they include:

1. unacceptable foods which do not adhere to local dietary patterns,

2. packaging problems which include pesticides found in the package lining, and

3. health problems which result from poor sanitary practices in the preparation of these foods.

Jelliffe (1968) notes that many times the food received from food aid programs has no relation to local food habits, and, furthermore, as in the case with powdered milk, it has discouraged mothers from breastfeeding (in favor of an inferior food). Frequently, especially with respect to grains, the packaging is permeated with pesticides as a means of preventing insect destruction. The contamination of the food is, therefore, almost unavoidable under field conditions in many remote places. Because of poor sanitation practices, local health is endangered since much of the food requires preparation with water. This is compounded by the lack of potable water in most underdeveloped countries. Nevertheless, Jelliffe points out, the advantages of any food outweigh the disadvantages of malnutrition and hunger (when no alternative exists).

Another aspect of inappropriate food aid which should be discussed here is based on reports coming out of recipient nations as to people feeding the donated food to their animals. In Guatemala, for example, occasionally the recipients of food aid provided by PL-480 will feed it to their pigs and cattle instead of eating it. Though this might be

considered an inappropriate use of donated food, the recipients still derive some benefit via animal protein.

Insufficient Food Aid

Although contradictory to some of the previously discussed criticisms, it is argued that usually there is not enough food provided by conventional food aid programs, particularly in disaster situations (Wiseberg 1976), to combat hunger or provide minimal relief. Though, on a global and national level food aid supplies appear in impressive quantities, rarely does a given recipient nation receive enough food to feed all of its needy people. (Per individual, the amount of aid is often insignificant.) A recent example of this would be the case of the refugees from Ethiopia.

In the case of PL-480 food, as administered by CARE and others, the individual, too, rarely receives enough food to successfully deal with the problem of hunger. In these programs, the recipient is allotted a maximum of eight pounds monthly (for a list of the foods provided, see the following section which describes a food program). Furthermore, this issue at the level of the individual is even more complicated by other problems relating to and resulting from poor local planning and administration. For example, Jelliffe (1968) notes that many times the individual recipient (parents) will take their children off their normal diets and place them solely on foods provided by food aid programs, which can be and usually are inadequate in amount and insufficient nutritionally as the mainstay of their diet. This is generally the result of improper, or the complete lack

of education by local food aid administrators as to the place of these supplemental foods in a correct diet.

In conclusion, the criticisms leveled at food aid (programs) in general and, specifically, at PL-480, are numerous and wide-ranging in that they point out its social, economic and political nature. To date, the tendency is to examine the political and economic nature of food assistance instead of its nutritional consequences. Also, as hypotheses, most of these criticisms have yet to be tested in some scientific and systematic manner. Many are made on ideological grounds which lead critics to selectively collect evidence and to interpret it in such a way as to bolster their argument. The above description was designed to outline and order some of the very complex and diverse criticisms made of food distribution programs. Many of the criticisms discussed obviously overlap. By reviewing them, a background is provided against which the specific research to be discussed below can be better understood.

An Ethnography of a Food Aid Program

An ethnographical account of an ongoing food aid program will be helpful in providing insight into the way food aid programs such as those examined in this study are carried out. Therefore, the following brief description of a food program which is conducted in the Health Post in Patzite, El Quiche, Guatemala under the auspices of CARE, a private international voluntary organization, and the Ministry of Public Health of Guatemala is offered. The food used in this program is donated by the United States government under Title II of the revised

Food For Peace Act (PL-480) of 1977. It should be noted here that all food aid given to Guatemala by the United States is appropriated under Title II.

CARE, with the permission of the Ministry of Public Health, operates a nationwide food program in Guatemala aimed at the identification of malnourished persons and, through donated foods and education related to nutrition and hygiene, attempts to eradicate the problem of malnutrition. This program is generally referred to as Maternal-Child Health (MCHC) Care. It is directed at pregnant and lactating mothers and children under the age of six since it is in these two groups that the consequences of malnutrition are most serious.

Though the food distributed is donated by the United States government, these food products are always referred to as productos de CARE (CARE products) for two reasons: first, the packaging is written in English (and most people in Guatemala do not speak English) and, secondly, CARE distributes these products, not the U. S. government. The program itself is administered by local health officials and/or personnel. The beneficiaries receive eight pounds of food products per month per eligible individual. The products consist of two pounds of powdered skim milk, two pounds of CSM (corn-soy-milk powder), two pounds of wheat flour, one pound of rice-soy mix (high protein), and one pound (approximately one-half liter) of oil (peanut or soy). Rarely, however, do the beneficiaries receive the full amount because of insufficient supplies. Usually, they receive the maximum available, about six to seven pounds per person.

In order to receive the CARE products, each beneficiary has to comply with certain requirements:

1. Only pregnant and/or lactating mothers and children under six are eligible.

2. Nutritional, health and hygiene lectures and food preparation demonstrations precede the distribution of products, and attendance is required. These talks include such topics as child care and cooking, in an attempt to incorporate new ideas so as to improve nutritional status.

3. A nominal fee per beneficiary is charged for the products. This money is used to pay for transportation of the foodstuffs from the departmental capitol. Some of this money is used to buy necessary medical supplies such as syringes. The fee ranges from 10¢ per individual to 5¢ for each additional beneficiary in the same household.

4. Regular medical check-ups are required of all beneficiaries, the frequency depending upon age. This physical examination includes height and weight measurement.

On the basis of ethnographic observations, it would appear that the CARE program, at least in Patzite, is relatively effective. It reaches a great number of people (500 individuals) who desperately need assistance, be it food, medical and/or education. Immediate results in malnourished children can be seen and measured. The program may or may not be the "cause" for this improvement, but must be considered as a major factor. Similar results were observed in Honduras, according to May and McLellan (1972).

Several problems plagued this particular food program in Patzite in its early stages:

1. There was a lack of successful coordination and planning between the national, regional and local administrations.

2. A consistent timetable for the arrival of foodstuffs was non-existent.

3. Supplies, in general, were never sufficient.

However, after a change in administrative personnel at the top in CARE/Guatemala, in 1979, many of these and other problems were solved.

CARE programs at the local level vary greatly from place to place, although program directives are the same. The success or failure of any given program is generally due to a lack of consistent supervision, as well as motivation on the part of local officials and health personnel. Also, all of the problems noted above are further compounded by the lack of "official" support by the Ministry of Health and other government agencies in Guatemala. The support given by the Ministry was only nominal.

As a final note, there were reports of black marketing and profiteering of the foods provided via PL-480 in some specific areas. For most of Guatemala, however, this was not the case. These activities instead, tended to be very localized.

Summary

The purpose of this chapter was to examine the socioeconomic and political consequences of food aid in light of the hunger issue. Hunger is a serious global problem and one that seems to correlate significantly with the world's exponential population growth. However, as Hopkins and Puchala (1978, 1980) point out, population growth is not so much a factor as is unequal distribution of food resources and supplies. Two solutions to hunger, especially in the underdevleoped world, are usually proposed: the long-term solution is to initiate a "self-reliant/self-sufficient" agricultural development strategy which insures some sort of equitable distribution of resources and supplies. The short-term solution is food aid.

Since food aid and its consequences are the primary interests of this chapter, several criticisms of this form of assistance were

presented. As an explanatory technique, food aid was examined in light of the official United States food assistance program, PL-480 (Food For Peace). Then, for an appropriate example of an ongoing food program in action, a brief ethnographical account of one food program was presented.

One conspicuously absent, but very important consideration is the effect of food aid on nutrition and hunger. The majority of research done on food programs makes very little mention of the importance of food assistance to the nutritional well-being of the hungry. This probably reflects the interests of researchers in the social, economic and political ramifications of food aid. As a consequence, the majority of the literature is concerned with the nature of food aid in terms of dependency, as a political weapon or its effect on agricultural productivity and is more ideological than scientific in character. By examining the impact of food assistance on nutrition, these other arguments can either be substantiated or placed in a different perspective.

The primary function of food aid, whatever its political and social ramifications, is to alleviate hunger. This fact underscores the need for a scientific and systematic evaluation of the consequences of food aid in terms of this primary purpose. In the case of PL-480, aside from all of its shortcomings, Wiseberg (1976: 114) states:

> It is true that PL-480 food feeds hungry people and can be the critical determinant between life and death.

With this in mind, it seems that the ultimate question, in determining whether food aid is a viable tool in combating hunger, which needs to be answered is: Does the dnoated food help to improve the nutritional

status of its recipients? If it does not, then, it cannot be justified in terms of its primary objective.

Many developmentalists contend that the solution to hunger and malnutrition is the development of agriculture. Yet, food aid, despite all of its negative consequences, is considered to be necessary by many (Christenson 1978; Hopkins and Puchala 1980) to meet the immediate nutritional needs of the malnourished. Maletnlema (1978: 316) states an interesting Third World view as follows:

> Donated foods are unacceptable, in principle, as a means of solving the malnutrition problem. We believe in the Chinese saying: 'Give a man a fish and you feed him for a day, but teach a man how to fish and you feed him for life.' There are, however, times when donated foods are essential: while one is learning the art of fishing one must eat.

The point made here is that without successful short-term food aid programs, the long-term solutions to malnutrition are not viable.

In conclusion, the justification for food aid is ultimately based on the general assumption that adequate nutrition is a human right, as noted by Hopkins and Puchala (1978). Food aid should serve as a guarantee to that "human right". Famine is a global problem and, as such, it should be responded to multinationally. Being a multinational effort and by providing food aid multilaterally, its political nature is removed. Political ideology is less likely to be the determinant of who is eligible and who receives assistance if food aid is managed at the international level. Furthermore, the recipient country is more likely to maintain its independence economically under such conditions. Food aid should be so organized that only the social and nutritional aspects are left as main considerations

for determining participation. This is the reason the Food and Agriculture Organisation of the United Nations believes that food aid needs to be multilateral in its donations, control, administration and implementation in order to most effectively combat hunger.

FOOTNOTES

[1]Bread for the World is a political lobby which is a coalition of religious organizations whose interests include hunger and poverty.

[2]The minimum caloric intake necessary to maintain the average man is 2,700 calories daily, while for a woman it is 2,000. This figure probably refers to those individuals who only have access to an amount of calories less than the minimum. (This is the reason for the designation of hungry instead of starving.)

[3]For the purposes of this study and given the type of food aid found in Guatemala, Title III was not included in this text. Title III was written into the revision of PL-480 legislation in 1977 (Lappe, Collins and Kinley 1981). Its purpose is:

> to increase the access of the poor in the recipient country to a growing and improving food supply through activities designed to improve the production, protection, and utilization of food, and to assist the well-being of the poor in the rural sector (from J. E. Baker in Culver and Yetley 1980:104).

The aid provided under this title is tied to Title I in that it is a constraint placed on the recipient country by the U.S. as a prerequisite to receiving Title I.

CHAPTER IV

AN ETHNOGRAPHIC OVERVIEW

The purpose of this chapter is to present briefly the socio-cultural, economic, political and environmental context in which this investigation was conducted. This ethnographical background should aid in understanding the results of the analyses of the data collected on food programs. The first section is concerned more specifically with Guatemala, including the physical environment as well as a brief description of its historical, political, economic and sociocultural nature. The second section examines in more detail the two regions which are the foci of this study: San Lucas Toliman and San Martin Jilotepeque. Ethnographic data from each of these regions are presented so as to provide some comparisons. Finally, the third part of this chapter contains a description of food programs found in these two regions at the time of the implementation of the present research. This discussion hopefully will give some insight as to similarities or dissimilarities exhibited by the different programs being studied.

Guatemala

In area, Guatemala covers approximately 42,000 square miles and is roughly the size of the state of Ohio. The topography of Guatemala includes two major mountain ranges, the Sierra de los Cuchumatanes and the Sierra Madre, which run east-west. Aside from these mountain ranges, there are also at least 36 volcanoes, many of which are "alive,"

running parallel to the Pacific coast. Three river valleys extend to the Caribbean coast.

There are basically five regions which are geographically defined and which support very diverse ecologies and environments: 1) the Western Highlands, 2) the Pacific South Coast, 3) the Eastern Plateau, 4) the Caribbean Lowlands, and 5) the Peten Lowlands. The northernmost section of Guatemala, known as the Peten, is primarily a semi-rainforest with a hot, wet climate. This tropical environment is also found in the Caribbean Lowlands as well as in the narrow strip of coastal plain lying along the Pacific coast. It is in these latter two areas where the vast majority of the commercial export-agriculture is based. On the other hand, the Eastern Plateau, better known as El Oriente, is characterized by a relatively drier, semi-arid environment. It is in the Western Highlands, referred to as El Altiplano, where approximately three-fourths of the total population of Guatemala lives, that there is the greatest environmental variability with elevations in some areas reaching over 3,000 meters. In general, the climate of Guatemala varies greatly with the altitude, with cool temperatures in the highlands and hot, tropical temperatures in the lowlands. Most of Guatemala experiences distinct wet and dry seasons, each lasting about six months, though in the lowlands, rain is common throughout the year.

According to the 1973 census, Guatemala recorded a population of some 5,160,221, however, present estimates run about 7 million. Being an ethnically "pluralistic society", approximately 45 percent of the total population is classified as Indian, while the remainder is Ladino.

Of that 5,160,221 people, 1,878,198 reside in urban areas while the rest (3,282,030) live in the rural areas. Nearly 60 percent of that population of Guatemala is classified as rural, pointing out that Guatemala, though experiencing rapid urbanization (approximately 1+ percent net rural-to-urban migration annually), is presently a rural-oriented country (World Bank 1981).

In the 1973 census, the population of Guatemala City was estimated to be about 890, 026 (currently estimated to be about 1.2 million). This figure represents 47.3 percent of the total urban population and almost 20 percent of the total national population. This demographic distribution has been described by Roberts (1973) and Smith (1976) as being an urban primate system. (See Table 1 and Figure 1). As a result of this hyper-urbanization, a significant proportion of the national resources are funneled into Guatemala City, creating an imbalance in the social, economic and political systems.

Guatemala's history extends back more than 2,000 years, the evidence of which is impressively exhibited in the abundant monumental architecture found at such archaeological sites as Tikal, Kaminaljuyu and Iximche, to name but a few. The descendents of these ancient Mayan Indians still comprise a significant part of Guatemala's heritage. It was in 1523 that Pedro de Alvarado, a lieutenant under Cortes, with 300 Mexican allies invaded the land now known as Guatemala. This colony, which originally encompassed all of present-day Central America, was called the Kingdom of Guatemala. It was not until 1821 that Central America declared independence from Spain and it was not until 1839 that the Republic of Guatemala as an independent

political entity was formed. Since then it has been plagued by political instability, resulting in numerous changes in the government. Examples are numerous with the most famous coup d'etat occurring in 1954, with the overthrow of the Arbenz government. For an excellent description of the history of the political system of Guatemala, see Adams (1970).

As mentioned earlier, Guatemala's population is comprised primarily of two ethnic groups: Indians and Ladinos. If used in the broadest sense, Ladino simply refers to that part of the population which does not adhere to traditional Indian beliefs or wear Indian dress and which speaks Spanish as their native language. This term no longer implies genetic inheritance as it once did, but rather socioculturally defined ethnicity, as pointed out by Carmack (1970: 88):

> It should also be clear that the distinction between the two is no longer "racial", for many Indians have become Ladinos; indeed, whole villages formerly known to be Indian have become Ladino (a process known as "transculturation").[1]

Historically, though, the term Ladino has been used to designate a racial group composed of mixed Indian and Spanish ancestry (Dombrowski et al. 1970). Various definitions of Indian and Ladino can be found in Adams (1970), Roberts (1973) and Tax (1941).

Linguistically, aside from the official national language of Spanish, there are 17 major Indian languages spoken, including Quiche, Cakchiquel, Mam and Kelchi. These 17 Indian dialects correspond consistently with the different major Indian sub-cultures.

Among the Indians, there are several agricultural rituals which have probably been practiced for a thousand years, though significantly

TABLE 1

Rank Order of the Twenty Largest Cities in Guatemala, Showing Population[1]

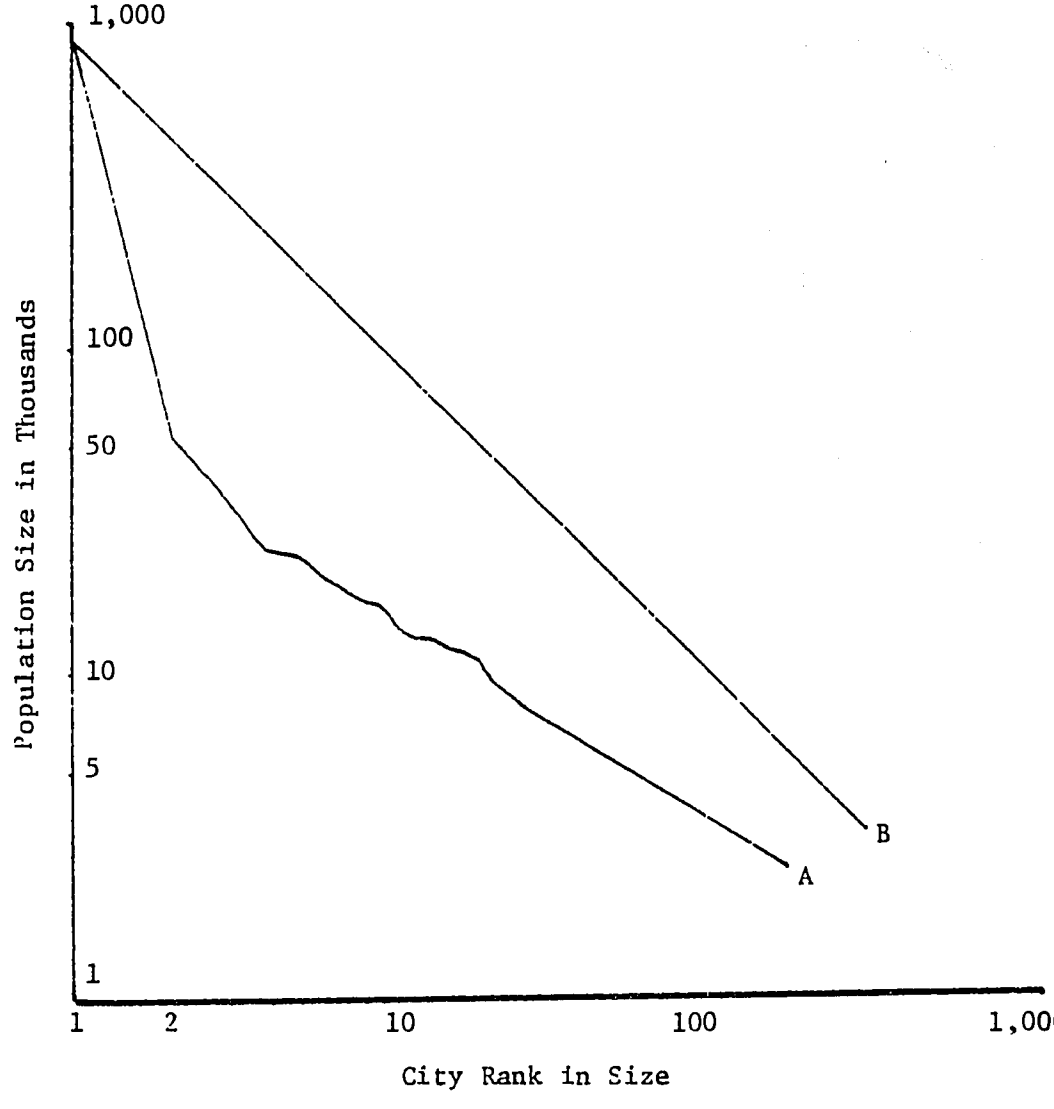
No.	City	Population
1.	Guatemala City[2]	890,026
2.	Quezaltenango	53,021
3.	Escuintla	33,205
4.	Mazatenango	23,285
5.	Puerto Barrios	22,589
6.	Retalhuleu	19,060
7.	Antigua Guatemala	17,994
8.	Chiquimula	16,126
9.	Coatepeque	15,979
10.	Jalapa	13,788
11.	Chimaltenango	12,860
12.	Zacapa	12,688
13.	Huehuetenango	12,570
14.	Santa Lucia Cotz.	11,998
15.	Coban	11,418
16.	Santiago Atitlan	11,416
17.	Comalapa	10,980
18.	San Pedro Sac.	10,874
19.	Tiquisate	9,658
20.	San Jose	9,402

[1]These figures are taken from the 1973 Guatemalan census.

[2]Guatemala City includes Mixco, Villa Nueva, Chinautla and Amatitlan for reasons that they are presently appendages of the capitol city (Adams 1970).

FIGURE 1

Rank-size Distribution of Guatemalan Cities[1]



A Rank-size distribution of cities by size for Guatemala

B "Ideal" distribution of cities by size according to rank-size rule

[1] Note that this graph is based on a logarithmic scale.

modified. However, more important is the formal institution of religion and the religious structure found in each community, which incorporates religious, civil and political functions and, as Dombrowski et al. (1970) and others (Carmack 1970) point out, influences both the economic and sociocultural life in these villages by maintaining traditional customs. Its primary function is to bind the community into a cohesive society. This religious structure among the Indians is called the cofradia, a religious brotherhood. It is mainly in charge of the town's patron saints and fiesta titular, a municipal celebration conducted once a year honoring the town's patron saints. (See Reina 1967 for a more detailed account of the role of the fiesta titular and the cofradia.)

It has been estimated that at present more than 95 percent of the total population of Guatemala is Roman Catholic, even though there is still a "considerable native syncretism," according to Dombrowski et al. (1970). There is a recent movement afoot by the Catholic Church, which is generally referred to as Catholic Action, in an attempt to combat this assimilation of traditional beliefs into Catholicism. In some towns, the Catholic Church has banned the rituals surrounding the patron saints, as conducted by the cofradia, and even refuses to participate in the towns' fiesta titular.[2]

Politically, Adams (1970) describes an essentially binary power structure in Guatemala which is fundamentally divided along ethnic lines, with Ladinos controlling the political power. As he and others (Martinez-P. 1975; Carmack 1970) demonstrate, this structural relationship has its basis historically in the encomienda which was instituted at the time of the Conquest. During the early years of

the Colonial period, the Indians were awarded to the conquistadores, the Spanish, in grants called the encomiendas. Under this system, the Spanish were to convert the Indians to Catholicism in exchange for labor or monetary tribute. Gibson (1966) contends that the encomienda was merely "a device for transferring Indian wealth to Spanish hands, in a procedure that was more orderly than outright looting of spoils." Even though officially abolished in 1542 as the result of widespread abuses, this system continued throughout the Colonial period and was "the model for forced labor systems imposed on the Indians by succeeding governments" (Dombrowski et al. 1970), only to be called by a different name.

The present national economy of Guatemala is primarily based on export agriculture which includes coffee, cotton, sugar, bananas and beef, respectively, while it imports such consumption goods as foods, clothing, domestic appliances, automobiles and medicines, as well as intermediary goods and raw materials (Dombrowski et al. 1970). Imports exceed exports, creating an unfavorable balance of trade. Approximately 65 percent of the total labor force of Guatemala is employed in or engaged in agriculture. However, there is some light industry which is almost exclusively concentrated in Guatemala City.

Guatemala's economic system has been described as typical "dual economy" (Roberts 1978). This dual economy refers to the presence of formal and informal sectors in the economic structure. The formal or modern economic sector is based on capital-intensive activities and capital accumulation (McGee 1971). For Guatemala, Roberts (1978) uses the notion of the "size" of activity in defining the modern

sector. However, the real emphasis in the literature on dual economies is concentrated on the informal economic sector, since it is the people who participate in this sector that are the focus of these studies. For Asia, Geertz (1963) terms these "informal" activities, part of the "bazaar" economy, as being characterized by: 1) a large number of small, independent entrepeneurs, 2) extremely competitive, 3) intensive-labor oriented, 4) minimal risk, 5) tertiary location, and 6) lack of capital accumulation. Murphy (1979) used income and the presence of fringe benefits, such as health insurance, to define the different economic sectors. Generally, though, the informal sector is analogous with "traditional" economic activities or systems, and is usually used to refer to indigenous economic activities. However, it is clear that in the urban context, particularly in Guatemala, the informal sector is not dominated by these traditional activities, but utilizes modern technology. Roberts found that in Huehuetenango, Guatemala, only about 10 percent of the labor force employed in the urban informal sector were involved in what can be classified as "traditional" activities.

It is perhaps more descriptive to say that Guatemala has three economic sectors: 1) the formal sector, being limited almost exclusively to the primary and secondary urban centers, 2) the informal sector, located throughout the country generally including such activities as shoeshining, transportation, etc., and 3) the traditional sector, being bound particularly to domestic consumption-production for household use, usually limited to the rural hinterlands.

