

NUTRITION AND SOCIAL SCALE:
THE IMPACT OF SOCIAL DIFFERENTIATION ON DIETARY INTAKE

by

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THIS RESEARCH IS DEDICATED

TO:

REV. WILLIAM F. MASTERSON, S.J.

WITHOUT WHOSE DIVINE LOVE AND UNYIELDING FAITH IN MAN
I WOULD NOT HAVE FINISHED THIS RESEARCH.

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Chapter I

BACKGROUND OF THE STUDY

INTRODUCTION

The cost of massive attack upon hunger and malnutrition will be great in money; the cost of doing nothing will be immeasurable in terms of lost human potential and social unrest.

(Report of the Council on Foods and Nutrition to the A.M.A. Board of Trustees "Malnutrition and Hunger in the United States" in Sourcebook on Food and Nutrition, 1st Ed., Scarpa, L. and A. C. Kieffer, (eds), Chicago, Marquis Academic Media, 1978, p.5).

Malnutrition, with its debilitating effects on man and society, is an important concern to all. Substantial evidence from research shows clear association between nutrition and maintenance of health.¹ The relationship describes nutrition as one of the major factors causing chronic diseases, such as cancer, cardiovascular disease, hyperten-

¹ Joint Subcommittee on Human Nutrition Research, Critical Issues in Human Nutrition and Research Training in the 1980s, in The American Journal of Clinical Nutrition 34, 5, May 1980, p. 1004-1006)

² (a) Food and Agricultural Organization of the United Nations (1970), Requirements of Ascorbic Acid, Vitamin A, Vitamin B12, Folate and Iron, Nutrition Meetings Report

sion, diabetes, and obesity. Additional information² shows that protein-calorie malnutrition is widespread throughout the world; the incidence of anemia is high and vitamin A deficiency severe. Its less dramatic manifestations include growth retardation, weight loss, depression and weakening. Its severest forms reveal that those persons affected early with severe malnutrition, like kwashiorkor and marasmus, die. Death rates are vastly greater among the malnourished than among the well-nourished. Obviously, malnutrition has devastating, immeasurable consequences to individuals and society.

Research plays an essential role in solving the problems associated with malnutrition. Nutrition data constitute one of the most invaluable indicators of the people's quality of life. For nutrition research to make a maximum contribution to improving the quality of life, some selected research priorities must include improvement in the assessment of dietary intake of households. This study is a survey to assess the household dietary intake and its relation to community.

Ser. NO. 47 (Rome FAO/WHO), and

(b) Villavieja, Gracia, Herminia SP. Abaya, Milagros M. Costales, and Corazon M. Cerdana, "Assessment of Infants and Toddlers' Usual Diet in the Philippines" in Abstract of Food and Nutrition Researches, Seminar Report Series 7, Food and Nutrition Research Institute, Manila, Philippines, July 1981.

THE RESEARCH PROBLEM

This dissertation takes as the basic problem the study of the relationship between socioeconomic characteristics of a community and dietary intake, in both the community and household analyses, using theories of social differentiation. After having verified that these factors are associated, the study continues to investigate the impact of these factors on household diets.

THEORETICAL FRAMEWORK

These problems are derived from a social theory which states that as a society increases in scale, e.g. from rural to urban, there are at least two factors which adequately and necessarily describe and explain the observed social characteristics of a community (Redfield, R. 1941,³ 1947;⁴

³ Redfield, Robert, The Folk Culture of Yucatan. Chicago: University of Chicago Press, 1941.

⁴ _____, "The Folk Society" in The American Journal of Sociology 52, 1947:293-308.

Shevky & Williams, 1949;⁵ Shevky & Bell, 1955;⁶ Hillery, G., 1968).⁷ If, in fact, a society has shown an increase in social scale, there occur social trends including changes (1) in the distribution of occupations, education, and economic activity, and (2) the organization of the family. This is a theory of a development process of a society. Where numerous changes are occurring as a community develops, they are integrated into these major forces just mentioned; where these forces are conceived as different continua (Redfield, R., 1941; Hillery, G., 1968),⁸ communities are classified according to these observed structural and social characteristics.

Within this century, alone, three major distinctive research studies, not counting subsequent replications, have shown strong support for this social theory. The first is Redfield (The Folk Culture of the Yucatan, 1941)⁹ whose

⁵ Shevky, Eshref and Marilyn Williams, The Social Areas of Los Angeles: Analysis and Typology. Berkeley: University of California Press, 1949.

⁶ _____ and W. Bell, Social Area Analysis: Theory, Illustrative Application and Computational Procedure. Stanford: Stanford University Press, 1955.

⁷ Hillery, George, A. Jr., Communal Organizations: A Study of Local Societies. Chicago: The University of Chicago Press, 1968.

⁸ op.cit.

⁹ op. cit.

folk-urban continuum becomes a theory of society. In developing a theory, he makes a simultaneous investigation of a series of communities all taken from a single culture. The empirical study of the culture of Yucatan peninsula consists of four communities: Tusik, the tribal village; Chan Kom, the peasant village; Dzitas, the town; and Merida, the city. His basic problem is the relation among the variables of isolation, homogeneity, disorganization, secularization, and individualization. In clarifying the problem, he states:

The isolation and homogeneity of this community are taken together as an independent variable. Organization or disorganization of culture, secularization and individualization are regarded as dependent variables. The choice of isolation and homogeneity as independent variables implies the hypothesis that loss of isolation and increasing heterogeneity are causes of disorganization, secularization, and individualization (Redfield, R., 1941, p. 344).¹⁰

The finding of this study shows that the most isolated and homogeneous systems have the highest degree of cultural organization, while the least isolated and most heterogeneous units manifest the most cultural disorganization, the most extensive secular organization and the greatest importance of the individual. The first chief variable of this theory is individualization, which is defined as any socially approved human behavior that does not involve family,

¹⁰ op.cit.

class, neighborhood, village or other primary group. The other important concept is secularization, which Redfield used to describe the rural-urban continuum as pertaining to activities which relate to those found in the market places. Then Redfield proposed that the social changes responsible for increasing secularization and individualization are the development of a money economy and the consequent increase of contacts within the community.

While Redfield devoted his study of society to folk village, Shevky, et al. (1941, 1955)¹¹ began their study in urban communities with social area analysis initially being applied in the Los Angeles area and San Francisco Bay regions. In the process of the development of a society, there are social trends which happen within the system. These social changes are identified as social status, family status, and ethnic status. Together, they constitute the social differentiation index. Although there are numerous statistical indicators that explain these social changes, the variables which possess high statistical independence through factorial analysis and high correlational values are the distribution of occupation and the level of education in the community for the index of social status, and the fertility rate and the women's labor force participation rate

¹¹ op cit.

for the index of family status. The factorial analysis of social areas shows that communities can be adequately and reasonably classified according to a social differentiation index defined in terms of the above variables.¹²

Several empirical studies of the Shevky-Bell analysis were replicated inside the United States (Arsdol, et al. 1958¹³ Anderson, et al. 1961a, 1961b¹⁴ Tryon, R., 1955).¹⁵ and Udry, R., 1964).¹⁶ Several studies conducted outside of the United States are as follows: McElrath (1950)¹⁷ in Ghana, Jamaica and Rome; Abu-Lughod (1969)¹⁸ in Egypt; Herbert (1967)¹⁹ in England. The general findings of these studies point out that social status, as statistically measured by type of occupation and level of education, has high univer-

¹² Shevky, Eshref and Wendell Bell, Social Area Analysis. Stanford, California, Stanford: Stanford University Press, 1955.

¹³ Arsdol, M., S. Carmelleri, and S. Schmidt, "The Generality of Urban Social Area Indexes." in American Sociological Review, 23 (June) 1958: 227-384.

¹⁴ Anderson, R. and Lee L. Bean, "The Shevky-Bell Social Areas: Confirmation of Results and A Reinterpretation." in Social Forces, 40 (Dec. 1961): 119-124.

----- and J. Egeland, "Spatial Aspects of Social Area Analysis" in American Sociological Review, 26 (June 1961): 392-398.

¹⁵ Tryon, Robert, Identification of Social Areas by Cluster Analysis. Los Angeles: University of California Press (1955).

¹⁶ Udry, Richard, "Increasing Scale and Spatial Differentiation: New Tests of Two Theories and Shevky and Bell." in

sal utility to describe increasing differentiation in various communities. In the family status variable, the fertility rate and women's labor force participation rate are sensitive indicators, though these indicators tends to become more important relative to social status as industrialization decreases (Abu-Lughod (1969)).²⁰ The proportion of single-family dwelling units and the composition of ethnic groups do not consistently associate with increasing social scale of communities.

Another piece of major research about a theory of society is the work done by Hillery (1968).²¹ Unlike the quantitative study of Shevky, et al., Hillery's research is a qualitative, cross-cultural community analysis from existing research studies of twenty folk villages, towns, and cities found in North America, South America, Europe, Africa, the

Social Forces, 42, no. 4, (May 1964):403-413.

¹⁷ McElrath, D. "The Social Areas of Rome: A Comparative Analysis" in The American Sociological Review, 27, (June 1968):376-391.

¹⁸ Abu-Lughod, Janet L., "Testing the Theory of Social Area Analysis: The Ecology of Cairo, Egypt" in The American Sociological Review, 34, (April) 1969: 198-212.

¹⁹ Herbert, D.T. "Social Area Analysis: A British Study" in Urban Studies, 4, (February 1967):41-61.

²⁰ op. cit.

²¹ Hillery, Jr., George, A., Communal Organizations: A Study of Local Societies Chicago, The University of Chicago Press, 1968.

Middle East and Asia. Starting inductively from the available cases of folk villages, his conclusion is that villages and cities are both communities, varying from each other in degree, and both are distinct from total institutions.

In studying a community, like a folk village, a town or a city, he inductively constructs a model consisting first of 19 traits common to all communities and second of an integrating construct that organizes the traits into a series of foci or continua. Then, comparing the model of a folk village with the model of a city, he arrives at a major conclusion that a city is a variation of the same type of thing as the folk village. "The two models," he adds, "are best to be viewed as varying from each other in degree, that is, as existing on continua."²² There are three foci or continua out of which a village or city can be qualitatively discriminated: family, cooperation, and space. He explains²³

The three foci of the city are qualitatively distinct, and as such they represent no less than three dimensions. Probably more accurately, one should speak of three complexes of dimensions, each operating to a large degree independently of the others and yet each influencing the others.

Hence, the definition of a community, be it a village or a city, is not necessarily like that of an object (for instance, a community with its geographical boundary) but a

²² op. cit. p. 61.

²³ op. cit. p. 61

system of households integrated by cooperation. Cooperation is a form of human behavior, with its present taxonomy composed of mutual aid and contract. Applying these components of human behavior (19 traits), he observes cooperation in a village as more of mutual aid. Hillery asserts:²⁴

Cooperation is most conspicuous among the institutions. Its institutionalized form, mutual aid, exists in all the villages, particularly in connection with economic pursuits.

In contrast, cooperation in a city is contractual and it is this trait that hold the city together in its heterogeneity.

He adds:

The third fact is the obvious importance of contracts to all of the cities, even when contracts are looked at in the narrow sense. There is, first, the contractual nature of the market place - and markets are central to the urban economy. Second, there is the presence of money in the five cities. Money may be looked upon as a contract in at least two ways: (1) between the society which sanctions and upholds its use and the individuals who use it; and (2) between the partners to the exchange who recognize the limitations placed upon themselves.

In summary, the studies of Redfield, Shevky, and Hillery are similar works on social differentiation. Increasing secularization in Redfield's study corresponds to social rank in Shevky's and to cooperation in Hillery's works; in the same manner, Redfield's individualization relates to family status in Shevky's and family construct in Hillery's

²⁴ op. cit. p. 36.

works. In other words, Hillery's foci of family, cooperation and space are likened to Redfield's folk-urban continuum; the same foci also correspond to the indices of social area analysis developed by Shevky. The number of variables associated with family decreases from the folk village to the city, and the number of factors associated with cooperation and space increases from the folk village to the city.

From these theories of social differentiation, an important assumption must be stated. When households having similar social characteristics (such as the same social position and the same level of living) are grouped together, persons belonging to these households behave in a particular way. Those in other groups, with different characteristics from the first group, behave differently. This inference is tested in household food habits with this principal hypothesis: Households having more urban social characteristics have more adequate food intake.

ADEQUATE FOOD INTAKE

In this section, a brief statement about adequate food intake is made. The study primarily assumes that sufficient dietary intake is a good criterion to differentiate households into groups.

Essential to health is an adequate food intake which contributes to being well-nourished. To keep the body in the best possible condition, every person should supply his or her body with all the essential nutrients from a balanced diet. It is important that an adequate amount of calories and nutrients be eaten everyday.²⁵

In the Philippines, the Food and Nutrition Research Institute (FNRI), an agency of the National Science Development Board (NSDB) and the leading institution actively involved in nutrition research, classifies main food groups as shown in Table 1. (For detailed classification, see Appendix H. See also Appendix F for local food groups observed during the survey but not found in Appendix H.) In the study the said food groups constituting food intake were used to analyze food consumption.

An adequate diet will, by definition, provide full stores in the body of all nutrients required for maintenance, growth and repair of tissues, and the subject will be in good health when examined clinically. The diagram may be shown as follows:²⁶

²⁵ See Fisher, Patty, and Arnold E. Bender, The Value of Food, Oxford: Oxford University Press, 1979.

²⁶ To be sure, good health depends on many factors - food, heredity, climate, hygiene, exercise. The diagram assumes that food is the most important of all these.

TABLE 1
PHILIPPINE FOOD GROUPS

1. Energy Foods:

- a) Cereals and Cereal Products
- b) Starchy Roots and Tubers
- c) Sugars and Syrups
- d) Fats and Oils

2. Body-Building Foods:

- a) Fish, Meat, and Poultry
- b) Eggs
- c) Milk and Milk Products
- d) Dried Beans, Nuts, & Seeds

3. Regulating Foods:

- a) Green Leafy and Yellow Vegetables
- b) Vitamin C-Rich Foods
- c) Other Fruits and Vegetables

Source: Food and Nutrition Research Institute, (FNRI) Manila, Philippines.

Adequate diet ----> full body stores ----> good health.

What would happen if the intake of one or more nutrients fell slightly below the person's needs? This first stage would be that the body stores would be reduced and would fall continually, until eventually there might be no stores at all. This would have no effect on the apparent health of the person and could only be revealed if samples of the blood or tissues were analyzed for the levels of nutrients, i.e., by biochemical examination.

When the diet is even more deficient or the slight deficiency has continued over a long period, the normal functioning of the organs and tissues may be impaired, but there may be no sign of ill-health. A disturbance of function can be demonstrated by biochemical measurements. For example, iron deficiency anemia is a state which is fairly easily detected by taking a sample of blood and testing the level of hemoglobin or red blood cells present. Since iron and protein are necessary to build red blood cells, a low hemoglobin level usually indicates a deficiency of one of these nutrients - usually iron. In other cases, it is only when the tissues are actually damaged that clinical signs appear. One example of poor nutritional status is bleeding gums, often associated with a deficiency of ascorbic acid (vitamin c). However, there are symptoms which could be caused by

conditions completely unrelated to diet. Hence, it is an important point to remember in the assessment of household diets that this is only one of a combination of several factors determining nutritional status.

In the Philippines, food, particularly cereals, is by far the most important item in the household budget. In urban areas, food expenses constitute 49 percent and in rural areas, 62 percent of the total expenditures. See Table 2.

In addition, the results of the Food and Nutrition Research Institute national survey²⁷ shows the following food groups which are less than 50 percent of the requirements:

- 1) Starchy roots and tubers
- 2) Fats and oils
- 3) Eggs
4. Milk and Milk products
- 5) Dried beans, nuts and seeds
- 6) Green leafy and yellow vegetables.

In terms of nutrient intake, the Philippines is 88.6 percent adequate in energy, 102.9 per cent adequate in protein, and 91.7 per cent adequate in iron.²⁸ The major food contributors of energy, protein, and iron are rice and rice products which supply 58 per cent, 43.1 percent and 34.1 per cent of

²⁷ Food and Nutrition Research Institute, First Nationwide Nutrition Survey-Philippines, 1978 Summary Report, Manila, Philippines: NSDB, 1981.

²⁸ The per cent nutrient adequacy is measured as follows:

$$\text{Nutrient \% Adequacy} = \text{Nutrient Intake} / \text{Nutrient RDA} \times 100$$

TABLE 2
 Percentage Distribution of Family Expenditures
 Philippines, 1971

<u>Categories</u>	<u>Urban</u> Per Cent	<u>Rural</u> Per Cent
Food	48.9	61.5
Alcohol and Tobacco	4.7	5.9
Clothing	6.3	6.3
Consumer Durables	2.6	2.1
Housing	12.5	6.8
Utilities	3.6	3.6
Medical Care	2.0	2.0
Education	4.4	3.1
Transportation	4.0	3.1
Other Services	9.8	6.3
Taxes and Gifts	1.2	.7
Total	100.00	100.00

Source: World Bank Country Report-Philippines: Priorities and Prospects for Development, Wash. D.C., The World Bank, 1976, pp. 54, 108.

these nutrients respectively. The "Operation Timbang," one of the nutrition programs conducted by the national government through the National Nutrition Council,²⁹ showed that of the 1.5 million preschool children weighed by September 1975, 23 per cent were found to have normal weight; 48 per cent were mildly undernourished; 24 per cent were moderately malnourished; and 5 per cent were severely malnourished.

In short, the dietary intake of most of the population has been so unsatisfactory that malnutrition has become a major health problem in the Philippines.³⁰

REVIEW OF THE LITERATURE

This section presents a review of research findings on topics relevant to the hypotheses of the study concerning social factors which influence human nutrition. Different levels of dietary intake are observed from diets of different socioeconomic groups as characterized by differences in income, occupation, education, and household size.

²⁹ "Timbang" means "weighing."

³⁰ World Bank Country Report, The Philippines: Priorities and Prospects for Development, Washington, D.C., The World Bank, 1976.

Poverty-stricken families are nutritionally worse off in comparison with wealthier households. Adrian, et al (1976)³¹ using the 1965-66 survey data of the United States Department of Agriculture observed strong association between nutrient intake and individual income when he converted the quantities of food consumed to quantities of nutrient content. Income was also significantly correlated with dietary adequacy by Shifflett (1980).³² Wray and Aguirre (1969)³³ found significant correlation between incidence of protein-calorie malnutrition in Colombia preschool children and income. In the Philippines, Valenzuela (1978)³⁴ found positive association between the two variables. Also in the Philippines, Battad (1978)³⁵ added that increase in income

³¹ Adrian, J. and R. Daniel, "Impact of Socioeconomic Factors on Consumption of Selected Food Nutrients, U.S." American Journal of Agricultural Economics. 58 (1976): 31-38.

³² Shifflett, Peggy, A., Future Time Perspective and Food Habits of the Ages. Ph.D. Dissertation, unpublished. Texas A&M University, 1980.

³³ Wray, J.D. and A. Aguirre, "Protein-Calorie Malnutrition in Candelaria, Colombia. 1. Prevalence, Social and Demographic Causal Factors, in Journal of Tropical Pediatrics, v.15, 1969:76-98.

³⁴ Valenzuela, Rosario, E. "A Study on Nutrient Distribution Within the Family and Factors Affecting Nutrient Intake." in The Philippine Economic Journal, v. X111, no. 36, 1978, pp.168-184.

³⁵ Battad, Josefina R. "Determinants of Nutritional Status of Preschoolers" in The Philippine Economic Journal, v. XV11,1978.

is not directly related to the improvement in nutrient intake of the preschool children because the increase of income by parents may not necessarily be directed to increase food consumption of preschoolers. She cited a study on Laguna, Philippines households which observed a 4 per cent rise in per capita calorie and protein intake after a doubling of household income while in another study of a feeding program in Bulacan, Philippine households, higher gains in weight were observed after 8 months only. She concluded that unless increases in income are directed to preschoolers through specific education, the income effect may largely be lost. Then studying only vitamin A and C intake, Hendell (1965)³⁶ observed income as directly correlated with these particular nutrients. Hence, amounts of food and types of food consumed both vary with income; there is a tendency to consume a larger quantity of foods as income rises.