More specifically with respect to the overall economic system, Dombrowski et al. (1970), Adams (1970) and others point out that regionally Guatemala exhibits provincial separation and this separation is characteristic of the sociocultural, religious and political systems as well. Also, this division appears to be even more firmly rooted at the local level. As Carmack (1970; 1980) and Fox (1978) note in the Western Highlands, every village and its rural hinterland, has economic specialties which might include certain handicrafts such as weaving, crops such as wheat, or labor. Furthermore, information from the Popol Vuh suggests that this "specialized community production" was probably instituted long before the Conquest and these regionally produced goods or functions were used to support a larger urban system, even in pre-colonial times. From these urban centers, goods and services were redistributed back to other communities (Carmack 1980). Presently, for example, the primary good produced in Patzite, El Quiche, is pottery, whereas in Chimente, Totonicapan, it is furniture (Rodeheaver and Rodeheaver 1980). As a result, there is considerable exchange which takes place between the various communities and, in this case, Santa Cruz del Quiche (the provincial capitol of El Quiche) serves as the meeting ground for trade and interaction between these different communities.

There is a trend throughout much of Latin America, including Guatemala, for the primate city and the associated formal economy to develop at the expense of the other urban centers and the rural hinterlands. In a historical context, Portes and Walton (1976: 21) summarize this rural-urban relationship:

> While the Spanish and Portuguese colonial rules emphasized the city over the countryside, they provided existing cities with a measure of economic autonomy. Each served as a commercial center for a vast hinterland and maintained (legal or illegal) contacts with the outside. Concentration of urban development in a few cities gradually stripped the remaining ones of their economic autonomy. While they continued to grow they came to depend more and more on the directives from the primary cities. The economic and social orientation of most cities toward their own hinterland gradually changed as they became functional appendages of the enterprises and authorities centered in the capitol. ...The economic and social evolution of Latin American cities never deviated markedly from the general directions set in colonial days.

This historical trend, combined with the process of primate urbanization, developed into what Carol A. Smith (1976: 256), while describing Western Guatemala specifically, calls: "...a regular central-place system made up of smaller systems that are both different from one another and different from the high-level organization of the larger system," not to mention their independence from each other. She further believes that the development of Guatemala City is dependent upon the underdevelopment of the other regions, in that "...the whole tendency of the region-wide system is to feed back into the growth and economic power of the top-heavy system." (Smith 1976: 261) Given this urban-rural relationship between Guatemala City and the rest of the country and the absence of a formal economic sector, infrastructure and services in rural areas, specialization in the goods produced in each particular rural area becomes more pronounced. What results is either specialization in export oriented agriculture or in subsistence agriculture.

The National Health and Nutritional State

As of 1973, the average life expectancy of a Ladino male in Guatemala was 61 years and for a Ladino female, 60 years, whereas for an Indian male it was 45 years and for an Indian female, 44 years. The mortality rate of all Guatemalans generally runs around 1.4 percent, with an infant mortality rate of approximately 4.63 percent and neonatal rate of 0.95. The principal causes of death include: 1) acute respiratory infections (e.g. tuberculosis); 2) diarrheal syndrome, perinatal mortality, intestinal parasitism, acute deficiency diseases (particularly vitamin A), infections of the respiratory apparatus, cancer, senility and whooping cough (the last four being especially prevalent in Guatemala City); and, 3) general malnutrition (this being particularly true in the rural areas).

With respect more specifically to nutrition and nutritional status in Guatemala, as of 1973 the total population under the age of five years was 986,222. Estimates of chronic nutritional status with respect to this population are: 1) nutritionally well, 18.6 percent (183,437), 2) mild malnutrition, 49 percent (483,249), 3) moderate, 26.5 percent (261,349), and 4) severe, 5.9 percent (58,187). INCAP (1971) conducted nutritional surveys throughout Guatemala and found the basic diet to be sufficient in calories, iron, calcium and vitimin C. However, nutritional problems generally include: 1) protein deficiency, 2) vitamin A deficiency, 3) riboflavin deficiency, and 4) nutritional anemias. After INCAP's 1971 study, vitamin A was introduced into the Guatemalan diet by commercially supplementing it in sugar. It has been suggested that most of these nutritional and health problems could be prevented with proper diets, more adequate

shelter, better health practices and potable water (Jelliffe 1966). Ethnographic evidence suggests that the solution to most of these problems, however, is a socioeconomic one (Rodeheaver and Rodeheaver 1980).

Besides malnutrition and rapid urbanization, there are many other problems which plague Guatemala and reinforce each other. One such problem is education. In Guatemala, the literacy rate falls between 30 and 40 percent, with an average level of education being the second grade. Finally, there is a relatively severe problem with respect to nutrition, as more than four-fifths of the population exhibits malnutrition of some degree. Berg (1973) indicates that education seems to play an important role in avoiding general nutritional problems, suggesting that Guatemala's low literacy rate may be a source of aggravation.

One way to summarize the sociocultural situation in much of rural Guatemala is to think in terms of the stresses or pressures placed on the biocultural system of the traditional Mesoamerican village because of its position in the world-system. Johnston and Selby (1978) and Selby and Garretson (1981) identified at least four sources of stress: economic, environmental, demographic and sanitational. On a world-systems scale, worsening economic conditions are severely felt in agricultural-export economies such as those on which people in Guatemala depend for income. Average daily wages in 1980 were about 1.75 dollars and, with the fall in coffee prices, people were finding it more and more difficult to generate enough income to feel themselves.

Environmentally, Guatemala is slowly becoming a desert wasteland as the result of deforestation because of population growth and growth

in export agriculture. As a consequence of deforestation, rainfall patterns have been interrupted (Johnston and Selby 1978), causing not only ecological uncertainty, but disruption in the sociocultural system because of environmentally forced migration into the cities. This uncertainty in the ecological or environmental conditions further results in the underproduction of food.

Population pressures have also intensified. Dombrowski et al. (1970) note that the mortality rate in Guatemala has dropped significantly over the last 30 years, from a mortality rate in 1950 of 2 percent, to 1.68 percent in 1965 and, presently to about 1.4 percent. Add to this the increasing birth rate (3.6 percent in 1973) and it becomes evident that there is significant stress on the resources from over-population.

Most of these traditional Mesoamerican villages tend to be very unhealthy places in which to live, with relatively non-existent sanitation facilities. The major result of poor sanitation is disease, which operates synergistically with malnutrition, creating a very poor quality of life.

The end result of these stresses or pressures is a very poor state of health and nutrition. Selby and Garretson (1981) also note that cultural factors, too, are very important in determining the nutritional state of an individual or population. For example, they state (336): "Ethnographic studies of Mesoamerican families have shown that food is diverted to those members who contribute most to its economic state and away from the noncontributors (children)." Ethnographic data from Patzite, El Quiche, Guatemala support this

contention (Rodeheaver and Rodeheaver 1980). In conclusion, not to consider all of these aspects of Guatemala's sociocultural, economic and political nature, as well as its history, would be to ignore the important variables or factors involved in the socioeconomic and nutritional outcome for its people.

Site Descriptions

The following section presents some ethnographical background on the sites used in this study in order to provide a better understanding of the context of the survey data and of important factors present in this context that determine nutritional status. This section will include brief descriptions of both San Lucas Toliman and San Martin Jilotepeque, the two towns chosen for this study.

San Lucas Toliman

San Lucas Toliman, located in the Guatemalan administrative department[3] of Solola, is situated on the southwest corner of Lake Atitlan, the south end of which is bordered by four volcanoes: Atitlan, Toliman, San Pedro and Santa Clara. The lake itself is located at an elevation of approximately 1,550 meters above sea level, with an approximate depth of more than 376.3 meters (1,129 feet). The volcanoes are part of a chain which runs in a northwesterly to southeasterly direction, parallel to the Pacific coast.

San Lucas Toliman is just one town in a network of villages which ring the lake's edge. Prehistorically, the lake provided both a source of commerce and food production through fishing. However, due to a combination of overfishing, a delicately balanced ecology[4] and

more recently, the introduction of "black bass," a very aggressive predator which fed out the native species of fish, the fishing industry has all but disappeared (Farrell 1977; Woods 1968). The production of coffee and tourism have supplanted fishing as the major commercial activity. Subsistence agriculture based on corn and beans remains important as a major occupation for most of the people residing along the shores of the lake, as is the case in most of Guatemala.

Lake Atitlan, aside from being a very popular tourist attraction, is the "crossroad" or point at which the Guatemalan highlands join the Pacific south coast. A great deal of the migratory labor for commercial agriculture on the Pacific south coast is funneled through this area. San Lucas Toliman, itself, is only one kilometer from the departmental highway which connects the coast and the highlands and, as such, is a primary migration stop for people working on the fincas, or plantations located in the Pacific lowlands.

Historically, little is known about San Lucas Toliman prior to 1930, at which time the town's records were destroyed in a fire (Farrell 1977). However, Lothrop (1933) noted that there are archaeological remains which can be associated with the town. Farrell (1977) suggests, on the basis of what little historical data there is, certain linguistic features (Tax 1937; McBryde 1947) and some ethnographic data, that San Lucas was probably a sparsely populated "outpost" of Santiago Atitlan, a present-day neighboring Tzutuhil speaking community.

However, more important in San Lucas Toliman's history with respect to present-day conditions was the introduction of coffee during the mid-nineteenth century, and later, in 1884, as a result of

the emphasis placed on increased coffee production by then Guatemalan President, Rufino Barrios. Farrell (1977: 43) notes that one result of this national interest in the town of San Lucas Toliman was a "large migration of Cakchiquel speakers from Solola...to take advantage of employment generated by the introduction of coffee." San Lucas was already located on the geopolitical boundary between the Cakchiquel and the Tzutuhil, but since then, because of the impact of coffee and the resulting migration, San Lucas Toliman has become predominantly Cakchiquel.

The central town, San Lucas Toliman, administrative center of the municipio (roughly equivalent to a U.S. county) by the same name, is found at an elevation of approximately 1,591 meters (5,170 feet) above sea level. The highest point in the municipio reaches an altitude of 2,231+ meters (7,251 feet), while the lowest point is about 1,500 meters (4,875 feet). San Lucas is located at the latitude of 14° 36' 60" north and at the longitude of 91° 08' 31" west of the Greenwich Meridian.

Because of the altitude and the geographical situation, San Lucas Toliman, as well as most of the other villages which ring Lake Atitlan, enjoys a moderate climate and temperature. It is usually cool at night and warm in the daytime, with low temperatures rarely falling below 10°C (approximately 50°F) and highs rarely above 27°C (80°F), characteristic of all the lake area. In 1977, recorded meteorological data placed the lowest temperature at 11.4°C and the highest at 24.7°, creating very comfortable living conditions for both the residents and tourists.

As is the case for most of Guatemala, San Lucas undergoes two major weather changes annually: summer, which is characterized by dry conditions, and winter, which is characterized by significant amounts of rainfall (i.e. the rainy season). Summer includes the months of November to April with high temperatures reaching nearly 28°C and low temperatures around 11°C. Winter, including the months of May through October, has highs of 25°C and lows generally about 13°C. Rainfall during the summer rarely exceeds 182.7 millimeters total, whereas in winter, total precipitation levels can reach more than 548.1 mm (Anuario Estadistico 1977). During the rainy season, the rains tend to come in the afternoon.

San Lucas Toliman has a population which has been described as ethnically pluralistic (Nash 1966; Colby and van den Berghe 1969), in that there are two major ethnic groups: Indians and Ladinos. Table 2 presents the ethnic breakdown of the population of San Lucas Toliman, as well as its makeup geopolitically and according to sex. From the latest census data available (1973), there were approximately 8,362 inhabitants of San Lucas, with Indians comprising about 87 percent and Ladinos, 13 percent. Whereas Indians are almost evenly represented in both the urban and rural areas, the vast majority of Ladinos, over 80 percent, live in the urban center of San Lucas. As an interesting note, Woods (1968) states that as of 1950 about 27 percent of the Ladino population were not native born, whereas only 6 percent of the Indian population were born elsewhere.

The basic diet of both the Indian and the Ladino of San Lucas Toliman, as is the case in all of Guatemala, includes primarily black

TABLE 2

The Population of San Lucas Toliman Classified According to Urban-Rural Residence, Ethnicity and Sex.[1]

	Total	Urban	Rural	Indian	Ladino	Male	Female
Total	8,362	4,532	3,830	7,269	1,084	4,218	4,144
Urban	4,532	-	-	3,653	871	2,237	2,295
Rural	3,830	-	-	3,616	213	1,981	1,849
Indian	7,269	3,653	3,616	-	-	3,674	3,595
Ladino	1,084	871	213	-	-	539	545
Male	4,218	2,237	1,981	3,674	539	-	-
Female	4,144	2,295	1,849	3,595	545	-	-

[1]The data for this table is taken from the 1973 Guatemalan census (Censo 1973: 10). Also, note that there is missing information on nine individuals, eight urban and one rural.

beans and corn tortillas, supplemented by coffee, sugar, dry white cheese and such fruits as bananas. Other less important articles in the diet are certain native vegetables, such as the guisquil, aposote and pacaya, and wild greens and roots, such as ichintal, particularly in the Indian diet.[5] Meat tends to be more common in the Ladino diet. The cost is prohibitive to most of the Indians because of their lower socioeconomic levels.

Coffee production for the purposes of international export continues to dominate the economy of San Lucas Toliman. Because of the very attractive environmental and climatic conditions of San Lucas, coffee became the primary source of income for the local people. The coffee industry, however, is still dominated by foreign investors of non-Guatemalan orgins. As a result of the success of coffee, today there are ten coffee fincas or plantations within the township's boundaries.[6] The labor force of these fincas resides there year-round and they are descendents of the earlier migrants from the other villages along the lake (Farrell 1977). Probably the most important result of this economic system of export, cash crop agriculture, is that is has almost completely supplanted the previous economic system that was traditionally oriented.

Woods (1968) estimated that over 75 percent of the males in San Lucas work in agriculture as a primary occupation, with most being at least nominally involved in the production of coffee. Farrell (1977) found that at least 42 percent of all male household heads have an average of one acre planted in coffee. Therefore, the local economy and income earnings are subject to fluctuations in the world market

price of coffee. This inconsistency affects both the small farmer and local businessman.

As to the significance of the role that coffee plays in the socio-economic system and the daily lives of the people of San Lucas Toliman, Farrell (1977: 50) states:

> ...the behavioral consequences of pursuing a coffee strategy has been an overall increase in cash availability, permitting greater expenditures on non-essential product goods and services, as well as on the traditional vehicles of prestige and status (i.e., the cofradia).

Aside from its newfound connection to the world export agricultural economy, San Lucas is in most respects a traditional Mesoamerican village. Cakchiquel, a Mayan dialect, is the principal language of San Lucas; although at least 89 percent of the Indian men and 65 percent of the Indian women over the age of 14 have a basic knowledge of Spanish. Many of the Ladinos, likewise, can speak some Cakchiquel (Woods 1968). Woods considers this to be a "modified" Cakchiquel dialect. However, this modification of the language can probably be best explained in terms of the history of San Lucas, where in the past, some investigators have defined the San Lucas Maya-speakers as Tzutuhil (Lothrop 1933; Tax 1937). There is another aspect of Mayan languages and communities that must be considered with respect to regional variations. As is the case in all of the Western Highlands, dialects within a particular Mayan language, for example Cakchiquel, are distinguishable by community. Each community has its own peculiarities of vocabulary.

Aside from language, another ethnic difference which characterizes Guatemala's pluralism is dress. In Guatemala, this distinctive feature

is associated with the type of traditional clothing that is worn exclusively by Indian populations. For Indian males in San Lucas, the traditional dress includes knee pants made of red and white striped cotton, generally with animal figures embroidered on the pant legs. The shirt is relatively simple in design and the colors are variable. Finally, there is a large cloth belt (faja) and a short, dark blue wool jacket. However, traditional dress for Indian males has been mostly discarded for the more modern or "western" dress which is worn by the Ladino population. Traditional dress for Indian women includes the huipil, a simply cut blouse with red and white stripes. Also, there is the corte, a wrap-around skirt, and an elaborately designed faja covered with animal figures. But, as Sol Tax noted, by 1937 most of the Indian women had already replaced the original handwoven huipil with a modern, less expensive one, probably because of the prohibitive costs of the handwoven blouses.[7]

The predominant religion in San Lucas Toliman is Roman Catholicism; but, Catholicism in Highland Guatemala can be described as being comprised of two entirely separate domains: the traditional, which is characterized by the level of traditional Mayan beliefs integrated into the religious system and the more formal, as expressed by Accion Catolica (Catholic Action).

More specifically with respect to the role of religion in the daily lives of the people of San Lucas Toliman, Nash (1969) points out the important function of the fiesta titular, also known as the patron saint's day. Life in most Guatemalan villages centers around this festive holiday whether or not people follow the traditional ways. The fiesta provides a release valve for people who have spent

a year working without a holiday. The traditionalists are responsible for the execution of this fiesta. However, most people participate if only as spectators. The central religious order or hierarchy, the cofradia, is in charge, not only of the coordination and conducting of these religious celebrations, but also caring for the image of the patron saint, the preparation and dressing of the saint prior to the exhibition during the fiesta and the carrying out of religious rites designed to appease these saints.[8] Furthermore, they are responsible for financing the fiesta titular. These celebrations can be very expensive and drain off considerable money that otherwise would be available to improve level of living. (See Cancian 1967 for a more detailed description of the cofradia and fiesta titular.)

Catholic Action was initiated by Catholic priests in the 1940's in an attempt to draw much of the religious support away from the cofradias and to increase the influence of priests in the various communities (Adams 1970). There are many reports of priests demanding, during the fiesta, that church members ignore the festivities. Rarely, however, do they receive much support during these two weeks of celebration.

What complicates the religious situation even more is the fact that many of the members of Catholic Action also participate in the cofradia. In addition, the Protestants or evangelicos are rapidly becoming a major force in San Lucas, even though the traditionalists still far outnumber them (Farrell 1977).

The final aspect of the "world" of the people of San Lucas Toliman includes what might be referred to as the political system and the

community infrastructure. Community services include a national government sponsored Centro de Salud, or health center, from which "western" medicine is dispensed. Non-western medicine is, however, still practiced by the curanderos, or local folk doctors. Also, servicing the urban center of San Lucas are a non-potable water system, a common marketplace, electricity, one telephone, telegraph and postal service, and a public transportation system. There are recreation facilities, a small library and an urban school which has six grades. The local government is made up of an alcalde, or mayor, and six regidores, equivalent to aldermen, all of whom are elected, as well as a federal government appointed secretary and a small police force which is supplied by the National Police.

In summation, San Lucas Toliman is a town which, because of its location, depends on export agriculture as the basis of its economic system. Its social system is generally determined by its ethnic and religious plurality. As a final comment, the power and/or political structure is dominated by the Ladinos, who also control the economic system as well. In general, Indians are outside the economic and political mainstream and their socioeconomic levels as a group reflect this. They do, however, control the informal, traditional religious system.

San Martin Jilotepeque

San Martin Jilotepeque, situated in the administrative department of Chimaltenango, is the more isolated of the two sites selected for this study. It is connected to the rest of Guatemala by a steep winding dirt road which intersects with the Pan American Highway in

Chimaltenango. The transportion system, commuting buses and commercial trucks, and the communication system, a telegraph line, link San Martin to the departmental capitol and, thus, to the other cities and villages of Guatemala. Located in the central highlands of Guatemala on a plateau, the terrain of San Martin Jilotepeque and its surrounding hinterland is mountainous with dramatic changes in altitude, extending from about 700 meters to approximately 2,000 meters.

According to The Annals of the Cakchiquel, a native manuscript written shortly after the Conquest, the indigenous political system of the Cakchiquel was deteriorating because of the political rivalry with the Quiche, an endemic situation which resulted in local sociopolitical problems. As a result of this crisis, the Spanish easily conquered the Cakchiquel by 1530 (Skjorshammer 1979). Subsequently, by 1540 these newly conquered peoples were gathered into new settlements and forced to labor for their Spanish conquerers, building their cities and working their agricultural fields. The town of San Martin Jilotepeque was founded in 1545 when the Indians of the community of Xilotepeque were forced to move there. This move was designed to facilitate the encomienda (Martinez-P. 1975).

Eventually, this encomienda system gave way to repartimiento and, later, to a form of forced labor, the debt peonage system. (Detailed descriptions of these systems can be found in Martinez-P. 1975.) Because of this debt peonage labor system, many of the Indians of San Martin were forced to migrate seasonally to work on coffee plantations. It was not until 1930 that then Guatemalan President Ubico abolished debt peonage (Dombrowski et al. 1970; Martinez-P. 1975). Prior to

that, from 1884 until 1920, over half of all the male heads of households from San Martin migrated to the coast to harvest coffee (Adams 1978), making San Martin a major supplier of agricultural labor. Excellent historical discussions of San Martin can be found in Adams (1978) and Skjorshammer (1979).

The town of San Martin Jilotepeque, located 21 kilometers southeast of the departmental capitol of Chimaltenango, is situated at an elevation of approximately 1,785.6 meters (5,803 feet) above sea level. Its area contains 251 square kilometers, in which the topography varies greatly, ranging from elevations of about 700 meters in the Motagua River valley to over 2,000 meters along the mountain ridge which separates San Martin fom Comalapa. As a result of this dramatically varying terrain, the climate, rainfall and ecology also differ significantly. Furthermore, the municipio of San Martin Jilotepeque is physically defined from the neighboring municipios of Comalapa, San Jose Poaquil, San Juan Sacatepequez, Joyabaj and Chimaltenango by such geological features as the Motagua River and mountains. Not only is San Martin physically isolated from its neighbors, but for the same reasons mentioned both under the discussions of Guatemala and San Lucas Toliman, it is also very distinct culturally (Adams 1957).

Because of this geographical and climatic variability, the annual average temperatures range from a high of about 29.5°C (about 85°F) to a low of about 6°C (approximately 42°F), depending upon the specific location in the municipio. The meteorological record for the town of San Martin during the year of 1977 indicated an annual average high temperature of 21.7°C (72°F) and a low of 8.2°C (47°F), whereas there

are some 60 days a year in which more than 655 millimeters of precipitation fall.

As noted in the discussion of San Lucas Toliman, San Martin also undergoes two major seasonal weather changes designated as summer and winter. Summer,often referred to as the dry season, is primarily limited to the months of November through April at which time there is an average high temperature of 21.6°C and a low of 6.6°C, whereas in winter, May through October, the high temperature reaches 21.8°C and the low, 9.8°C. It is during the winter, also referred to as the rainy season, that the great majority of precipitation falls, with more than 613.3 millimeters being recorded within a period of 54 days (Anuario Estadistico 1977). On the other hand, during the summer it rains only an average of six days with a total of 40.9 millimeters.

The town of San Martin is a bi-ethnic community as is the municipio, being made up of Indians and Ladinos. Table 3 presents the breakdown of the population of San Martin Jilotepeque ethnically, geopolitically and according to sex. From the latest available census data (1973), there are approximately 33,066 inhabitants in the entire municipio of San Martin, with Indians comprising 85 percent and Ladinos, the remaining 15 percent. One surprising statistic that comes to attention is that only eight percent of the Indian population of San Martin lives in the urban center, whereas over one-third of the Ladino population resides there. With respect to the ethnic makeup of the urban center of San Martin Jilotepeque, approximately 57 percent is Indian while the remaining 43 percent is Ladino. Skjorshammer (1979) suggests that this could be explained historically as being related to the repartimiento labor system.[9]

TABLE 3

The Population of San Martin Jilotepeque Classified According to Urban-Rural Residence, Ethnicity and Sex[1]

	Total	Urban	Rural	Indian	Ladino	Male	Female
Total	33,066	3,770	29,296	28,099	4,943	16,464	16,602
Urban	3,770	-	-	2,133	1,631	1,708	2,062
Rural	29,296	-	-	25,966	3,312	14,756	14,540
Indian	28,099	2,133	25,966	-	-	14,044	14,055
Ladino	4,943	1,631	3,312	-	-	2,409	2,534
Male	16,464	1,708	14,756	14,044	2,409	-	-
Female	16,602	2,062	14,540	14,055	2,534	-	-

[1]These data come from the 1973 census (Censo 1973: 70). Note that there is missing information on 24 individuals, 6 urban and 18 rural.

Also, as noted in the description of San Lucas, the basic diet of the Indian and Ladino of San Martin is composed primarily of black beans and corn tortillas, with supplements including coffee, sugar, dry white cheese and such fruits as banas, depending upon the season.

As in San Lucas Toliman, the principal language besides Spanish is Cakchiquel-Maya. At present, approximately 85 percent of the Indian male population and 65 percent of the Indian female population can speak a minimal amount of Spanish. As for dress, the second major visible ethnic trait, there has been a significant trend among Indian men toward more modern, western clothing, probably as a result of its being less expensive. Indian women tend to hold to the more traditional clothing of the huipil, corte and faja.