Members of a household may also be at risk of malnutrition when parents have less education. The lower the level of parents' education, the less able they are to understand the health and nutritional needs of the children. Wray and Aguirre (1968)³⁷ in Columbia found that mothers' literacy

³⁶ Hendel, Grace, M., Mr. Burk and L. A. Lund, "Socioeconomic Factors Influence Children's Diets" in Journal of Home Economics, 51, no. 3, March 1965, pp. 205-208.

³⁷ op. cit.

was statistically important in deriving the probability of their children's level of nutrition. Studies by Haley, et al (1977)³⁸ Hendel (1965), Adrian, et al. (1976), Battad (1978) and Valenzuela (1978) have also observed significant positive association between these two variables.

Large family size may or may not aggravate the families' poor nutrition condition. One position is that the more children there are in the family, the lower the dietary intake. MacCorquodale, et al., (1977)³⁹ and Wray, et al., (1969)⁴⁰ found such a relationship between nutritional status and family size. Other studies which confirmed these results are Adrian, et al, (1976) and Battad ((1978). But Ballweg (1972)⁴¹ and Stephen (1975)⁴² both found no significant relationship between those two variables. In addition,

³⁸ Haley, Maudie, Dola Ancoine and Jesse Rae, "A Comparative Study of Food Habits: Influence of Age, Sex, and Selected Family Characteristics.11" in Canadian Journal of Public Health, 68, July/August, 1977, pp.301-306.

³⁹ MacCorquodale, D. and J.R. deNova, "Family Size and Malnutrition in Santo Domingo" in Public Health Reports, v. 92, no. 5, Sept. Oct., 1977, pp.453-457.

⁴⁰ op. cit.

⁴¹ Ballweg, J.A., "Family Characteristics and Nutrition Problems in Preschool Children in Fond Parisien, Haiti," in Journal of Tropical Pediatrics, Monograph 23, Sept. 1972.

⁴² Stephens, A.J., "The Impact of Health Care and Nutritional Education on an Urban Community in Zambia" in Journal of Tropical Medicine and Hygiene, v. 78, May 1975, pp. 97-105.

the study of Hermann (1967)⁴³ provided results showing positive association of actual food intake and family size - the bigger the family size, the higher the physical requirements for food.

Related to family size is the timing of child-bearing factor in relation to the nutritional status of children. Bulatao-Jayme (1980)⁴⁴ observed that children born of mothers with 3-year birth intervals have been found less prone to malnutrition than those born at shorter intervals.

Mixed results existed also in terms of the association between nutrient intake and the employment of mothers. Battad (1978)⁴⁵ claimed a negative association between employment of mothers and nutritional status. However, Valenzuela (1978)⁴⁶ and Adrian, et al. (1976)⁴⁷ noticed significant increase in nutrient consumption of children when housewives were working.

⁴³ Hermann, R., "Interaction Effects and the Analysis of Food Expenditures" in the Journal of Farm Economics, 49 (1974);821-832.

⁴⁴ Bulatao-Jayme, Dr. Josefina, et al., "Relationship of Mother's Fertility Behavior to the Nutritional Status of Infants and Preschool Children." A paper presented to the Third Asian Congress of Nutrition in Jakarta, Indonesia, Oct. 6-10, 1980.

⁴⁵ op. cit.

⁴⁶ op. cit.

⁴⁷ op. cit.

Very few studies were found that address the direct issue of association between social scale and human nutrition in a community level. DeWalt, et al (1975) studied nutritional correlates of a Mexican community that measure association between variables using household, and not community, as a unit. Sims, et al. (1972)⁴⁸ studied the nutrient intake of preschool children as the output that resulted from the interaction between the child and the family. A similar study by Caliendo (1978)⁴⁹ employed an ecological approach in investigating socioeconomic and environmental factors relative to the children's dietary status.

The purpose of the review of the related literature has been to determine the important factors operating in the change of food habits. Currently, literature shows mounting increase in studies of various factors at the individual level of analysis. Very few focus on the community level. While the literature review has provided several findings that support the hypothesis of the study, it has further provided an insight into constructing a type of study to which the existing literature has not turned its attention.

⁴⁸ Sims, Laura, S., B. Paolucci and P. Norris, "A Theoretical Model for the Study of Nutritional Status: An Ecosystem Approach" in Ecology of Food and Nutrition, 1972, v.1, pp. 197-205.

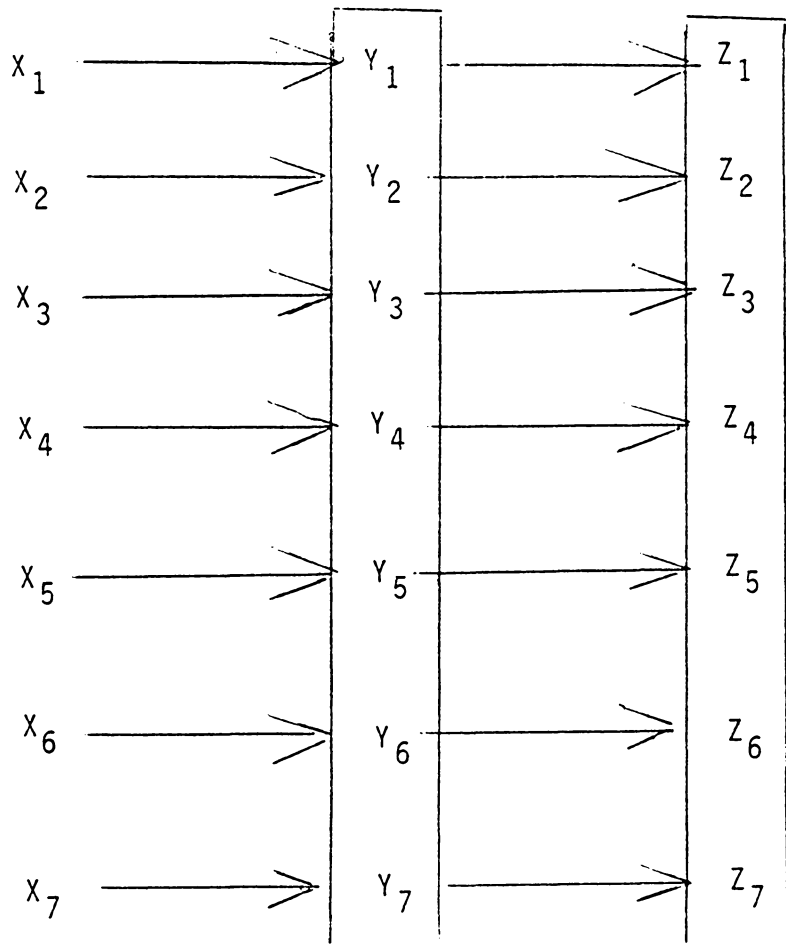
⁴⁹ Caliendo, Mary A. and D. Sanjur, "The Dietary Status of Preschool Children: An Ecological Approach" in Journal of Nutrition Education, v. 10, no.2, pp.69-72.

Hence, the result of the literature review has been a determination to make a comparative study at both the community and household levels in order to contribute to the understanding of social scale and human nutrition.

Household data may be more central than community level data because food consumption is ultimately an act done by individuals. But there are approaches to problem identification in planning for instance for which community study may turn out to be more practical than individual level study. For instance, in development planning, to know how many people are short of nutrients is operationally meaningless unless one knows who and where they are. In community level design, one can locate the population groups which have severe risk of malnutrition. Further, dietary intake study uses recommended allowances of nutrients which are standards appropriately applicable to certain groups in the population, like children or adults, and not to a particular individual.

THE RESEARCH MODEL

After having reviewed the available literature related to the study, this study presents a model to identify the relationship obtained between the variables of interest. See Figure I.



Where:

- X = are exogenous, independent correlates of social scale;
- Y = are community level changes represented by strata;
- Z = are dietary intake changes.

Figure I - Conceptualization of Flows from Social Scale to Dietary Intake

The logic of this model presumes that changes in the household's dietary intake are attributed to social differences that have affected each of them in diverse ways. Of the various types of diverse influences, the main factors that have affected the household in important degree appear to have been household income, education, occupation, and household size. Other factors such as national political condition, prices, trade, and availability of food are assumed to have affected them in uniform ways and do not explain major differences in their social behavior. Hence, the model attributes the differences to socioeconomic factors that explain the major differences in food consumption and nutrient intake of households in a community.

First Hypothesis. The present study hypothesizes that a group of households which are advantaged in terms of social characteristics is positively associated with dietary intake. It is postulated that a community with a group of households having higher income, education, occupation, and small household size shows higher food consumption than another community whose households have lower income, education, occupation, and bigger household size. In testing this assumption, stratum is the variable.

It is further assumed that especially when households were, at present, living at a low level of food consumption,

occupation of either the husband or wife or any eligible member of the household would further add to increased food consumption.

While the review of literature provided mixed results of women's employment, this study assumes that a wife's occupation significantly improves the family food consumption as well as nutrient intake. When the wife has an occupation, she provides not only additional income but also improvement of the diet of all the members of the family because, it is assumed, she, not the husband, decides what food to buy. This is particularly true in a Filipino family.

Because of the increased cash income which the wife and the other members would now contribute, it is further assumed that she would gain in status with her husband and with kin. Because of her high status and because of her wider contacts as a result of holding a job, her aspirations for a higher standard of living would begin to rise. She would likely desire more and higher quality foods for the home. But additional children would to some extent threaten the standard of living she has already enjoyed. An additional member brought into the household would require additional resources to feed. Hence, demographic characteristic in terms of family size has a direct effect on dietary intake.

Second Hypothesis. The study goes on further to hypothesize that increases in average food and nutrient intake are brought about by improvement in income, occupation, education and decrease in household size. This problem takes into consideration the correlates as having direct effects on dietary intake. The unit of analysis is the household.

Third Hypothesis. In addition, the study goes on to hypothesize that increases in food expenditures are also positively associated with the improvement in social conditions. As households experience improvement in income, education, occupation and decline in household size, they would increase expenses for food. The expenses for food would obviously compete with other expenses such as education for the children, but it is assumed that households would decide to increase food consumption at a certain level.

Fourth Hypothesis. It is finally hypothesized that household income has the strongest influence on food intake, and food expenditures. Increase in income would allow higher food expenditures so that more food intake would result in higher caloric and nutrient intake.

Such, in brief, are the specific hypotheses that govern the research which is described in the present report.

SIGNIFICANCE OF THE STUDY

This research attempts to establish a predictable relationship between social characteristics and dietary intake. Once association between these factors is empirically supported, the indicators used, such as income, education, occupation, and household size are readily available from census or survey research in many countries. From these studies, planners can regularly establish reasonable estimates of food consumption needs of any community.

One practical application of this study is that it attempts to reveal the food and nutrition condition of a community. The quantity and value of reported food items consumed over the reference period provide the nutrient contents which are compared with recommended dietary allowance. The comparison identifies groups which are at risk of malnutrition. Thus, this study endeavors to identify the social and demographic characteristics of deprived households in greater detail.

Another important concern is policy evaluation involving food subsidies, distribution and food production. Sensible and realistic analysis of these policies' influences on food consumption and human nutrition demands the understanding of the causes of malnutrition. Numerous studies (see litera-

ture review) relating household characteristics to food consumption exist. Proceeding from this existing research, this study measures these major variables in numerous ways to describe the deprived households principally food intake, nutrient intake and food expenditures. These data should be convenient and useful for policy decisions and program planning in various fields, most important among which are health, economics, food production, and general social and family welfare.

LIMITATION OF THE STUDY

Measuring nutritional status of families entails an assessment of an interrelated number of tests on the household's dietary, clinical, biochemical, and anthropometric status. This study limits its assessment to the dietary status of households.

Further, one can point to a number of social factors which affect dietary intake, ranging from the interrelated patterns of food supply, technologies, values, and norms to social categories, and economic and social organizations. There are further physiological, psychological, and sociological points of view. In this study the measure of food in-

take is limited to socioeconomic factors from community and household points of view. Moreover, dietary intake takes into account various aspects such as food consumption, nutrient intake and food expenses. Finally, analysis of dietary intake involves a number of foods, vitamins, and minerals. This study picks some food groups and nutrients which are useful because they are commonly consumed by families and for which research studies⁵⁰ have shown them to be useful. The omission of certain factors should not be construed to minimize their relevance or deny their existence: they merely fall outside the scope of the present study. Further, any generalization made in the study should apply only to people in places and cultures with generally similar social and economic conditions as Misamis Oriental province.

DEFINITION OF IMPORTANT CONCEPTS

The key concepts used in this study may now be defined.

(1) Food Habits - may be defined as the study of the means by which individuals or groups of individuals, in response to social and cultural pressures, select, consume, and

⁵⁰ Such as Food and Nutrition Research Institute studies in Manila, Philippines.

⁵¹ Mead, M., "The Problem of Changing Food Habits" in Committee on Food Habit Report, National Research Council

utilize a portion of the available food supply.⁵¹ Mead explains that food habits refers to "the culturally standardized set of behavior in regard to food manifested by individuals who have been reared within a given cultural tradition."⁵²

(2) Social Scale. It is a generally accepted practice to refer to the strata or layers found in a society as social scale. As used in this study, a social scale is a designation for a group of households found in municipalities sorted into three strata according to average income per capita and the rate of high school completion per municipality. The term is meant here not so much of social class in the strict sense which usually is considered to involve conscious in-group class feeling and a class ethos that tend to form relatively major groupings, but rather relative status differentials that categorize people. Social scale assumes a continuum of statuses without any clear cut division of people into distinct social classes. The status differences are gradual. It considers the social, economic, and demographic characteristics to rank status but not to form hierarchically ordered social classes. This conception proceeds from the study's theoretical framework which does not clear-

Bulletin No. 108, p. 21.

⁵² op. cit. p. 21

ly divide community into distinct social classes.

Social scale presents some indication of relative levels of living which would be advantageous for comparison. These variables of household income, occupation, education, and household size are used as correlates of social scale and the social categories are stratum I, II, and III. Hereafter, for convenience the reference to these social influences are called social scale, understanding, however, that it consists of income, occupation, education, and household size.

(3) Barangay - A city or municipality is composed of several barangays, the smallest political subdivision in the country. For the purpose of the survey, a barangay is the primary unit in the sample.

(4) Household - A household is an aggregate of persons generally but not necessarily bound by ties of kinship, who live together under the same roof and eat together or share in common the household food. Members comprise the head of household, the relatives living with him and other persons who share the living for reasons of work or other consideration.

(5) Nutrition - is the study of foods in relation to the needs of living organism.⁵³ It implies all areas of intake,

⁵³ Bender, Arnold, E. Dictionary of Nutrition and Food Technology Boston:Butterworth (Publishers) Inc., 1978.

digestion, assimilation, utilization, metabolism, and excretion.⁵⁴ Three types of study may be identified in relation to nutrition, such as:

a) Dietary intake analysis - which relates to caloric and nutrient intakes.

b) Nutritional status study - which provides both dietary intake and anthropometric, clinical, and biochemical data. Hence, nutritional status is determined by (1) comparing dietary studies of nutrient intake with accepted standards, (2) clinically evaluating physical signs of nutritional health, and (3) biochemically measuring the nutrients in the body.⁵⁵

c) Physical analysis - which provides only anthropometric, clinical, and biochemical data. Anthropometric data include height, weight and skinfold, while the clinical data cover physical signs and symptoms, and the biochemical data refer to the analysis of blood, urine, and other biological materials.

The present study deals with dietary intake analysis.

⁵⁴ Notes from Jane Wentworth, Dept. of Food and Human Nutrition, VPI & SU, Blacksburg, Va. 24061.

⁵⁵ Bass, Mary Ann, L Wakefield, and R. Kolasa, Community Nutrition and Individual Food Behavior, Minneapolis, Burgess Publishing Co., 1979, p. 152.

(6) malnutrition - is the disturbance of form or function arising from a deficiency or imbalance of one or more nutrients.

Malnutrition⁵⁶ may be classified as primary or secondary. Primary malnutrition is defined as an inadequate or excessive, (example calories), intake of nutrient for the normal body requirements. Secondary malnutrition results from factors that interfere with ingestion, absorption and assimilation of essential nutrients or from various stress factors that increase body requirements. Two common examples of secondary malnutrition are anemia associated with intestinal parasites (particularly hookworm) in children and malnutrition resulting from chronic diarrhea and infections.

It is important that a clear distinction be made between primary and secondary malnutrition in population surveys. Failure to recognize the conditioning factors associated with secondary malnutrition can falsely lead to the conclusion that all malnutrition cases were caused by dietary inadequacies.

7) Platewaste - refers to the edible portions of food which are left on the dining table or on the plates after the family has finished eating and are given to household pets or discarded.

⁵⁶ op.cit. p. 3

8) Leftovers - refers to the food items, cooked and/or raw, which were left behind but were intended to be eaten during the next meal or in between meals or at a later time with family members.

SUMMARY

This dissertation takes as its main problem the understanding of the influence of socioeconomic factors upon household dietary intake. This basic problem is derived from the early studies on social differentiation in which an inference may be framed that persons belonging to a group of households having similar social characteristics behave in a particular way while other persons who belong to other groups with different social characteristics from the first group behave differently. Then the research model presents four specific hypotheses to guide the investigation of the present problem.

A mounting body of literature relating socioeconomic factors with dietary intake considers the individual and household as units of analysis. Few studies use community as the unit of study. To understand more fully this phenomenon, this study attempts to use both community and household analyses of the association between social differentiation and food consumption.

Clearly identifying the social and demographic characteristics of deprived households, this study may demonstrate the practical application of the research design to answer important questions being asked in development programs. The next section explains the details of this design.

Chapter II

RESEARCH METHODOLOGY

RESEARCH DESIGN

Research is an art. Research is a science. Research is a process. Research is all these things and more. It is hoped ...that we can keep science in its proper perspective, not as the ultimate solution to the amassing of knowledge but as one of the paths of human wisdom.

Hillery, Jr., George, A., A Research Odyssey: Developing and Testing A Community Theory, New Brunswick: Transaction Books, 1982.

To accomplish the objectives of this research, a multi-focused survey, using some of the social factors identified in the earlier studies, is employed to stratify population into three groups. The basis of stratification is the index of social scale which is based on available municipal data of mean income per capita and the rate of high school completion.⁵⁷ These factors rank municipalities into three

⁵⁷ National Census and Statistics Office, Manila, Philippines, 1975 Integrated Census of the Population and Its Economic Activities - Population - Misamis Oriental, Vol. 1, Final Report, Phase 1, Manila: NEDA.

groups out of which separate two-stage sample selection would be conducted.

Income per capita for 1980 was categorized and assigned scores in the following manner.⁵⁸

<u>Income Level</u>	<u>Score</u>
less than or equal to P800.00	1
P801 to P1,200	2
P1,201 and greater.	3

The data for highest grade of schooling completed, per municipality, for all persons 15 years and over, were computed in terms of the rate of high school completion to total eligible persons and given scores as follows:

<u>Educational Level</u>	<u>Score</u>
less than or equal to 12.00	1
12.01 to 17.00	2
greater than 17.01	3

Hereafter, the index of social differentiation for any municipality was calculated by summing the individual scores and dividing by two. For example, a municipality which had an income per person of P1,200.00 in 1980 (score 2) and which had an educational level of 17 (score 2) would, by defini-

⁵⁸ The dollar exchange was p8.00=\$1.00.

tion, have a social scale rank of 2 or $(2 + 2)/2 = 2$. The above procedure was uniformly followed for all municipalities of Misamis Oriental and the final phase was to translate the various scores into social scale strata which was done as follows:

<u>Social differentiation Score</u>	<u>Social Scale Strata</u>
less than 1.50	stratum III
1.51 to 2.49	stratum II
greater than or equal to 2.50	stratum I.