With respect to religion, the primary faith is Roman Catholicism, though there have been significant gains made by the Protestant movements over the last twenty to thirty years. As in San Lucas, Catholicism is either practiced in terms of traditionalism, the combination of orthodox Catholic beliefs with traditional Cakchiquel, or modern Catholicism as presented by Accion Catolica. It should be noted, however, that unlike San Lucas, the role of the cofradia in religious affairs such as the fiesta titular is insignificant. Adams (1978) says that this is probably due to the strong presence and involvement of Ladinos in church affairs, to the exclusion of the Indians, as well as the strength demonstrated historically by the Catholic priests in San Martin Jilotepeque. The role of religion in San Martin, therefore, is more western in nature.

The economy of San Martin Jilotepeque is based on agriculture with an emphasis on corn and beans, wheat, coffee and sugar, in that order. The primary form of agriculture is subsistence agriculture which is concerned with the cultivation of corn and beans, the mainstay of the basic Guatemalan diet. As compared to San Lucas, there is minimal export agriculture, with most of the commercial agricultural produce (wheat, coffee and sugar) going directly to the domestic market in San Martin. About 97 percent of the total population of San Martin is involved in some form of agriculture, according to Skjorshammer (1979). However, as Adams (1978) points out, nearly half of the people of San Martin are landless. In this respect, San Martin is different from its neighboring municipios in that a large proportion of the land is tied up in the land tenure system of latifundios which are worked by tenant farmers. The harvest of agricultural goods from the borrowed land must be shared with the landowners. Also, a good number of the people of San Martin, 23 percent, still reside on the fincas. It should be noted, though, that most people have access to some land for subsistence farming, even though as tenants.

As a final note with respect to the economy of San Martin, the basic economic unit of production and consumption is the household and/or family, as is the case for all of the Guatemalan highlands. Economically, the family produces its income through a number of different means, but particularly through migrant labor and cottage industry such as weaving. There are also several agricultural cooperatives or unions in San Martin which are designed to help improve the economic situation of the farmer. It is through these cooperatives that many families manage to survive.

As for the educational and health systems, San Martin Jilotepeque has roughly the same services as San Lucas Toliman. The same description can also be given for the system of government.

In summation, the social, economic and political divisions in San Martin Jilotepeque follow the same pattern exhibited in San Lucas; that is, Ladinos tend to control these systems. On the other hand, the control of the Church is also in the hands of the Ladinos, unlike that of San Lucas.

Food Aid and Food Aid Programs in Guatemala

The following section gives a description of food aid provided under Public Law 480 to Guatemala and of those food aid programs in particular which operated in San Lucas Toliman and San Martin Jilotepeque at the time of this investigation. This is not intended to be a detailed account, but rather provide some basic information as to the sites of investigation. For a more extensive description of the nature of food aid provided to Guatemala under PL-480, see Bates et al. (1982). The information and observations found in the following account come from a series of interviews with the respective agencies for the particular purposes of this study.[10]

Guatemala

Table 4 presents the total amount of Public Law 480 food aid distributed in Guatemala from July 1973 to March 1980. All of the PL-480 food distributed in Guatemala is administered by either CARE, the Cooperative for American Relief Everywhere, or CARITAS, the local counterpart of Catholic Relief Services. From 1959 to 1975, CARE

distributed 58 percent of the PL-480 food aid while CARITAS distributed the remaining 42 percent. However, in 1977, CARE handled 54 percent and CARITAS, approximately 46 percent (Froman et al. 1977: 5). In 1971, about 12.4 percent of the total Guatemalan population received food from either CARE or CARITAS.

There are four programs by which CARE and CARITAS distribute PL-480 food in Guatemala: 1)Mother-Child Health Care, which receives about 55 percent of the foods donated, 2) Food-For-Work, about 28 percent, 3) School Lunch Program, 16 percent, and 4) Institutional Feeding, 1 percent. (See Table 5). The MCHC program is designed to improve the health and nutritional state of children under six years of age, as well as to educate the mothers and/or family of such children in applied nutrition, better hygiene practices, family planning and how to best use locally available resources. The second most utilized food program is Food-For-Work (FFW), primarily administered by CARITAS. This program is designed t provide a food supplement to volunteer laborers "working on projects of collective benefit undertaken by their communities" (Froman et al. 1977: 10). The school lunch program is managed exclusively by CARE with the approval of the Ministry of Education, in an attempt to improve the nutritional status of school children. The smallest food program, the Institutional Feeding program, is managed by CARITAS. In this program, food is distributed to institutions other than schools, such as orphanages and homes for the aged.

Froman et al (1977) point out that the cost of getting the food to Guatemala is almost equal to the cost of the food itself. This

TABLE 4

CARE and CRS Distribution of Commodities in Guatemala
July 1973 to March 1980 (in thousand pounds)[1]

Period	Wheat Flour	CSM (Corn Soy Milk)	Non - Fat Powdered Milk	Soybean Oil	Rolled Oats	Bulgur	Sorghum Grits	WSDM (Whey Soy)	Yellow Corn	WSB (Wheat Soy Blend)	Incaparina	Soy Fortified Rice	Pinto Beans	TOTAL
Jul-Dec.73	2,364	1,440	537	503	255	138	-	-	-	390	-	-	-	5,617
Jan-Jun.74	2,283	1,918	337	667	63	197	-	-	-	536	-	-	-	6,001
Jul-Dec.74	2,312	1,907	1	514	323	263	424	38	493	56	-	-	-	6,331
Jan-Jun.75	2,894	1,665	86	521	191	1,368	1,090	432	536	275	19	-	-	9,077
Jul-Sep.75	609	811	107	301	200	426	442	421	14	321	56	-	-	3,708
Oct-Dec.75	381	789	66	217	231	223	178	330	552	383	28	-	-	3,378
Jan-Jun.76	4,045	2,814	158	1,267	1,257	1,458	983	1,144	795	3,209	9	-	69	18,108
Jul-Sep.76	2,197	1,676	909	810	805	978	751	175	1,493	1,211	-	-	3,143	14,150
Oct-Dec.76	579	910	648	445	333	591	368	307	1,424	871	-	-	2,412	8,888
Jan-Mar.77	1,420	170	703	444	12	733	639	470	1,466	999	-	-	2,813	9,869
Apr-Jun.77	1,442	560	1,200	738	605	676	157	364	722	448	-	-	2,006	8,918
Jul-Sep.77	1,567	461	1,083	568	203	949	296	410	28	71	-	-	430	6,066
Oct-Dec.77	1,233	674	995	655	433	711	734	584	-	327	-	-	59	6,415
Jan-Mar.78	1,783	1,328	694	636	482	741	498	884	-	212	-	-	41	7,299
Apr-Jun.78	1,288	2,011	1,078	676	324	581	94	165	-	114	-	-	-	6,331
Jul-Sep.78	1,278	1,771	1,320	758	523	248	21	29	-	149	-	-	-	6,097
Oct-Dec.78	375	1,536	1,199	654	394	1,081	2	8	-	174	-	-	-	5,423
Jan-Mar.79	771	2,117	1,261	692	163	1,516	-	-	-	160	-	-	-	6,680
Apr-Jun.79	1,911	1,161	1,336	825	188	76	-	-	-	200	-	1,157	-	6,854
Jul-Sep.79	871	1,595	1,500	807	450	17	-	-	-	179	-	1,115	-	6,534
Oct-Dec.79	702	1,571	1,609	768	412	9	-	-	-	192	-	1,633	-	6,896
Jan-Mar.80	264	1,138	797	408	376	5	-	-	-	224	-	750	-	3,962

[1] From Bates et al. (1982: 70)

TABLE 5

Projections of PL-480 Assistance to Guatemala in 1977 by the Type of Food Distribution Program and the Responsible Agency[1]

Agency	Type of Program									
	Mother-Child Health Care Program		Food-For-Work Program		School Lunch Program		Institutional Feeding Program		Total	
	tons	recipients	tons	recipients	tons	recipients	tons	recipients	t	r
CARITAS	3,400	77,000	3,900	35,000	0	0	200	3,500	7,500	115,500
CARE	5,600	128,000	600	5,000	2,600	180,000	0	0	8,800	313,000
TOTAL	9,000	205,000	4,500	40,000	2,600	180,000	200	3,500	16,300	428,500
Percent	55%	48%	28%	9%	16%	42%	1%	1%	100%	100%

Note: These figures were based on 1977 projections; tons and number of recipients were rounded off to the nearest hundred.

[1]This table is taken from Froman, Jackson and Gersony (1977: 11).

cost derives from the transportation of food from the United States to Guatemala, as well as from administrative overhead.

San Lucas Toliman

In the San Lucas Toliman area, there are three food distribution programs operated by CARE, CARITAS and the Christian Children's Fund, respectively. Approximately 2,000 people are enrolled in the various programs. There is probably some overlapping, however, with many of the recipients receiving food from more than one program. Based on the interviews, these food programs affect around 20 percent of the total population of San Lucas Toliman.

CARE (Cooperative for American Relief Everywhere):

CARE is a well known international voluntary agency, with headquarters in New York. Though it primarily deals with food assistance, it is also involved in such projects as potable water. In San Lucas, the CARE distribution is operated by the Centro de Salud (health center) and is administered by a registered nurse and supervised by the doctor in charge of the health center. The food program in San Lucas was begun in April, 1979. Prior to this, however, CARE participated in a joint program with CARITAS. Food was either distributed through the Health Center or through the local health promoters at the villages or plantations (fincas).

Presently, there is only one type of CARE food program in San Lucas, the Maternal-Child Health care program. There were 900 beneficiaries served through 16 rural locations, and 45 pregnant mothers and 50 children at the urban Health Center as of April, 1980. The

program has grown significantly since its inception, from 650 to nearly 1,000 beneficiaries.

CARE distributes five types of food products: fortified wheat flour, powdered skim (enriched) milk, soy fortified rice, corn/soy/milk (CSM) flour and oil (peanut or soy). The total amount of food distributed per beneficiary per month comes to eight pounds.

There are four prerequisites for participation in the CARE food program. The participant must be either 1) a pregnant mother, 2) a lactating mother, 3) a nursing child, or 4) a pre-school child under the age of six. If a woman qualifies, then, she must attend scheduled medical examinations in order to receive the food aid. Children must also be weighed and measured and pregnant mothers must undergo routine checkups.

The primary problems reported by those managing the CARE food distribution program in San Lucas include the irregularity of food deliveries and the tendency of some beneficiaries to throw away or sell the food. On the other hand, the principal benefit of the CARE program, as perceived by the San Lucas Health Center personnel, is that it acts as an incentive to attract people to the center for medical attention.

Catholic Relief Services/CARITAS:

The CARITAS food distribution program is operated by the Catholic Church in San Lucas, administered by church employees and supervised by the local Health Center doctor and a church employed registered nurse. The program was initiated prior to 1976. CARITAS concentrates

primarily on the people who live in the town of San Lucas Toliman, whereas CARE emphasizes distribution particularly to the people who live in the rural areas.

The food program for pre-school children is the only on-going food assistance program in San Lucas administered by CARITAS at present. Any child under the age of six is eligible to participate. As of April, 1980, 800 children were enrolled in the program.

CARITAS usually distributes five different products, but the type and quantity of food vary with the availability of the food products. These products include CSM flour, powdered skim milk, soy-fortified rice, oil and fava bean flour. The food is distributed once a month at the church to the families of qualified children. The average amount of food distributed per month is eight pounds. In order to receive the food, the beneficiary must have proof of a scheduled medical examination. The examination also includes weighing and measuring.

The program administrator for CARITAS noted that the only problem was occasional misuse of the food received from the program. However, no comment was made as to the benefits of the program.

Christian Children's Fund:

Although this food program does not directly relate to this study, the Christian Children's Fund (CCF) program is important in that it is an on-going food assistance program in San Lucas. The CCF food program is operated by CCF employees in cooperation with the Catholic Church.

The original CCF program, which provides free supplementary meals for all students at the parochial and community elementary schools, began in January, 1975. In January, 1980, CCF extended the food program

to the families of some of the students in the parochial school. There are three types of CCF programs: 1) the school children program, which provides a midmorning snack to more than 1,000 children, 2) a program for selected children from school in which 250 families (representing 390 children) receive money donated by sponsors in order to buy food, and 3) the discount food program, which sells food at discount prices to selected families. The type of food for the school children's snacks includes Incaparina, a high protein, vitamin-enriched food made from grain, milk and vegetables which is prepared as an atol,[11] or a grain-based gruel and bread. All children participating in the CCF program receive a monthly ration of two pounds of Incaparina and one pound of oats. The snacks are distributed to the school children on a daily basis throughout the school year, whereas in the CCF family program, the food is distributed once a month, at which time the beneficiaries receive talks on hygiene, health and food preparation.

Though there are no prerequisites for participating in the CCF food programs, there are certain factors or criteria which determine who is enrolled as a participant. These include the size of the family, occupation of the parents and lack of land ownership. In addition, no more than two children per family may participate in these programs.

As a rough measure of the nutritional status of the recipient children, height and weight measures are taken on a regular basis. No major problems with corruption have been encountered in San Lucas and improvement in the general health and nutritional status of the participating children over a one to two year period has been noted by health center personnel.

San Martin Jilotepeque

In the San Martin Jilotepeque area, there are two food assistance programs, one conducted by CARE and the other by World Vision. A total of over 1,100 people are affected by the two programs.

CARE:

The CARE food assistance program in San Martin Jilotepeque is operated by the Health Center, administered by the Rural Health Technician (TSR) and supervised by the doctor in charge of the San Martin Health Center. This particular program began in February, 1978. The Maternal-Child Health care program involves 711 beneficiaries which includes 159 pregnant mothers, 78 lactating mothers, 223 nursing children and 251 pre-school children. The descriptions of the CARE programs in San Lucas,and those provided in Chapter II,apply to the distribution systems, the prerequisites for participation and the health evaluation system used in San Martin Jilotepeque. Classes in health, hygiene and nutrition are given prior to the distribution of the food products to the recipients. Then, a nominal fee is charged for the food. This fee is designed first to preserve the dignity of the recipient, and second, to aid in the costs of transporting the foods. Finally, some consideration is given, in San Martin, to the socioeconomic level, family size and general health conditions of the beneficiaries.

Four general problems are cited by the Health Center personnel with respect to the CARE food distribution program. The first problem arises because many beneficiaries do not properly follow instructions for prepartion of the foods and this results in either the rejection of the foods or in health problems because of poor hygiene practices.

Secondly, there is usually an inadequate supply of foods provided by CARE so that the number of beneficiaries can not be increased even though a need exists to do so. Frequent inconsistency in the scheduling and arrival of food shipments, as well as variability in the quantity of foods available is the third problem. Finally, there is some abuse and/or misuse of the food products since they are sometimes either given away or sold. Despite these problems, the CARE food program is seen by most of the local leaders and residents as being helpful in the improvement of health and nutrition of recipients, especially those in lower income levels.

World Vision:

World Vision Relief Organization, Inc., based in California, states as its objectives: "to provide emergency relief and social welfare services in areas of need" (Crosby and Smyth, 1971: 480). Aside from food assistance programs, World Vision also provides technical assistance and supplies. The food assistance program operated by World Vision in San Martin Jilotepeque began in April, 1977, but more recently it has been extended to include such programs as literacy classes, and classes in skill and craft development. This food aid program is targeted at children. Its financial support comes from international sponsors and, as of June, 1980, there were 379 children enrolled.

The availability of food supplies determines the type and quantity of food assistance. Usually, there is a one pound per product per child limit on the foods, which include Incaparina,[12] oats, sugar and rice. The mothers of recipient children receive the food at their convenience once a month. It is required that an interested person

apply for admission into the program and wait for a sponsor. Also, there is an age limit with respect to recipient children. Height and weight measures of the child are recorded in order to inform the sponsor of the child's well-being.

World Vision program personnel note that there is slight misuse of the food products by selling them or feeding them to animals. They also report, however, significant improvement in the health and nutritional status of many of the children enrolled in their program.

Summary

This chapter presents background information on the setting in which this research was conducted. Some attention was not only given to the two sites of investigation, San Martin Jilotepeque and San Lucas Toliman, but also to the national sociocultural, economic and political conditions of Guatemala. Evident from these discussions is the fact that socioeconomic differences and disparity in political power are structurally divided along lines which are distinctly Indian-Ladino. Finally, this chapter also provides a description of the food programs being conducted in the two towns examined in this study.

FOOTNOTES

[1] There are several examples of studies which have attempted to deal with the problem of "transculturation." Gillin (1951) and Warren (1978) more specifically deal with this process. They and others also use the term, "Ladinoization," to refer to the same phenomenon.

[2] Fiesta titular generally contains much of the indiginous belief system and, during the course of the celebration, a great deal of the associated traditional ritual is exhibited. This is usually the sore spot with respect to the Catholic priests. Interestingly, considerable sums of money are spent in bringing about this celebration; for example, I estimated that more than 30,000 dollars were contributed toward the fiesta titular of Patzite in 1980. For an excellent discussion of the fiesta and the role of the cofradia, see Cancian (1967).

[3] A Guatemalan administrative department is roughly equivalent to a U.S. state in that it is a sub-national political administrative unit.

[4] There is very little aquatic vegetation because of the depth of Lake Atitlan. It is this vegetation which is necessary for the survival of fish. (This was related to me by managers of the fish stocks of Lake Atitlan.)

[5] Guisquil is a starchy vegetable native to Mesoamerica. The fruit grows on a viney plant and the fruit itself is characterized by a green skin covered in what appears to be thorns.
Aposote refers to a "weed" that is used primarily to flavor foods, in particular black beans.
Pacaya is the immature flower of the pacaya palm tree.
Ichintal is the root of the quisquil plant, also used as a diet starch.

[6] As Nash (1957) and Farrell (1977) point out, the owners of these fincas are members of the "Metropolitan Upper Class;" that is, they live in Guatemala City rather than on their plantations. Usually, the finca is managed by a trusted supervisor who generally exercises complete control over its operation.

[7] Discussions as to the community distinctions according to traditional dress of the Guatemalan Indian can be found in Tax (1937, 1968) and Carmack (1970, 1980). However, as Martinez-P. (1975) and Skjorshammer (1979) have pointed out, the formalization of traditional clothing which characteristically distinguishes one community from another was institutionalized by the Spanish shortly after the Conquest as a means of controlling the migration of Indians.

[8] These images are usually maintained by certain families in the communities who are financially responsible for their upkeep and respective celebrations, which can be very expensive.

[9] Repartimiento refers to the system of labor promoted in Guatemala and other Latin American countries after the abolition of the encomienda. It was basically a form of taxation which the Indian population paid with labor. The Indians obligated to pay this tax were either sent to the coast to work on the fincas or provided labor for the creation of public works.

[10] These interviews were conducted by Tom Edwards, the research coordinator of the Guatemalan Earthquake Study.

[11] Atol, a gruel generally made of corn or rice, is a customary drink in most of Guatemala. It is often consumed during breaks from work throughout the day. It helps to replace some of the energy spent while working in the milpa, the corn and bean patch.

[12] Incaparina is a low cost, high protein commercial food developed by INCAP in Guatemala. It is a corn-based flour with the addition of vegetable protein concentrates, primarily soy and cotton seed flours. Though it is used mainly an atol, it can be added to other flours as a supplement.

CHAPTER V

RESEARCH DESIGN, SAMPLING AND METHODOLOGY

This chapter presents the research design for this study by discussing how the data were collected, the sampling procedures utilized and the methodology used in data analysis. In addition, the reasoning used in the operationalization of the concepts employed in the analysis is presented.

Research Design and the Units of Analysis

This study employs a comparative approach aimed at contrasting populations composed of people currently enrolled in regular food assistance programs with people not involved in such programs. In order to implement this design, a sample of families (or households) enrolled in food programs and a sample of non-program families (or households) were chosen from two *municipios* (urban centers), five *aldeas* (rural communities) and one *finca* (plantation) from two different regions, San Martin Jilotepeque and San Lucas Toliman.

Information was gathered by means of interviews with household members on food consumption patterns, agricultural production, income, level of living, and on attitudes toward food-related topics. Nutritional measures were also made on pre-school aged children from each sample household.

After being pre-tested, the interview schedule and nutritional measurement procedures were employed on a sample of 238 families or

households in San Martin and San Lucas. Table 6 gives the distribution of sample households according to community and program status. These interviews were initiated in June and completed by early August, 1980.

The research design employed in this study called for the collection of data on each sample household at one point in time. Because of time constraints and because it was impossible to organize a new food program strictly for experimental purposes, it was necessary to conduct this study by comparing and contrasting families already enrolled in a food program with families in the same communities not enrolled in such programs. This meant that no measures were available for the nutritional status of participants prior to their entrance into the food program. There are therefore no "before" measures on nutritional status for members of either the experimental group (families on food programs) or the control group (families not on food programs).

This sort of research design is discussed by Campbell and Stanley (1966) under the label of "Static Group Comparisons."[1] Its major weaknesses lie in the lack of "before" measures to be compared with "after" measures and with the lack of randomization of subjects with respect to control-experimental group status. This latter weakness means that the experimental group, in this case food program families, is selected on the basis of variables related to program participation criteria. As a consequence, this group does not represent a random sample of the population of a given community. The control group consists of people not on the food program and is therefore also nonrandom since program families have already been removed from it. In all liklihood these two groups will differ in important social and economic characteristics

TABLE 6

Household Sample, Classified by Sample Area and Program Participation

	Beneficiary Households	Non-Beneficiary	Total
San Martin Jilotepeque	41	41	82
Xesuj	7	6	13
Varituc	4	6	10
Xejuyu	7	6	13
Subtotal	59	59	118
San Lucas Toliman	41	42	83
Santo Tomas	6	1	7
Panimaquip	6	--	6
Aguas Escondidas	6	18	24
Subtotal	59	61	120
Total	118	120	238

related to nutritional status. It becomes difficult therefore to evaluate the role of food programs in producing nutritional differences as compared to variables related to sampling itself.

In order to draw conclusions from static group comparisons it is necessary to introduce statistical control procedures to remove the effects of sample differences on the dependent variables. This research was designed to include a range of such variables to be employed as statistical controls in making comparisons between the experimental and control groups. The variables to be used for this purpose are largely socioeconomic and cultural in nature.

Sample and Sampling Method

To obtain a group of families participating in food programs a purposive sampling procedure was employed. Lists of participants in existing food programs in the sample communities were obtained from food program records and a random sample of participants was drawn from these lists for interview. The control group sample was drawn from a list of households obtained from data collected in the Guatemalan Earthquake Study and from reconnaissance surveys in rural communities. After eliminating from this list families participating in the program, a random sample of the remaining families in the community was drawn for interview. This procedure resulted in the household sample shown in Table 6. In San Martin, a total of 82 families were interviewed in the town proper, 41 household interviews conducted among food program families and 41 non-program families. Aside from the town proper, three *aldeas* are also represented in the San Martin sample, as indicated in Table 6; these *aldeas* include Xesuj, Varituc and

Xejuyu with 13, 10 and 13 households respectively. Therefore, the total household sample from the San Martin region is 118, representing a total of 167 pre-school aged children from which the nutritional measurements were taken, as indicated in Table 7. In San Lucas, a total of 83 households were interviewed in the town proper with 41 program families and 42 non-program families. The rural area of San Lucas is represented by two aldeas, Panimaquip and Aguas Escondidas (an aldea of Godinez), and one finca, Santo Tomas. These rural communities contain samples of 6, 24 and 7 households, respectively; giving a total sample from the San Lucas area of 120. There are 143 pre-school children in the San Lucas sample, shown in Table 7, from whom the nutritional measurements were taken.

The two regions of San Martin and San Lucas were selected because they share numerous characteristics such as the population size, ethnic proportions, and so on. Nevertheless, they exhibit significant differences in their socioeconomic makeup and particularly so in their respective economic systems. San Martin has a primarily domestic consumption oriented subsistence economy, whereas San Lucas is involved more heavily in an agricultural-export oriented economy. These economic characteristics combined with such factors as the land tenure systems, dictate the life styles of people in the two study areas and as a consequence, can have significant effects on nutrition. These towns were also selected because extensive data was available on them from the just completed Guatemalan Earthquake Study.

In addition to the central town in each region, three rural communities were selected in order to provide a cross-section of the rural area. The rationale for doing this was that no two rural areas

TABLE 7

Sample Characteristics for Pre-school Aged Children, Classified by Sample Area and Program Participation

	Beneficiary	Non-Beneficiary	Total
San Martin Jilotepeque	73	39	112
Xesuj	10	13	23
Varituc	10	9	19
Xejuyu	8	5	13
Subtotal	101	66	167
San Lucas Toliman	65	34	99
Santo Tomas	13	2	15
Panimaquip	12	0	12
Aguas Escondidas	9	8	17
Subtotal	51	92	143
Total	110	200	310

are alike and the differences being exhibited not only in socio-economics, but in the nature of agricultural orientations, social systems and environments are reflected in the nutritional status of their populations. There were two criteria used to select rural communities:

1. The prospective community had to have households which participated in food programs.
2. The community had to be accessible to the interviewer.