This research design proceeds from the main theoretical assumption that community can be categorized according to the extent of social differentiation they have experienced. If on the basis of the findings, one stratum is found to be different from the other strata in aspects pertaining to the social and economic conditions of the people, this design presumes that the stratum relative to other strata is different, differing greatly in its social characteristics.

Further, this design assumes that a stratum where a group of households has a lower level of income, education, occupation, and bigger household size could be considered to represent what in a community is lacking in social and economic improvements. Then when a stratum is compared relative to dietary intake, the observed differences could be

attributed to socioeconomic conditions provided that other disturbing factors were assumed to have affected all the strata equally and the socioeconomic conditions are the major uncontrolled variables influencing them differentially.

The logic of this design, however, is much weaker than an experimental design in which one has control over the disturbing factors to some extent and especially the experimental variables, which in this case are the social characteristics of households in a community. If effects of disturbing factors could be eliminated or well controlled, such a design might give fairly strong indications of causal influence. Hence, readers should bear this in mind when assessing results obtained by the present study. Attempts to show causality will, of necessity, be logically weak because of lack of control on both the experimental variables and the disturbing factors such as food prices. The hypotheses of this study are mainly hypotheses of association rather than causality.

RESEARCH SETTING

To meet adequately the objectives of the study, a provincial survey starting from August 15, 1981 to October 31, 1981 was conducted in Misamis Oriental, Philippines. This place is a suitable setting for this study because this researcher who comes from the same place, will come home to work in this area. It is hoped that this study will provide useful information to the nutrition program of the provincial government.⁵⁹ See Figure II.

⁵⁹ The Province of Misamis Oriental has a provincial Nutrition Secretariat who actively coordinates the nutrition projects implemented by the national and local public and private organizations.

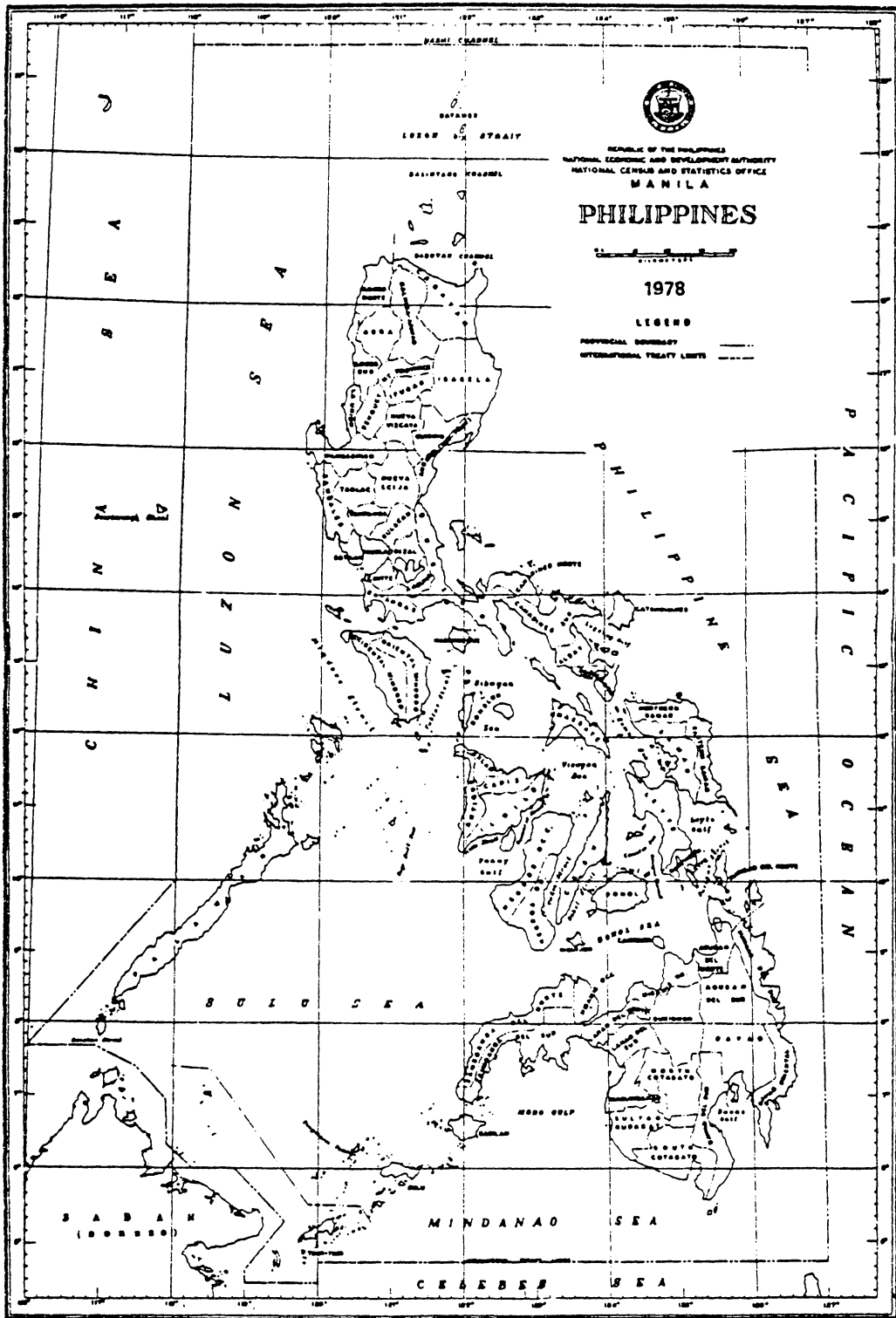


Figure 2: Map of Philippine Islands

Land Area

Misamis Oriental is bounded on the north by the Mindanao Sea and on the west by Iligan Bay while on the south and southwest are the provinces of Bukidnon and Lanao del Norte and on the east by Agusan del Norte. It is generally a hilly region with best soils along the coastal plains and in the river valley, where the bulk of the population lives. It has a land area of 3,570.1 square kilometers⁶⁰ representing 1.19 per cent of the total land area of the Philippines. The general weather profile shows continuous tropical heat with high relative humidity. The average humidity is 80 per cent and the average temperature is 81.3 degrees F (27.4 degrees C.). The average annual number of rainy days is 155 days and the average annual rainfall is 242.1 cm. The rainfall pattern is designated as Philippine Intermediate type A climate which features a short dry season lasting from one to three months and the absence of pronouncedly rainy season. Peaks of rainfall occur in June and October.

⁶⁰ National Economic Development Authority (NEDA), Mis. Or. Provincial Statistical Profile, p. 6.

Population

From 1975 to 1980, the population of the province has increased by 133,333 indicating an annual population growth of 3.84 per cent during the period as compared to 3.47 during 1970-75.⁶¹ With an increase in population, a corresponding increase of 37.5 persons per square kilometer is noted during 1975-80. The province presently has a population density of 194.5 persons per kilometer. See Figure III.

During 1970-75, the population has become even more predominantly male within the five-year period with 104 males for every 100 females as compared to 101 males in 1970.⁶² The urban population has remained predominantly female with only 98 males for every 100 females while the rural population has remained predominantly male with 105 males for every 100 females.

The process of urbanization has gained very little headway in the province. Rural residents still comprise 79.1 per cent of the population while urban residents constitute 20.9 per cent. For the male population, the proportion of rural residents (79.7%) has increased by 0.8 per cent while a corresponding decrease is noted for their urban counter-

⁶¹ Office of the Census and Statistics, Region X, Cagayan de Oro, Philippines.

⁶² op. cit.

POPULATION DENSITY BY MUNICIPALITY MISAMIS ORIENTAL: 1975

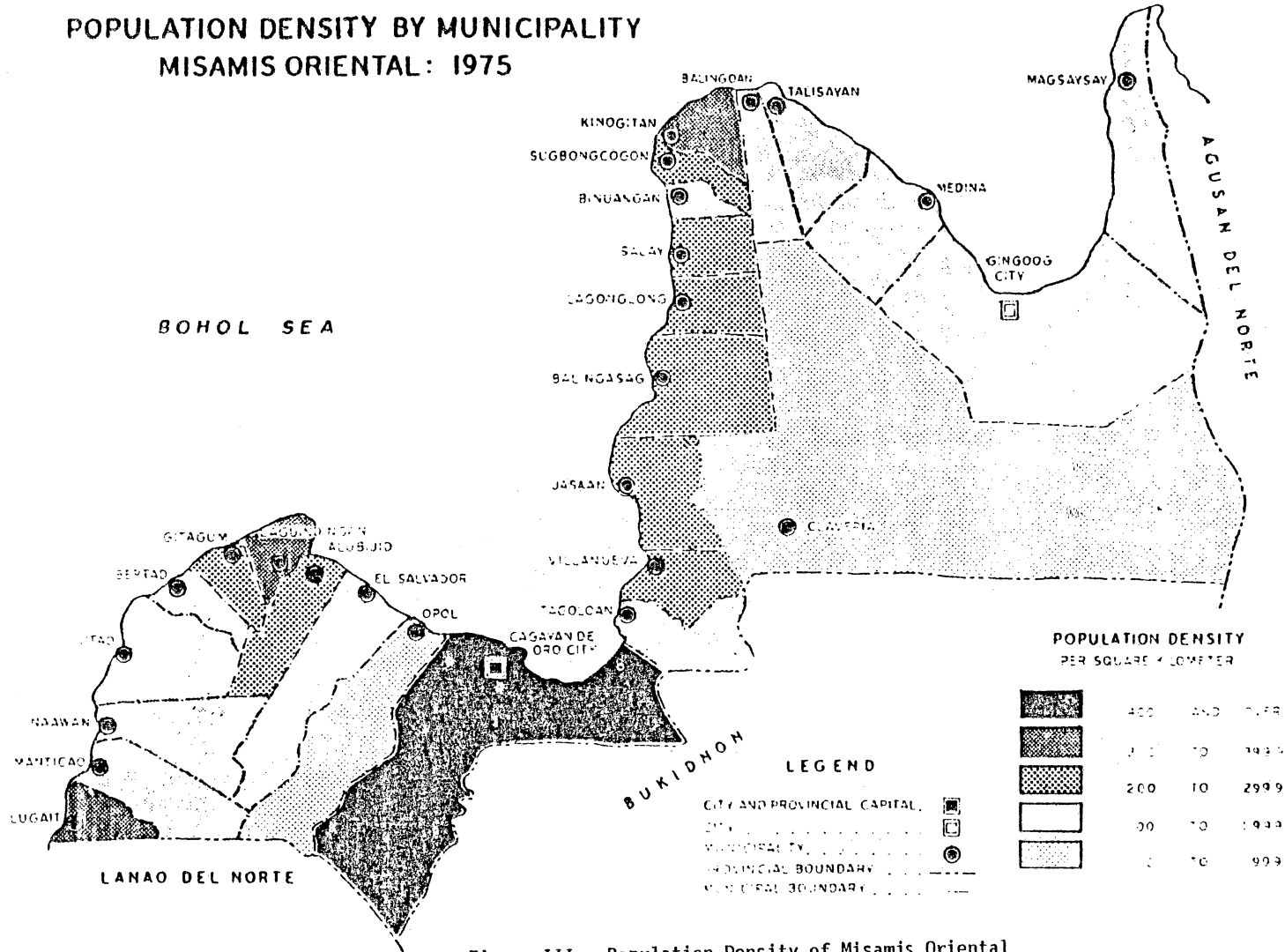


Figure III - Population Density of Misamis Oriental

parts (20.3%). The same pattern holds true for the female population with urban residents comprising 21.5 per cent, representing a decrease of 0.6 per cent, and rural residents comprising 78.5 percent, representing a corresponding increase of 0.6 per cent. Hence, compared to the 1970 statistics, higher growth rate for the rural population than the urban population existed. See Table 3.

TABLE 3
Rural-Urban Population-Mis. Or., 1975

<u>Categories:</u>	<u>1975</u> <u>Number</u>	<u>Per Cent</u>	<u>1970</u> <u>Number</u>	<u>Per Cent</u>
Both Sexes	560,490	100.0	472,756	100.0
Urban	117,071	20.9	102,278	21.6
Rural	443,419	79.1	370,478	78.4
Male	285,432	100.0	238,062	100.0
Urban	58,027	20.3	50,322	21.1
Rural	227,405	79.7	187,740	78.9
Female	275,058	100.0	234,694	100.0
Urban	50,044	21.5	51,956	22.1
Rural	216,014	78.5	182,738	77.9

Source: Office of the Census and Statistics, Region X,
Cagayan de Oro, Philippines, p. xx.

Economic Characteristics

Industrial development has been light in this province. A ferro-chemical plant and an electro-alloy company are located in Manticao municipality. In Naawan Municipality, the third municipality from the western boundary, a vinyl factory is located which employs 50 persons. In the next municipality, Initao, an agro-forestry corporation employs another 45 persons.

Cagayan de Oro City is the site of a large fruit producing and canning industry, the Philippine Packing Corporation, a subsidiary of California Packing Corp., one of the divisions of the Reynolds Company. A chartered city since 1950,⁶³ it covers 41,278 hectares and has 215,733 people as of 1980. It has Lumbia Airport with jet airline services to Manila and to other big cities, an excellent deep water harbor called Macajalar Bay with boat services to many points of the country, and land bus services that reach to all points of the island.

Going farther to the east, in Jasaan, large Japanese cosmetic and resin plants are located. In the next municipality, Villanueva, the Industrial Estate of the Philippine Veterans Industrial Development Corp. (Phivedec) is

⁶³ Madigan, Francis, S.J., Birth and Death in Cagayan de Oro, Manila:Ateneo University Press, 1972.

found, and there a large Japanese Kawasaki Sintering Plant, which employs about 500 persons, is located.

Social Characteristics

The people of Misamis Oriental are mainly Cebuano speaking people. Table 4 shows 96.68 per cent speak this language. In the entire islands, there are eight mother tongues out of about 75 languages that comprise about 86 per cent of the population: cebuano (24 per cent), Tagalog (21 per cent), Ilocano (12 per cent), Hiligaynon (10 per cent), Bicol (8 per cent), Samar Leyte (6 per cent), Pampangan (3 per cent), and Pangasinan (2 per cent). In addition, the four hundred years of Spanish colonial rule left a strong mark of christianity on the Philippines: In 1960 over 80 per cent of the Filipino people were Roman Catholic, 3 per cent Protestant, and about 5 per cent Muslim.⁶⁴

⁶⁴ World Bank Country Report, The Philippines: Priorities and Prospects for Development, Washington, D.C., The World Bank, 1976, p. 6.

TABLE 4
 Percentage Distribution of Population According to Language
 Misamis Oriental, 1975

<u>Dialect</u>	<u>Population</u>	<u>Per Cent</u>
Cebuano	541,876	96.68
Tagalog	4,862	.87
Hiligaynon	3,660	.65
Samar Leyte	1,376	.25
Ilocano	1,080	.19
Chinese	704	.13
Maranao	692	.12
All Other Dialects	6,240	1.11
Total	560,490	100.00

Source: National Economic Development Authority (NEDA)
 Region X, Misamis Oriental - Provincial Statistical Profile,
 p.4.

SAMPLING DESIGN

In this research, a stratified, two-stage sampling design with probability proportional to size was employed to attain the best estimates. The two-stage sampling design involves the sampling frames of all barangays and households in each stratum. The basic sampling frame for 1980 from which the sample barangays were drawn was obtained from the Office of the Census and Statistics, Region X, Cagayan de Oro City, Philippines. After the towns and cities were stratified, sample barangays were chosen with replacement and with probabilities proportionate to size by accumulating the household populations in each stratum, using a random numbers table. Altogether 39 barangays were chosen, 13 in each stratum. See Appendix A and E.

The sampling frames for households were secured mostly from the Barangay Captain and from the office of the Research Institute of Mindanao Culture, of the Dept. of Sociology, Xavier University, Cagayan de Oro, Philippines. All maps of the selected barangays were secured from the office of the National Census and Statistics, Region X, of the same city. The random selection of households was by systematic basis with random start. Setting a sample size of 520 households, the systematic selection followed the following procedure:

a) number the households enumerated in the list of households consecutively from 1 to n , where n =total number of households in a sample barangay.

b) A household sample size of each chosen barangay is determined as

$SS=n/15$, where 15 is the sampling interval.

c) Compute K =sampling interval as $K=N/520$ where N =overall household size of the stratum. For example, $8075/520=15$. See appendix C.

d) Determine S = random start. This is a random number inclusive from 1 to K chosen from the table of random numbers. For a one digit number K , simply close one's eyes and use a pencil to point to any numbers. If the number does not fall within 1 and K , repeat until successful. For a two-digit number K , choose any two columns in the table, then move downwards until one gets the number inclusive from 01 to K .

e) The list of households consists of households listing number S , $S + K$, $S + 2K$, $S + NK$ until all sample households are chosen. If, in a chosen barangay, there are 48 listed households, the sample size is $48/15=3$. Then if the random number chosen inclusive from 1 to 15 is 12 the sample households chosen are 12, $12 + 15$, and $12 + 2(15)$ or 12, 37, and 42.

However, at the time of the survey, the occasional shooting between the government forces and the underground guerilla prevented the interviewers from entering two of the three selected barangays in Gingoog City. Replacement by choosing another barangays through simple random selection was the final solution. The consequence of probability estimates will be discussed in the section of estimation procedure.

DATA GATHERING METHODS

This research uses personal interview and 24-hour recall method to gather data. The items of information included in the questionnaire cover the following parts:

Part 1	Household Information
Part 2	Combined Household Income
Part 3	Household Size Data
Part 4	Food Consumption

A copy of the questionnaire is in Appendix K. Questions and instructions are given in English but Cebuano translation (enclosed in parenthesis) have been incorporated into the questionnaire. Before its final printing, the preliminary draft was pre-tested in Cagayan de Oro City and Opol, the adjacent town. A final draft was then drawn incorporating revisions from the pre-test.

All interviewing was done by a group of interviewers and supervisors who are the regular research assistants of the Research Institute of Mindanao Culture (RIMCU), Xavier University and who come from the areas selected for fieldwork. The ages of the interviewers and supervisors hired ranged from 21 to 30. All of them have college degrees and have had at least 3 years experience in interviewing at RIMCU. An interviewing manual was drawn to guide interviewers during their training and fieldwork. It contains an introduction to orient interviewers to the purposes behind the survey, instruction on the selection of informants, the conduct of the interview, and the filling out of the questionnaires and other relevant information for classification and enumeration purposes. See Appendix C.

Eight interviewers and 1 supervisor were trained for one week (the researcher also supervised during the fieldwork). After training, a dry run was conducted during which time the interviewers were each required to select and interview ten households for the questionnaires. Before the interviewers were released for fieldwork, it was made certain at the briefing that they understood the instructions and concepts involved in the survey.

For the questionnaire and the food recall, an interviewer spent an average of 1 hour and 30 minutes in every house-

hold. Each interviewer completed an average of 5-6 interviews a day.

To aid the interviewers in interviewing and to avoid field errors, each interviewer was provided copies of the food composition table, standard household weights and measures, and the list of local common foods. They were divided into two groups, each headed by a supervisor. One group of interviewers, who came from municipalities located in the west, went to the west side, while the other group went to the east side.

DATA PROCESSING

Data processing involves two primary stages: manual processing and machine processing. Manual processing is always done in preparation for data conversion operations. It involves editing and coding of questionnaires and food recall. In editing, one inspects and corrects errors such as omissions, doubtful and inconsistent entries. In this case, the interviewers were instructed to review the entries at the conclusion of the interview. In filling out the forms, no blank answer was allowed, and doubtful and unreasonable answers were verified. During the interview day, the supervisors observed and checked the interviewers; at the end of the day, they further edited the completed questionnaires.