This second criterion was especially important since interviewers were unable to reach one of the originally scheduled communities (Choatulun) due to impassable roads and a substitute had to be found. The aldea of Xejuyu was selected.

The sample of food program beneficiaries in both regions was selected by a random house-to-house search. In the town of San Martin proper, this was a problem since the vast majority of beneficiaries lived in the rural area. Out of 450 households involved in the CARE food programs, only 60 lived in the town of San Martin Jilotepeque. Therefore, nearly all of the town beneficiaries were interviewed. In the San Martin region the remaining families were scattered among 10 aldeas and within them about 11 caserios. Locating beneficiaries was the most time consuming part of the sampling procedures because of its "purposive" or specific nature.

In order to obtain a random sample of non-program families, households in the urban centers of San Martin and San Lucas Toliman were aggregated into "sectors." Each sector, on the average, contained

approximately 20 households and was delineated by either natural or man-made boundaries. After dividing households into sectors, the total number of households was divided by the total number of sectors in order to calculate the sampling interval. On the basis of this interval, the households in the sample were selected according to the table of random numbers. As a result, three households were selected from each sector. This sampling procedure produced a representative sample of the target population across all ethnic, religious and socioeconomic levels.

Since this target population for the control group was supposed to consist solely of non-beneficiaries of food programs, a method for eliminating accidentally included food program participants was devised. This method involved conducting the assigned interview, but then, to further include the house with the next highest number. All the houses within a given sector were sequentially numbered. The result was to remove the beneficiary household from the non-program household sample, yet identifying it, and replacing it so as to maintain some form of consistency.

In the rural areas of the San Martin Jilotepeque and San Lucas Toliman regions, for obvious lack of this kind of community organization which is characteristic of urban centers, this particular sampling strategy could not be applied. What resulted was a door-to-door approach, maintaining as much randomness as possible.

Finally, with respect to the sampling plan and procedures, five sub-sample strategies were developed for analytical purposes. In the analysis these sample groups will be compared using various

measures of nutritional status. These sub-samples used for comparison consist of: 1) program versus non-program participation, to be referred to from now on as the program participation variable, 2) regional location, indicating whether or not one is from either San Martin Jilotepeque or San Lucas Toliman, 3) urban-rural location, distinguishing those individuals and/or households coming from either urban centers or the rural hinterlands, 4) ethnicity, referring to whether one is either Indian or Ladino, and, 5) sex, distinguishes the measured individual as either male or female. The first three sample divisions were purposively selected for, as has been been described earlier. However, ethnicity and sex were not prerequisites of the sampling design. It was assumed that the random nature of the sampling design would select for these differences as well. If the ethnic and sexual breakdowns were relatively accurate, then that would be a positive statement with respect to the quality of the sample. Interestingly, both of these sample divisions were relatively well-represented in the sample, with 80 percent being Indian and 20 percent being Ladino. Forty-nine percent of the measured individuals were male, with the remaining 51 percent being female, as indicated in Table 8. These figures are not significantly different from the population proportions as recorded in the 1973 census.

Several "irregularities" may be noted in the sample which should be explained briefly. First, in examining Tables 6 and 7 (pp. 113, 116), there are more pre-school children than households; this is due to variation in the household size and age characteristics. All children under five years of age in a sample household were measured

TABLE 8

The Distribution of Indians and Ladinos According to Sex in the Sample Population

	Indians	Ladinos	Total
Male	115	32	147
Female	136	27	163
Total	251	59	310

for nutritional status. Also, in the non-program household sample, there are approximately twice as many measured children represented as in the households on food programs. This probably reflects the type of sampling procedure as well as something about the nature of the household. The purposive sampling procedure is selective in nature, whereas the random procedure used in sampling the non-program households provides a more cross-sectional picture of the general household. These program households tend to be younger than the non-program ones, with the average head-of-house being 33 years old as compared to 41 years old for non-program families. Because of this age difference fewer children are to be expected in one sample as compared to the other. Table 9 presents the nature of the sample according to the different sub-sample characteristics (i.e., program status, ethnicity, sex and region).

TABLE 9

Distribution of the Sample Population According to Program Status, Region, Ethnicity and Sex

Region and Community	Population Characteristic						
	Program Participant	Non-Participant	Indian	Ladino	Male	Female	Total
San Martin	41	71	74	38	58	54	112
Xesuj	7	16	22	1	9	14	23
Varituc	4	15	19	0	5	14	19
Xejuyu	7	6	10	3	7	6	13
Subtotal	59	108	125	42	79	88	167
San Lucas	65	34	84	15	43	56	99
Aguas Escondidas	9	8	15	2	12	5	17
Panimaquib	12	0	12	0	6	6	12
Santo Tomas	13	2	15	0	7	8	15
Subtotal	99	44	126	17	68	75	143
TOTAL	158	152	251	59	147	163	310

Methodology

The data collected in this research furnishes a wide range of information on households and on their individual members, including information on ethnicity, domestic assets, household possessions, land tenure and availability, crop production, household and agricultural income, and the marital status, age, religion and educational level of the head of the household, as well as information on the nature of water and sanitation facilities available. The specific type of information collected can be seen by examining the questions in the interview schedule which is included in the appendices.

From the data generated by these questions, several indices or scales were created to provide a means of measuring several variables related to the effects of food programs on participants. One of these indices provides a measure of household socioeconomic status by the use of a level-of-living or domestic assets scale. Other indices measure the nutritional status of children under five years of age for each sample household. Finally a scale was created to measure the level, or quality, of sanitation characteristic of a family. The following section briefly discusses the most relevant of these scales.

Nutritional Data and Nutritional Measures

The nutritional, or more properly, growth data, recorded on each child under five years of age included measurements of height and weight. Two separate measures of height, in centimeters, and of weight, in kilograms, were taken and then averaged in order to correct for error. The age of the measured child was recorded in months rather than

years. The physical instruments used to obtain the height and weight were portable field weight scales, metric sticks and "baby boards" (for supine length).

The sample population measured consisted of children in sample families between ages zero and five years. The selection of this age range was based on the premise that this is the most important period of growth and human development. During this critical growth period, children are particularly sensitive to fluctuations in nutrition, stress, and to changes or disruptions in their environment and these conditions, in turn, are expressed in effects on growth (Jelliffe 1966). Jelliffe and Jelliffe (1973) point out that the relationship between growth and nutritional status is especially strong in this age group. "A child's growth rate reflects, better than any other single index, his state of health and nutrition; and often indeed his psychological situation as well." (Eveleth and Tanner 1976: 1).

It is also this age group that runs the greatest risk of malnutrition. As a result, individuals in this age range are usually selected for anthropometric assessment. Furthermore, this phenotypic expression of stress is a general measure of the health and nutritional state of an entire population. The justification for conducting this assessment on children in order to make generalizations about the entire population is best summarized by Chang (1976: v): "The health of a population is reflected most accurately by the rate of growth of its children." Also, there was an additional reason for selecting preschool age children. This group tends to be least affected by genetic influences (Habicht et al. 1974; Johnston et al. 1976).

In this investigation, there are four measures of nutritional status being used. These indices include: 1) height-for-age, denoted from now on as Chronic Nutritional State, 2) weight-for-height-excluding age, denoted as Acute Nutritional State I, 3) weight-for-height-for-age, denoted as Acute Nutritional State II, and 4) weight-for-age, denoted as Acute Nutritional State III. The standardized heights and weights, according to age, are sex specific, that is, they are designed to account for differences in growth due to different patterns of development according to sex.

Socioeconomic Measures

Generally, income is the most common indicator used to measure economic well-being. In the rural hinterland outside of a large city in the underdeveloped world, however, income is not a very reliable indicator of level of living (Bates and Killian 1981), since not all household assets, possessions and resources are acquired through the use of money. It has been suggested that socioeconomic indicators derived from household possessions which can be used to measure "domestic assets" are more reliable in depicting the real household situation (Belcher 1951, 1972; Bates and Killian 1981).

In a paper prepared for the Third International Conference, The Social and Economic Aspects of Earthquakes and Planning to Mitigate Their Impacts, in Bled, Yugoslovia, Bates and Killian (1981: 1) propose "a modified level of living scale," called an Index of Domestic Assets which provides insight into the socioeconomic status of households. Briefly, this domestic assets scale is a modification of such scales as proposed by Chapin (1935), Sewell (1940) and Belcher (1951;

1972), designed to be applicable more specifically in Guatemala, and potentially to the Third World.

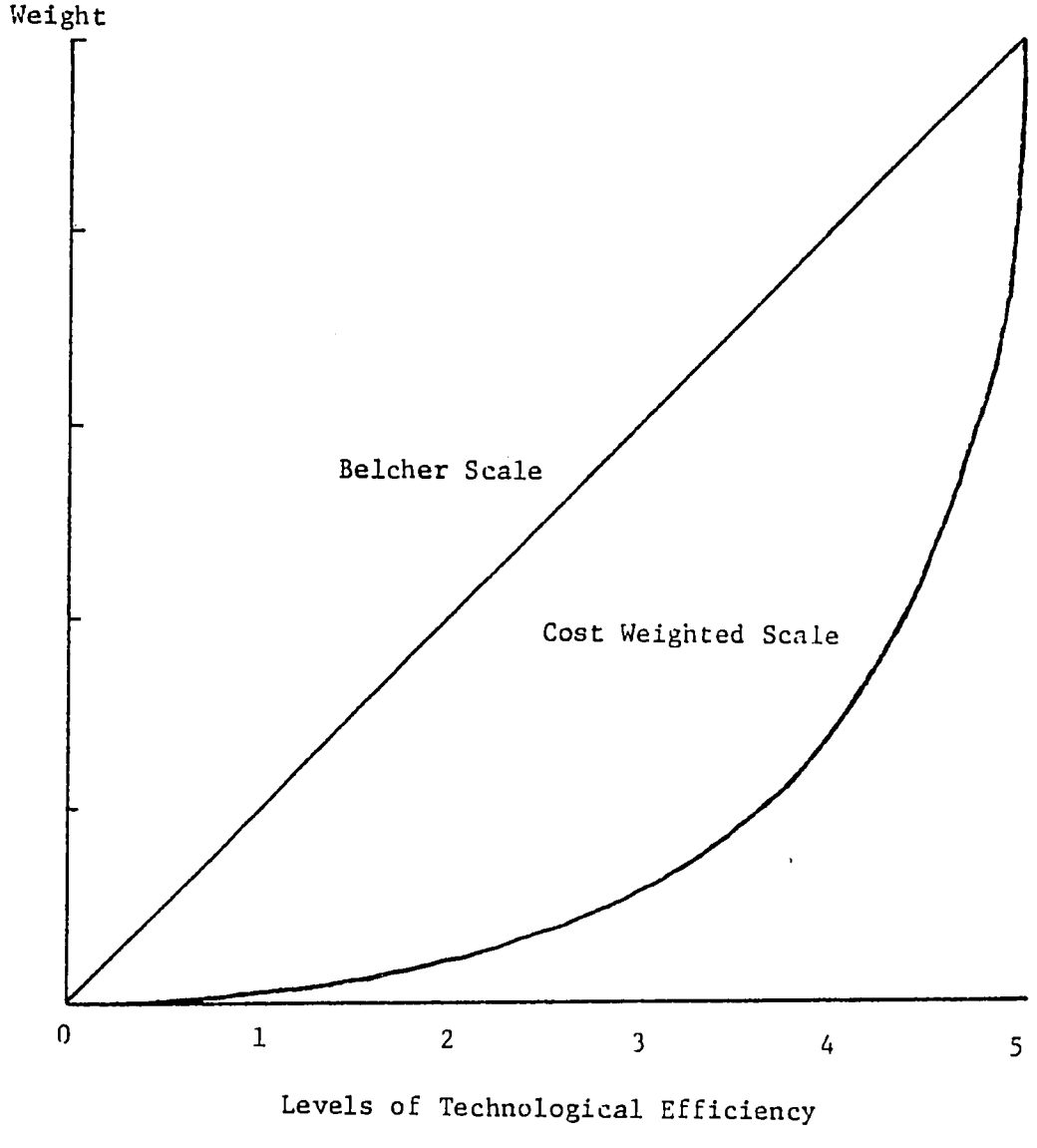
Whereas in the Belcher (1972) scale a series of points are awarded for a household having a particular physical asset, the Bates and Killian scale employs a system for weighting these items by their cost. This becomes especially important since the distance between the value of a clay pot and a refrigerator, though both being used for storing food, does not translate very well on a scale which involves equal distance between the points; that is, the magnitude of the value between any two given items is diminished. Figure 2 demonstrates this difference.

The Index of Domestic Assets is designed to demonstrate the socioeconomic position of the household in relationship to other sample households. Therefore, a brief discussion of the indicators used in this domestic assets scale is in order. In this scale, there are eight indicators which include the form of lighting in the house, the method of preserving perishable food, the type of cooking equipment, the water source, the facilities available for washing dishes and a shelter component dealing with the type of construction of the walls, floor and roof of the house.

Items on the scale weight alternative ways of performing a given function by the cost of using that alternative. For example, with respect to materials used for walls in the house, at one end of the scale walls are constructed of adobe (sun-dried mud bricks), while at the other end, kiln-fired clay bricks or concrete block with iron or steel supports are used. Floors range from dirt to cement to fired and glazed tile. Roofs are generally made of either thatch, fired

FIGURE 2

A Comparison of Two Level-of-living Scales:
Cost Weighted Scale Versus Belcher Scale[1]



[1] From Bates and Killian (1981: 15)

clay tiles or corrugated steel (lamina). Water may be obtained either from a river, well or potable water systems which are sometimes piped directly into the houses. Lighting in the home may include candles, gas or kerosene lamps or even electric lights. The preservation of perishable food may, at one end of the scale, be in the form of clay pots or, at the other, a refrigerator. Cooking fires in the middle of the house predominate in much of Guatemala, but there has been a trend toward wood-burning stoves (pollos) and propane gas or kerosene stoves. Dishes may either be washed directly in the river or in pilas or, as in some cases, even in dishwashers.

On each domestic assets item, this range of alternatives is taken into account by weighting the item used in the particular household by its dollar cost on the market. The household score is then derived from accumulating the cost of its total domestic assets as measured by this scale into a total score representing the value of domestic assets in dollars.

The logic behind the selection of these domestic assets items is simple. The type of materials from which a house is constructed, for example, is an important indicator of socioeconomic status because houses vary in how costly they are to construct. Similarly, the cost of obtaining other kinds of household equipment and facilities also varies. The poor, quite naturally use the least expensive means of performing household functions, while more well-to-do people use more expensive facilities. As a consequence, the kinds of household assets used by a family are indicators of their economic status. A general trend is underway in Guatemala in which there is a shift from adobe,

a relatively inexpensive wall material, to walls made of brick or cement block which are more expensive. This trend leads not only to a difference in house-type, but is an indicator of the upgrading of the household's socioeconomic status. The same process is at play with respect to flooring and roof material used in house construction; that is, tile floors,which are more expensive, will replace dirt floors if at all economically possible.

Also, as the socioeconomic level or status of the household improves, investments are generally made toward acquiring more modern possessions, particularly gas or kerosene stoves and refrigerators. There have been numerous accounts by anthropologists and sociologists visiting an informant's house, only to be amazed at the emphasis on and extent of material acquisition. There would be refrigerators, blenders and televisions. Whether or not there was electricity in the house was unimportant. What was important was the enhancing of one's socioeconomic position or status.

It is evident that this Index of Domestic Assets concentrates on shelter, water and on articles pertaining to food preparation. It is believed that these items are probably the best indicators of socioeconomic status. In Guatemala, it is in these areas where households' energies and activities are concentrated in an attempt to improve level of living.

The domestic assets score derived from the above procedure has been examined in terms of its relationship to other variables that measure socioeconomic status in earlier work done on the Guatemalan Earthquake study and has been shown to be significantly correlated to

such variables as income, education, land tenure, ethnicity and remoteness of community. Since these variables are also indicators of socioeconomic status there is reason to be relatively confident that the domestic assets scale measures this variable.

Sanitation Index

A sanitation index was designed solely for this study and was based primarily on ethnographic observations, as well as on an understanding of health conditions and hygiene facilities in Guatemalan households. Seven variables compose the sanitation index, which include data on flooring, the location of the kitchen, access to water, food storage, waste disposal, method of cleaning eating utensils, and fuel and cooking materials. The sanitation scale ranges from a minimum of zero to fourteen points, with each variable worth at least two points.

The flooring variable includes three categories: 1) dirt, 2) fired clay tiles and 3) "hygienic" flooring (i.e. concrete, glazed tile, etc.); the critical factor being its sanitary capability. The location of the kitchen is important since in the Guatemalan highlands there is a tendency for kitchens to be located outside under open-sided shelters. These outside kitchens are frequented by household pets and farm animals which commonly contaminate the cooking area. The variable dealing with access to water simply refers to access to either potable or contaminated water. Food storage includes maintaining food in the open or in closed containers, or finally, the presence of a refrigerator. There are three types of (human) waste disposal which are relevant here: 1) no specific method of disposal, which promotes reinfection of diseases and parasites, 2) latrines, where reinfection is greatly

minimized but still can affect health conditions; and 3) sewage disposal systems, which are most efficient in preventing reinfection. The method of cleaning eating utensils involves certain levels of sanitation based on either methods which introduce more bacteria and viruses, or disinfect. The final variable in this sanitation index deals with fuel and cooking materials. Wood fires cannot reach and maintain the temperature that fossil fires can, which is necessary in destroying certain pathogenic bacteria found in foods.

The sanitation index was created by awarding points for the possession of the igher level sanitary facility. This index should be useful because the relationship between sanitary conditions and health and nutrition is well documented (Scrimshaw and Gordon 1968; Jelliffe and Jelliffe 1979). However, the bivariate correlation between sanitation levels and socioeconomic levels is high, though not overly multicolinear, according to some statisticians, with a correlation coefficient of .64.[2]

Summary

This chapter presents the analytical framework used in this study and summarizes the sampling procedure. This sample population is composed of 310 children between the ages of day-1 and 5 years from 238 families. The information collected on them includes not only their measured nutritional status, but also socioeconomic data. The sample is divided into an experimental group (families and children on food programs) and a control group (families and children not involved in food programs), selected randomly from the same villages. The result of comparisons between these groups are presented in the following chapter.

FOOTNOTES

[1] Both Campbell and Stanley (1966) and Brim and Spain (1974) note that the major advantage of the "static-group comparison" is that the likelihood of errors due to extraneous variables is reduced.

[2] Most economists tend to set a limit of 0.5 to 0.6 as a way of dealing with the problem of multicolinearity; however, other statisticians feel comfortable with a limit as high as 0.7. (This information was related to me by Dr. E.M. Beck of the University of Georgia.)

CHAPTER VI

THE RESULTS OF THE ANALYSIS OF THE DATA

The purpose of this chapter is to present descriptive statistics derived from the analysis of the data as a starting point for answering the questions posed at the beginning of this study. The first section presents the results of the univariate procedures used in describing the nutritional state of the sample populations in comparison with national health and nutritional data on Guatemala.

The second section is concerned with examining the various dependent and independent variables and the relevant relationships between them in order to achieve a better understanding of the interaction between food aid and nutritional status. From this review of the variables, a determination will be made as to which factors are most important to include in a more complex multivariate analysis.

The Nutritional State of the Sample Population

Before discussing the nutritional state of the sample, it would be useful for comparative purposes to restate the general nutritional state of the Guatemalan population. The total population in Guatemala under the age of five years in 1973 was 986,222. It has been estimated that the nutritional state of this population was as follows: 1) nutritionally well, 18.6 percent (183,437); 2) mildly malnourished, 49 percent (483,249); 3) moderately malnourished, 26.5 percent (261,349); and, 4) severely malnourished, 5.9 percent (58,187). Against this

background the nutritional state of the sample under investigation should be examined. The univariate analysis indicates that: 36 percent (110) of the sampled children exhibit mildly retarded growth as the result of mild chronic malnutrition; 29 percent (89) show moderately retarded growth, reflecting moderate chronic malnutrition; 18 percent (56), severely stunted growth as the result of severe chronic malnutrition; and only 17 percent (55) exhibit no indications of chronically retarded growth. With respect to acute malnutrition in the same population, 41 percent (127) show mild cases, 26 percent (81) moderate and 7 percent (22) severe, with only 26 percent (80) exhibiting no evidence of acute nutritional problems. (For a visual representation of this comparison between the sample and national statistics see Figure 3.)

If chronic malnutritional effects on growth are controlled for, a different perspective as to the nature of (strictly) acute malnutrition is presented; this is demonstrated in the weight to height ratio which ignores age (i.e. weight-for-height-excluding age). This particular measure of acute malnutrition will be referred to from now on as "Adjusted Acute Nutritional State." In the same sample population, 62 percent (190) exhibit no notable growth deficiencies whereas 31 percent (94) indicate mildly acute nutritional problems, 6 percent (19) moderate and 1 percent (4) severe. For the mean nutritional score of the sample population and their standard deviations and medians according to percent-normal, see Table 10. A score of 100 represents 100 percent normal.

These means and medians are generally very close, as can be seen in Table 10 and Figure 4. This demonstrates that the sample

FIGURE 3

A Comparison of the Nutritional State of the National and Sample Populations

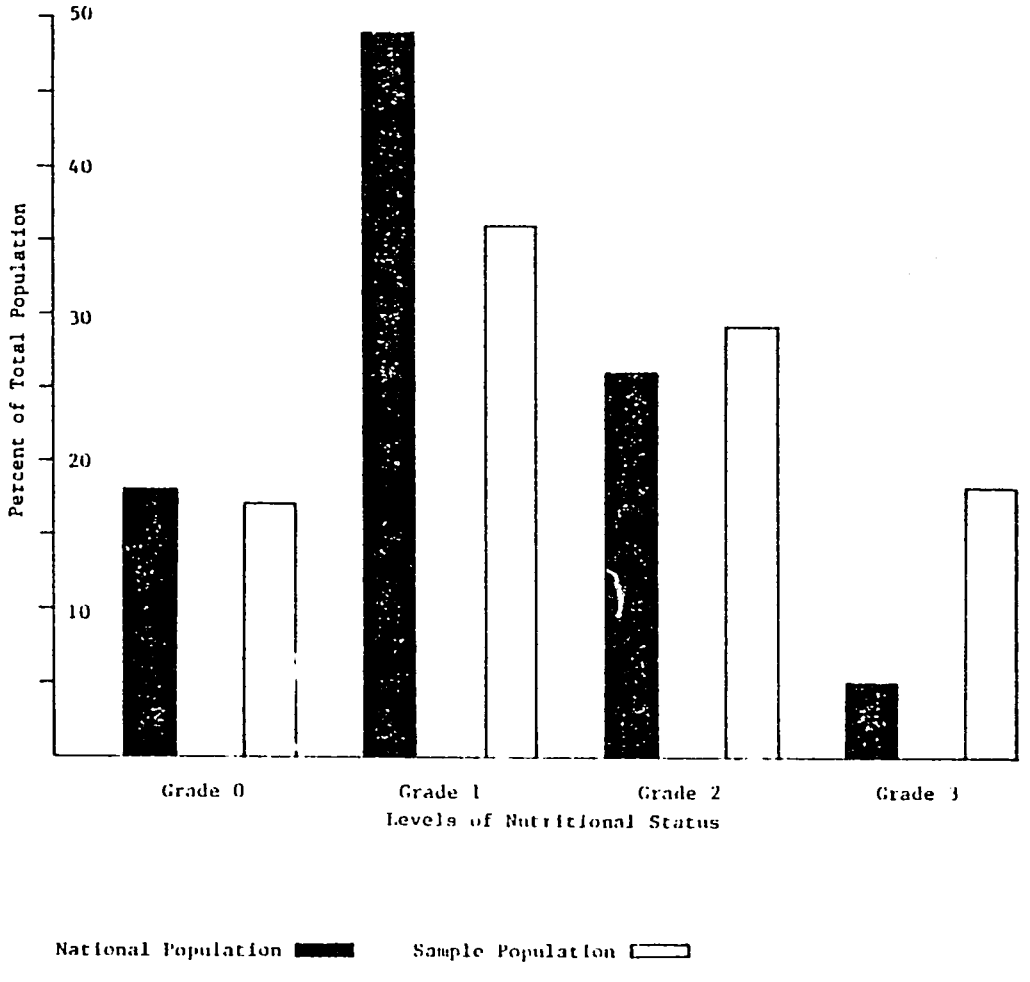


TABLE 10

The Means, Standard Deviations and Medians of Nutritional Status of the Sample Population

	Mean[1]	Standard Deviation	Median
Chronic Nutritional State	90.27	6.61	90.37
Acute Nutritional State			
adjusted acute	103.73	10.68	103.13
weight-for-height-for-age	94.80	11.88	93.75
weight-for-age	86.01	15.72	84.40

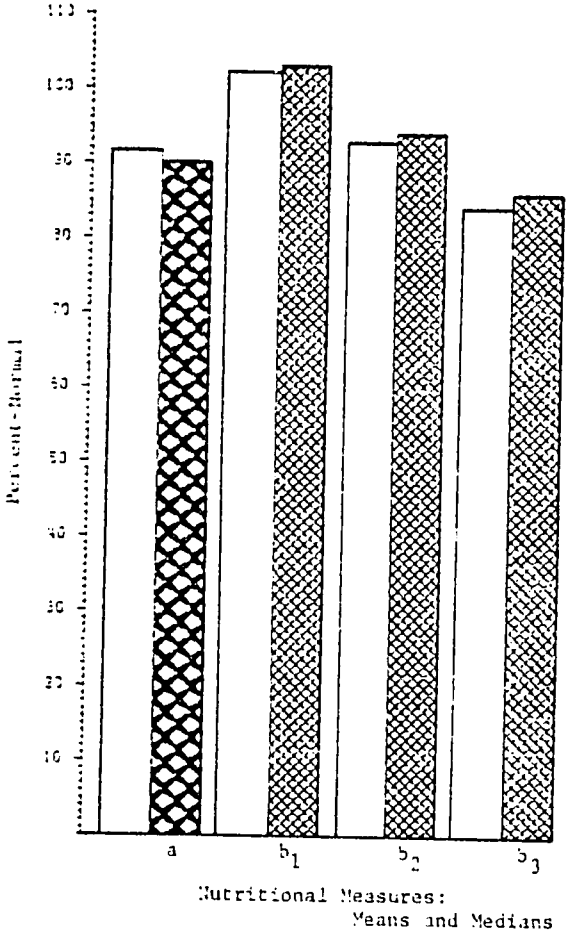
n = 310

1 These means indicate the percent of the normal standard attained by the average child in the sample.

note: See the appendices for the cut-off points according to the particular nutritional parameter.