The project central office for fieldwork was located at the Searsolin, Xavier University, Lumbia, Cagayan de Oro City where the final editing, coding, and computations of food weights were done. In processing nutrition data,⁶⁵ three computations were done: household food intake, household nutrient intake, and recommended dietary allowances of nutrients of households. A COBOL computer program was employed at the Agricultural Research Center, University of the Philippines, Los Banos, Laguna, Philippines. This package converted the data on food consumed to a percentage adequacy of nutrient intakes of household diets considering the appropriate recommended dietary allowances according to age, sex and physiological conditions of each member of the household. These percentages were used in correlations with the explanatory factors of the research. See Appendix K.

⁶⁵ The computations used came from the Office of Food and Nutrition Research Institute (FNRI), Manila, Philippines.

RELIABILITY AND VALIDITY

In this research, the questions of reliability and validity enter into the appraisal of a 24-hour recall method and the assessment of specific procedures employed to avoid sampling and non-sampling errors. First, the 24-hour recall is appraised valid and reliable to estimate dietary intakes of population groups. Burk (1976)⁶⁶ observed satisfactory levels of reliability for the 24 hour recall when relative standard errors for several groups of four major surveys were compared. Gersovitz, et al. (1978)⁶⁷ study concluded that both the 24-hour recall and the 7-day record provided about equally accurate estimates of the mean intake but the 24-hour recall is prone to over-reporting low intake and under-reporting high intakes. Regression analysis showed significant differences between actual and recalled intake in six nutrients. This study, using 65 subjects of at least 65 years of age, reflects the aged weakness of memory.⁶⁸ Furth-

⁶⁶ Burk, Marguerite and E. Pao, "Metodology for Large-Scale Surveys of Households and Individual Diets." in Home Economic Report 40, USDA, Washington, D.C., 1976.

⁶⁷ Gersovitz, Mitchell, J.P. Madden, and H. Smicklas-Wright, "Validity of the 24-Hr Dietary Recall and Seven-Day Record for Group Comparisons" in Journal of the American Dietetic Association, v. 3, July, 1979, pp. 48-55.

⁶⁸ Campbell, V. A. and M.I. Dodds, "Collecting Dietary Information from Groups of Older People" in Journal of American Dietetician Association, 1967, v. 57, pp. 29-33.

er, Lechtig et al., (1978)⁶⁹ indicated that in terms of the reliability of the method, their study shows that the most important factors affecting reliability derives from the subject under study and the instrument per se (e.g. survey) and not from the type of survey (e.g. one or seven day). Their study further found out that the 24-hour recall is "at least valid to estimate mean dietary calories and protein intake in population groups; it may not be good enough in assessing individual intake." This instrument should be useful in this survey using a group of households as a unit of analysis to measure dietary intake.

Non-Sampling Variations

Estimates from survey data are subject to two types of error: sampling and non-sampling errors. Common sources of non-sampling errors are:

a) failure to measure some of the chosen households because of oversight, or failure to locate them, or refusal or their not being at home.

⁶⁹ Lechtig, R., C. Yarborough, R. Martorell, H. Delgado, and R.E. Klein, "The One-day Recall Dietary Survey: A Review of Its Usefulness to Estimate Protein and Calorie Intake," in Archivos Latinoamericanos de Nutricion, XXVI, Sept. 1976, p. 248-274.

b) errors of measurement resulting from an imprecise or biased measuring device or from an inaccurate or biased response. And,

c) errors of editing, coding, and tabulating of results.

Failure to Measure Units in the Sample

Because lists of households and maps of dwelling units were available, no problem was encountered in locating homes listed in the household sampling frames.

Errors in Measurement

1) Survey Devices. The measuring devices were the interview schedule and the 24-hour recall. Steps to minimize errors due to measuring devices have already been discussed in the earlier section of data collection procedures.

2) Response Errors. A review of the questionnaire shows that the questions asked revolved around some sensitive subjects like income, food consumption, etc.. But the questions were drawn in such a way that the results would have a minimum of bias arising from an inaccurate or biased response. The interviewers were also trained to probe whenever they

got inadequate responses. Moreover, repeated pledges to informant of confidentiality of data helped to allay their fears.

Possibly, the effect of measurement errors would be felt mainly on the sections on income and food consumption. Possible direction of bias in this section is understatement of income and overstatement of food consumption.

3) Editing, Coding, and Tabulating Errors. The data were checked, rechecked, and verified to minimize errors. Errors of this type were not numerous and any such remaining errors are believed to be very few and random. See Appendices E and F.

Sampling Variations

Aside from non-sampling errors, the estimates are subject to random sampling variations whenever any of the units are measured instead of the complete population of N units. Factors involved in sampling variations include the sampling design and estimation procedures. To verify sampling variations in the survey, the study compared the estimated population profiles with that of the 1975 census for Misamis Oriental and for the whole country. The result shows that the percentages of groups of households in each category approx-

imates that of the provincial and national figures of the National Census and Statistics Office, Manila, Philippines, a government agency regularly conducting census and surveys throughout the islands.

At the time of the survey, 29.60 per cent of the population belonged to the younger age group, 0-9; 26.14 per cent to the adolescents, 10-19; 2.09 per cent to the retiring age group, 70-above. This means there was 42.17 per cent who belonged to the adult or working age group, 20-69. See Table 5.

TABLE 5
 Percentage Distribution of Population By Age

<u>Population Groups</u>	<u>Survey</u> Per Cent	<u>NCSO-Mis.Or.*</u> Per Cent	<u>NCSO-National*</u> Per Cent
Children:			
0 - 9	29.7	31.6	29.8
Adolescents:			
10-19	26.2	26.2	26.9
Adults:			
20-39	26.6	26.3	26.5
40-49	7.9	7.5	7.8
50-59	5.1	4.5	5.2
60-69	2.5	2.5	2.1
70-above	2.0	1.4	1.7
Total	100.0	100.0	100.0

Source: National Census and Statistic Office, Manila, 1975
 Integrated Census of the Population and Its Economic
 Activities - Population - Misamis Oriental, Vol. 1, Final
 Report, Phase I, Manila: NEDA, 1975.

ESTIMATION PROCEDURES

Results of data analyses as reported in the next section are given in terms of means, percentages, and frequency distributions. Computations of these values are based on the estimation procedures given in this section. For specific variables used in the analysis see Appendix G.

As mentioned earlier, the number of sample households of each barangay was derived from the 1980 census data. The assumption was that the theoretical estimate of size was equal to the actual size since the actual measure was not available for the final sampling stage. No adjustment was made of size when the estimates did not tally with the actual size. Hence, the census data served as the basis for computing the probability estimates.

The following notations are used:

Let y_{ijk} = be a characteristic possessed by the k th household in the j th barangay belonging to the i th stratum.

m_{ijk} = be the number of sample households in the j th barangay belonging to the i th stratum,

where

k = ranges from 1 to m_{ij} (number of k th households),

j = ranges from 1 to n_i (number of i th barangay),

i = ranges from 1 to 3.

The probability of barangay selection⁷⁰ in the i th stratum:

$$P_{ij} = M_{ij}/M_i, \text{ or}$$

= no. of households in the j th barangay/total number of households in the i th stratum.

(1) Then, for each barangay, the population total (Y_{ij}) is estimated:

$$\hat{Y}_{ij} = M_{ij} \cdot \bar{y}_{ij}, \text{ where}$$

\bar{y}_{ij} = is the sample mean of the j th barangay and

the estimated variance is:

$$\text{Var}(\hat{Y}_{ij}) = M_{ij}/m_{ij}(m_{ij}-1) \cdot \sum_{k \approx 1} (Y_{ijk} - \bar{y}_{ij}).$$

The above formula becomes the most conservative estimate for the systematic sampling scheme used in the study, so that the population mean, Y_{ij} is estimated as:

$$\bar{Y}_{ij} = \bar{y}_{ij}, \text{ and}$$

⁷⁰ The following estimates were formulated by Mr. Robert Tripp and Prof. T. Rao of the Dept. of Statistics, VPI & SU. Grateful acknowledgement is expressed to them. The use of these tools and the interpretation of results are the responsibility, not of them, but of this researcher.

the variance estimate is:

$$\text{Var}(\hat{y}_{ij}) = 1/m_{ij}(m_{ij}-1) \cdot \sum_{k=1}^{m_{ij}} (y_{ijk}-y_{ij})^2.$$

(2) For the i th stratum, the population total Y_i is estimated as:

$$\hat{Y}_i = 1/n_i \cdot \sum_{j=1}^{n_i} (Y_{ij}/P_{ij}), \text{ where}$$

n_i = is the no. of barangay sampled;

P_{ij} = the actual probability of selecting the j th barangay.

In this study, the estimate is determined from the census data. The estimated variance of the population total is as follows:

$$\text{Var}(\hat{Y}_i) = 1/n_i(n_i-1) \cdot \sum_{j=1}^{n_i} (Y_{ij}/P_{ij} - \hat{Y}_i)^2.$$

The per household mean of the i th stratum is Y_i and it is estimated by:

$$Y = Y_i/M_i, \text{ i.g. total of } Y/\text{total number of households.}$$

and this has estimated variance as:

$$\begin{aligned} \text{var}(Y) &= 1/M_i \cdot \text{Var}(\hat{Y}_i), \text{ or} \\ &= 1/M_i \cdot 1/n_i(n_i-1) \cdot \sum_{j=1}^{n_i} (\hat{Y}_{ij}/p_{ij} - \hat{Y}_i)^2. \end{aligned}$$

(3) For the entire population, the population total, Y , is estimated as:

$$\widehat{Y} = \widehat{Y}_1 + \widehat{Y}_2 + \widehat{Y}_3,$$

with estimated variance as:

$$\text{Var}\widehat{Y} = \text{Var}(\widehat{Y}_1) + \text{var}(\widehat{Y}_2) + \text{Var}(\widehat{Y}_3).$$

The per household mean for the population, grand mean, is Y , and is estimated as:

$$\begin{aligned} \widehat{Y} &= \widehat{Y}/M, \text{ or} \\ &= \widehat{Y}_1 + \widehat{Y}_2 + \widehat{Y}_3/M_1 + M_2 + M_3. \end{aligned}$$

The estimated variance is:

$$\text{Var}(Y) = 1/(M_1+M_2+M_3) \cdot (\text{Var}(\widehat{Y}_1) + (\text{Var}(\widehat{Y}_2) + \text{Var}(\widehat{Y}_3)).$$

For the methods of analysis in the study, Tripp said that the weighted least squares may be more preferable to use than the ordinary least squares. One reasonable set of weights to use is:

$$w_{ijk} = P_{ij} \cdot (m_{ij}/M_{ij}).$$

That is for each stratum i , each barangay j obtains w_{ijk} and gives each of the m_{ij} observation the same weight w_{ijk} . Such weights (see Appendix B) are used in the methods of

analysis of variance and multiple regression. The reasons are two: First, the two-stage sampling design requires the formulation of estimates that consider the probability of sample selection in the first and second stages. Second, the substitution of two of the three original barangays at Gingoog City deviated from the manner of selecting barangays with probability proportional to size.

The results suggest that the weighted least squares technique improves the regression models by increasing their coefficients. For instance, comparing the association of protein with the model in the weighted least squares method with the association revealed by the ordinary least squares method, one finds that the weighted least squares method has increased the coefficient from .45 to .51; it becomes 113 per cent of its original value. The regression models thus explain larger proportion of the variations in the dependent variables.

SUMMARY

In summary, precise data are essential elements of a successful study from which valid results and conclusions can be drawn. On the whole, the sampling procedures and data gathering tools included training, manuals of instructions,

specific guidelines and definitions which may assist in providing a reasonable estimate. However, the research design and the estimation procedures are not without their limitations. The estimates may have unknown sources of error so the results must be considered tentative. Limitations of this study were discussed so that users of the data could be made aware of the limitations underlying the conclusions drawn from the results.

Chapter III

SOCIAL SCALE AND STRATUM ANALYSIS

INTRODUCTION

It has become apparent that social well-being is not a linear function of the economic growth that has led, in many countries to increasing social alienation and has triggered deep-seated environmental crises. One of the most shocking experiences of the decade has been the realization of the tremendous amount of human suffering and destitution taking place in a rich or at least potentially rich world. This is found even in some highly developed countries.

UNESCO's Policy- Relevant Quality of Life Research Program in The Quality of Life Comparative Studies, A. Szalai and F.M. Andrews (eds.), California: Sage Publication Inc., 1980.

In the first chapter of results, data gathered were analyzed using one-way analysis of variance and chi-square to compare the three strata. Comparison is necessary in order to discover whether conclusions can be reached as to the diversity of the three populations covered in the survey. If the strata do not differ significantly from each other, then it makes no sense to examine the hypotheses relative to com-

munal differentiation. This conclusion would help provide a context for the study of household's dietary intake in the light of the social conditions present in the strata.

A test of significance of difference among strata is now initiated. In the comparison, it is not expected that differences in dietary intake will prove significant because variations in food intake among households are expected to be great. A low level of food intake is likely to be found in stratum III; on the other hand a high level of food intake will be reported in stratum I. Comparisons are not expected to give standard errors that are capable of showing significance. Nevertheless, between the two possible errors of accepting a false hypothesis and rejecting a true one, statistical theory would counsel accepting a false hypothesis. If improvement in income, occupation, education, and a decline in household size have been in fact important influences in dietary intake and this hypothesis is rejected as untrue, a very promising insight will have been lost. On the other hand, accepting a false hypothesis will probably not greatly affect any developmental policy for the province at all.

The analysis of significant differences endeavors to establish a consistent status ranking - a continuous spectrum of statuses - such that stratum III avails the lowest and

stratum I the highest gain in socioeconomic benefits. The earlier stratification ranks strata using two available data only; this analysis uses additional social and demographic data to indicate relative levels of living without showing clear structural breaks (e.g. social classes).

HOUSEHOLD INCOME ANALYSIS

A very important social characteristic of any population is its income. It is an important criterion for comparison because income is usually associated not only with prestige and power but also with education, employment and possession of physical resources. Thus, income presents some indications, at least, of relative levels of living, which would be advantageous for differentiation of the three populations.

Among the indicators of household income included in the survey are information upon real (cash plus kind) income, cash income only, sources of income, and major type of income. The real household income is the combined earning of all eligible members that includes cash and noncash earnings. Thus the major categories of income are cash and non-cash income. The major sources of income by type was patterned after that of the National Census and Statistics Office, (NCSO) Manila, Philippines, as follows:

1) Own Household OperatedActivity:

- a) Farming,
- b) Poultry, livestock and fishing,
- c) Own manufacturing, store and others.

2) Not Own Household OperatedActivity:

- a) Salaries and wages,
- b) Pensions, gifts, and winnings,
- c) Commissions and tips.

HOUSEHOLD INCOME ANALYSIS RESULTS

The average annual income of each stratum, which was the actual August, 1981 mean income in current pesos is analyzed by stratum. If one were to assume no difference in the three strata, the probability by variance analysis of getting a mean household income that is greatest in stratum I and greater in stratum II than in stratum III is .0001 - a highly significant finding. Hence, this set of real and cash household income data furnish strong evidence for the conclusion that the three strata are heterogeneous. See Table 6.

Data for types of income further reinforces the findings of household income. Evidently stratum 1 was getting higher cash income than the rest of the strata. The order of magnitude was linear. Under the hypothesis of no difference,

TABLE 6
Mean Household 1980 Income by Stratum

<u>Categories</u>	<u>S t r a t u m</u>			<u>Sign.</u>
	I	II	III	
a) Total cash hh income	P12,280.00	P4,216.00	P3,594.00	0.0001
b) Total real hh income	P14,769.00	P5,769.00	P5,663.00	0.0001
c) N = 523	205	181	137	

the chi-square score was highly significant (less than .0001 level), showing strong evidence that the high percentage of cash income in stratum 1 was more than the common result in sampling so that the hypothesis of no difference is rejected. Percentage was used as an indicator of this variable and the data are shown in Table 7.

Following the data on types of income, the data on major sources of income were analyzed to determine whether they support the earlier findings. Households in stratum 1 were advantaged by major source of income. Relatively more households received income from salaries and wages, 55.61 per cent in stratum 1 as against 38.12 in stratum 11 and 22.63 in stratum 111. Using .05 level of significance, a null hypothesis of no difference was set. If the null hypothesis was actually incorrect, it was expected to find the chi-square value larger than unity. In this set of data, the value obtained was 37.85 and at 2 df, was found highly significant at 0.0001. See Table 8.

Thus, these data show large differences in household income between strata. All these differences are not only significant, they are also important indications of differences among these populations. Clearly, the households in stratum I are to a much larger extent receiving higher income than are the households in the other strata. From

TABLE 7

Percentage Distribution of Types of Income by Stratum

<u>Categories</u>	<u>Stratum I</u> % (No.)	<u>Stratum II</u> % (No.)	<u>Stratum III</u> % (No.)	<u>Sign.</u>
(1) Cash income	89.76 (184)	66.30 (120)	39.42 (54)	.0001
(2) Non-cash inc.	10.24 (21)	33.70 (61)	60.58 (83)	
Total N=523	100.00 (205)	100.00 (181)	100.00 (137)	

TABLE 8

Percentage Distribution of Household Major Sources of Income
by Stratum

<u>Categories:</u>	<u>Stratum I</u>	<u>Stratum II</u>	<u>Stratum III</u>	<u>Sign.</u>
	<u>%</u>	<u>(No.)</u>	<u>%</u>	<u>(No.)</u>
a) Sources from own hh activities	44.39	(91)	61.87	(112)
b) Sources from non- own hh activities	55.61	(114)	38.12	(69)
Total N=523 hh= household	100.00	(205)	100.00	(181)
			100.00	(137)

these sets of data, one is led to conclude with some assurance that these three strata are heterogeneous with regard to amount, kind, and sources of household income.

HOUSEHOLD DEMOGRAPHIC CHARACTERISTICS ANALYSIS AND RESULTS

The survey furnishes numerous sets of indicators of a very useful nature for measuring the demographic characteristics of the population. These are the household size, total dependency ratio, child-woman ratio, total living children, and timing of child-bearing.

All of the 5 sets of data show significant differences among the strata. A fairly strong indicator of demographic characteristics is the total dependency rate (significant beyond .0001). Moreover, the foregoing result is supported when other variables were further examined. The three strata are significantly different in terms of child-woman ratio, total living children, timing of child-bearing and household size. Therefore, the conclusion that these demographic data tend to show is that at the time of the survey, although some small degree of similarity exists, the populations were fairly heterogeneous in demographic characteristics. See Table 9. These sets of variables use totals and means as indicators of household demographic characteristics.

TABLE 9
Fertility Level Indicators by Stratum

<u>Categories:</u>	<u>Stratum</u>			<u>Sign.</u>
	<u>I</u>	<u>II</u>	<u>III</u>	
(a) Household size	5.88	6.47	6.08	.07
(b) Total dependency ratio	26.15	30.41	36.61	.0001
(c) child-woman ratio	72.19	73.48	100.85	.0002
(d) total living children	4.39	5.22	6.49	.0206
(e) timing of child bearing	2.03	2.31	2.13	.10
N = 523	205	181	137	

As mentioned earlier, the level of significance does not need to be fixed because this study considers these factors, for instance the household size (significant at greater than .07), as important forces for the development of Misamis Oriental province. The model, which will be presented in the section of multivariate analysis, would not have been developed had the significance level been set at a fixed rate, for instance at .05 significance level.

MALE OCCUPATIONS ANALYSIS AND RESULTS

This section considers occupation of eligible household male members another important criterion for comparison because it objectively indicates level of living. The point of this comparison among strata will be to examine especially employment in non-household operated enterprises. The data examined are for the rate of males employed over the total eligible male members of the household. The data showed that employment among males was highest in stratum 1. The values, however, did not differ significantly among strata. See Table 10.