FIGURE 4

Mean and Median Nutritional Scores
for the Sample Population



Mean Chronic Nutritional State: height-for-age

Mean Acute Nutritional State: 1) adjusted acute, 2) weight-for-height-for-age and 3) weight-for-age

Median nutritional scores corresponding to each adjacent measure

distributions are relatively normal rather than extremely skewed. Finally, except for the adjusted measure of acute nutritional status, the means and medians fall within the category of nutritional status designated as Grade-1 malnutrition, thus, indicating the relative poor nutritional state of the sample population. In short, the average child in the sample studied was suffering from malnutrition.

The Variables

The purpose of this section is to examine some of the factors important in the relationship between food aid and nutritional status. The literature suggests that there are many variables which might influence nutritional status. However, given the context of this study (Guatemala) time, money and the availability of information, only certain variables can be considered.

The dependent variable in this study is the nutritional status of measured children, as indicated by the four nutritional measures previously discussed. The independent variables include food program participation, ethnicity, domestic assets, income, urban-rural location, region, sex, age of the household head, level of self-sufficiency, education, literacy and the level of sanitation of the household. Table 11 presents a correlation matrix for the relationships among these variables for this sample. There are significant correlations between the dependent variable(s) measuring nutritional status and such independent variables as socioeconomic indicators, ethnicity, region, urban-rural location, sex and education. A brief description of the variables and their relationships to nutrition will be helpful in interpreting later analysis.

TABLE 11

Zero-order Correlations Among Dependent and Independent Variables

Variable	CNS	ANS$_1$[a]	ANS$_2$[b]	ANS$_3$[c]	PP	R	EI	S	U-R	DA	I	E	L	AHI	SS	S
Chronic Nutritional State	1.000 -															
Acute Nutritional State$_1$[a]	0.0881 (0.1243)	1.000 -														
ANS$_2$[b]	0.5560 (0.0001)	0.7885 (0.0001)	1.000 -													
ANS$_1$[c]	0.8057 (0.0001)	0.5844 (0.0001)	0.9352 (0.0001)	1.000 -												
Program Participation	-0.0788 (0.1671)	-0.1291 (0.0232)	-0.11[illegible]5 (0.0416)	-0.1207 (0.0340)	1.000 -											
Region	-0.1680 (0.0031)	-0.0023 (0.9680)	0.0960 (0.0937)	-0.0664 (0.2444)	0.0888 (0.1192)	1.000 -										
Ethnicity	0.2138 (0.0002)	0.0549 (0.3362)	-0.0656 (0.2524)	0.1264 (0.0263)	-0.0143 (0.5476)	-0.1671 (0.0032)	1.000 -									
Sex-of-the child	0.0860 (0.1317)	-0.1021 (0.0733)	-0.0697 (0.2238)	-0.0473 (0.4073)	-0.0361 (0.5269)	0.0058 (0.9190)	0.0648 (0.2559)	1.000 -								
Urban-Rural location	0.0114 (0.8144)	0.0974 (0.0876)	0.0805 (0.1600)	0.0840 (0.1407)	0.0307 (0.5909)	0.0284 (0.6189)	0.2249 (0.0001)	0.0087 (0.8796)	1.000 -							
Domestic Assets	0.2932 (0.0001)	0.2371 (0.0001)	0.0984 (0.0857)	0.2995 (0.0001)	-0.2185 (0.0001)	-0.1269 (0.0257)	0.3936 (0.0001)	0.0437 (0.4443)	0.0983 (0.0846)	1.000 -						
Income	0.1126 (0.0480)	0.0976 (0.0868)	0.0646 (0.2599)	0.1195 (0.0357)	-0.1792 (0.0016)	0.0704 (0.2174)	0.2648 (0.0001)	0.0632 (0.2684)	0.0586 (0.3046)	0.3721 (0.0001)	1.000 -					
Education	0.2434 (0.0001)	0.1538 (0.0068)	0.0114 (0.8424)	0.2082 (0.0002)	-0.0705 (0.2163)	-0.1145 (0.0443)	0.3634 (0.0001)	0.0212 (0.7107)	0.1989 (0.0004)	0.4595 (0.0001)	0.2442 (0.0001)	1.000 -				
Literacy	0.1727 (0.0023)	0.0629 (0.2706)	-0.0179 (0.7554)	0.1039 (0.0681)	0.0555 (0.3311)	-0.1613 (0.0045)	0.1643 (0.0038)	0.0219 (0.7010)	0.0870 (0.1271)	-0.2517 (0.0001)	0.1248 (0.0283)	0.6375 (0.0001)	1.000 -			
Age of Household	0.0250 (0.6644)	-0.0694 (0.2281)	-0.1059 (0.0671)	-0.0397 (0.4917)	-0.2065 (0.0003)	-0.1882 (0.0010)	0.2696 (0.0001)	0.0162 (0.7794)	0.0819 (0.1552)	0.0083 (0.8858)	-0.0250 (0.6643)	-0.1995 (0.0005)	-0.2946 (0.0001)	1.000 -		
Self-sufficiency	-0.1536 (0.0068)	0.0193 (0.4918)	0.0504 (0.3796)	-0.0932 (0.1020)	0.0267 (0.6405)	0.1476 (0.0094)	-0.3195 (0.0001)	-0.1098 (0.0538)	-0.3755 (0.0001)	-0.1592 (0.0050)	-0.1361 (0.0167)	-0.2896 (0.0001)	-0.2152 (0.0001)	-0.0471 (0.4119)	1.000 -	
Sanitation	0.2604 (0.0001)	0.1983 (0.0005)	0.0744 (0.1943)	0.2486 (0.0001)	-0.0717 0.2085	-0.1235 (0.0300)	0.4999 (0.0001)	0.0490 (0.3907)	0.2245 (0.0001)	0.6497 (0.0001)	0.4387 (0.0001)	0.5590 (0.0001)	0.3455 (0.0001)	-0.0152 (0.5417)	-0.2956 (0.0001)	1.000 -

[a]Acute nutritional measure, weight-for-height-for-age, [b]Acute nutritional measure, "adjusted acute," [c]Acute nutritional measure, weight-for-age.

As discussed earlier, there are five dimensions used to define the nature of the sample in this investigation. These dimensions or sub-samples include two categories each for program participation, region and urban-rural location. Two categories of ethnicity and two for sex-of-the-child yield the remaining sub-sample populations. (The breakdown of the nutritional state according to these sub-samples can be found in Table 33, located in the appendicies.) With this in mind, a brief discussion of those independent variables unrelated to the dimensions of the sample will be useful in order to set the stage for analyzing these variables and their relationship to the above sub-samples. These variables include domestic assets, income, education, literacy, age of the household head, level of self-sufficiency and level of sanitation.

Domestic Assets

The domestic assets variable was defined earlier as the level of living of a household as measured by the possession of domestic assets. This is probably the best socioeconomic measure of relative economic status in rural areas in the underdeveloped world primarily because of the inapprpriate nature of income (i.e. legal tender), outside the major urban centers, as a viable and predominant economic medium. Money is generally limited in traditional economies and, instead, subsistence production or barter takes its place.

As indicated in Table 12, there are significant correlations between the level of living indicator, domestic assets, and all but one of the dependent variables which measure both acute and chronic nutritional status. This result is expected since those families

TABLE 12

Zero-order Correlations Between Domestic Assets, Measures of Nutritional Status and Other Measures of Economic Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	0.2932	0.0001
Acute Nutritional State		
adjusted acute	0.0984	0.0857
weight-for-height-for-age	0.2371	0.0001
weight-for-age	0.2995	0.0001
(Independent)		
Income	0.3721	0.0001
Education	0.4595	0.0001
Literacy	0.2517	0.0001
Age of the Household Head	0.0083	0.8858
Self-sufficiency	-0.1592	0.0050
Sanitation	0.6497	0.0001

with adequate resources should tend to be better off nutritionally. The question arises, however, as to why the adjusted nutritional parameter measuring acute nutritional problems does not indicate such a significant relationship. This lack of sensitivity to one's level of living is probably due to the nature of the parameter itself. It is so finely attuned to changes in weight, considering no past changes in either height or weight that it varies independently of economic status. Its level of sensitivity is much greater than any of the other acute measures. Furthermore, as an indicator, this measure points out that acute forms of malnutrition pay no heed to one's level of living, per se. and may be more sensitive to disease factors.

With respect to the other independent variables shown in Table 12, there are significant relationships between domestic assets and education, income, ethnicity, literacy, level of self-sufficiency and sanitation level. With the exception of ethnicity, the variables of education, literacy, income and sanitation level are also directly associated with higher socioeconomic status. The higher the level of domestic assets, the greater the likelihood of more education. As for domestic assets and ethnicity, Indians tend to be poorer than Ladinos which is what is expected based on the structural relationships between the two groups in Guatemala. Finally, with respect to the level of self-sufficiency, the correlation coefficient indicates that the higher the level of living of the household, the less likely that household is to be self-sufficient, in that it will produce everything it will need or consume. This simply means that poorer households have to be as self-sufficient as possible rather than depending upon

the market for consumer goods. Sex, age of the household head and the urban-rural location appear to be of no importance with respect to the level of living of the household as expressed in domestic assets in the villages studied.

Income

Though it has been argued above that income is an inappropriate socioeconomic indicator in a country like Guatemala, it is interesting to examine income's performance as a variable in relationship to nutrition. Table 13 presents the results of the test of these binary relationships.

Income follows a pattern similar to that of the level of living indicator, domestic assets. The major difference is that, as a socioeconomic measure, income appears to be less sensitive to the effects of the other variables. This discrepancy is most evident in one of the acute nutritional measures. With respect to the acute measure, weight-for-height-for-age, this insensitivity can probably explain the lack of a relationship which is demonstrated with domestic assets shown in Table 12.

Education

The education variable refers to the number of years of formal education attained by the head of the household from which the sampled children come. Berg (1973) and Mayer (1973) point out that there is a relationship between the level of education of the parents and the nutritional (and health) state of their children; that is, the higher the educational level, the better the nutritional status. In this

TABLE 13

Zero-order Correlations Between Income, Measures of Nutritional Status and Other Measures of Economic Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	0.1126	0.0480
Acute Nutritional State		
adjusted acute	0.0646	0.2599
weight-for-height-for-age	0.0976	0.0868
weight-for-age	0.1195	0.0357
(Independent)		
Domestic Assets	0.3721	0.0001
Ethnicity	0.2648	0.0001
Education	0.2442	0.0001
Literacy	0.1248	0.0283
Age of the Household Head	-0.0250	0.6643
Self-sufficiency	-0.1361	0.0167
Sanitation	0.4387	0.0001

sample population, with the exception of the adjusted nutritional parameter measuring acuteness, there are highly significant correlations between the household head's level of education and the degree to which his or her children are affected by both acute and chronic forms of malnutrition, demonstrated in Table 14.

As for the remaining variables, there are significant correlations between educational level and literacy, age of the household head, level of self-sufficiency and the level of sanitation of a household. The relationship between education and literacy is obvious. Between education and the age of the household head, the correlation indicates that the younger the head is, the more educated. This points out the effectiveness of recent educational programs such as those to promote literacy and primary education which have been emphasized by the national government of Guatemala.

An inverse relationship exists between educational level and the level of self-sufficiency. The more educated the head of household, the less self-sufficient the household is. Finally, the correlation matrix indicates that as one's educational level goes up, so does one's level of sanitation. These results seem consistent with the arguments in the literature as to the relationship between nutritional status and education.

Literacy

Based on the above analyses, the variable of literacy would appear multicolinear with education, even though they measure two different variables. Literacy simply refers to whether or not the head of household can read and write, while education refers to the actual number

TABLE 14

Zero-order Correlations Between Education, Measures of Nutritional Status and Measures of Economic Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	0.2434	0.0001
Acute Nutritional State		
adjusted acute	0.0114	0.8424
weight-for-height-for-age	0.1538	0.0068
weight-for-age	0.2082	0.0002
(Independent)		
Literacy	0.6375	0.0001
Age of the Household Head	-0.1995	0.0005
Self-sufficiency	-0.2896	0.0001
Sanitation	0.5590	0.0001

of years of school attended. The two variables are not, however, mutually exclusive.

Table 15 presents the results of the bivariate procedures examining the relationship between literacy and the dependent variable(s) and certain independent variables. Briefly, the results indicate similar patterns exhibited by the variable, education and, therefore, do not really require detailed discussion.

The most interesting aspect of the binary relationship between the nutritional variable(s) and literacy is that, unlike education, literacy is only important with respect to the chronic nutritional problems. Literacy provides no protection against acute undernutrition, but may against chronic problems. However, to suggest why the dramatic difference occurs would be purely speculation. It could be that being literate does not mean that one necessarily has sufficient educational experience to deal successfully with acute nutritional problems associated with disease.

As for the remaining variables, the same basic pattern emerges which was characteristic of education; that is, literate households tend to be less self-sufficient, younger in age and maintain better levels of sanitation.

Age of the Household Head

The variable, age of the household head, is straightforward and attempts to provide some indication as to the age structure of the household. There is significant literature which examines the developmental cycle of the household. It has been argued that during the earliest and latest stages in the developmental cycle, the household

TABLE 15

Zero-order Correlations Between Literacy, Measures of Nutritional Status and Measures of Economic Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	0.1727	0.0023
Acute Nutritional State		
adjusted acute	-0.0179	0.7554
weight-for-height-for-age	0.0629	0.2706
weight-for-age	0.1039	0.0681
(Independent)		
Age of the Household Head	-0.2946	0.0001
Self-sufficiency	-0.2152	0.0001
Sanitation	0.3455	0.0001

has to call on every resource in order to survive. Table 16 presents the correlations between age, nutritional status and the independent variables dealing with the level of self-sufficiency and sanitation level of a household. As can be seen, there appears to be no significant or direct relationship between the age of the household head and how well-off nutritionally his or her children may be. Furthermore, age is not related, at least directly, to the level of self-sufficiency and sanitation. At best, these variables are only possibly related to age within the context of socioeconomic status.

Self-Sufficiency

The variable, "Self-sufficiency," measures how much of a given family or household's needs are cared for directly by its members. This measure was created by combining the proportion of foodstuffs (ie.e corn and beans), clothing, furniture, fuel and everyday household goods produced by the household itself in relation to what is consumed by that household. It was roughly measured in terms of percent, with 0 percent meaning that nothing consumed was produced by that household, whereas 25 percent, 50 percent, 75 percent and 100 percent represent increasing levels of self-sufficiency. Table 17 presents the bivariate relationships expressed between the variable of self-sufficiency and nutritional status and level of sanitation.

With respect to nutritional status, the level of self-sufficiency of a household is only important in the long-run (i.e. with respect to chronic malnutrition). It appears that the less self-sufficient a household is, the better off nutritionally are its members. The variable of self-sufficiency undoubtedly reflects differences in

TABLE 16

Zero-order Correlations Between the Age of the Household Head, Measures of Nutritional Status and Measures of Economic Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	0.0250	0.6644
Acute Nutritional State		
adjusted acute	-0.1059	0.0671
weight-for-height-for-age	-0.0694	0.2281
weight-for-age	-0.0397	0.4917
(Independent)		
Self-sufficiency	-0.0473	0.4119
Sanitation	-0.0352	0.5417

TABLE 17

Zero-order Correlations Between Self-sufficiency, Measures of Nutritional Status and Sanitation

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	-0.1536	0.0068
Acute Nutritional State		
adjusted acute	0.0509	0.3796
weight-for-height-for-age	-0.0393	0.4918
weight-for-age	-0.0932	0.1020
(Independent)		
Sanitation	-0.2956	0.0001

socioeconomic status. However, at the same time, it is an important factor which has to be dealt with since it is a basic principle in subsistence-oriented economic systems and, as a whole, most of Guatemala, excluding Guatemala City, is basically subsistence-oriented.

Finally, this indirect relationship between socioeconomics and level of self-sufficiency can be seen in its relationship to the sanitation level of the household. Table 17 shows that those households which are most self-sufficient tend to exhibit lower levels of sanitation. In essence, those who do not have money resources or at least access to those resources are self-sufficient because they have to be. Poor households generally produce everything that is consumed, although in fact, they are not producing enough to sufficiently satisfy their needs, this being dramatically demonstrated in the nutritional status of their children.

Sanitation

The creation of the sanitation index was discussed in Chapter V. The basic concept behind the variable of sanitation was that the better the sanitation level, vis-a-vis sanitation facilities, the better the health and nutritional state of the members of the respective households. It has been argued intensely by many developmentalists and policy-makers that improved sanitation conditions will bring about improved health and nutritional states. In Table 18, insight into the binary relationships between nutritional status and sanitation level in the sample population is proved.

As indicated, there seem to be highly significant relationships between sanitation and nutritional status, with the higher level of

TABLE 18

Zero-order Correlations Between Sanitation and Measures of Nutritional Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	0.2604	0.0001
Acute Nutritional State		
adjusted acute	0.0744	0.1943
weight-for-height-for-age	0.1983	0.0005
weight-for-age	0.2486	0.0001

sanitation being correlated to a higher nutritional status, as expected. However, this correlation is not as clear-cut as it would appear. The most serious problem clouding the relationship between sanitation and nutrition involves the household's level of living (i.e.domestic assets). If we go back and examine the relationship between sanitation and domestic assets, we find that there is a strong positive correlation of .65 between the two variables. This correlation, however, is partially a result of the fact that certain items used to measure sanitation are also included in the domestic assets scale. Therefore, what may be occurring is that the relationship between sanitation level and nutritional status is being produced more by economic factors than those related to hygiene. Because of this overlap between these variables they will be divided for the remainder of the discussion of the bivariate analyses, but the sanitation variable will be dropped from the final multivariate analysis so as to avoid potential problems associated with multicollinearity.

Comparisons of Sub-samples with Respect to the Relationships to the Independent and Dependent Variables

Attention will now be turned toward the five sub-sample strategies involving the five sub-populations described earlier. A more thorough investigation of the independent variables just discussed will be provided in the framework of these five sub-populations: program participation, region, urban-rural location, ethnicity and sex.

Program Participation

Program participation refers to whether or not the family of the measured individual receives food aid supplements by way of food aid

programs. It is this variable which is of primary concern to this study. It permits insight into the impact of food aid on nutritional status by comparing experimental and control populations. Table 19 presents some initial findings with respect to the binary relationships between program participation and the other independent variables, as well as its relationship to the dependent variable(s) of nutritional status. In executing these correlations, those families not involved in food programs were coded 0, while those participating were coded 1.

Critics of food programs have argued that food aid and food aid programs have either no effect or an insignificant one on the nutritional status of its recipients for such reasons as the distribution of inappropriate foodstuffs. Still others have maintained that there is improvement in nutritional status as the result of these food programs (May and McLellan 1972). Table 19 shows that the relationship between program participation and nutritional status is negative. Therefore, there is a tendency for those families participating in food programs to show greater degree of acute malnutrition than those not on programs. There is, however, no correlation between chronic malnutrition and program participation.

This bivariate analysis suggests that program participation is probably a response on the part of food program managers to acute and immediate nutritional problems in the communities being studied. As a matter of fact this is the aim of both CARE and CARITAS in Guatemala.[1] These correlations seem to indicate that the food aid is reaching its target population, the acutely malnourished and to

TABLE 19

Zero-order Correlations Between Program Participation, Measures of Nutritional Status and Measures of Economic Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	-0.0788	0.1671
Acute Nutritional State		
adjusted acute	-0.1165	0.0416
weight-for-height-for-age	-0.1291	0.0232
weight-for-age	-0.1207	0.0340
(Independent)		
Sex-of-the-child	-0.0361	0.5269
Income	-0.1792	0.0016
Domestic Assets	-0.2185	0.0001
Ethnicity	-0.0343	0.5476
Education	-0.0705	0.2163
Literacy	0.0555	0.3311
Age of the Household Head	-0.2065	0.0003
Self-sufficiency	0.0267	0.6405
Sanitation	-0.0717	0.2085

furnish a partial answer to the first question posed in Chapter I at least in an indirect manner.

Since chronic nutritional problems usually do not demand immediate attention as do those of an acute nature, this would seem to explain the discrepancy in correlation significance between the chronic nutritional measure and program participation, as opposed to the acute measures.

This difference between those families who participate in food aid programs and those which do not in the nutritional status of their preschool children can also be seen by examining their mean and median nutritional scores, as presented in Table 20. The mean and median nutritional status of program participants are consistently lower than those of non-beneficiaries. However, it must be remembered that these means and medians are statistically significant only with respect to the acute nutritional state.

In order to further examine the relationship between program participation and nutritional status, t-tests were performed on the means and medians just presented. In Table 20, the t-tests show a consistent pattern indicating the extent of this relationship. Again, the results of the t-tests would seem to indicate that there is significant discrimination in who participates in food programs in favor of those who are more malnourished.

With respect to the other independent variables presented in Table 20, significant correlations exist with program participation only with respect to the socioeconomic indicators of income and domestic assets and the age of the household head. It would seem reasonable to assume that those who participate in food programs come from lower socioeconomic levels, since there is more need at

TABLE 20

T-tests for Significance of Difference Between Mean and Nutritional Scores According to Program Status

Nutritional State		Participants[1]	Non-participants[1]	t/z	df	Probability
Chronic Nutritional State						
height-for-age	$\bar{x}$	89.89	90.97	1.39	307.0	0.1671
	sd	6.69	6.43			
	md	90.15	91.12	1.47		0.1427
Acute Nutritional State						
adjusted acute	$\bar{x}$	102.81	105.40	2.05	304.0	0.0416
	sd	10.30	11.18			
	md	102.46	105.07	1.79		0.0738
weight-for-height-for-age	$\bar{x}$	93.66	96.86	2.28	307.0	0.0232
	sd	11.16	12.87			
	md	92.94	95.25	2.42		0.0158
weight-for-age	$\bar{x}$	84.60	88.56	2.13	307.0	0.0340
	sd	15.09	16.55			
	md	83.62	85.83	1.70		0.0886

[1]Note that these figures are in "percent-normal."

those levels for food supplementation, not to mention access to general medical care. The correlations indicate that this is the case. The lower the economic status of a family the more the tendency to be a participant in a food program.

According to ethnographic observation of similar programs in Patzite, El Quiche and Santa Cruz del Quiche, Guatemala, however, there was no purposively intended discrimination of the basis of economic status. Nevertheless program participants did tend almost exclusively to come from the lower socioeconomic strata. The sample population in this study appears to follow this same pattern.