When attention is turned from the employment of all males to the occupational status of the male household heads, clear differences appeared. The data for the three strata

TABLE 10

Rate of Male Employed to Total Eligible Male Members by
Stratum

<u>Category</u>	<u>Stratum I</u>	<u>Stratum II</u>	<u>Stratum III</u>
Rate of male employed to total eligible male members	86.46	81.34	83.81
N = 523	205	181	137

revealed considerable heterogeneity of occupational status of household heads. Of 86.46 per cent eligible males employed in stratum I, 40.49 per cent were employed in higher categories of employment; whereas of 83.80 per cent employed males in stratum III, only 16.59 per cent were in similar employment. The difference is highly significant. This indicator and some others which follow have a problem. For example, the information included the entire population, that is, members who are not household heads. However, since the point of study is comparison, the problem is not important because they are common to all strata. See Table 11.

Further data for male employment are derived from class of worker. In these data further differences appear. Considerably more persons were employed in government and non-government wage employment in stratum I than in stratum III. This finding accords well with the previous finding of a larger group engaged in non-farming and non-fishing occupations. See Table 12.

These are important social differences because eligible males in stratum I are to a much larger extent turning to occupations other than agriculture for their living and are finding opportunities in these fields for non-farm employment. It seems clear that such pursuits would result in

TABLE 11

Percentage Distribution of Male Household Heads Occupational Status by Stratum

<u>Categories:</u>	<u>Strat 1</u> % (No.)	<u>Strat 11</u> % (No.)	<u>Strat 111</u> % (No.)	<u>Sign.</u>
a) Farming & fishing	13.49 (93)	22.53 (144)	25.70 (110)	.0001
b) Non-farm/non-fish.	40.49 (279)	20.34 (130)	16.60 (71)	
c) Not applicable	46.01 (317)	57.12 (365)	57.71 (247)	
Total N = 1756	100.00 (689)	100.00 (639)	100.00 (428)	

TABLE 12

Percentage Distribution of Class of Workers by Stratum

<u>Categories:</u>	<u>Strat I</u>		<u>Strat II</u>		<u>Strat III</u>		<u>Sign.</u>
	%	(No.)	%	(No.)	%	(No.)	
a) non-gov't worker	20.90	(144)	15.65	(100)	15.19	(65)	.0001
b) government worker	7.69	(53)	3.60	(23)	2.80	(12)	
c) self employed	24.82	(171)	23.16	(148)	24.30	(104)	
d) unpaid worker	46.59	(321)	57.59	(368)	57.71	(247)	
Total N = 1756	100.00	(689)	100.00	(639)	100.00	(428)	

generally higher levels of income. Hence, these findings collaborate closely the earlier results.

FEMALE OCCUPATIONS ANALYSIS AND RESULTS

Female employment is a further interesting aspect of occupational differentiation of strata. The data for eligible womens' participation in the labor force is a rate of eligible females employed to all eligible females. The result suggests that more women were employed in stratum I than in other strata and the difference is significant. See Table 13.

The survey further provides additional useful indicators for women's participation in the labor force: percentage of eligible women's contribution to household income and whether a married woman is employed for salary or not. Data for the mean of the percentage contribution of eligible women to household income showed significant difference again. However, the question is, rather, whether the difference is large enough to be important. The distinction between stratum I and III is twice as great as that between stratum I and II. Thus, this difference is important because it supports the conclusion that the strata are diversified with regard to women's employment. See Table 14.

TABLE 13

Rate of Female Employed to the Total Eligible Female Members
by Stratum

<u>Categories:</u>	<u>Stratum I</u>	<u>Stratum II</u>	<u>Stratum III</u>	<u>Sign.</u>
a) Rate of employed female to total eligible females.	45.16	29.74	21.17	.0001
N = 523	205	181	137	

TABLE 14

Percentage Distribution of Employed Women's Contribution to
Household Income by Stratum

<u>Categories:</u>	<u>Stratum I</u>	<u>Stratum II</u>	<u>Stratum III</u>	<u>Sign.</u>
Percentage contribution of married women to hh total income	21.11	15.26	10.37	.0017
N = 523	205	181	137	

The next set of data, employment of married women was examined. The result shows that women's employment for salary was highest in stratum I and higher in stratum II than in stratum III. The difference is highly significant. These figures suggest substantially the same picture of heterogeneous groups as that supplied from the information on male occupation. See Table 15.

TABLE 15

Percentage Distribution of Married Women Employed for Salary
or Not by Stratum

<u>Categories:</u>	<u>Stratum I</u>	<u>Stratum II</u>	<u>Stratum III</u>	<u>Sign.</u>
	<u>%</u> (No.)	<u>%</u> (No.)	<u>%</u> (No.)	
1) Married woman is housewife solely	23.80 (164)	26.60 (170)	28.50 (122)	.0001
2) Married woman also engaged for salary	7.69 (53)	4.23 (27)	3.97 (17)	
3) Not applicable	68.51 (472)	69.17 (442)	67.52 (289)	
Total N = 1756	100.00 (689)	100.00 (639)	100.00 (428)	

EDUCATIONAL DATA ANALYSIS AND RESULTS

The number of persons who attained higher education must now be considered. This is another aspect of socioeconomic life which this study considers as important as income, occupation, and household size. This survey furnishes two sets of indicators: the rate of eligible members who completed high school to the total eligible members and the highest grade completed for all eligible members.

The first data analyzed were for the rate of members who have finished high school. Interpretation of these data is based upon the proportion of eligible members who have completed high school during the period of the survey to the total eligible members 15 years and over in all households. Stratum I had the highest rate among the strata. This result is indicative of a real difference in education among strata. It is realistic to take the data as evidencing diversity in educational levels among strata. See Table 16.

The data for highest grade completed, however, were not without their limitations. The values were for individual members and were not household data. In addition, they included those not eligible for completing an education, like children. But the point of issue here is comparison. Since the data for all the strata were subject to this limitation,

TABLE 16

Rate of Members Who Completed High School To Total Eligible
Members by Stratum

<u>Categories:</u>	<u>Stratum I</u>	<u>Stratum II</u>	<u>Stratum III</u>	<u>Sign.</u>
Rate of members who completed H.S. over total eligible members.	39.44	21.42	14.67	.0001
N = 523	205	181	137	

the analysis is still useful. The result of analysis in the highest grade completed is identical to the high school completion data. Significant difference was observed among strata (beyond .0001). It reinforces the findings of highest average of high school completion in stratum I when compared with the other strata. The conclusion that these educational data tends to show is that in 1980, the three strata were fairly heterogeneous in educational background. See Table 17.

TABLE 17

Percentage Distribution of Members Highest Grade Completed
by Stratum

<u>Categories</u>	<u>Stratum I</u>	<u>Stratum II</u>	<u>Stratum III</u>
1) No education	5.11	6.68	7.96
2) Grade 1-5	20.68	29.84	32.78
3) Elem. completion	14.74	18.93	15.91
4) H.S. 1st-3rd Yr	17.87	13.44	12.47
5) H.S. Completion	9.47	8.62	4.51
6) College 1st-3rd Yr	8.24	2.62	3.92
7) College 4th-5th Yr.	3.38	1.10	.95
8) Graduate Study	1.81	.68	0
9) Not applicable	18.70	18.09	21.50
N = 3239	1214	1183	842

OTHER SOCIAL INDICATORS

This section contains variables which are contextual conditions present in all three populations. The logic of using these other social indicators for comparison is to explore them as circumstantial evidence when they appear to support the heterogeneity of strata. They are thought to be equally determinative as the other major variables.

Poverty Threshold for Misamis Oriental

A further interesting aspect of human nutrition is the concept of minimum poverty threshold in the Philippines. Abrera (1975)⁷¹ measured poverty operationally by setting down a minimum adequate diet from a nutritional standpoint. She derived, in 1975, the food income threshold proxy for North Mindanao, where the province of Misamis Oriental is located, as P 4,437.00 for an average family size of 6. This was the minimum amount for 1975 that could purchase a nutritionally adequate diet.

⁷¹ Abrera, Ma. Alcestis, "Philippine Poverty Thresholds" in Measuring Philippine Development by M. Mangahas, (ed) Manila:DAP, 1976.

In this study it is argued that for a family with an average size of 6, the amount of food threshold income during the period of the survey was p8,000.00 after considering the inflation rate of food prices from 1975 to 1980.

The Bureau of the Census, Manila, Philippines, has computed a food price index for North Mindanac indicating that by 1981 food items in Region X had risen to a level of 298.5 per cent over the level of 1972 (100 per cent). The purchasing power of a peso then had declined to 33 per cent from its 1972 level for Region X. At that average annual rate of inflation, what was the food cost for the region of P4437.00 in June, 1975 would have been P9185.00 in June, 1981. In view of the foregoing, it seems reasonable to have P8000.00 as a minimum food threshold income for August 1981 when the present survey was carried out. This variate may be as good as the earlier major variable because it considers rural/urban residence and household size to discriminate households at risk for malnutrition.

The data showed exceptionally large differences significant at beyond .0001 level. It thus presents additional support to the earlier findings. See Table 18.

TABLE 18

Percentage Distribution of Household Who Have Attained Food
Threshold Income by Stratum

<u>Categories</u>	<u>Stratum I</u>		<u>Stratum II</u>		<u>Stratum III</u>		<u>Sign.</u>
	%	(No.)	%	(No.)	%	(No.)	
a) Income less than food threshold income	37.07	(76)	79.56	(144)	78.10	(107)	.0001
b) Income greater than or equal to food threshold income	65.82	(129)	18.88	(37)	15.31	(30)	
Total N = 523	100.00	(205)	100.00	(181)	100.00	(137)	

Socio-economic Status of Households

Father Madigan of the Research Institute for Mindanao Culture (RIMCU), Xavier University, Cagayan de Oro City, has established a set of criteria to measure social status. Like other factors, it presents some indication at least of relative levels of living which could be used for contrasting the three strata. See Appendix I: "SES Schedule".

The result of analysis suggests that stratum III contains many more families considered as low status because a greater percentage of 69.34 was present in III as compared to 36.59 in stratum I. Stratum II has about as big a proportion as is present in stratum III. It seems clear that households in stratum I are to a much larger extent higher in social status than households in the other strata. Such indication would generally be obtained in a group of households possessing higher mean levels of living. See Table 19. The indicator was percentage of households that fall in each category set.

TABLE 19

Percentage Distribution of Households Social Status by
Stratum

<u>Categories:</u>	<u>Stratum 1</u> % (No.)	<u>Stratum 11</u> % (No.)	<u>Stratum 111</u> % (No.)	<u>Sign.</u> (No.)
a) Lower Status	36.59 (75)	71.27 (129)	69.34 (95)	.0001
b) Middle Status	31.22 (64)	19.89 (36)	20.44 (28)	
c) Upper Status	32.20 (66)	8.84 (16)	10.22 (14)	
Total N = 523	100.00 (205)	100.00 (181)	100.00 (137)	

SUMMARY

The foregoing data, using analysis of variance and chi-square, appear to show that stratum I was distinct in all social categories with stratum II and III during August 1981, the period of the survey. Stratum I was clearly advantaged.

The household income data reveal large differences between strata. There is considerable evidence of having many households of lower status found in stratum III and more of higher social status in stratum I. Further, the occupational data reveal that stratum III was predominantly agricultural - with more workers in farming and fishing occupations, a finding which reinforces the results of large differences in household income data. They also show greater differences in terms of female occupation, household size, and education. In addition, the two background variables explored in the strata appeared more congruous with an association rather than the opposite, and when considered together with other factors, added circumstantial evidence for such an association. Hence, these data do provide evidence to support the contention that the three strata differ very much in terms of social scale. After assessing the socioeconomic conditions present in the three strata, this chapter con-

cludes that they have been different in relevant variables such as income, education, occupation, and household size.

Food consumption, like other forms of human behavior, is the result of some complex social phenomena. It is at least probable that social scale had something to do with food consumption of the households. This survey with data shown in the next chapter examines the relationship between social scale and dietary intake of households.

Chapter IV

ANALYSIS ON DIETARY INTAKE AND STRATUM

INTRODUCTION

The population-food crises in the less-developed regions of the world appears massive and intractable... The potential for tragedy is great; even if the world succeeds in feeding those presently in need, it may only be deferring the starvation of many more to the future, unless available food supply keeps pace with population growth or population growth is curtailed.

McGraw Hill Encyclopedia of Food, Agriculture and Nutrition, D.N. Lapedes (Ed.), New York: McGraw Hill Book Co., 1977. p. 1.

In this second chapter of results, examination of the impact of social scale upon various aspects of dietary intake of families is initiated.

The logic of the study suggests that stratum analysis is the linking point between social scale and nutrition analysis. If stratum I, relative to other strata, experienced no comparative increase in terms of food intake, this would call into question basic assumptions of the present study. Without higher average food intake in stratum I following increases in conditions of living, it would be unrealistic to see that changes in income, education, occupation and a

decline in household size could have been of nutritional benefit to the economically poorer households of the area. Food is obviously such a basic element of level of living that failure to increase food consumption relative to increased income, education, occupation and decreased household size would be tantamount to questioning the common assumptions in many studies relating to development.

In the examination of impacts, average food intake will be expected to be greatest in stratum I and higher in stratum II than III. If, in fact, such expectations are verified, the increase in food intake in stratum I will be attributed to differences in social scale as the major variable of strong influence producing the difference. This is so because there is concomitant positive variation between social scale and nutrition if both variables are associated with stratum.

DIETARY INTAKE CONDITION IN MISAMIS ORIENTAL

How well fed were the families in Misamis Oriental during the survey period? In terms of food consumption,⁷² the families had sufficient intake in comparison to the Philippine

⁷² Food or nutrient adequacy is measured as follows:

$$\frac{\text{actual food or nutrient intake}}{\text{recommended dietary allowance}} \times 100$$

standard (Food and Nutrition Research Institute-FNRI):

<u>Categories</u>	<u>Per Cent Sufficiency</u>
a) Cereals and Cereal Products	105.43
b) Fish, Meats, & Poultry	133.10

The next food items where they had less than 100 per cent but more than 50 per cent sufficiency were:

<u>Categories</u>	<u>Per Cent Sufficiency</u>
a) Fats and Oils	85.50
b) Other Fruits and Vegetables	85.10

The food items which they had consumed at less than 50 per cent of the desirable level of sufficiency were:

<u>Categories</u>	<u>Per Cent Sufficiency</u>
a) Starchy Roots & Tubers	17.98
b) Sugars and Syrups	20.33
c) Eggs	22.18
d) Milk and Milk Products	4.32
e) Dried Beans, Nuts and Seeds	28.68
f) Green Leafy & Yellow Veg	37.89
g) Vitamin C-Rich Foods	29.06

Relative to the entire Philippines, the families at Misamis Oriental had better intake of fats and oils and fish, meats and poultry food groups; but they had lower intake in starchy roots and tubers, sugars and syrups, milk and milk products, eggs, and vitamin c-rich food groups. The portion of milk was grossly inadequate since it was only four per

cent of the recommended allowance. This group of food intake does not provide enough calcium, vitamin A and C, and complex carbohydrates (fiber). See Table 20.

If the households were to be identified as poorly fed if they had less than the minimum requirements of nutrients,⁷³ then the cut-off points may be established as:

- a) less than 80 per cent of energy, and
- b) less than 70 per cent of protein and fat.

Analysis results show that consumption per household per day of food energy was 6241 kilocalories and was 51 per cent adequate of the recommendations; protein intake was 216 grams and was 72 per cent adequate of the recommendations; and iron intake was 69 mgs, which also met 76 per cent of the recommended allowance. See Table 21.

When data by stratum were analyzed, the results showed that a majority of the households in stratum III have lower than the minimum level of nutrient intake: 89 per cent in calories; 75 per cent in protein; and 73 per cent in iron. In contrast, stratum I was more heavily represented in nutrient intake above the minimum: 41 per cent in calories; 72 per cent in protein; 63 per cent in iron. The difference is

⁷³ This standard is based from the Food and Nutrition Research Institute (FNRI), Manila, Philippines.

TABLE 20

Mean One Day Per Household Food Consumption

Misamis Oriental, August 1981

<u>Food Groups</u>	<u>Food Consumption</u> <u>Gm/day</u>	<u>Recommended</u> <u>Diet. Allow.</u> <u>Gm/day</u>	<u>Percent</u> <u>Sufficiency</u>	<u>Philip-</u> <u>pines*</u>
A) ENERGY FOODS:				
1) Cereals and Cer. Prod.	2130.14	2020.48	105.43	102.8
2) Starchy Roots & Tubers	65.95	366.70	17.98	49.8
3) Sugars and Syrups	29.22	143.67	20.33	113.8
4) Fats and Oils	147.59	172.62	85.50	45.2
B) BODY-BUILDING FOODS:				
5) Fish, Meats, & Poultry	747.74	561.77	133.10	85.5
6) Eggs	27.78	125.23	22.18	29.6
7) Milk and Milk Products	21.48	496.79	4.32	34.4
8) Dried Beans	29.24	101.95	28.68	46.0
C) REGULATING FOODS:				
9) Green Leafy & Yellow Veg	126.41	333.58	37.89	38.3
10) Vitamin C-Rich Foods	98.08	337.47	29.06	56.8
11) Other Fruits & Veg.	453.34	532.72	85.10	116.8

Source: *Data from the 1978 Philippine First Nationwide Nutrition Survey Summary Report by Food and Nutrition Research Institute (FNRI), Manila, Philippines, 2nd Rev., January 1981, p.1.

TABLE 21

Mean One-day Per Household Nutrient Intake

Misamis Oriental, August 1981

Categories	Nutrient Recommended Per Cent Phil.*			
	<u>Intake</u>	<u>Daily</u>	<u>Allow.</u>	<u>Adequacy</u>
a) Calories(kcal)	6,241.08	12,114.0	51.51	88.6
b) Protein (gm .)	216.62	298.32	72.61	102.9
c) Iron (mg)	52.40	69.23	75.69	91.7

Source*: Data from the 1978 Philippine Nationwide Nutrition Summary Report by FNRI, Manila, Philippines, 2nd ed. Rev. January, 1981.

significant at .0001 level. Hence, the data from the foregoing tables show that people in stratum III have extreme deprivation of nutrients in their diets: only 11 per cent of the total minimum allowance recommended in calories was met, 25 per cent in protein and 27 per cent in iron. See Table 22.

In terms of the risk of malnutrition, the raw figures should not be interpreted as showing the magnitude of malnutrition. In addition to the limitation inherent in dietary intake, statistical assumption of each of the nutrient categories recommended dietary allowances should also be considered.⁷⁴ For instance, the standard for protein intake has one unit of standard deviation from the mean and the magnitude of the standard deviation is 25 per cent of the recommendations (which is approximately the case of the categories in this study). Such percentage should be interpreted to mean as including 50 per cent below the minimum requirements and another 50 per cent above it. For instance, in the case of stratum III of this study where there were 137 households, if 50 per cent were found to fall below the mi-

⁷⁴ Lechtig, R., C. Yarborough, R. Martorell, U. Delgado and R. E. Klein, "The One-day Record Dietary Survey: A Review of Its Usefulness to Estimate Protein and Calorie Intake" in *Archivos Latino Americanos de Nutricion*, pp. 243-271.

TABLE 22

Percentage Distribution of Household Nutrient Intake By
Stratum

Misamis Oriental, August 1981

<u>Categories</u>	<u>Stratum 1</u>	<u>Stratum 11</u>	<u>Stratum 111</u>
1) CALORIES:			
a) <-80%	58.54	80.54	89.36
b) 80-109	20.49	10.81	5.67
c) 109 >	20.97	8.65	4.97
2) PROTEIN:			
a) < 70	27.32	57.30	75.18
b) 70-119	41.46	30.27	13.48
c) 119 >	31.22	12.43	11.35
3) IRON:			
a) < 70	36.59	61.62	73.76
b) 70-119	32.68	21.08	14.18
c) 119 >	30.73	17.30	12.08
N = 523	205	181	137

nimum requirement, it could tell that 34 households did not meet the recommendations and another 35 did meet it.