As for the age of the household head, it was found that the average program participant's household head tends to be younger than the non-participant, with the average participant having a mean age of 33 years (and a median of 31) and the non-participant, a mean age of 37 years (and a median of 37). The significant correlation coefficient presented in Table 19, (p. 155) points out this age disparity. Much of the literature on households suggests that middle-aged households tend to be better off economically. Since there are usually no young children in these households, they are less likely to be program participants. On the other hand, the younger households tend to require more assistance, and are, therefore, more likely to be included in food programs.

With respect to the remaining variables included in Table 19, there are no significant correlations. Since there is not supposed to be any discrimination as to program participation according to sex and ethnicity, this is to be expected. Also, there is no reason to

suspect that there would be any difference between those households which participate in food programs and those which do not in regard to their level of self-sufficiency.

Berg (1973) and Mayer (1973) note that there is a significant relationship between the level of education of the parents and the nutritional (and health) state of their children; that is, the higher the educational level, the better the nutritional status. Though Table 19 seems to demonstrate this direct relationship between education and nutritional status, it would seem reasonable to expect program participation to be negatively associated with education. Rather, there is no relationship between one's level of education and whether or not one participates in a food program. However, the fact that acute nutritional problems predominate in program participants probably explains the lack of a significant relationship with education, in that people of all educational levels are vulnerable to acute changes in their nutritional state, particularly as the result of disease.

Region: San Martin Jilotepeque versus San Lucas Toliman

"Region" refers to whether the measured child (and respective family) is from San Martin Jilotepeque or San Lucas Toliman. The intention of this variable is to examine different regions as to the effect of food aid on nutritional status. Region also provides insight on a cross-sectional basis as to the national nutritional situation, not to mention any differences or similarities between the two regions as exhibited in the nutritional status of their respective populations.

Another aspect of these regions involves the difference in economic systems. San Lucas Toliman primarily depends on an export, mono-cash-crop economy which produces coffee almost exclusively. San Martin Jilotepeque relies more heavily on a subsistence-agricultural economy.

It has been argued throughout much of the literature dealing with political economy in the Third World that societies which produce the majority of their subsistence (i.e. foodstuffs, etc.) tend to be better off socioeconomically, and thus nutritionally, than those which devote a significant proportion of their energies to cash crop economies. The idea here is that subsistence production cannot be replaced by paid labor since the value of that subsistence cannot be matched proportionately by wages. For example, in 1980, a day's labor in Guatemala would bring in one dollar and fifty cents. Ethnographic observations indicate that an avarage family of four could not eat three meals a day of proper nnutritional quantity and quality on this wage. Furthermore, it is this treadmill effect of the Third World economies which creates what Cravioto (1970) has called the "spiraling effect in malnutrition." This seems to be the case with respect to San Lucas Toliman, to a greater degree than San Martin Jilotepeque.

Table 21 presents the bivariate relationships between the region variable and the dependent and the other independent variables. In these correlations San Martin is coded 0 and San Lucas is coded 1. With respect to nutritional status, there is no significant relationship between region and acute nutritional problems. Again, since measures of acute nutritional changes tend to pick up only those immediate shifts which are usually due to illness, immediate loss of

food supplies or disaster, then, a difference according to region in the acute nutritional status in the sample population should not be expected. However, with respect to the chronic nutritional state, if what the literature is arguing is correct (that is, the type of economy aids in the determination of the state of well-being of a given population), then a significant correlation between the region where one lives and one's level of nutritional status should be expected if differences in economy are found between regions. According to the results presented in Table 21, there is a significant correlation between this variable, region, and the chronic nutritional status of its respective inhabitants. Based on the correlation coefficient, the measured individuals from San Martin Jilotepeque (coded 0) are nutritionally better off than their counterparts in San Lucas Toliman (coded 1). This would tend to suggest that the argument that those who produce subsistence primarily do in fact tend to be better off nutritionally than those who mainly produce wage labor under the conditions being experienced in most of Guatemala.

In order to better understand this problem of regional difference in nutritional state, t-tests were conducted on the relevant means and medians. The results of these t-tests are presented in Table 22. As indicated in the chronic measure, there is a significant difference in the means and medians of the two regions, with the inhabitants of San Martin Jilotepeque showing the higher values. Again, the question arises as to why the chronic nutritional measure demonstrates significant differences regionally. No such differences are found for acute measures. Though here in these t-tests of the means and medians, regional differences in economic systems cannot be directly pin-pointed

TABLE 21

Zero-order Correlations Between Region, Measures of Nutritional Status and Other Measures of Economic Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	-0.1680	0.0031
Acute Nutritional State		
adjusted acute	0.0960	0.0937
weight-for-height-for-age	-0.0023	0.9680
weight-for-age	-0.0664	0.2444
(Independent)		
Income	0.0704	0.2174
Domestic Assets	-0.1269	0.0257
Ethnicity	-0.1671	0.0032
Education	-0.1145	0.0443
Literacy	-0.1613	0.0045
Age of the Household Head	-0.1882	0.0010
Self-sufficiency	0.1476	0.0094
Sanitation	-0.1235	0.0300

TABLE 22

T-tests for Significance of Difference Between Means and Medians for Nutritional Status According to Region

Nutritional Measure		San Martin J.[1]	San Lucas T.[1]	t/z	df	Probability
Chronic Nutritional State						
height-for-age	$\bar{x}$	91.29	89.07	2.91	249.2	0.0040
	sd	5.42	7.62			
	md	91.12	89.15	-1.99		0.0456
Acute Nutritional State						
adjusted acute	$\bar{x}$	86.97	84.88	1.17	307.0	0.2444
	sd	15.17	16.32			
	md	84.88	82.81	-0.86		0.3901
weight-for-height-for-age	$\bar{x}$	94.82	94.77	0.04	307.0	0.9680
	sd	11.89	11.90			
	md	93.13	94.55	1.19		0.2333
weight-for-age	$\bar{x}$	102.80	104.85	-1.66	273.8	0.0985
	sd	9.80	11.56			
	md	102.25	104.26	1.15		0.2520

[1]Note that these figures are in "percent-normal."

as the cause for differences in nutritional status, the initial indications derived from these tests in the context of the remaining independent variables depicted in Table 21 would suggest that there is some kind of relationship between region, socioeconomics and nutritional status, that is, San Martin people are better off than those of San Lucas. Long-term problems, such as those produced by economic systems, are generally structural and these long-term problems are manifested in chronic malnutrition.

Finally, with respect to the other independent variables found in Table 21, regional differences appear to be significant in domestic assets, ethnicity, education, literacy, age of the household head, self-sufficiency and sanitation level. In all instances, with the exception of the level of self-sufficiency of the household, the households of San Martin Jilotepeque tend to be better off than their counterparts in San Lucas Toliman. Probably variables such as domestic assets and education are pointing out something about the general nature of the socioeconomic structure of Guatemala. They seem to indicate that regional differences, which are primarily based in different economic systems, are significant enough to actually manifest themselves in the nutritional status of their children.

The variable of self-sufficiency is in itself an indicator of a poor economic condition. Even though a household may be considered, or at least considers itself self-sufficient, the concept of self-sufficiency should not be mistaken as implying that a given household is producing everything that is needed. Rather, it is simply producing everything that is consumed in a particular household. Nothing

more can be afforded. As for the direction of this particular correlation coefficient, the households of San Lucas Toliman are more self-reliant than those of San Martin Jilotepeque.

As for the variable of income, there does not appear to be a significant relationship between the region in which a household is located and the amount of income acquired by that household. What seems to be indicated here is that income levels are relatively the same in both areas. However, more intesting is the possibility that what this may be in fact demonstrating, at least indirectly, is that though the local economy of San Lucas Toliman is income-oriented, no greater levels of income are being generated there than in San Martin Jilotepeque where a more subsistence-oriented economy is operating. When this is taken in the context of what human energy is available to a given household and where that energy is being expended in order to survive, the picture of the regional disparity being exhibited in much of Guatemala becomes clearer.

Urban-Rural Location

This variable compares urban and rural sub-samples with each other. The major difference between the urban centers and the rural areas studied includes limited accessibility to such goods and services as potable water, medicine and health care and electricity. Potable water, in particular, is important in the general health state of an individual or community. "Urban" in the spatial context of this study does not carry the usual connotations. Rather, it refers to centralized aggregates of households which are politically recognized

as the governing seat for each region and have populations greater than 3,000. Therefore, because of the nature of the "urban" centers in these particular regions, direct accessibility to food supplies in not limited to either type of location, urban or rural. The only reason food supply may be more of a problem in large urban centers than in the rural hinterlands is due to limits on the availability of land.[2] Table 23 provides some insight into the bivariate relationships between the urban-rural variable and the dependent and other independent variables.

There are no significant relationships between the urban-rural variable and nutritional status. It does not seem to matter if an individual or household resides in either the urban center or the rural area. This would seem to suggest that the argument as to accessibility to goods and services is inadequate .

Only four of the other independent variables show indications of relationship to the variable, urban-rural location. These include the level of self-sufficiency, ethnicity, education and sanitation level. The binary results between one's level of self-sufficiency and the location of the household in either the urban or rural areas demonstrate that households in the rural areas tend to be more self-reliant. The same basic relationship exists with respect to the educational level and sanitation level of the household; that is, households in the rural areas tend to be less educated and have more primitive forms of sanitation (i.e. no facility in rural areas versus latrines and flushing toilets in urban centers).

Surprisingly, domestic assets appear to have no relationship to the location of the household, be it urban or rural. It can be

TABLE 23

Zero-order Correlations Between Urban-Rural Location, Measures of Nutritional Status and Measures of Economic Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	0.0134	0.8144
Acute Nutritional State		
adjusted acute	0.0805	0.1600
weight-for-height-for-age	0.0974	0.0876
weight-for-age	0.0840	0.1407
(Independent)		
Domestic Assets	0.0983	0.0846
Income	0.0586	0.3046
Ethnicity	0.2249	0.0001
Education	0.1989	0.0004
Literacy	0.0870	0.1271
Age of the Household Head	0.0819	0.1552
Self-sufficiency	-0.3755	0.0001
Sanitation	0.2245	0.0001

speculated on the basis of ethnographic observations that this is probably due to a lack of outstanding economic opportunities in either area. Income is also unrelated to urban-rural location for a very similar reason. Sources for generating income are generally limited in both rural and urban areas by the almost exclusively informal economic sector. In these urban centers, as is the case of all of Guatemala located outside Guatemala City, there is no industrial base. As for the age of the household head, there is no reason to suspect, based on ethnographical observation, that there would be differences in the ages of those heads in the rural and urban areas. Finally, it is interesting to note that literacy rates are approximately the same for both areas. This seems to indicate that there is probably a nominal amount of instruction taking place in the rural areas, though formal education is less prevalent.[3]

Ethnicity

The variable, "ethnicity," refers to whether the individual being measured is recognized as either Indian or Ladino. Adams (1970) discusses in great detail the power (sociopolitical) structure of Guatemala and he points out that Indians have significantly less access to the mechanisms of power, as well as to goods and services, than do Ladinos. Based on these sociocultural aspects, it is reasonable, therefore, to expect that this imbalance will be correlated to nutritional status. Table 24 presents these correlations.

Ethnically, acute nutritional problems become significant only when the amount of weight is considered in light of the age of the

TABLE 24

Zero-order Correlations Between Ethnicity, Measures of Nutritional Status and Measures of Economic Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	0.2138	0.0002
Acute Nutritional State		
adjusted acute	-0.0056	0.2524
weight-for-height-for-age	0.0549	0.3362
weight-for-age	0.1264	0.0263
(Independent)		
Income	0.2648	0.0001
Domestic Assets	0.3936	0.0001
Urban-Rural Location	0.2249	0.0001
Education	0.3634	0.0001
Literacy	0.1643	0.0038
Age of the Household Head	0.2696	0.0001
Self-sufficiency	-0.3195	0.0001
Sanitation	0.4999	0.0001

measured individual. According to this nutritional parameter, Indians (coded 0) are more likely to exhibit acute nutritional symptoms. However, this measure has a tendency to pick up the chronic effects of nutrition because of the age factor. Acutely, the effects of nutrition are not felt any differently by either ethnic group. However, this relationship between ethnicity and nutritional status must be considered in the context of the chronic nutritional state.

There tends to be a very significant correlation between Indians and chronic nutritional problems. Indians tend to suffer more from persistent, long-term conditions of undernutrition than do Ladinos. This relationship between ethnicity and the acute and chronic nutritional state seems to demonstrate that the structural position of one ethnic group over another insures that, in general, one will be better off than the other with respect to the nutrition of their children.

Based on this observation, t-tests were conducted on the means and medians of the nutritional measure for the two ethnic groups represented in this sample population. The results are presented in Table 25. After comparing the means and medians, again it is apparent that acute nutritional problems are not characteristic of any one ethnic group as opposed to the other. However, as demonstrated earlier, there is a chronic difference ethnically in nutritional status. Indians tend to show a greater degree of chronic nutritional problems than do Ladinos.

Although no acute differences are being picked up by the t-tests, there is an interesting discrepancy worth noting. In the nutritional

TABLE 25

T-tests for the Significance of Difference Between Means and Medians for Nutritional Status According to Ethnicity

Nutritional Measure		Indian[1]	Ladino[1]	t/z	df	Probability
Chronic Nutritional State						
height-for-age	$\bar{x}$	89.59	93.17	-3.84	307.0	0.0002
	sd	6.64	5.65			
	md	90.02	92.25	2.20		0.0282
Acute Nutritional State						
adjusted acute	$\bar{x}$	104.08	102.30	1.15	304.0	0.2524
	sd	10.62	10.87			
	md	104.17	100.00	-2.17		0.0300
weight-for-height-for-age	$\bar{x}$	94.48	96.14	-0.84		
	sd	11.31	14.04			
	md	93.60	94.51	0.46		0.6447
weight-for-age	$\bar{x}$	85.05	90.09	-1.98	77.7	0.0509
	sd	14.97	18.14			
	md	84.18	84.76	0.46		0.6447

[1]Note that these figures are "percent-normal."

measure entitled "adjusted acute," the median value presented in Table 25 indicates that Indians enjoy a higher nutritional state than do Ladinos. It is this particular measure which completely ignores chronic nutritional problems and considers only the immediate nutritional state. Also, as mentioned above, Stini (1971) argues that populations which persistently experience malnutrition will eventually adjust to that state of inadequate nutritional intake, in that the required quantity of food intake is lowered. One implication of these results provided in Table 25 is that the reason why Indians tend to have a higher mean and median nutritional score is that Indians can better withstand nutritional stress than can Ladinos. Unfortunately, the median value only is significant, thus detracting from this interpretation.

Other significant ethnic differences, presented in Table 24 (p. 169) include domestic assets, income, urban-rural location, education, literacy, level of self-sufficiency, sanitation level and the age of the household head. All the correlations between these variables and ethnicity simply confirm the census data which indicate that there is a tendency for Indians to be poorer, live in the rural areas, be less educated, more illerate, more self-sufficient (or rather less involved in the formal economic sector), have less access to sanitation facilities and, as heads of households, to be younger than Ladinos.

Sex-of-the-Child

The sex-of-the-child variable refers to male and female differences of the children being measured with respect to nutritional

status. Jelliffe (1968) suggests that in many Third World societies food is allocated in quantity and quality on a priority basis, in which female children are usually the last to receive it. This was anticipated to be the case in Guatemala as well. Table 26 presents the results of the initial bivariate procedures examining the relationships between sex and nutritional status.

The relationship between the sex of the measured child and nutritional status is not significant; that is, the nutritional state among males and females is relatively the same. In order to make sure that the sex variable played no role, a t-test of the means and medians of nutritional status was conducted. Table 27 demonstrates that, again, there is no difference according to the sex of the measured child.

Multivariate Analyses

Given the discussion of the variables and the information uncovered by the univariate and bivariate analyses, a simple linear regression was performed on the relevant variables in order to assess more accurately the impact of food aid and food aid programs on nutritional status. This analysis partials out the effects of the various factors. Initially, a regression with interaction terms, according to program participation versus non-participation, was run and, as a result, different variables were found to be important.

Because of the results of this multivariate procedure and since the basis for dealing with the questions as to the effects involves whether or not one is included in a food program, linear regressions

TABLE 26

Zero-order Correlations Between Sex-of-the-Child and Measures of Nutritional Status

Variable (Dependent)	r_a	Probability
Chronic Nutritional State		
height-for-age	0.0860	0.1317
Acute Nutritional State		
adjusted acute	-0.0697	0.2238
weight-for-height-for-age	-0.1021	0.0733
weight-for-age	-0.0473	0.4073

TABLE 27

T-tests for the Significance of Difference Between Means and Medians for Nutritional Status According to Sex of the Measured Child

Nutritional Measure		Female[1]	Male[1]	t/z	df	Probability
Chronic Nutritional State						
height-for-age	$\bar{x}$	89.73	90.87	-1.53	298.8	0.1268
	sd	7.35	5.63			
	md	90.34	90.63	0.40		0.6926
Acute Nutritional State						
adjusted acute	$\bar{x}$	104.44	102.95	1.22	304.0	0.2238
	sd	10.71	10.61			
	md	103.09	103.18	0.34		0.7317
weight-for-height-for-age	$\bar{x}$	95.95	93.53	1.82	302.5	0.0703
	sd	12.99	10.41			
	md	94.13	93.13	-0.52		0.6069
weight-for-age	$\bar{x}$	86.72	85.23	0.84	292.6	0.4001
	sd	17.89	12.92			
	md	84.46	84.16	-0.06		0.9525

[1]Note that these figures are in "percent-normal."

were conducted according to program status. The same set of variables was used in both models in order to insure consistency, as well as to point out as nearly as possible the exact relationship these variables have to program participation.

A Theoretical Model

A theoretical model, necessary to developing the basis for the multivariate analysis, was constructed on the premise that food aid, via food aid programs, intervenes between the various independent variables and the dependent variable--nutritional status. At this stage of the analysis, it is not important whether this intervention has a positive, negative or even neutral effect on nutritional status. The most important question to arise from this is: Does program participation intervene in the outcome of the recipient's nutritional state of being? Figure 5 presents a schematic representation of this model.

Based on the preceding conceptual framework, it would be most valuable to examine the significance of bivariate correlation coefficients between the variables and program participation, as well as the relationship between the same independent variables and non-participation. These relationships are demonstrated in Tables 28 and 29.

As can be seen in Table 28, which deals with those families not participating in food programs, there are significant correlations between non-participation and region, urban-rural location, ethnicity, sex-of-the child, education, self-sufficiency and domestic assets. This implies that, under "normal" conditions where there is no nutritional intervention program, significant differences in a given population's nutritional state of being are generally determined by these

FIGURE 5

A Model of the Role of Food Aid and Food Aid Programs in Nutritional Status

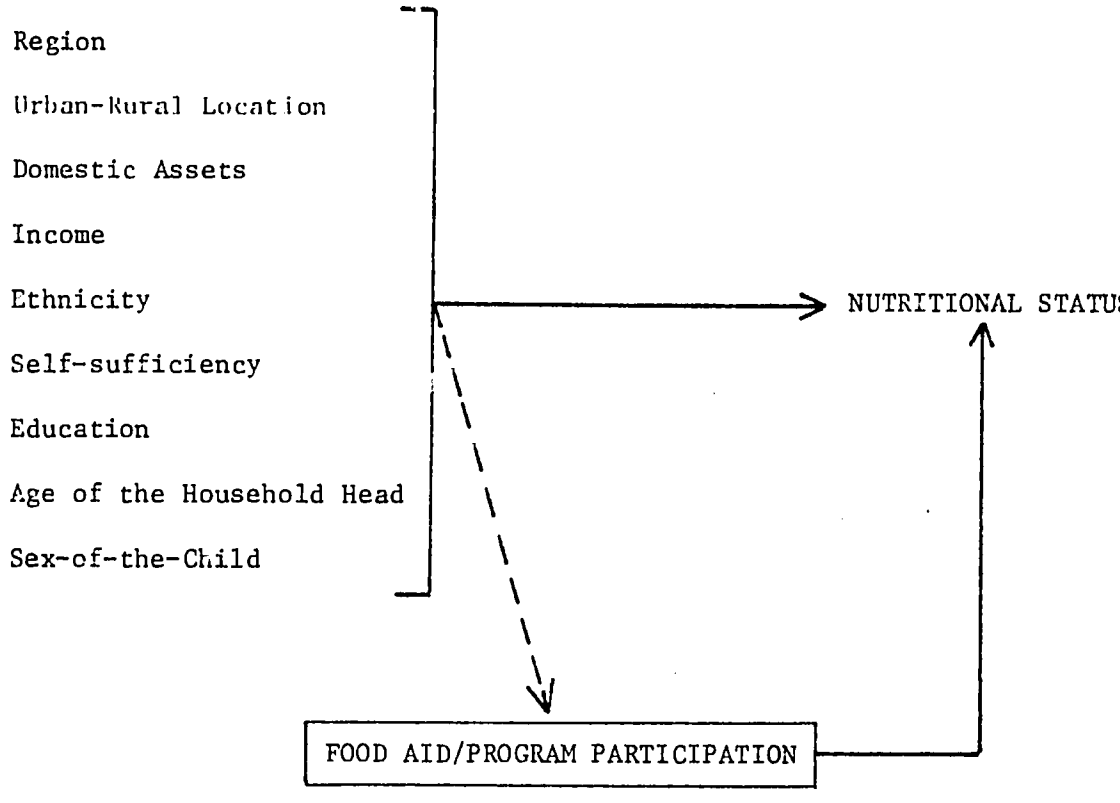


TABLE 28

Zero-ordered Correlations Between Measures of Nutritional Status and Various Independent Variables for Those Families Not Participating in Food Programs

Dependent Variables	Independent Variables								
	Region	Urban-Rural Location	Ethnicity	Sex-of-the-Child	Education	Age of the Household Head	Domestic Assets	Income	Self-sufficiency
Chronic Nutritional State	-0.3523 (0.0002)	-0.0997 (0.3000)	0.4117 (0.0001)	0.1930 (0.0433)	0.4411 (0.0001)	-0.1045 (0.2909)	0.4517 (0.0001)	0.1810 (0.0585)	-0.2890 (0.0022)
Acute Nutritional State									
adjusted acute	-0.0771 (0.4254)	0.2596 (0.0064)	0.0612 (0.5273)	-0.0387 (0.6893)	0.2780 (0.0171)	-0.1634 (0.0990)	0.1673 (0.0821)	0.0704 (0.4667)	0.0787 (0.4159)
weight-for-height-for-age	-0.2297 (0.0158)	0.1955 (0.0406)	0.2317 (0.0149)	-0.0567 (0.5560)	0.3972 (0.0001)	-0.1866 (0.0668)	0.3548 (0.0001)	0.1206 (0.2095)	-0.0813 (0.3983)
weight-for-age	-0.3007 (0.0014)	0.1137 (0.2370)	0.3320 (0.0004)	0.0318 (0.7418)	0.4649 (0.0001)	-0.1805 (0.0668)	0.4521 (0.0001)	0.1647 (0.0855)	-0.1700 (0.0757)

TABLE 29

Zero-ordered Correlations Between Measures of Nutritional Status and Various Independent Variables for Those Families Participating in Food Programs

Dependent Variables	Independent Variables								
	Region	Urban-Rural Location	Ethnicity	Sex-of-the-Child	Education	Age of the Household Head	Domestic Assets	Income	Self-sufficiency
Chronic Nutritional State	-0.0634 (0.3737)	0.0787 (0.2692)	0.1003 (0.1586)	0.0252 (0.7243)	0.1160 (0.1027)	0.0710 (0.3187)	0.1339 (0.594)	-0.0597 (0.4019)	-0.0818 (0.2508)
Acute Nutritional State									
adjusted acute	0.2146 (0.0025)	-0.0226 (0.7529)	-0.1532 (0.0316)	-0.0953 (0.1828)	-0.1537 (0.0311)	-0.1111 (0.1203)	-0.0886 (0.7155)	0.00093 (0.8972)	0.0398 (0.5787)
weight-for-height-for-age	0.1583 (0.0256)	0.0417 (0.5590)	-0.0704 (0.3228)	-0.1405 (0.0477)	-0.0399 (0.5759)	-0.0403 (0.5717)	-0.0031 (0.9649)	-0.0264 (0.7112)	-0.0085 (0.9047)
weight-for-age	0.0884 (0.2144)	0.0728 (0.3069)	-0.0102 (0.8861)	-0.1030 (0.1476)	0.0160 (0.8221)	0.0052 (0.9421)	0.0521 (0.4646)	-0.0482 (0.4990)	-0.0446 (0.5321)

sets of conditions. For this reason, these variables indicated in Table 28, plus the variables, age of the household head and income, were selected for the set of factors to be included in the multivariate regression models so as to arrive at a better understanding of the role of food aid and food aid programs in the outcome of one's nutritional status.