FOOD INTAKE ANALYSIS

The first major hypothesis was that dietary intake is associated positively with social scale of the community. This hypothesis was examined on two levels: first, using stratum and second, using household as the units of analysis.

The first analysis used food intake as the indicator of dietary intake. Since there are twelve food groups, the first variable, total food intake, represents the accumulation of all of them for comparison among the strata. If a hypothesis of no real difference were presented, the probability of obtaining a result that favors stratum I is highly significant at 0.0001 level. The result suggests a positive relationship between food intake and social scale. This association, however, does not prove causality by itself because of the weakness of the design. Nevertheless, the logic of this line of reasoning is to identify social scale as associated with the increases in household food intake by stratum. See Table 23.

TABLE 23

Percentage Distribution of Total Food Intake By Stratum

<u>Categories</u>	<u>Stratum I</u>		<u>Stratum II</u>		<u>Stratum III</u>		<u>Sign.</u>
	<u>%</u>	<u>(No.)</u>	<u>%</u>	<u>(No.)</u>	<u>%</u>	<u>(No.)</u>	
a) low-300	8.78	(18)	30.81	(56)	35.46	(48)	.0001
b) 301-600	31.71	(65)	42.16	(76)	34.04	(46)	
c) 601-900	31.71	(65)	14.59	(26)	17.73	(24)	
d) 901-1200	14.63	(30)	3.78	(7)	5.67	(9)	
e) 1201-above	13.17	(27)	8.65	(16)	7.10	(10)	
Total N = 523	100.00	(205)	100.00	(181)	100.00	(137)	

Using the mean one-day food intake data, the result of the analysis shows the same relationship as the total food intake variable. The two important indicators of food intake are significantly different among strata. This result suggests that the group of households having the greatest risk of nutritional deficiency in terms of food intake is stratum III; it has the lowest food intake. See Table 24.

TABLE 24

Mean One-day Per Household Food Intake Per Household By
Stratum

<u>Categories</u>	<u>Stratum</u>			<u>Sign.</u>
	<u>I</u>	<u>II</u>	<u>III</u>	
1) Total Food Intake (gm)	4,494	4,007	3,505	.001
2) Fish, Meat & Poultry (gm)	969	729	448	.0001
N = 523	205	181	137	

ANALYSIS OF NUTRIENT INTAKE

Still another important aspect of dietary intake is nutrient intake. The point to consider here is that nutrient intake is also associated with social scale. The common assumption is that households as a group would, because of improvement in education and getting good occupation, improve their condition of living. In this framework, improvement of socioeconomic conditions would further improve the nutrient intake in their diets. Note here that stratification design assumes the comparison of the three strata as representing three different social conditions taken at a single point in time. It does not imply longitudinal analysis.

In assessing these data, the present researcher observes that several hypotheses might be presented to illustrate the association between nutrient intake and social scale. These hypotheses are as follows:

- H1: Social scale is positively related with calorie intake;
- H2: Social scale is positively related with protein intake;
- H3: Social scale is positively related with iron intake.

Still the assumption of these hypotheses is that the amount of nutrient intake of a group of households in stratum I should exceed the groups found in other strata. This is so because the improvement of socioeconomic conditions are

shown to have occurred in stratum I that have made possible the increase in nutrient intake of households.

RESULTS OF NUTRIENT INTAKE ANALYSIS

These hypotheses are examined first using data by stratum. The results show that there is evidence that social scale influences the households nutrient intake. The levels of nutrient intake tend to vary directly with stratum levels. In stratum I, households have higher levels of intake than those in either stratum II or III. These data support the three hypotheses that social scale is positively related with nutrient intakes. See Table 22.

The conservative chi-square estimate might not have been valid even if frequency analysis have been used, so variance analysis is employed to estimate the difference of the means of one-day nutrient intake per household between strata. The result, however, is the same. Significant differences are observed among strata in all these indicators. Similarly, stratum III appears to have the lowest nutrient intake. Evidently, the group of households in stratum III has the greatest risk of nutritional deficiency in terms of calories, protein, and iron. See Table 25.

TABLE 25
 Mean One-day Per Household Nutrient Intake

<u>Categories</u>	<u>Stratum</u>			<u>Sign.</u>
	<u>I</u>	<u>II</u>	<u>III</u>	
1) Calorie	8,462	5,793	3,598	.0001
2) Protein	279	202	143	.0001
3) Iron	68	46	36	.0001
N = 523	205	181	137	

HOUSEHOLD LEVEL ANALYSIS

The objective of stratum analysis is to demonstrate a study that uses community level data. This design proceeds from the earlier analysis employed by Hillery, Shevky and Redfield. However, this type of research is subject to ecological fallacy (Robinson, 1950)⁷⁵ when one makes inference to individual households with data that come from the stratum level. To avoid this bias, this study follows the suggestion of Langbein, et al. (1978),⁷⁶ which is to stratify the population in terms of the independent variables used in the research. Further, to support the findings derived from stratum level, this research proceeds to employ a household level of analysis.

In this section, bivariate analysis at a household level begins. The same hypotheses can be tested using the correlates of social scale as the independent variables. This bivariate analysis uses simple regressions.

Explanatory variables of special interest here are male employment rate (homap), high school completion rate (hoed), female employment rate (hofap), household real income (x61),

⁷⁵ Robinson, W.S., "Ecological Correlation and the Behavior of Individuals" in The American Sociological Review, v. 15, pp. 351-357.

⁷⁶ Langbein, Laura, and Allan J. Lichtman, Ecological Inference. Beverly Hills: Sage Publications, 1978.

and household size (X66). The dependent variable of dietary intake is operationalized by percentage adequacy of protein intake (pc14).

Results show that all the categories of social scale are individually associated significantly with nutrient intake except the rate of male employment. The demographic characteristics, operationalized as household size, is the most important variable and the others, in the order of magnitude of influence, are household income, female occupation, and education level. Household size is negatively associated with protein intake. See Table 26.

The conclusion must be that dietary intake is associated with social scale both in terms of stratum and in terms of households. The first and second hypotheses are strongly supported.

The logic of the design requires that the strata were to be different with regard to indicators of income, occupation, education, and household size. In fact, stratum I seems to have been significantly advantaged at the time of the survey. The other influences were assumed to have influenced the families in uniform ways. Since there is a concomitant variation between the strata and dietary intake on one hand and social indicators and strata on the other hand, then social indicators may be claimed to be associated

TABLE 26

Simple Regression Coefficients of Protein Intake With Social
Scale Correlates

<u>Categories:</u>	<u>r</u>	<u>b</u>	<u>B</u>	<u>sign.</u>
1) Male employment rate	.05	6.88	.042	ns
2) H.S. completion rate	.20	31.24	.207	.0001
3) Female employment rate	.18	21.21	.178	.0001
4) Household real income	.20	.10	.198	.0001
5) Household size	-.66	-792.54	-.379	.0001
6) Total Living children	-.14	-112.47	-.136	.0001

r = simple correlation

b = unstandardized coefficient

B = standardized (Beta) coefficient

with the increase in levels of food and nutrient intake of families.

FOOD COST ANALYSIS

If social scale has been associated with an increase in food consumption, what other dietary intake indicators might have been influenced? Dietary intake indicators that may be examined with these social differences could be the food expenditures of families. Families have different spending habits. This study assumes that the way they spend money for food varies with income: Those with more money tend to spend more on food.

The common assumption of this third major hypothesis is that poor families spend primarily on food whenever additional money is secured. Families would thus have to spend first on food before anything else. For those who are better off, it is assumed that they could buy better quality food, for instance those with low calorie content. In this framework, it would appear that income could influence families' tendency to buy good food.

Was such opportunity to eat a good quality of food observed, even if not clearly? In stratum I relatively with others? If so, what kinds of data would enable one to assay this hypothesis and the possible existence of association between social scale and nutrient status of households?

Such data might include the total cost of foods consumed for each family.

Still, the assumption of this hypothesis is that the amount of food expenses of households in stratum 1 should exceed that in the other strata. This is so because big socioeconomic improvements have occurred to households in stratum I that have made possible the increases in food expenditures.

RESULTS OF FOOD COSTS ANALYSIS

Do the data show a marked differential in food costs for households? If so, this would powerfully support the hypothesis of association between social scale and dietary intake. The implication of finding significantly higher food costs in households under better social conditions would be that the household members would increase the nutrient content of their diets; higher average nutrient intake may improve their health. The hypothesized mode of influence is that:

a) such an increase in income would make it possible to buy adequate and nutritious food;

b) these foods have enough nutrient content that they have met the daily recommended dietary requirements;

c) when adequate, nutritious foods are available, good health of family members is encouraged.

The influence of social scale is clearly evident. The data again support the hypothesis that social scale contributes to the increase in food expenditures. Large differences appear which are not only significant (at beyond .0001), they are also important differences that lead to the conclusion that social scale definitely has been one of the main forces in influencing food consumption of families. See Table 27.

After having verified at household level that household size and real income are the most important explanatory variables, the next analysis examines the mean one-day dietary intake per household according to the categories of social scale. The present analysis deals with the actual dietary intake, by which is meant the usual household food intake without regard to the recommendations.

A somewhat surprising result is the finding of the regularity of both the food and nutrient intake that increases from the smallest to the largest household size. Yet the positive association is of interest because it confirms the belief that the bigger the household size, the greater the physical requirement of foods and nutrients, as well as food expenses per household. See Table 28.

TABLE 27

Multiple Regression Coefficients of Food Costs with Social Scale Correlates

Categories	r	b	B	Sign.
1) Male employment rate	.14	.050	.136	.0018
2) H.S. completion rate	.32	.111	.322	.0001
3) Female employment r.	.26	.071	.260	.0001
4) Household real inc.	.46	.0005	.482	.0001
5) Household size	.24	1.13	.235	.0001

TABLE 28

Mean One-day Per Household Dietary Intake by Household Size

<u>Categories</u>	<u>1-2</u>	<u>3-4</u>	<u>5-6</u>	<u>7-8</u>	<u>9-10</u>	<u>11-></u>
1) Total Food In (gm)	3,260	3,165	3,635	4,395	4,682	5,590
2) Cereals (gm)	1,905	1,854	2,052	2,242	2,361	2,638
3) Fish, Meat & etc (gm)	440	543	684	893	932	1,121
4) Calories (kcal)	3,489	3,476	4,322	7,219	7,902	12,115
3) Protein (gm)	133	141	175	251	267	369
4) Food Costs (Peso)	12.15	12.60	14.37	18.40	24.15	34.22

When household real income is examined with the same set of dietary intake indicators, the results suggest a positive relationship between the dietary intake and income: the higher the income, the greater the intake of food and nutrient.

What is a more interesting result appears to be the regularity with which both the quantity and the quality of foods consumed increase from the poorest to the richest income group. Food and nutrient inadequacies appear commonplace among the lowest income group. This result confirms the earlier finding that poverty-stricken families are nutritionally worse off than wealthier families. See Table 29.

TABLE 29

Mean One-day Per Household Dietary Intake By Real Income

(By Hundreds)

<u>Categories</u>	<u><-19</u>	<u>20-30</u>	<u>31-60</u>	<u>61-100</u>	<u>101-150</u>	<u>151-></u>
1) Total Food In. (gm)	2,126	3,169	3,864	4,602	4,928	6,585
2) Cereals (gm)	836	1,527	1,967	2,530	2,854	3,957
3) Fish, Meat & etc (gm)	448	672	800	781	767	1,113
4) Calories (kcal)	2,801	4,912	6,535	6,877	6,564	9,754
5) Protein Intake (gm)	101	184	226	238	223	331
6) Food Costs (peso)	9.35	14.95	18.55	20.60	21.30	31.55

SUMMARY

Chapter III had shown that strata I, II and III were essentially different in relevant variables during the survey. These variables are: income, education, occupation, and household size. A multi-focused survey with stratified population was chosen for the study. Stratum I was seen as moving more in an urban direction, when it was subjected to various social influences. On the other hand, stratum III represents itself as people in this stratum who were not exposed to the explanatory variables or were least exposed to them, compared to those people in stratum I.

By the logic of the design, hypothesized differences between strata are attributed to the social factors, provided that other disturbing factors can be shown to have affected them uniformly; and that the explanatory variables can be shown to have been the only uncontrolled variable operating on the strata differentially. But such was not the case.

Hence, the logic of this design is not as strong as a true experimental study with separate groups, both measured before the application of the experimental stimulus. The present study is more for the demonstration of association rather than of causality.

Against this logical background, in Chapter IV it was asked whether average food intake in stratum I had increased to higher levels than in the other strata. Indeed this was the most basic question of all. If social scale is not associated with higher food intake in all the strata, it would be necessary to question the basic assumption of this study.

However, the survey data support this basic assumption. Average food intake was found to be higher in stratum I. Households found in areas with high income were observed to have higher average food intake than households in strata with no high income. The difference was significant beyond 0.0001 by binomial probability.

Higher food intake may not be enough to raise the physical health of household members. For the food intake to improve the physical condition of the members, it also has to increase the nutrient intake. Furthermore, food expenditures would have to be a necessary mix before improving the condition of living of the people.

In fact, was nutrient intake increased? If so, was it an adequate increase? Survey results show the large increase in nutrient intake in stratum I is an indication that nutrient intake was an associated factor influenced by the improvement in social scale.

Data on food cost show a similar influence of social scale. Increase in food cost was observed in stratum I as compared with the other strata. The data on food costs should confirm the conclusion of the inference made that social scale is associated with dietary intake.

If not, household analysis of social scale provides stronger evidence as it shows important associations between each of these categories with each of the dietary intake indicators. A somewhat interesting result is that when raw food intake data were considered without regard to appropriate household recommendations, positive associations exist between social scale and food intake. When household requirements were considered, however, negative relationship appears between household size and dietary intake. Such association is highly significant. While each of these simple associations shows results which may not be the same when all the relevant variables are combined, the next chapter presents a model combining all these major variables by multivariate analysis.

In summary, the data indicate with considerable strength an association between income, occupation, education, and household size, in Misamis Oriental, and the variable increase in dietary intake in terms of food consumption, nutrient intake and food expenditures, because:

- a) of the increase of average food intake from stratum III to stratum I;
- b) the sharp increase of nutrient intake in households from stratum III to I; and;
- c) the sharp increase in food expenses for households from stratum III to I.

Chapter V
MULTIVARIATE ANALYSIS

INTRODUCTION

One of the major impediments to the development of sociological research even in countries where the material conditions are ample, is rooted in the failure of a society to recognize the necessity of applying such research results to problems of policy.

Lazarsfeld, P.F. Main Trends of Research in the Social and Human Sciences, in Social Sciences, Preface by Rene Maheu, Director General of Unesco, Paris: Nijmegen (The Netherlands).

In an endeavor, first, to obtain additional information about the association of income, employment, education, and household size with food intake, nutrient status, and food expenses, this chapter turns attention to multivariate analysis. Next, since aggregate data analysis is subject to ecological fallacy, this multivariate analysis checks the findings derived from aggregate data.

The methodology for analysis in this section is multiple regression. Regression views the association of variables by stating the amount of change in the dependent variable

associated with the amount of change per unit of the specific independent variable while other independent variables are controlled. The association is estimated using two measures : (1) the unstandardized (b or original) slope coefficient and (2) the standardized (beta) coefficient. The original slope coefficient b states this relation in terms of units of the dependent variable associated with the change per unit of the independent variable in question.⁷⁷ The beta coefficient is the standardized coefficient where the original b coefficient is multiplied by the standard deviation of the independent variable (e.g., household real income) and divided by the standard deviation of the dependent variable (e.g., protein intake). This process transforms the standard deviations of each variable to a unit variance, 1, to make the Y intercept (regression constant a) equal to zero, and to make the beta coefficient equivalent to a simple correlation between the dependent variable and the standardized independent variable in simple regression equation. Hence, these multiple regression coefficients view the association of variables in two dimensions.

The beta coefficient, as far as this comparative research is concerned, is more important than the original slope coefficient. While the b coefficient is computed in terms

⁷⁷ Blalock, Hubert, M. Jr., Social Statistics (rev.) New York, McGraw-Hill Book Co., 1979, pp.479-482.

of the original values of the various independent variables and states the per unit change in the dependent variable associated with the per unit change in the independent variable, the beta coefficient is directly comparable between independent variables because it is expressed as some proportion of 1.00 and hence it indicates the relative importance of the various independent variables for association with the dependent variable.

NUTRIENT INTAKE ANALYSIS AND RESULTS

In this section, the analysis starts with nutrient intake as the dependent variable. Six factors were examined for relationship to mean per day nutrient intake. One of these six variables was placed in the equation for control purposes. It might mask the association of independent variables with nutrient intake, either by exaggerating the relationship or by attributing to other factors what in fact is due to social scale, if not controlled.

Variables included as explanatory factors were total household real income (X61), household size (X66), male employment rate (homap), female employment rate (hofap), high school completion rate (hoed), and total living children

(X68). The indicator for nutrient intake was protein (pc14). Since calorie intake was highly correlated (.81) with protein intake, analysis of protein is represented by protein-calorie analysis.

All are not highly associated as the total (simple) correlation of these five explanatory variables are shown in table 30.

TABLE 30

Simple Correlation Coefficients of Protein with Social Scale
Correlates

<u>Categories:</u>	<u>Protein:</u>
1) Male employment rate	.042
2) H.S. completion rate	.228
3) Female employment rate	.194
4) Household real income	.214
5) Household size	-.313

MULTICOLLINEARITY

With multiple regression as the method of study, the problem of multicollinearity is potentially very important. Multicollinearity means that the intercorrelation of variables is at an extreme degree like such correlation of 1.00 or -1.00 or near such figures. If they are highly correlated, the variances of the original and beta coefficients may be large and thus affect the precision of the estimates. However, this problem will be less serious if the study has a large sample size.

In the present regression, none of the explanatory variables are high in the level of intercorrelation. They are all correlated at low levels below .31. The sample size of 520 is quite a good number. Multicollinearity, thus, is not a serious concern for the present regression.

The results of the regression are now presented for the explanatory variables of interest. First, multiple regression coefficient of the six variables with protein intake was .51 which means that these variables explained about 26 per cent of the variation in the dietary protein intake. This coefficient was significant at beyond 0.0001. The standardized and unstandardized slopes are shown in Table 31.

TABLE 31

Multiple Regression Coefficients of Protein Intake with
Social Scale Correlates

<u>Categories</u>	<u>b</u>	<u>Beta</u>	<u>Sign.</u>
1) Male Employment Rate	20.66	.128	.0010
2) H.S. completion rate	18.23	.120	.0054
3) Female employment rate	15.51	.131	.0013
4) Household Real Income	.090	.169	.0002
5) Household Size	-896.56	-.430	.0001
6) Total living children	-73.97	-.089	.0218

These sets of data showed household size variable as associated with the greatest change in grams of protein intake, and it was highly significant at 0.0001 while controlling for the other four explanatory variables. As can be seen, the direct change of protein intake per unit of household size, which was placed last and which therefore should have the least chance of explaining much variation in the multiple regression, had, when the other variables were considered, accounted for 896 grams less for every single member added to the household. This is a strong proof for the importance of the association of household size with dietary protein intake. Similarly, the beta coefficients make it more clear that household size is most strongly associated with protein than with the other independent variables. The standardization of coefficients did not change one first conception of the relationship. In the multiple regression, the first variable explains the variation in the nutrient intake before the next variable, like the household size, can contribute. Still, its beta coefficient showed nearly three times its importance when compared with household income. Hence, the association of nutrient intake and household size is convincing and real even under the impact of other variables.

The strong correlation of household size variable with protein intake furnishes one of the important insights coming from multiple regression. In retrospect, if parents have fewer children, one might expect them to be able to provide more adequate protein intake in their diets. This result confirms the findings of earlier research about the negative relationship between household size and dietary intake. The present study identifies household size as the most important indicator relative to dietary intake.