Table 29 presents the relationships that are exhibited between program participation and the same set of variables listed in Table 28. Only in a few instances does there appear to be a relationship; these include region, ethnicity, sex-of-the-child and education. If one participates in a food program, one is likely to come from the San Lucas Tollman area (coded 1), be Indian (coded 0), be female (coded 0) and have a lower education level (with respect to the head of the household). In all cases, interestingly, these correlations with program participation and the respective nutritional status are related to acute malnutrition; this having been pointed out earlier in the bivariate analysis. Program participation, in other words, tends to be determined by one's acute nutritional state.

The Linear Regression Models

With this background information, attention can now be turned to the linear regression models which were designed on the basis of food program status (i.e. programs versus non-program families). For each of two sub-populations, there are four regression models which correspond to each of the four nutritional parameters: height-for-age, adjusted acute (weight-for-height-excluding age), weight-for-height-for-age and weight-for-age. As mentioned before, these multivariate

analyses are designed to partial out the interactional effects of the variables, weigh them against each other and present a more accurate assessment of the various variables. Tables 30 and 31 present the results of the multivariate regressions.

As can be seen in Table 30 in which the different variables are of equal value, the most influential and predictive chronic factors among the control population (i.e. non-participants) include region, ethnicity, domestic assets, urban-rural location and sex-of-the-child, respectively. As for their acute nutritional state of being, the variables of region, urban-rural location and domestic assets are also important. However, the education variable which did not appear to be important in one's chronic nutritional state is significant in one's acute nutritional state. Again, this seems to point out that education can play a major role in preventing acute nutritional problems, as noted earlier in this chapter.

When examining the same set of variables for the experimental population (i.e. program participants) shown in Table 31, there are no significant effects exhibited in their chronic nutritional state, unlike the control population. However, the variables of region, education and sex-of-the-child do appear to have an impact on their acute nutritional state.

First, the most notable aspect of these analyses is that, as suggested by the initial bivariate analyses, the same variables which were found to be very significant in determining the nutritional status of the children of those families who did not participate in food programs were of relatively no consequence for the program

TABLE 30

Regression Estimates for Models Linking Independent Variables to the Nutritional Status of Families Not Participating in Food Programs: Additive Effects of Values

Dependent Variables	Independent Variables										
	Region	Urban-Rural Location	Ethnicity	Sex-of-the-Child	Education	Level of Living	Age of the Household Head	Income	Self-Sufficiency	r^2	Prob. > F
Chronic Nutritional State											
Height-for-age	-4.4870**[a]	-2.5553*	4.157*	2.1466*	0.2556	0.0006*	0.0153	-0.0001	-0.2674		
	(1.0999)[b]	(1.1123)	(1.7293)	(1.0088)	(0.2380)	(0.0003)	(0.0513)	(0.0005)	(0.2147)	0.4783	0.0001
	-0.3347[c]	-0.1834	0.2663	0.1651	0.1290	0.2111	0.0250	0.0137	-0.1050		
Acute Nutritional State											
Adjusted acute	-2.9542	7.0684**	-4.6362	-0.8360	0.9609	0.0093	-0.0506	0.0004	0.4962		
	(2.3133)	(2.3355)	(3.6182)	(2.1217)	(0.5005)	(0.0006)	(0.1079)	(0.0010)	(0.4517)	0.1831	0.0213
	-0.1311	0.3018	-0.1767	-0.0383	0.2886	0.0538	-0.0492	0.0456	0.1160		
Weight-for-height-for-age	-7.0780**	4.6465	-0.8074	-1.7832	1.2332*	0.0009	-0.0120	0.0001	0.1738		
	(2.4111)	(2.4383)	(3.7120)	(2.2114)	(0.5216)	(0.0006)	(0.1124)	(0.0010)	(0.4708)	0.3122	0.0001
	-0.2765	0.1747	0.0271	-0.0718	0.3260	-0.1636	-0.0103	0.0098	0.0158		
Weight-for-age	-10.9990**	2.1649	3.1040	0.4736	1.3423*	0.0016*	-0.0068	0.0004	-0.0917		
	(7.9399)	(2.9732)	(4.5983)	(2.6964)	(0.6360)	(0.0008)	(0.1371)	(0.0[illegible]2)	(0.5740)	0.4023	0.0001
	-0.3285	0.0622	0.0796	0.0146	0.2713	0.2318	-0.0044	0.0034	-0.0144		

[a]Unstandardized Coefficient
[b]Standard Error of the Estimate
[c]Standardized Coefficient
* p < .05, ** p < .01

TABLE 31

Regression Estimates for Models Linking Independent Variables to the Nutritional Status of Families Participating in Food Programs: Additive Effects of Values

Dependent Variables	Independent Variables										
	Region	Urban-Rural Location	Ethnicity	Sex-of-the-Child	Education	Level of Living	Age of the Household Head	Income	Self-sufficiency	r^2	Prob. > F
Chronic Nutritional State											
height-for-age	-0.2747[a] (1.0394)[b] -0.0208[c]	0.1663 (1.2303) 0.0116	0.3379 (1.5270) 0.0197	0.5849 (0.9727) 0.0441	0.2895 (0.1930) 0.1215	0.0010 (0.0009) 0.0955	0.0471 (0.0589) 0.0702	-0.0061 (0.0064) -0.0736	0.0928 (0.2233) 0.0377	0.0401	0.5565
Acute Nutritional State											
adjusted acute	3.4190* (1.5756) 0.1663	0.4319 (1.8650) 0.0194	-1.6578 (2.3147) -0.0624	-2.1946 (1.4745) -0.1065	-0.5972* (0.2926) -0.1614	-0.0004 (0.0013) 0.0233	-0.0620 (0.0892) -0.0594	0.0053 (0.0097) 0.0413	-0.3145 (0.3385) -0.0822	0.0855	0.0480
weight-for-height-for-age	3.0603 (1.7031) 0.1407	0.5519 (2.0159) 0.0235	-1.1693 (2.5020) -0.0416	-3.3615* (1.5938) -0.1541	-0.1506 (0.3162) -0.0385	0.0005 (0.0014) 0.0274	0.0194 (0.0965) 0.0176	0.0017 (0.0104) 0.0125	-0.1896 (0.3659) -0.0468	0.0462	0.4366
weight-for-age	-2.7633 (2.3327) 0.0938	1.0341 (2.7612) 0.0325	-0.9763 (3.4270) -0.0256	-3.0731 (2.1830) -0.1040	0.0993 (0.4331) 0.0187	0.0014 (0.0019) 0.0582	0.0703 (0.1321) 0.0470	-0.0040 (0.0143) -0.0216	-0.1101 (0.5012) -0.0201	0.0246	0.8562

[a]Unstandardized Coefficient

[b]Standard Error of the Estimate

[c]Standardized Coefficient

* $p < .05$

participants.[4] Only in two cases do two particular variables seem to play possibly a significant role: the region variable in the model of the adjusted acute nutritional status denoted by weight-for-height-for age and the sex-of-the-child. One possible explanation of the regional difference could be that there is more bias in the selection criteria of those programs found in San Martin Jilotepeque than those in San Lucas Toliman, as suggested by the other lines of analyses and the ethnographic data.

In San Lucas Toliman, there is a very strong religious element involved in the promotion of food programs. The local Catholic priest is extremely active in promoting the food programs conducted by CARITAS/ Catholic Relief Services. As a result, there is a greater likelihood that there will be more people in those food programs of San Lucas Toliman who are not as acutely deficient in nutritional status as those of San Martin Jilotepeque.

Tables 28 and 29 (pp. 178 and 179) demonstrate that the factors most important in the chronic nutritional and health state of an individual or population are different from those variables involved in their acute nutritional and health state. The results of the linear regression analyses presented in Tables 30 and 31 lead to the important conclusion that food aid and food aid programs are mitigating the negative effects of socioeconomic variables that generally create the conditions for chronic hunger and malnutrition. The variables being mitigated are socioeconomic and political disparity, education and access to apparently other important institutions. The impact of factors related to socioeconomic inequality which appear to be related to, and

may even determine the nutritional status of a given population seem to be negated, or mitigated, when members of a population are introduced to food programs. However, this is not to say that food aid alone, or simply joining a food program, is the answer. On the contrary, without a successful nutritional and hygiene education program and consistentent medical care, from which the food supplements can be distributed, food aid is only a very short-term solution at best, as suggested throughout the literature.

Summary

The question arises when attempting to summarize this chapter concisely: What do the data and the analyses demonstrate? First of all, the results of the univariate, bivariate and multivariate analyses were presented so as to arrive at answers to the questions proposed in the beginning of this study. Consistently, the data point out that certain categories of people characteristically demonstrate the measurable effects of chronic undernutrition. This population tends to be Indian, poor, illiterate and live in San Lucas Toliman. More specifically with respect to program status, what has become evident from the analyses of the data is that when people are not on a food program, indicators of socioeconomic status have a strong relationship in predicting nutritional status. However, when they are involved in food programs, these indicators lose their predictive capabilities. At the same time, there is a difference in the type of nutritional status exhibited according to one's program status. Program participants tend to show greater signs of acute malnutrition, as opposed to the presence of chronic malnutrition among

non-participants populations. In the following chapter, the questions presented at the beginning of this study will be dealt with more directly and the interpretations of the data analyzed in the present chapter will be used to provide answers.

FOOTNOTES

[1] Based on ethnographic evidence similar to that discussed in Chapters III and IV, CARE food programs in particular are used as an incentive (or "carrot") to attract sick people, especially children, into the health clinics for treatment.

[2] The type of nutritional problems are argued to be much different in the large urban centers than those found in rural areas because of the different sets of conditions (Austin 1980). Interestingly, in the case of Guatemala City, there is usually much greater accessibility to food, as well as a wider variety, than in other areas of the country. It was also noted that those foods which could be found available in both Guatemala City and the rural areas were cheaper in cost in the City.

[3] There is a national literacy program in Guatemala which is designed to reach the rural hinterlands.

[4] It could possibly be inferred from this analysis that these variables might be operating among the entire population under "normal" conditions, in which there would be no food programs.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Summary

The purpose of this investigation has been two-fold. First, it attempts to evaluate the impact of food aid and food aid programs on the nutritional status of recipients in two municipios in Guatemala. Second, it provides a partial test of the hvpothesis proposed by Johnston and Selby (1978) that external inputs are required to prevent the total breakdown of the biocultural system which results in a downward "spiraling effect on malnutrition," such as that found in traditional Mesoamerican villages.

To set the stage for the investigation of these concerns, the concepts of nutrition and nutritional status were defined in Chapter II. Nutritional status refers to the relative degree of success attained by an individual in assimilating substrates into body tissues as measured against established norms. Nutritional status is measured in terms of how much of the growth potential is actually realized, according to growth standards. It can be inferred from much of the relevant data on nutrition and development that the nutritional state of children in a given population is an indicator of the sociocultural, economic and political well-being of that population.

Chapter III dealt with food aid and food aid programs as devices for socioeconomic and nutritional intervention by presenting background

information with respect to Public Law 480. The criticisms of food aid are numerous. For instance, Lappe and Collins (1977) contend that food aid not only creates dependency on food supplements, but also creates a disincentive to agricultural production. M. Wallerstein (1980) even challenges the notion that food aid is primarily motivated by humanitarianism. Rather, he argues that U. S. agro-business is the major beneficiary of food aid programs instigated under the auspices of PL-480. Furthermore, Wallerstein argues that food aid can be used as a political weapon, as was the case in India. On the other side of the coin, it is generally recognized that food supplied through food aid programs such as those examined here has fed hundreds of thousands of people who otherwise would have had little or nothing to eat.

The criticisms of food aid raise extremely complex issues for which there are many interpretations. The fact remains that food aid and food aid programs exist and are among the most common approaches to the problems of hunger and malnutrition. Because they have been so often criticized and defended on ideological grounds rather than on the basis of careful scientific research, it is high time that the most rigorously objective scientific procedures be used in their evaluation.

Ethnographic descriptions of Guatemala and the two sites of investigation, San Martin Jilotepeque and San Lucas Toliman, were presented in Chapter IV. Basically, Guatemala is a pluralistic society which is made up ethnically of Indians and Ladinos. This ethnic division imposes important sociocultural constraints. Among other things, there is a tendency for the distribution of power and the access to economic resources, goods and/or services to be limited

according to these constraints. In addition to ethnic divisions, there are certain significant differences in the economic system which are expressed regionally within Guatemala.

The nature of the sample, research design and methodology was presented in Chapter V. The sample was comprised of 310 children from 238 households from the San Lucas Toliman and San Martin Jilotepeque areas. There were five dimensions or sub-samples recognized in this sample population which included program status, regional location, urban-rural location, ethnicity and sex-of-the-child. The first three criteria were purposively designed into the sample. It is within the analytical framework provided by these sub-samples that univariate, bivariate and multivariate tests were conducted. Chapter VI examines those results and presents some interpretations as to the interrelationships between the different variables and nutritional status. The following section is a summary of those conclusions.

Conclusions

There are at least four important conclusions which can be drawn from the analysis of the data. It must be remembered that these results are designed to be applicable to the two regions under investigation, however, there are implications for those areas throughout the underdeveloped world, particularly Central America and Latin America, where there exist similar conditions. First, food programs, as implemented in San Lucas Toliman and San Martin Jilotepeque, are reaching the intended target population. Evidence for this is found in the significant correlations between participation in a program and

socioeconomic measures which indicate relative poverty. The food distributed by food aid programs is reaching the poorest segments of the two communities studied in Guatemala. Additional evidence is found in the significant statistical difference between the control and experimental populations in their levels of acute malnutrition with the control group having a higher nutritional status than the experimental group. There was very little difference observed, however, in the level of chronic malnutrition between the two groups. These results indicate that food programs are directed towards the more acutely malnourished children in the two communities. Even though there were control-experimental group differences, there were no differences in the nutritional status of Indians and Ladinos or those who lived in either the urban centers or rural areas for people participating in food programs. Yet, there were significant socioeconomic differences between the control and experimental groups, including level of living and income, for example. This would further seem to suggest that there is a relatively even distribution of foods to the needy, thus, reaching the target population.

The second and most important conclusion to be drawn from this study is that food programs seem to be slightly improving the nutritional status of their recipients. This is a conclusion drawn from interpretation of the multivariate analysis. A regression model, incorporating independent variables shown by earlier analysis to be associated with malnutrition, was tested on the control and experimental populations separately. The socioeconomic variables which ordinarily predict malnutrition were found to be significant in the

case of the control group, even after overlapping interactions between variables were removed by partialing out procedures. However, these same variables did not prove to be significant predictors of nutritional status in the experimental group. The most reasonable interpretation of this finding is that food programs operate to overcome or mitigate the effects of socioeconomic variables on the nutritional status of children enrolled in such programs. Once on the program, children from families of lower and higher economic status measure similarly on both acute and chronic malnutrition measures. The only way this could happen is for the food being distributed to improve the nutritional status of the children about equally. However, food programs do not have the effect of overcoming malnutrition entirely, since the experimental population sample still measures as malnourished. In other words, food programs seem to be directed towards the most needy families. When these families are enrolled, the food supplements seem to overcome the remaining socioeconomic differences among them so that economic differences no longer are associated with differences in the nutritional status of participating children. Nevertheless, these children continue to measure malnourished. This appears to mean that a slight improvement in their nutritional status has taken place but not enough to overcome malnutrition entirely.

The findings suggest the following policy implications for food program management. It appears that food programs are being directed towards the population most in need. However, as the data demonstrate, even children not on the program suffer from malnutrition in the communities studied. This would seem to indicate that food programs

need to be expanded in order to include a larger population.[1] Also, the fact that children included in the food programs continue to be malnourished even after participation seems to indicate that greater quantities of food must be delivered through food programs in order to entirely overcome the effects of sociocultural, economic, educational and political factors which operate on the majority of the population in Guatemala.

Other data from this study seem to indicate that sanitation is associated with malnutrition, even in the experimental group. This implies that a greater effort to overcome the effects of unsanitary living conditions might further improve the effectiveness of food delivery programs since better sanitation would allow food distribution to have a greater impact, particularly on acute nutritional status when disease factors are removed from the environment. In order to accomplish this, a combination of education and basic infrastructure construction is needed. This education-infrastructure package would include formal and informal education directed at how to prevent health, hygiene and nutritional problems, whereas the construction of infrastructure might include making improvements primarily in sanitation facilities such as latrines, sanitary kitchens and food storage, animal and insect control, as well as potable water systems.

The third conclusion which can be drawn from this study is that there is evidence that modernization of local economic systems, by emphasizing cash crop agriculture, has a negative impact on the nutritional status of people, particularly their children. Comparison between San Lucas Toliman and San Martin Jilotepeque in the nutritional

status of both experimental and control group subjects demonstrates that there is a difference in the nutritional state of children in these communities. The children, as a whole, of San Martin Jilotepeque display higher nutritional status than do those of San Lucas Toliman. The latter community has an economy which is closely linked to cash crop agriculture and tourism. This means that local residents depend almost exclusively on a money-based economy and are not as heavily involved in subsistence agriculture as people in San Martin Jilotepeque. Ethnographic evidence seems to show that when poor people operate in a cash economy they tend to spend a significant proportion of the money they receive in wages on products other than food.[2] Such evidence also indicates that cash incomes in those areas which lie outside the major urban centers (where cash economy is more developed and incomes are higher for the same amount of work) do not match in buying power the value produced through subsistence agriculture. This difference is registered in the better nutritional status of children living in subsistence economies and the lower status of children in more modernized cash crop economies.

This finding has the following policy implication. Efforts should be made in communities similar to San Lucas Toliman to foster or preserve aspects of the subsistence economy as cash economic systems are developed. In communities such as San Lucas, where modernization has gone a long way already, there is a need to improve the access of people to land which can be used for producing consumable food produce. Food programs designed to improve the nutritional state of a given population should therefore be accompanied by programs designed to

improve the ability of the poor to produce at least a major portion of their own food supply. This concept is currently being applied in some of the food programs conducted in Guatemala. In San Lucas the current program for agricultural development should be strengthened and plantation owners should be encouraged to set aside land to be used by their workers in producing food for their own use.

The fourth conclusion drawn in evaluating food aid and food aid programs is that there is evidence that PL-480 food products are sometimes misused rather than consumed for their intended purpose. Interviews with program personnel as well as local leaders support this often repeated criticism. Other ethnographic evidence indicates that sometimes this food is either thrown away, sold, traded or fed to livestock. The reason most frequently given is that the food products are unfamiliar and cannot be prepared in a way that is acceptable to some program participants. This misuse or wastage of foodstuffs provided by food programs has the following policy implications. First, in order to reduce this misuse, consideration should be given to the appropriateness of particular food supplements, and possibly, to changing the nature of food products being distributed to complement more exactly local cultural preferences. If this cannot be done, greater effort should be made to educate recipients in ways to use or prepare the food products so that they are more acceptable to them. It is this part of food programs which is most often neglected at the local level. Although this was the strategy intended by the administrators of such food programs, there is a serious coordination-management problem in insuring that what is intended is actually carried out. In most food programs observed, this practice of

educating the recipient in the use of food products was not evident. This is important also because it is related to the disease factor. If contaminated water is used in preparing foods then their nutritional effect is negated from the start.

In conclusion, with respect to the evaluation of food aid and food aid programs, there is substantial evidence that there is a positive impact of such aid on the nutritional status of its recipients. Whether or not this impact is sufficient to justify its costs depends upon the interpreter. The evidence in this study would seem to indicate that food aid and food aid programs are warranted.

This investigation and a previous study (Bates et al. 1982), furthermore, indicate that in fact food aid programs serve at least two functions: 1) to provide food for emergency relief in disaster situations, and 2) to provide food supplies to target populations which chronically and acutely suffer the effects of malnutrition. In the case of Guatemala and the particular communities studied, food distribution does not seem to act to undermine local agricultural incentives for the production of consumerable food resources (Bates et al. 1982). Instead, food programs can operate to help alleviate problems of hunger and malnutrition by providing an educational and general health resource to the poorest segments of a population. Finally, a third function that food aid might serve is to act as an additional resource and/or catalyst in the support of social and economic development programs, as suggested by Timmer (1978) and others. Much of the policy implications suggested take this fact into account. When properly administered, food aid and food aid programs have the

capacity to promote development because they deal with improving the health and nutrition of the lower socioeconomic levels of society, providing them with additional food supplies and education.

However, as noted earlier in this study, food aid cannot serve as a "cure" to the problems of hunger and malnutrition, but rather it can only deal with their "symptoms." Timmer (1978: 34), an agricultural economist, notes:

> Malnutrition is not simply an unfortunate appendage attached to the body economic and politic, to be surgically removed by skilled technicians using a variety of precisely targeted programs--with or without food aid. Malnutrition is a structural condition of the body itself, and any measures to correct the condition will involve the entire social organism.

Though food aid is clearly a short-term response, it does have the potential for long-term ramifications in dealing with hunger and malnutrition.

It is now necessary to deal more directly with the second hypothesis proposed in Chapter I. That hypothesis was stated as follows: Food aid and food aid programs act to impede the "spiraling effect of malnutrition" and, thus the "downward spiral" of the biocultural system (i.e. biocultural disequilibrium). As noted, there is a breakdown in the biocultural system of the traditional Mesoamerican village, including San Lucas Toliman and San Martin Jilotepeque, and this "breakdown" is manifested in the health and nutritional states of a population.

In the case of the sample population under investigation here, there was a significant problem of malnutrition demonstrated by various measurements. This combined with the phenomenon of rapid

urbanization, demonstrated in the relevant statistics presented earlier, points out exactly what Johnston and Selby (1978) were describing.

Based on the conclusions already discussed above, particularly that which dealt with the regression model, the hypothesis presented in this study appears to be valid. The regression model clearly demonstrates that food aid programs can act to mitigate the negative effects of the socioeconomic systems. Thus, the traditional Mesoamerican villages, San Lucas and San Martin, are in effect being kept going by external inputs such as food aid and food aid programs, as argued by Johnston and Selby (1978) and Selby and Garretson (1981).

As a final comment, food aid and food aid programs can and do serve humanitarian purposes, especially helping to alleviate hunger and malnutrition. On that basis, it can be argued that food programs are necessary. Nevertheless this does not belie the fact that something more than simply feed hungry people is needed to solve the problems being faced by the underdeveloped countries of the world today. Structural changes or solutions are evidently necessary. The most important question is how to achieve a socioeconomic "revolution" without paying the cost of violence and social disruption. The only convincing answer appears to be found in "development"; that is, in the improvement in the quality of life for all citizens by improving their social, economic, political and environmental systems and institutions. What seems also to be evident is that political ideology must be discarded when it comes to deciding the priorities for emphasis on where and how to develop.[3] Without a well-balanced and comprehensive

approach to solving the problems of the underdeveloped, as well as the developed worlds, injustice and poverty will continue to exist and create global insecurity.

FOOTNOTES

[1] This does not imply that food programs in general do not attempt to reach all the people who suffer from malnutrition. There will always be some who refuse to participate in such programs. However, there are managerial limits placed on food programs, particularly with repect to how many people will be provided for by the allocated food supplies, as well as how much food is actually available for each person. Consideration may need to be given to not only upgrading the type of foods, but also the quantity to be provided.

[2] This seems to be a consistent pattern noted throughout the anthropological literature as well.

[3] We probably need to discard our academic pettiness also. Instead of seeking economic solutions as defined by classical economic theory with specific economic goals in mind, a holistic approach is the only valid approach.

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APPENDICES

TABLE 32

Cut-off Points for Graded Nutritional Status Used in this Study

	Grade	Percent of Normal
Chronic Nutritional State		
height-for-age	0	≥ 95.0
	1	90.0 - 94.9
	2	85.0 - 89.9
	3	< 85.0
Acute Nutritional State		
adjusted acute	0	≥ 100.0
	1	90.0 - 99.9
	2	80.0 - 89.9
	3	< 80.0
weight-for-height-for-age	0	≥ 100.0
	1	90.0 - 99.9
	2	80.0 - 89.9
	3	< 80.0
weight-for-age	0	≥ 90.0
	1	80.0 - 89.9
	2	60.0 - 79.9
	3	< 60.0

TABLE 33

Frequencies of Nutritional Status According to Sex, Region, Ethnicity and Severity

Nutritional Status	Grade	Characteristics: Region: San Lucas No.	San Lucas %	San Martin No.	San Martin %	Sex: Male No.	Male %	Female No.	Female %	Ethnicity: Indian No.	Indian %	Ladino No.	Ladino %	Urban-Rural Location: Urban No.	Urban %	Rural No.	Rural %	Program Status: Program Participants No.	Program Participants %	Non-Participants No.	Non-Participants %
Chronic Nutritional State	0	23	16	33	20	26	18	29	18	38	15	17	29	37	18	18	18	30	15	25	23
height-for-age	1	45	32	65	39	54	37	57	35	88	35	23	39	81	38	29	29	74	37	36	33
	2	36	26	53	32	49	33	40	24	71	28	18	30	55	26	34	35	57	29	32	29
	3	39	27	16	9	18	12	37	23	54	22	1	2	38	18	18	18	39	19	17	15
		143	100	167	100	147	100	163	100	251	100	59	100	211	100	99	100	200	100	110	100
Acute Nutritional State	0	37	26	43	26	31	21	48	29	65	26	14	24	60	28	19	19	43	22	36	33
weight-for-height-	1	59	41	68	41	65	44	63	39	103	41	25	42	88	42	39	40	83	42	44	40
for-age	2	35	25	46	27	41	28	40	25	65	26	16	27	48	23	33	33	57	28	24	22
	3	12	8	10	6	10	7	12	7	18	7	4	7	15	7	8	8	17	8	6	5
		143	100	167	100	147	100	163	100	251	100	59	100	211	100	99	100	200	100	110	100
adjusted acute	0	96	67	96	57	90	61	99	60	160	64	30	51	135	64	54	55	113	56	76	69
	1	37	26	58	35	43	29	55	34	73	29	24	40	60	28	34	34	70	35	25	23
	2	8	6	11	7	11	8	8	5	16	6	3	6	10	5	9	9	14	7	6	5
	3	2	1	2	1	3	2	1	1	2	1	2	3	6	3	2	2	3	2	3	3
		143	100	167	100	147	100	163	100	251	100	59	100	211	100	99	100	200	100	110	100
weight-for-age	0	36	25	43	26	42	28	57	35	76	30	23	39	75	36	24	24	56	28	43	39
	1	59	41	68	41	60	41	48	30	88	35	20	34	72	34	36	36	71	35	32	34
	2	35	24	46	27	42	28	54	33	80	32	16	27	58	28	38	39	68	34	28	25
	3	13	10	10	6	3	2	4	2	7	3	0	0	6	2	1	1	5	3	2	2
		143	100	167	100	147	100	162	100	251	100	59	100	211	100	99	100	200	100	110	100

n = 310

INTERVIEW SCHEDULES

FFP1	0 0						
ID formulario (1-4)	Número tarjeta (5 6)	I. D. Municipio (7 8)	I.D. Comunidad (9-12)	Lugar (13) 0 - Centro de Salud 1 - Casa	I. D. Casa (14-16)	Fecha de entrevista día/mes/año	I.D. Encuestadora (23 24)

Nombre del Informante Principal	Edad del Informante (25 26)	Estado civil del Informante (27) 0 - Unido 1 - Casado 2 - Separado/divorciado 3 - Viudo 4 - Soltero	Sexo del Informante (28) 1 Masculino 2 - Femenino

Nombre de Jefe (Actual)	Edad del Jefe (años cumplidos) (29-30)	Religión del Jefe (31) 0 - Católico Cofradía 1 - Católico 2 - Acción Católica 3 - Católico Cofradía y Acción Católica 4 - Protestante/Evangélico 5 - Agnóstico/Ateo	Años con la religión que tiene (32-33) Entrevistado anteriormente (39) 0 - No 1 - Si

Grupo Etnico (34) 0 - Indígena 1 - Ladino	Número de tarjeta del Informante (35-36)	Número de miembros del grupo casero (37 38)	I. D. de entrevista anterior (40-48)

TARJETAS 1-40

TARJETAS 01 39 (números impares)

Nombre y Apellidos	Tarjeta No. (1-8)	CARACTERISTICAS PERSONALES							VESTIDO						TRABAJO FAMILIAR			
		Sexo (25)	Parentesco (26 27)	Fecha de nacimiento dia/mes/año (28 33)	Alfabetismo (34)	Educación (35 36)	Adiestramiento escolar (37)	Idioma (38)	Calzado (39)	Pantalón (40)	Ropa (41)	Camisa (42)	Blusa (43)	Falda (44)	Agrícola (45)	Ganadero (46)	Artesanal (47)	Otro (48)
	01																	
	03																	
	05																	
	07																	
	09																	
	11																	
	13																	
	15																	
	17																	
	19																	
	21																	
	23																	
	25																	
	27																	
	29																	
	31																	
	33																	
	35																	
	37																	
	39																	

Cód.

25 Sexo
1 Masculino
2 Femenino

26 27 Parentesco
Vse clave en Instrucción

34 Alfabetismo
0 Analfabeto
1 Solo lee
2 Solo lee con dificultad
3 Escribe y lee con dificultad
4 Escribe y lee
5 Escribe y lee perfectamente
9 Sin información

Cód.

35 36 Educación
00 No cursó ningún grado
01 08 Primaria
09 09 Preparatoria o básica
10 12 Vocacional o especialidad
13 18 Universidad

Cód.

37 Actualmente asiste a la escuela?
0 No
1 Sí

38 Idioma
0 Sólo lengua
1 Lengua/español con dificultad
2 Lengua/español con fluidez
3 Español

Cód.

VESTIDO

39 Calzado
0 Huaraches
1 Cotizas
2 Sandalias
3 Zapatos

40 Pantalón
0 Largo
1 Bermudas

TARJETAS 1-40 (continued)

Nombre y Apellidos	PRIMERA OCUPACION					SEGUNDA OCUPACION					TERCERA OCUPACION				
	Ocupación 1 [40 56]	Tiempo completo [41]	Días por semana [57]	Sueldo diario [53 55]	Meses con ocupación [58 57]	Ocupación 2 [58 59]	Tiempo completo [60]	Días por semana [61]	Sueldo diario [62 64]	Meses con ocupación [65 60]	Ocupac 3 [67 68]	Tiempo completo [69]	Días por semana [70]	Sueldo diario [71 73]	Meses con ocupación [74 75]

Cols
41 Renda
0 Una
1 Nueva
42. Cambio
0 Igual
1 Occidental
43 Bien
0 Igual
1 Ligeramente occidental
2 Occidental

Cols
44 Salario
0 Cinco
1 Occidental
45 48 Ayuda en los quehaceres (trabajos de la familia)
0 No
1 Sí

Cols
46 Agricultura
48 Negocio
47 Artesanía
49 Otro

Cols
49 50 Ocupaciones
58 59 Vecindario
67 68 Instrucción
51 Tiempo completo
60 0 No
69 1 Sí
52 Días por semana
61 1 a 7
70

Cols
53 55 Sueldo diario
62 64 Ingresos extras y vacacional
58 57M Meses trabajo
65 68 1 a 12
74 76

TARJETAS 1-40 (continued)

OCUPACIONES ADICIONALES

Nombre y Apellidos	Tarjeta Nn. (5 6)	Ocupación adicional (25)	Ocupación 1 (26 27)	Tiempo compl. (28)	Días por semana (29)	Sueldo diario (30 32)	Meses con ocupac. (33 34)	Ocupn. 2 (35 36)	Tiempo compl (37)	Días por semana (38)	Sueldo diario (39 41)	Meses con ocupac (42 43)
	02											
	04											
	06											
	08											
	10											
	12											
	14											
	16											
	18											
	20											
	22											
	24											
	26											
	28											
	30											
	32											
	34											
	36											
	38											
	40											

CLAVE

Cols

25 Hace el miembro uno de los trabajos mencionados abajo?

26 27 35 36 Ver lista de ocupaciones

01 – Lavar y planchar
02 – Preparar alimentos
03 – Tejer/bordar
04 – Hacer otras manualidades
05 – Poner inyecciones
06 – Vender periódicos
07 – Lustrar
08 – Limpiar carros
09 – Acarrear agua
10 – Recoger/limpiar verduras
11 – Cortar zacate
12 – Pastorear
13 – Hacer jardinería
14 – Destazar
15 – Pescar

28 al 33 34 y 37 al 42 43 Ver las clases para columnas 51 al 56 57 tarjetas 01 39

TARJETA 41
(Cols. 5–6)

TENENCIA DE LA TIERRA

Cuerdas Locales													Cuerdas Costeras								No. de cuerdas (últimos 12 meses)						
Propias			Alquiladas		Prestadas		Comunales		Tamaño en varas				Propias		Alquiladas		Tamaño en varas				Vendidas			Compradas			DIOALO
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52

CLAVE

Col.

25 27. Total en cuerdas, anotando 3 números enteros.
28 29. Total en cuerdas, anotando 2 números enteros.
30 31.
32 33.
34 37. Varas por cada lado ej. 20 x 20
38 39. Total en cuerdas, anotando 2 números enteros
40 41.
42 45. Varas por cada lado.
46 48. Cuerdas vendidas, 3 números enteros
49 51. Cuerdas compradas, 3 números enteros } en los últimos 12 meses
52 Dió en alquiler algún terreno?
0 – No
1 – Si

TARJETA 42
(Cols. 5–6)

PRODUCCION AGRICOLA

MAIZ	Ganancia venta de maíz 1979				DONDEVEN	FRIJOL	Ganancia venta de frijol 1979				DONDEVEN	MAICILLO	Ganancia venta de maicillo 1979				DONDEVEN	TRIGO	Ganancia venta de trigo 1979				DONDEVEN	ARROZ	Ganancia venta de arroz 1979				DONDEVEN	CAFE	Ganancia venta de café 1979				DONDEVEN	YUCA	Ganancia venta de yuca 1979				DONDEVEN
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66

CLAVE

Para los rubros de los productos agrícolas, se preguntará si cosecharon tal producto en el año 1978: Se codificará así:

0 – No
1 – Si
9 – Sin información

Para los rubros de la ganancia de la venta de cada producto, se codificará con 4 números enteros la cantidad que dice el informante. Si no vendió nada se codificará con guiones.

9999 – Sin información

Para los rubros, DONDEVEN, que se refieren al lugar y la manera en que el grupo cosero vendió sus productos agropecuarios, se usará los siguientes códigos:

– – No aplica; no cosechó o no vendió
1 – Misma comunidad a particulares (por menor)
2 – Misma comunidad a comerciantes locales
3 – Misma comunidad a comerciantes de afuera
4 – Otra comunidad, por miembro del grupo
5 – Guatemala, por miembro del grupo
6 – Otro
9 – Sin información

TARJETA 43
(Cols. 5-6)

PRODUCCION AGROPECUARIA

TOMATE	Ganancia venta de tomate 1978				DONDEVEN	CEBOLLA	Ganancia venta de cebolla 1978				DONDEVEN	CHILE	Ganancia venta de chile 1978				DONDEVEN	VERDURAS	Ganancia venta de verduras 1978				DONDEVEN	FRUTAS	Ganancia venta de frutas 1978				DONDEVEN	AVES	Ganancia venta de aves 1978			DONDEVEN	GANADO	Ganancia venta de ganado 1978				DONDEVEN
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65

CLAVE

Se codificará estas columnas en la misma manera que para las columnas de la tarjeta 32 a excepción de la ganancia para la venta de aves (Cols 56 a 58), la cual se codificará con 3 números enteros.

Nota: 1) Fruta y verdura: incluye toda clase de estos artículos.

2) Aves de corral: toda clase.

3) Ganado incluye: vacuno, lanar, porcino, caballar, etc.

TARJETA 44
(Cols. 5 6)

OTROS INGRESOS Y AUTOSUFICIENCIA

Productos de Casa											Negocios											Autosuficiencia			
PRODCASA	PRODUNO		PRGDDOS		PRODTRES		Ganancia mensual todos los productos				NEGOCIO	NEGUNO		NEGDOS		NEGTRES		Ganancia mensual todos los negocios				COMIDA	ROPA	COMBUST	MUEBLES
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50

CLAVE

Col

25. Producción en la casa cosas para vender
0 – No (pasa a Col. 36)
1 – Si
9 – Sin información

26 27
28 29
30 31. Que cosas producen?
01 – Tela
02 – Ropa
03 – De pita, palma, caña
05 Alfarería
06 – Cosas metálicas
07 – Otro
99 Sin información

Col

32 35. Cuál es la ganancia mensual de todos los productos de la casa?
Se codificará con 4 números enteros

36 Tiene uno o más negocios?
0 – No (pasa a Col. 47)
1 – Si
2 – Sin información

37-38. Qué negocios tiene?
39 40. Vea clave de negocios
41 42. en el Instructivo

Col.

43 46. Cuál es la ganancia mensual de todos los negocios?
Se codificará con 4 números enteros

Que parte producen o consiguen sin pagar de los siguientes:

47. Comida
48. Ropa
49. Combustible
50 Muebles

Se usará la siguiente clave:
0 – Nada (0%)
1 – Poco (25%)
2 – La mitad (50%)
3 – Casi todo (75%)
4 – Todo (100%)
9 - Sin información

TARJETA 45
(Cols. 5-6)

INDICADORES SOCIOECONOMICOS

TENSITIO	TENCASA	PISO	PAREDES		TECHO	VENTANAS	CUARTOS	COCINA	FUENAGUA	DISTAGUA	LUZ	GUARALIM	SERVISAN	LAVTRAST	COMBUSTI	FACCOCIN	RADIO	TOCADISC	TOCACINT	TELE	CICLE	MOTO	CARRO	CAMION	CAMARES	MESAFORM	PULSERA	DESPERT
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53

CLAVE

Cols.

25 Tenencia de sitio y casa
26
0 – Usurpado
1 – Prestado
2 – Alquilado
3 – Propio
4 – Otro
9 – Sin información

27 De qué es el piso?
1 – Tierra
2 – Madera
3 – Ladrillo de barro
4 – Torta de cemento
5 – Ladrillo de cemento

28 29. De qué son las paredes?
01 – Materiales mezclados
02 – Caña, palma, palos, pata
03 – Bajareque
04 – Tapia
05 – Madera
06 – Lámina/duralita
07 – Mitad adobe; mitad liviano
08 – Mitad block, ladrillo, piedra; mitad liviano
09 – Adobe
10 – Block, ladrillo, piedra/terracreto
11 – Otro

Cols.

30. De qué es el techo?
1 – Paja, palma
2 – Madera
3 – Teja
4 – Teja sobre lámina
5 – Lámina
6 – Duralita
7 – Terraza
8 – Varios mezclados

31. De qué son las ventanas?
– – No hay
0 – Nada
1 – De plástico/nylon
2 – Tela metálica/cerdazo
3 – Madera
4 – De vidrio
5 – Otro

32 Cuántos cuartos tiene la casa?
1 – Uno, sucesivamente hasta 8

33. Está la cocina adentro?
– – No aplica (no hay cocina)
0 – No
1 – Si

Cols.

34 Dónde consigue el agua?
1 – Fuente natural, río, lago
2 – Pila pública
3 – Vecino
4 – Propio pozo
5 – Chorro/pila propio
6 – Chorro en casa
7 – Tanque o toneles
8 – Otro

35 A qué distancia va a traer agua?
0 – En sitio
1 – Menos de 100 m.
2 – 100 a 500 m.
3 – Más de 500 m.

36 Qué usan para alumbrar la casa?
1 – Candelas/quinque
2 – Lámparas /kerosena
3 – Lámpara Coleman
4 – Luz eléctrica
5 – Luz eléctrica con conecciones
6 – Otro

Cols.

37. Dónde guardan los alimentos?
0 – Nada
1 – Canastas
2 – Ollas
3 – Platera
4 – Hielera
5 – Refrigeradora
6 – Otro

38. Qué usan para hacer sus necesidades?
0 – Nada
1 – Escusado
2 – Letrina
3 – Inodoro
4 – Otro

39. Dónde lavan los trastos?
1 – Río/lago
2 – Cazo
3 – Pila pública
4 – Pila propia
5 – Lavatrastos en cocina
6 – Lavatrastos automático
7 – Otro

Cols.

40. Con qué combustible cocinan?
1 – Leña
2 – Carbón
3 – Kerosene (gas)
4 – Gas propano
5 – Otro
6 – Electricidad

41. Sobre qué cocinan?
1 – Tenamastes
2 – Tonel
3 – Poyo
4 – Poyo con plancha o parrilla
5 – Estufa kerosena
6 – Estufa propana
7 – Estufa con horno
8 – Otro

42. Tienen (de) _____ ?

a (Las cosas anotadas en los rubros)

53. Se usará los siguientes códigos:
0 – No
1 – Si
9 – Sin información

TARJETA 46
(Cols. 5-6)

MEJORAMIENTO DE LA COMUNIDAD

COSAS MAS NECESARIAS PARA MEJORAR LA VIDA EN LA COMUNIDAD																																				
LUZ	AGUA	CAMINOS	CALLES	ESCUELA	SERSALUD	DRENAJE	MERCADO	LETRINAS	IGLESIA	ALCALDIA	RASTRO	COMUNICA	COOP	AREADEPO	CASAS	TERRENOS	TRABAJO	SUELDO	EDUADULT	TRANSPOR	LIDERES	PROMAGRI	SANIAMB	AREAVERD	SALON	MANOOBRA	FINANCIA	MEJORED	MATERINF	PROGALIM	PERSEDUC	PROMSAL	PROFSAL	FROFAG	COMERCIO	FARMACIA	BIBLIOTC	OTRO
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63

CLAVE

Cols.

25-50 Cuáles piensa Ud. que son las cosas más necesarias para mejorar la vida en la comunidad?
0 – No (no mencionado)
1 – Si (mencionado)

25. Luz eléctrica
26. Agua potable
27. Caminos
28. Calles
29. Escuela
30. Servicios de salud
31. Drenaje
32. Mercado
33. Letrinas
34. Iglesia
35. Alcaldía
36. Rastro
37. Medios de comunicación
38. Cooperativas
39. Areas deportivas
40. Casas
41. Terrenos agrícolas
42. Fuentes de trabajo
43. Mejores sueldos
44. Educación de adultos
45. Transportación

Cols.

46. Líderes
47. Promotores agrícolas
48. Saneamiento ambiental
49. Area verde
50. Salón municipal
51. Mano de obra
52. Financiamiento
53. Mejor educación
54. Programa materno/infantil
55. Programa de alimentos
56. Personal de educación
57. Promotores/técnicos en salud
58. Personal profesional de salud
59. Personal profesional de agricultura
60. Más/mejor comercio
61. Farmacia
62. Biblioteca
63. Otro

TARJETA 47
(Cols. 5 - 6)

ACTITUDES SOBRE AYUDA

Columna	Código	Pregunta
25	____	Piensa Ud. que es bueno que la gente de aquí reciba ayuda sin ningún compromiso?
26	____	Piensa Ud. que la gente debe pagar algo de dinero por la ayuda que recibe?
27	____	Piensa Ud. que la gente debe trabajar a cambio de la ayuda que recibe?
28	____	Piensa Ud. que es bueno que toda la gente de aquí reciba la misma ayuda sin tomar en cuenta si son ricos o pobres?
29	____	Piensa Ud. que es bueno que aquí reciba ayuda únicamente la gente pobre?
30	____	Piensa Ud. que es bueno que aquí reciba ayuda únicamente la gente que participa en trabajos de beneficio para la comunidad?
31	____	Piensa Ud. que las autoridades municipales deben ser las encargadas de controlar la ayuda que llega a la comunidad?
32	____	Piensa Ud. que es bueno que un comité de vecinos sea el encargado de controlar la ayuda que llega?
33	____	Piensa Ud. que la ayuda prestada por una agencia debe ser controlada por esa misma agencia y no por las autoridades locales ni por comités locales?
34	____	Piensa Ud. que no se debe regalar casas a la gente de aquí?
35	____	Piensa que no se debe regalar alimentos a la gente de aquí?
36	____	Piensa Ud. que la gente de aquí debe ayudarse así misma y no esperar ayuda de fuera de la comunidad?
37	____	Piensa Ud. que las cooperativas son buenos medios para mejorar la situación económica de la gente de esta comunidad?
38	____	Piensa que hay personas aquí que necesitan alimentos y no los reciben?
39	____	Piensa Ud. que hay suficiente comida aquí y no es necesario traerla de afuera?
40	____	Piensa que aquí hay gente que reciben alimentos y no los necesita?

TARJETA 48
(Cols. 5 6)

PROGRAMAS DE ALIMENTOS

RECIBALIM	OTROMED	COMO	PROGRAMA															OTRAGEN	Opinión de programas				
			QUEAGEN	PARQUIEN	CADACUAN	CUANTIEN	Qué clase de alimentos										DIFGASTOS		PORQUEDA	AYUDAN	JUSTOS	AFECPROD	AFECPREC
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

Clave

Col.

25. Reciben alimentos de una agencia?
0 – No
1 – Si
2 – No, pero conoce programa
9 – Sin información

26 Ha conseguido por otro medio alimentos que da una agencia?
0 – No
1 – Si

27 Como los consiguió?
– – No aplica (Col. 26 0)
1 – Regalados, particular
2 – Por cambio, particular
3 – Comprados, particular
4 – Comprados, tienda
5 – Otro

28. De quién reciben los alimentos?
– – No aplica (Col. 25 0 ó 2)
1 – Escuela
2 – Iglesia católica
3 – Iglesia evangélica/protestante
4 – Cooperativa
5 – Clínica/puesto o centro de salud
6 – Agencia privada, Guate.
7 Otra agencia del Gobierno
8 – Agencia extranjera

Col.

29. Para quién son destinados los alimentos?
1 – Niños
2 – Madres
3 – Madres y niños
4 – Otro miembro del grupo
5 – Todos del grupo

30 Cada cuánto reciben los alimentos?
1 – A diario
2 – Semanalmente
3 – Cada 2 semanas
4 – Mensualmente
5 – Esporádicamente
6 – Una sola vez

31. Desde cuando reciben los alimentos?
0 – De 0 a 2 meses
1 – De 2 a 4 meses
2 – De 4 a 6 meses
3 – De 6 a 8 meses
4 – De 8 a 10 meses
5 – De 10 a 12 meses

32 33. al 40 41 Qué alimentos reciben?
01 – Maíz en grano
02 – Frijol en grano
03 – Leche en polvo
04 – Aceite
05 Harina de trigo
06 Otras harinas

Col.

07 – Suplemento preparado
08 – Arroz
09 – Bulgar
10 – Incaparina
11 – Otro
12 – Mosh
13 – Azucar

42. Nota una diferencia en los gastos por los alimentos que recibe?
0 – No, se gasta igual
1 – Si, se gasta menos
2 – Si, se gasta mas

43. Reciben Uds. alimentos de alguna otra agencia?
0 – No
1 – Si

44 Por qué piensa que la agencia les da alimentos?
0 – Mejorar salud
1 – Ayudar economía
2 – Introducir alimentos
3 – Aumentar asistencia Centro
4 – Dar alimentos excedentes
5 – Crear dependencia
6 – Comprometer gente
8 – Otro

Col.

45. Piensa que los programas de alimentos ayudan?
0 – No
1 – Si

46. Piensa que los programas son justos?
0 – No
1 – Si

47. Piensa que los programas afectan la producción agrícola?
0 – No
1 – Si, baja la producción
2 – Si, estimula (sube) la producción

48. Piensa que los programas afectan los precios de alimentos en la comunidad?
0 – No
1 – Si, suben los precios
2 – Si, bajan los precios

ANTROPOMETRIA

Tarjeta No. (5 6)	Nombre y Apellidos	Clave de persona (25 26)	Sexo (27)	Parentesco (28 29)	Edad en meses (30 31)	Peso (kg) Primera (32 34)	Peso (kg) Segunda (35 37)	Tipo de sosten (38)	Talla (cm.) Primera (39 42)	Talla (cm.) Segunda (43 46)	Inscrito en Programa (47)
60						— — . —	— — . —		— — — . —	— — — . —	
61						— — . —	— — . —		— — — . —	— — — . —	
62						— — . —	— — . —		— — — . —	— — — . —	
63						— — . —	— — . —		— — — . —	— — — . —	
64						— — . —	— — . —		— — — . —	— — — . —	
65						— — . —	— — . —		— — — . —	— — — . —	
66						— — . —	— — . —		— — — . —	— — — . —	
67						— — . —	— — . —		— — — . —	— — — . —	
68						— — . —	— — . —		— — — . —	— — — . —	
69						— — . —	— — . —		— — — . —	— — — . —	

CLAVE

Col.

25 26 Clave de Persona

Se anotará el número de la tarjeta 01-39 (numeros impares) en que el niño fue codificado

Col.

27. Sexo

1 - Masculino
2 - Femenino

28 29. Parentesco

Segun las tarjetas 01 39

Col.

30 31 Edad en meses

Se le calculará la fecha dada en tarjetas 01 39

32 34 y 35-37 Peso (kg)

Se anotará 2 números enteros y un decimal

Col.

38. Tipo sosten

1. Pañal
2 Columpio

39 42 y 43 46. Talla (cm)

Se anotará 3 numeros enteros y un decimal

Col.

47. Esta inscrito en el programa de alimentos?

0 - No
1 Si