Several other aspects of the regression are of interest. Clearly, household real income has considerable relationship with protein intake. Additional income, be it cash or in kind, would increase the amount of protein intake by a substantial amount. It is interesting to note that household real income showed next to household size in terms of the amount of beta coefficient in addition to large unstandardized slope because large beta coefficients in the regression are indicators of a fairly strong association between variables. The present association observed adds depth and background to the findings cited in the previous chapter which indicated an association between the correlates of social scale and household dietary intake. Further, the male employment rate appears to be equally strongly associated with protein intake. The same relationship exists in the

female employment rate. Both have significant coefficients after controlling for other independent factors. This is to be expected. In a Filipino family, the husband takes as his primary responsibility the provision of food for the family and the wife, especially when she is working, manages the money and decides what food to buy and eat. Further, educational level in terms of high school completion showed a strong association with protein intake. Increased knowledge is expected to improve protein intake.

In conclusion, this set of regression analyses has provided rather strong support for the association of social scale and human nutrition. This relationship was one of the main findings in Chapter 4, and it has stood up well to the test of multivariate analysis.

It is also of interest to examine the regression of the control variable. The indicator is the total living live births in a family. The total correlation with protein intake was $-.251$ and the unstandardized and standardized slopes were -73.98 and $-.089$ which were significant at beyond $.02$ level. It is clear that this variable does need to be controlled. If not controlled, it could conceivably mask the relationship between the major variables and protein intake.

FOOD INTAKE ANALYSIS AND RESULTS

Association of nutrition with social scale varies somewhat according to the type of indicator used. For this reason, the association for the same phenomenon may be shown using different dependent variables but the same independent variables. Other independent variables were not considered in the regression for the sake of consistency in the comparison. In this case, the same sets of explanatory variables are used. However, dietary intake is now measured by different foods consumed or food intake of households. The indicators used were the total food intake (pc91), fish, meat and poultry (pc8), and cereals and cereal products (pc1). In a Filipino family, these food items represent the common diets.

Total (zero-order) correlation analysis among dependent variables is necessary to determine whether or not the same phenomenon is examined. If they are highly correlated, separate regression equation may not be required because the same model is expected to be correlated to this second dependent variable. The intercorrelation coefficients between these variables were:

Categories	Protein
Aggregated Food Groups	.57

Fish, Meat & Poultry	.74
Cereals and Cereal Products	.49

The highest coefficient, 74 per cent, in fish, meat and poultry is moderately associated. The rest are less serious. Although fish, meat, and poultry is moderately correlated with protein, it seems desirable to include it nevertheless. This variable comprises food items which are so important in the diet that it is more likely to obscure the relationship by omission.

The multiple regression of these six variables with the total food intake as the dependent variable was .36 which explains 13 per cent of the variation in all the foods consumed.

The results are quite different from the dietary protein intake analysis. With the total food intake as the dependent variable, variables such as the male and female employment rates and high school completion rate become less significant. Household real income remains significant at the .03 level, but the household size remains strongly significant at .0001 level. See Table 32.

The results of the next regression showed that with fish, meat, and poultry as the dependent variable, the coefficient increases to .40 which explains 16 per cent of the variation in fish, meat, and poultry.

TABLE 32

Multiple Regression Coefficients of Total Food Intake with
Social Scale Correlates

<u>Categories:</u>	<u>r</u>	<u>b</u>	<u>B</u>	<u>Sign.</u>
a) Male employment rate	.055	5.17	.003	ns
2) H.S. completion rate	.091	91.19	.059	ns
3) Female employment rate	.033	10.49	.008	ns
4) Household real income	.074	.55	.102	.036
5) Household size	-.322	-6909.80	-.328	.0001
6) Living live births	-.130	-732.54	-.088	.038

These results show that all variables are important predictors of food intake except household real income. Female employment rate is barely significant at .09 level but the male employment rate and educational level are both significant at .04. The household size remains the most important predictor of the fish, meat, and poultry variable. See Table 33.

The multiple regression coefficient with cereals and cereal products as the dependent variable was still high at .36 which explains 13 per cent of the variation in cereals. The regression coefficient was significant at .0001.

While the male and female employment rates do not remain significant, the three important variables for cereals and cereal products are significant with their magnitude of influence in this order: household size, education, and household real income. See Table 34.

The results of these sets of equations with food intake as the dependent variables showed household size as the consistently most important variable that explains the variation in food intake. The relationship is linear. The other variables, although important in each of their own contribution to the variation of the food intake, do not remain strong when the impact of other independent variables are considered. These sets of equations all show household size

TABLE 33

Multiple Regression Coefficients of Fish, Meat and Poultry
With Social Scale Correlates

Categories:	r	b	B	sign.
a) Male employment rate	.017	36.55	.083	.045
b) H.S. completion rate	.122	37.92	.092	.047
c) Female employment rate	.081	23.18	.071	.097
d) Household real income	.068	.094	.065	ns
e) Household size	-.332	-1972.33	-.347	.0001
f) Living live births	-.168	-269.92	-.120	.004

TABLE 34

Multiple Regression Coefficients of Cereals And Cereal
Products with Social Scale Correlates

<u>Categories</u>	<u>r</u>	<u>b</u>	<u>B</u>	<u>Sign.</u>
a) Male Employment rate	.049	4.38	.028	ns
b) Education rate	.109	-18.62	-.128	.006
c) Female employment r.	.011	4.38	.028	ns
d) Household Real Income	.011	.048	.095	.051
e) Household size	.331	-717.83	-.359	.0001
f) Total living live births	.014	27.60	.034	ns

as the most important factor in food and nutrient intake and together they bolster confidence in the reliability of household size as an important measure of dietary intake.

FOOD COSTS ANALYSIS AND RESULTS

The next logical step is to regress the same set of independent variables upon food costs in a similar fashion as to the regression which was carried out for food and nutrient intake just examined. This section follows up the findings in Chapter 4 that social scale is associated with dietary intake in terms of food costs. The present inquiry examines this relationship by multivariate analysis. Food cost, the new dependent variable in this regression, is operationalized for present purposes as the total peso cost per day for food consumption per household. The other set of independent variables is defined in the same manner as in the previous regressions.

Again, some investigation has to be made of the dependent variables, just to make sure that they are not highly inter-correlated. Food cost is tested by its association with other dependent variables, and the coefficients are:

Categories	(food costs)
a) Protein	.37

b) Aggregated Food Groups	.14
c) Fish, meat, and poultry	.23
d) Cereals and cereal products	.04

Intercorrelations of this set of variables are not significant. The highest value is .37 which is less moderate.

The first important information about food costs is the mean one-day food expenses. The results of the analysis are as follows:

<u>Categories</u>	<u>Mean Food Costs</u>
Stratum 1	Pesos 25.35
Stratum 11	16.65
Stratum 111	12.15
Overall Mean	16.29

At a rate of 8 pesos per dollar, the average food expenses in terms of dollars are:

Stratum 1	\$ 3.17
Stratum 11	2.08
Stratum 111	1.52
Overall Mean	2.07

Under the hypothesis of no difference, the probability of obtaining such a result was highly significant beyond the

.0001 level. Further, the multiple regression coefficient of these independent variables with food costs as the dependent variable was .55 which explains 30 per cent of the variance in food expenses. This coefficient is the biggest when it is compared with the values of the earlier sets of regressions.

The most immediate point of interest is the correlation of household real income with food costs. In the other dependent variables, the coefficient of household real income was not significant more than any other variable. But in this set of regression coefficients, even after considering the contributions of other major explanatory variables, it was shown to have the most significant relationship with every change in food cost (at beyond .0001). For comparison, the value shows more than two times as high a value of association with food costs as is the case of the next highest coefficient, the household size with food costs. Surely, household real income is the most important factor in terms of food expenses. The same trend is observed in beta and original slope coefficients. In addition, all the associations are positive: that is, the larger the positive measures of the independent variables, the higher the indicated propensity of the households to spend for food. See Table 35.

TABLE 35

Multiple Regression Coefficients of Food Costs with Social
Scale Correlates

<u>Categories:</u>	<u>F</u>	<u>b</u>	<u>B</u>	<u>Sign.</u>
a) Male employment rate.	136	.034	.091	.016
b) H.S. completion rate	.322	.038	.110	.009
c) Female employment rate.	.260	.032	.120	.002
d) Household real income	.482	.0004	.373	.0001
e) Household size	.235	.787	.163	.0001

The results of analysis in food costs clearly support the final hypothesis that income is the most important variable in explaining the variation in dietary intake. While four other independent variables were held constant, each removing from the total relationship what is proper to each one of them as a factor, the partial coefficient for the household real income still remains the highest. When what belongs to other major variables has been considered, a big residue belonging to income remains. Therefore household real income is a very important factor with a real contribution to make for food expenditures.

However, this hypothesis was not supported in the earlier regressions where household size was shown as the most important variable in food consumption and nutrient intake.

STRATUM AS COMPARED WITH SOCIAL SCALE CORRELATES

The last section in this chapter follows up the findings in the previous chapter by examining further the relationship of social scale and dietary intake. In that chapter, evidence had been found that the impact of social differentiation upon household food consumption had registered two separate and distinct contributions to association. One is represented by socioeconomic status of groups of households

ranked as stratum I, II, and III in terms of mean income and rate of high school completion; the other is represented by household aspect as each family is classified according to income, education, occupation, and household size. The data in that chapter suggests linkages between dietary intake and stratum on one hand and between intake and income, education, occupation, and household size on the other hand, considered both singly and as a group. Then the present section attempts to examine the relative importance of these two types of data to food consumption by using multivariate analysis.

The data used for comparison are the beta coefficients and their significance levels. The stratum variable is a dummy variable, dichotomized into high and low. For D1, stratum I is given the code one and the other strata the number zero, and for D2, stratum III is given the code one and the other strata the number zero. Thus, the minus coefficient indicates a positive association between a higher stratum and dietary intake. The aspects of dietary intake examined are food and nutrient intake. Each of the correlates of social scale and stratum as independent variables are incorporated into a regression with the six dietary indicators as dependent variables.

First, the food intake. Of these explanatory variables, the largest contribution to association comes from the household size. The data show that quite substantial beta coefficients exist; all are highly significant (at beyond .0007 level). The association between stratum and dietary intake comes next in importance. Another interesting result includes the significant interactions of the explanatory variables when the dependent variables are cereals and other products and fish, meat, and poultry. See Table 36.

In terms of nutrient intake, the same results appear: the household size has the largest contribution in predicting dietary intake and the stratum variable comes next. Significant interaction exists when the predictive variables are regressed with food costs. See Table 37.

While these results are not surprising because knowledge of the earlier regression equations shows a weaker association between dietary intake and either income or education, still these results are of interest because the data confirmed the earlier finding that household size provides the largest impact to changes in household diets.

Why significant interactions of these explanatory variables appear when the dependent variables are such indicators as cereals, fish, meat, and poultry, and food costs is an interesting question. In terms of cereals, as high and mid-

TABLE 36

Comparison Between Stratum Variable and Social Scale
Correlates with d Intake

<u>Independent Variables:</u>	<u>Dependent Variables:</u>		
<u>A) Household Size & Stratum Variables</u>	<u>Total Food Intake</u>	<u>Cereals & Others</u>	<u>Fish, Meat & Poultry</u>
<u>1) Household Size:</u>			
1. b0	92802	14017	25181
2. b1	-6514	-442	-1787
3. B1	-.30	-	-.31
4. t-scores	-7.49	-3.40	-7.78
5. sign. levels	.0001	.0007	.0001
<u>2) D1:</u>			
1. b2	19853	977	5332
2. B2	.17	-	.17
3. t-score	3.63	.72	3.69
4. sign. levels	.0003	ns	.0002
<u>3) D2:</u>			
1. b3	6777	3850	-2512
2. B3	.059	-	-.08
3. t-scores	1.25	2.88	-1.74
4. sign. levels	ns	.004	ns
<u>4) Household Size & D1 Interaction:</u>			
1. b4	-	-254	-
2. B4	-	-	-
3. t-score	-	-1.24	-
4. sign. levels	ns	ns	ns
<u>5) Household Size & D2 Interaction:</u>			
1. b5	-	-533	-
2. B5	-	-	-
3. t-score	-	-2.76	-
4. sign. levels	ns	.006	ns
<u>6) R (square)</u>	<u>.13</u>	<u>.13</u>	<u>.16</u>
<u>7) N</u>	<u>521</u>	<u>521</u>	<u>521</u>

Table 36 (cont'd)

B) Household Real Income & Stratum1) Household Real Income:

1. b0	50589	11175	13850
2. b1	.05	-.0007	-.02
3. B1	.01	-.001	-.02
4. t-scores	.23	-.03	.44
5. sign. levels	ns	ns	ns

2) D1:

1. b2	23195	- 247	6601
2. B2	.20	-.02	.21
3. t-scores	3.83	-.42	4.11
4. sign. levels	.0001	ns	.0001

3) D2:

1. b3	7479	530	-2289
2. B3	.06	.04	-.07
3. t-scores	1.29	.95	-1.50
4. sign. levels	ns	ns	ns

4) Household Real Income & D1 Interaction:

1. b4	-	-	-
2. B4	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

5) Household Real Income & D2 Interaction:

1. b5	-	-	-
2. B5	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

6) R (square) .03 .004 .06

7) N 521 521 521

Table 36 (cont'd)

3) Rate of H.S. Completion & Stratum:

us 1) Rate of H.S. Completion:

1. bo	49202	11421	11891
2. b1	86.43	12.67	91.15
3. B1	.05	-.08	-
4. t-scores	1.25	-1.90	2.44
5. sign. levels	ns	ns	.01

2) D1:

1. b2	21915	567	9417
2. B2	.19	.0005	-
3. t-scores	3.72	.001	4.83
4. sign. levels	.0002	ns	.0001

3) D2:

1. b3	7863	479	-1823
2. B3	.06	.04	-
3. t-scores	1.36	.86	-1.03
4. sign. levels	ns	ns	ns

4) Rate of H.S. Completion & D1 Interaction:

1. b4	-	-	- 122
2. B4	-	-	-
3. t-scores	-	-	-2.73
4. sign. levels	ns	ns	.006

5) Rate of H.S. Completion & D2 Interaction:

1. b5	-	-	7.75
2. B5	-	-	-
3. t-scores	-	-	-.15
4. sign. levels	ns	ns	ns

6) R (square) -.03 -.01 -.087) N 521 521 521

Table 36 (cont'd)

D) Rate of Male Employment & Stratum:1) Rate of Male Employment:

1. b0	59694	11729	13422
2. b1	-107	-6.85	325
3. B1	-.06	-.04	.007
4. t-scores	1.54	-1.01	.17
4. sign. levels	ns	ns	ns

2) D1:

1. b2	24240	-214	6353
2. B2	.21	-.01	.20
3. t-scores	4.22	-.03	4.16
4. sign. levels	.0001	ns	.0001

3) D2:

1. b3	7812	549	-2318
2. B3	.06	.05	-.07
3. t-scores	1.36	.99	-1.51
4. sign. levels	ns	ns	ns

4) Rate of Male Employment & D1 Interaction:

1. b4	-	-	-
2. b5	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

5) Rate of Male Employment & D2 Interactions:

1. b5	-	-	-
2. B5	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

6) R (square) -.03 .006 -.06

7) N 521 521 521

Table 36 (cont'd)

E) Rate of Female Employment & Stratum:1) Rate of Female Employment:

1. b0	51093	11179	13528
2. b1	-6.97	-.32	5.93
3. B1	- .005	-.002	.01
4. t-scores	-.13	-.06	.41
4. sign. levels	ns	ns	ns

2) D1:

1. b2	23766	- 246	6265
2. B2	.20	-.02	.203
3. t-scores	4.08	-.44	4.06
4. sign. levels	.0001	ns	.0001

3) D2:

1. b3	7458	527	- 2258
2. B3	.06	.04	-.07
3. t-scores	1.29	.94	-1.47
4. sign. levels	ns	ns	ns

4) Rate of Female Employment & D2 Interaction:

1. b4	-	-	-
2. B4	-	-	-
3. t-score	-	-	-
4. sign. levels	ns	ns	ns

5) Rate of Female Employment & D2 Interaction:

1. b5	-	-	-
2. B5	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

6) R (square) .03 .004 .06

7) N 521 521 521

middle status households increase in family size, their consumption of rice and corn decreases; by contrast, as low status households raise their size, their consumption of rice and corn increases. This finding is substantiated by the greater main effects observed in D2 as compared with that in D1. One may speculate that lower status households decide to consume more rice and corn because these cereals are cheaper to buy than meat, poultry or fish. In the case of food costs, as a household moves from a lower status to a higher status, food costs positively increase; with the food costs of a high status household in the highest level, that of a low status household follows next and that of a middle status household is last. This is to be expected - upper status household has a higher income to buy more food relative to other household found in other strata.

But somewhat surprising is the interaction observed in fish, meat, and poultry. While more households in the middle and lower status consume fish, meat, and poultry when more members finished high school, the association in the upper status households with the same dependent variable is in the opposite direction: the more members finished high school, the lesser the upper status households' consumption

TABLE 37

Comparison Between Stratum Variable and Social Scale
Correlates with Dietary Intake

<u>Independent Variables:</u>	<u>Dependent Variables:</u>		
<u>A) Household Size & Stratum Variables</u>	<u>Calorie:</u>	<u>Protein:</u>	<u>Food Costs:</u>
<u>1) Household Size:</u>			
1. b0	8024	11594	7.62
2. b1	- 515	-735	1.20
3. B1	-.28	-.35	-
4. t-scores	-7.13	-9.25	4.21
5. sign. levels	.0001	.0001	.0001
<u>2) D1:</u>			
1. b2	2529	3111	2.03
2. B2	.25	.27	-
3. t-score	5.57	6.22	.68
4. sign. levels	.0001	.0001	ns
<u>3) D2:</u>			
1. b3	-1198	-1053	1.98
2. B3	-.12	-.09	-
3. t-scores	-2.64	-2.10	.68
4. sign. levels	.008	.03	ns
<u>4) Household Size & D1 Interaction:</u>			
1. b4	-	-	1.38
2. B4	-	-	-
3. t-score	-	-	3.07
4. sign. levels	ns	ns	.002
<u>5) Household Size & D2 Interaction:</u>			
1. b5	-	-	-.71
2. B5	-	-	-
3. t-score	-	-	1.68
4. sign. levels	ns	ns	ns
<u>6) R (square)</u>	<u>.21</u>	<u>.26</u>	<u>.28</u>
<u>7) N</u>	<u>521</u>	<u>521</u>	<u>521</u>

Table 37 (cont'd)

B) Household Real Income & Stratum1) Household Real Income:

1. b0	4266	6620	12.70
2. b1	.08	.04	.0004
3. B1	.17	.08	.39
4. t-scores	3.96	1.89	10.00
5. sign. levels	.0001	ns	.0001

2) D1:

1. b2	2202	3196	5.67
2. B2	.22	.28	.21
3. t-scores	4.46	5.65	4.85
4. sign. levels	.0001	.0001	.0001

3) D2:

1. b3	-1194	-999	-2.99
2. B3	-.11	-.08	-.11
3. t-scores	-2.54	-1.58	-2.69
4. sign. levels	.01	.06	.007

4) Household Real Income & D1 Interaction:

1. b4	-	-	-
2. B4	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

5) Household Real Income & D2 Interaction:

1. b5	-	-	-
2. B5	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

6) R (square) .15 .14 .31

7) N 521 521 521

Table 37 (cont'd)

C) Rate of H.S. Completion & Stratum:

us 1) Rate of H.S. Completion:

1. b0	4231	6497	13.88
2. b1	24.32	18.54	.07
3. B1	.18	.12	.21
4. t-scores	4.32	2.88	5.27
5. sign. levels	.0001	.004	.0001

2) D1:

1. b2	2343	3169	7.92
2. B2	.23	.28	.30
3. t-scores	4.89	5.77	6.54
4. sign. levels	.0001	.0001	.0001

3) D2:

1. b3	-1042	-895	-2.36
2. B3	-.10	-.07	-.09
3. t-scores	-2.22	-1.67	-2.00
4. sign. levels	.02	ns	.04

4) Rate of H.S. Completion & D1 Interaction:

1. b4	-	-	-
2. B4	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

5) Rate of H.S. Completion & D2 Interaction:

1. b5	-	-	-
2. B5	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

6) R (square) .16 .15 .227) N 521 521 521

Table 37 (cont'd)

D) Rate of Male Employment & Stratum:1) Rate of Male Employment:

1. b0	4240	6567	14.11
2. b1	17.52	11.02	.04
3. B1	.16	.09	.16
4. t-scores	4.03	2.21	4.18
4. sign. levels	.0001	.02	.0001

2) D1:

1. b2	2517	3343	8.60
2. B2	.25	.29	.32
3. t-scores	5.32	6.16	7.13
4. sign. levels	.0001	.0001	.0001

3) D2:

1. b3	-789	-875	-2.27
2. B3	-.09	-.07	-.08
3. t-scores	-2.10	-1.62	-1.89
4. sign. levels	.03	ns	ns

4) Rate of Male Employment & D1 Interaction:

1. b4	-	-	-
2. B4	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

5) Rate of Male Employment & D2 Interactions:

1. b5	-	-	-
2. B5	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

6) R (square) .15 .14 .20

7) N 521 521 521

Table 37 (cont'd)

E) Rate of Female Employment & Stratum:1) Rate of Female Employment:

1. b0	4973	6511	11.88
2. b1	-3.22	4.31	.04
3. B1	-.02	.02	.11
4. t-scores	-.55	.65	2.89
4. sign. levels	ns	ns	.003

2) D1:

1. b2	2847	3515	9.18
2. B2	.28	.31	.35
3. t-scores	5.99	6.52	7.65
4. sign. levels	.0001	.0001	.0001

3) D2:

1. b3	-1131	-981	-2.78
2. B3	-.11	-.08	-.10
3. t-scores	-2.37	-1.81	-2.31
4. sign. levels	.01	ns	.02

4) Rate of Female Employment & D2 Interaction:

1. b4	-	-	-
2. B4	-	-	-
3. t-score	-	-	-
4. sign. levels	ns	ns	ns

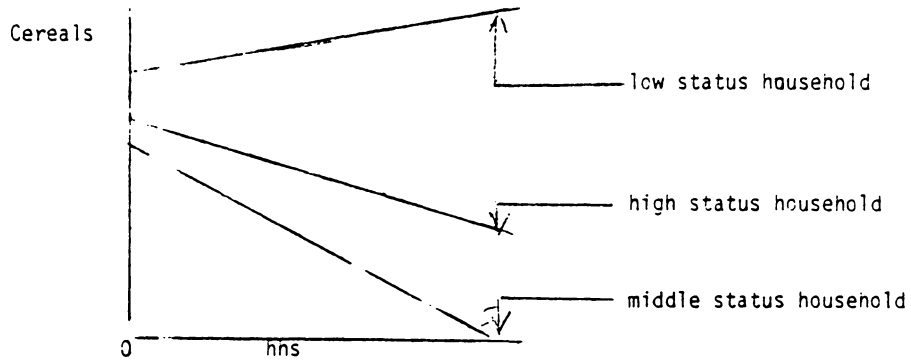
5) Rate of Female Employment & D2 Interaction:

1. b5	-	-	-
2. B5	-	-	-
3. t-scores	-	-	-
4. sign. levels	ns	ns	ns

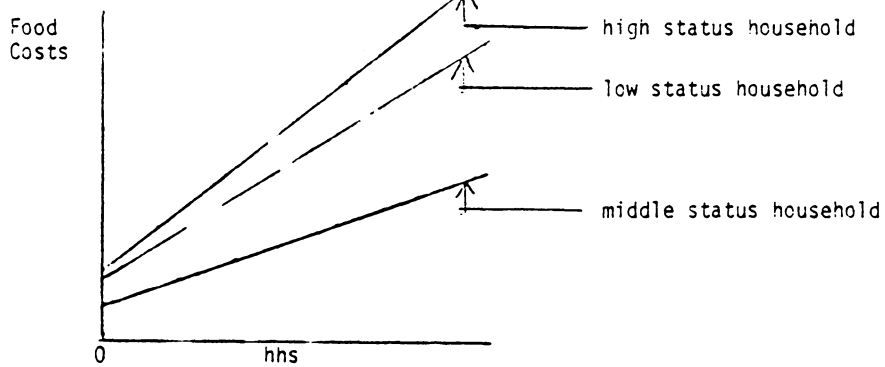
6) R (square) -.13 -.13 -.19

7) N 521 521 521

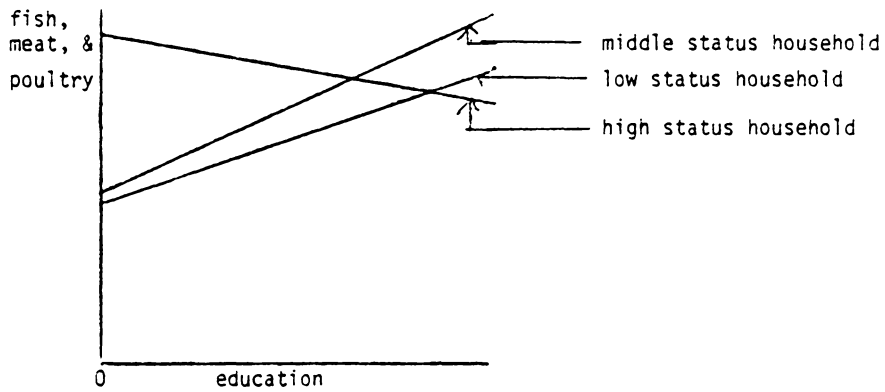
of fish, meat, and poultry. Apparently, after the upper status households have reached a certain threshold of improvement in education and income, further increase of these factors relates negatively with food intake. That is, fish, meat, and poultry is a non-linear function of social status and high school completion factors. These results are important research leads which deserve further investigation. See Figure IV.



a) Household Size and Stratum with Cereals and Other Products



b) Household Size and Stratum with Food Costs



c) Rate of H.S. completion and stratum with fish, meat, and poultry

Model: $Y = b_0 + b_1X_1 + b_2D_1 + b_3D_2 + b_4D_1X_1 + b_5D_2X_1$

where X_1 = correlate of social scale
 D_1 = upper status household
 D_2 = lower status household

Figure IV. Effects of Social Scale-Stratum Interaction on Household Dietary Intake

SUMMARY

With these regressions the check upon earlier conclusions by multivariate analysis is complete. The analysis supports the major findings of Chapter 4 quite strongly. This section has made clear that as a whole, social scale is a significant factor influencing dietary intake. The multiple R coefficients have shown significant relationships in all dimensions of dietary intake. When each of the correlates of social scale was considered as to its direct contribution, while other major explanatory variables were considered, household size consistently showed strong relationships with food and nutrient intake, while household real income was the most important factor in food expenses only.

Chapter VI

CONCLUSIONS, INTERPRETATIONS, AND RECOMMENDATIONS

CONCLUSION

Chapter four findings led to the conclusion of that chapter that social scale had been associated with food intake and nutrient status such that in areas with high levels of income, education, occupation and a small household size, there was also an increase in average food intake, nutrient intake and food cost. Because of weakness in the logical design of a multi-faceted survey, the conclusion, while fairly strong, is not compelling. Further analysis of the Chapter 4 data led to the same conclusion that social scale is associated clearly with dietary intake. This was done in the light of multivariate analysis using multiple regressions as the method of study. All the main associations found in chapter 4 have stood up well to this multivariate analysis. In addition, the multivariate analysis has contributed new insights into ways in which these associations have operated. Decrease in fertility rate, operationalized by total household size, was found to influence dietary intake in the most significant manner. Household real income had the most significant association with food cost only.

Therefore, the findings of chapter 4 have been amplified and supported by the findings of Chapter 5 on multivariate analysis.

The impact of social scale upon dietary intake as distinguished by univariate, bivariate, and multivariate analyses, was achieved using two distinct levels of analyses. The first was at the community level, represented by the strata considered as communities of households which are grouped according to their social characteristics. Strata were found to be significantly associated with dietary intake in terms of food intake, nutrient intake and food cost. Second, the household level was achieved when multivariate analysis was utilized employing simple and multiple regressions. The household data, in addition to showing the direct association of the correlates of social scale to dietary intake, also support the conclusions observed from data at stratum level.

In conclusion, the data of this survey strongly supported the main hypothesis: A group of households having higher social characteristics in terms of the level of household income, occupation, education is associated positively, and in terms of household size, is associated negatively, with a higher level of dietary intake.

GENERALIZATION

Several features of Misamis Oriental limit somewhat the generalization of this study to other parts of the world, especially countries with quite different cultural patterns. Specific factors of Misamis Oriental, which may not be found in other places, may have affected the results of the study. People are in general very poor. In the hot, moist climate of the tropics, the people have different types of food from people who are living in temperate climates.

Further, much of the effectiveness of income, employment, education and household size to dietary intake can also be affected by food supply, food prices, incidence of diseases, work requirement, and basic health condition of the people. Also dietary intake includes various aspects of food groups, nutrients, vitamins, and minerals. Hence these results may be suggested as an initial study for the relation of dietary intake and social scale.

Then how generalizable is this study? Such a question is not easy to answer. For the results to withstand in other climes and other ways of life, this study should be replicated to find out whether similar findings could be observed.

IMPLICATIONS AND RECOMMENDATIONS

A research design using stratum as a unit of analysis has provided an opportunity to study a social phenomenon at a community level using a group of barangays. This new innovation, which was not found in the search of related literature, is suggested as a useful method for community study. Studies involving impacts of developmental programs at community level may be made possible with this stratified two-stage design.

Generally, development planning for a certain program asks questions such as how to identify groups of people who are at risk and how to characterize them. The methods of this survey can answer them by stratifying the smallest political unit (barangay in this study) according to socio-economic characteristics. The results of the study have identified the group of people who were nutritionally at risk according to socio-economic characteristics and have demonstrated how to analyze social changes at one point in time in relation to certain aspects of human behavior.

In practice, this study has many valuable contributions. Before any program can be considered to meet a certain nutrition problem, planning involves identifying the specific problem and determining the causes operating in this prob-

lem. As mentioned in the foregoing, this study had demonstrated how to determine these requirements. Then, social conditions such as these factors operationalized in the study may become useful indicators for dietary intake. When they do, development planners can arrive at reasonable estimates of the communities' food consumption needs based on census and survey data available in many countries.

Moreover the independent variables consisted of two distinct features: one is fertility control, the other is increased income either through education or employment. The raising of the mean education levels and providing employment to raise income are manageable only at higher costs and on a long term basis. Whereas the reduction in household size is a factor that can be put in place at a predictable and manageable cost. With these qualifications, fertility control can be an appropriate developmental strategy. This insight was clearly distinguished in this study. A decrease in household size is a highly effective component of a package of development inputs for improving standard of living through improvement of diets. Hence, this program should be included in a development package for developing nations.

Subsequent study on families' socioeconomic characteristics in relation to dietary intake should include knowing the cut-off points of any of these major indicators when a

change in diet leads to adequate food intake. First, what is the income cut-off point when families begin to purchase better cereals or protein-rich foods? How many children should a family have so that it could meet such daily dietary requirement at such a level of income? These are some of the deeper questions that should be answered in subsequent study to enrich the literature of the impacts of socioeconomic factors on dietary intake.

Many researchers have used a stratified, two-stage, proportional to size sampling design with estimates using the ordinary least squares methods available in existing computer packages. As mentioned earlier, the results of this study using the weighted least squares estimates increased the coefficients in explaining the variation observed in the dependent variables. Hence, in addition to the low cost of the fieldwork, the increased precision of the estimates is an important reason to recommend the weighted least squares procedure in a stratified, two-stage probability proportional to size sampling design.

REFERENCES

- Abrera, Ma. Alcestis, Philippine Poverty Threshold in Measuring Philippine Development by M. Mangahas, (ed) Manila: DAP, 1976.
- Abu-Lughod, Janet, L., "Testing the Theory of Social Area Analysis: The Ecology of Cairo, Egypt." The American Sociological Review, 34, (April) 1969: 198-212.
- Adrian, J. and R. Daniel, "Impact of Socioeconomic Factors on Consumption of Selected Food Nutrients, U.S." American Journal of Agricultural Economics, 58 (1976): 31-38.
- Anderson, T. and Lee L. Bean, "the Shevky-Bell Social Areas: Confirmation of Results and a Reinterpretation." Social Forces, 40, (Dec. 1961): 119-124.
- _____ and J. Egeland. "Spatial Aspects of Social Area Analysis." American Sociological Review, 26 (June 1961): 392-398.
- Arsdol, M. Van, J. and S. Carmelleri and S. Schmidt. "The Generality of Urban Social Area Indexes." American Sociological Review, 23 (June) 1958: 227-284.
- Ballweg, J.A. "Family Characteristics and Nutrition Problems in Preschool Children in Fond Parisien, Haiti." Journal of Tropical Pediatrics, Monograph 23, Sept. 1972.
- Bass, Nancy Ann, L. Wakefields, and R. Rolosa, Community, Nutrition, and Individual Food Behavior, Minneapolis: Burgess Publishing Co. 1979, p. 152.
- Baster, Nancy. Social Indicators and Social Statistics in the Context of FAO's Consensus. ESS/MISC/78-5. Food and Agricultural Org. of _____ of the U.N., Rome, Italy, 65 pc., 1978.
- Battad, Josephine R. "Determinants of Nutritional Status of Preschoolers" in The Philippine Economic Journal, 36, xv11, 1978.
- Bell, Daniel, and M. Force. "Urban Neighborhood Types and Participation in Formal Associations." American Sociological Review, 20 (February) 1967: 26-34.

- _____ and Scott Greer. "Social Area Analysis and Its Critics."
The Pacific Sociological Review, 5, No. 1 (Spring) 1962:
 3-16. Washington, D.C., The Brookings Inst., 1973.
- Berg, A.
The Nutrition Factors: Its Role in National Development.
 Washington, D.C., The Brookings Inst., 1973.
- Blalock, Herbert, Jr.
Social Statistics. (Revised) New York: McGraw-Hill Book
 Co., 1979.
- Bulatao-Jayme, Josefina, G. Villavieja, and D.C. Jimenez.
 "Relationship of Mother's Fertility Behavior to the
 Nutritional Status of Infants and Preschool Children." A
 Paper presented to the Third Asian Congress of Nutrition
 in Jakarta, Indonesia, October 6-10, 1980.
- Burgess, H.J. and Ann Burgess, "A Field Worker's Guide to a
 Nutritional Status Survey."
The American Journal of Clinical Nutrition, 28 Nov.
 1975:1299-1324.
- Caliendo, Mayr A.
Nutrition and the World Food Crisis. New York: McMillan,
 1979.
- Clark, Faith, "Recent Food Consumption Surveys and Their
 Uses."
Federal Proceedings. 33 (1974):2270-2274.
- Currie, J.M., "The Analysis of Family Budgets." in
 W.J. Thomas, (ed)
The Demand for Food. Manchester: University of
 Manchester Press, 1972:15-36.
- Department of National Health and Welfare, Canada.
Nutrition: A National Priority, A Report by the
 Nutrition Canada, Ottawa. Information, Canada, 1973.
- Dewalt, K.M., P.B. Kelly, and G.H. Pelto, "Nutritional
 Correlates of Economic Microdifferentiation in a Highland
 Mexican Community" in Nutritional Anthropology,
 pp. 205-220.
- Durkheim, Emile.
The Division of Labor in Society. Glencoe, Ill.: The
 Free Press (1933).

- Haley, Maudie, Dola ancoin, and Jess Rae, "A Comparative Study of Food Habit: The Influence of Age, Sex, and Selected Family Characteristics." in Canadian Journal of Public Health, v. 68, July/August 1977, pp. 301-306.
- Hendel, Grace, M. Burk, and L.A. Lund, "Socioeconomic Factors Influence Children's Diets" in Journal of Home Economics, v. 57, no. 3 (March 1965) pp 205-208.
- Herbert, D.T. "Social Area Analysis: A British Study." Urban Studies, 4, (February 1967):41-61.
- Hillery, George, A., Jr. "The Folk Village: A Comparative Analysis." Rural Sociology, 26, (1961):337-791. _____
 "Villages, Cities, and Total Institutions." American Sociological Review, 28, 1963: 779-791.
- _____.
Communal Organizations: A Study of Local Societies. Chicago: The University of Chicago Press, 1968.
- _____. "A General Typology of Human Groups." in R. L Warren (ed), New Perspectives on the American Community, A Book of Readings. 3rd ed. Chicago: Rand McNally College Publishing Co., 1977. _____
A Research Odyssey: Developing and Testing a Community Theory. New Brunswick: Transactions Books, 1982.
- _____. "Selected Issues in Community Theory. Rural Sociology, No. 4, Dec. 1972, pp.535-551
- Hermann, R. "Interaction Effects and the Analysis of Household Food Expenditures." Journal of Farm Economics, 49 (1967): 821-832.
- Jellife, D.B.
The Assessment of Nutritional Status of the Community. Geneva: Who, 1966.
- Kish, Leslie. Survey Sampling. New York: John Wiley and Sons, Inc. (1968).
- Lecthig, R., C. Yarborough, R. Martorelli, H. Delgado and R. E. Klein, "The One-day Recall Dietary Survey: A Review of Its Usefulness to Estimate Protein and Calorie Intake," in Archivos Latinoamericanos de Nutricion, xxv1,3, Sept. 1976, p.243-274.

MacCorquodale, D., and J.R. deNova, "Family Size and Malnutrition in Santo Domingo, Public Health Reports, v. 92, no. 5 Sept-Oct., 1977, pp. 453-457.

McElrath, Dennis, "Societal Scale and Social Differentiation: Accra, Ghana." in Scott Greet, et al., (eds) The New Urbanization. New York: St. Martin's Press (1968).

Maine, Henry, Sumner. Ancient Law. London: Jr. Murray (1961).

McElrath, D. "The Social Areas of Rome: A Comparative Analysis." The American Sociological Review, 27, (June 1968): 376-391.

Mead, M. "The Problem of changing Food Habits" in Committee on Food Habits Report, National Research Council Bulletin No. 108, Washington, D.C., 1943, p. 21.

Pinstrup-Andersen, Per. "The Impact of Increasing Food Supply on Human Nutrition: Implication for Community Priorities in Agricultural Research and Policy." American Journal of Agricultural Economics 62, (August 1980): 512-513.

Redfield, Robert. The Folk Culture of Yucatan. Chicago: University of Chicago Press, 1941.

----- . "The Folk Society." American Journal of Sociology, 52, 1947: 293-308.

Shevky, Eshref, and Williams, Marilyn. The Social Areas of Los Angeles: Analysis and Typology. Berkeley: University of California Press, 1949.

----- and W. Bell. Social Area Analysis: Theory, Illustrative Application and Computational Procedure. Stanford: Stanford University Press, 1955.

Shifflet, Peggy A. Future Time Perspective and Food Habits of the Ages. Ph.D. Dissertation, unpublished. Texas A&M University, 1980.

Stephens, A.J., "The Impact of Health Care and Nutritional Education on an Urban Community in Zambia," Journal of Tropical Medicine and Hygiene, v. 78, May 1975, pp. 97-105.

Stuart, A., Basic Ideas of Scientific Sampling. New York, Hafner Publishing Co., 1968.

Tryon, Robert. Identification of Social Areas by Cluster Analysis. Los Angeles: University of California Press (1955).

Udry, Richard. "Increasing Scale and Spatial Differentiation: New Tests of Two Theories and Shevky and Bell." Social Forces, 42, no. 4, (May, 1964): 403-413.

United States Department of Agriculture, Agricultural Research Service, Methodology for Large-Scale Surveys of Household and Individual Diets by M.C. Burk and E. M. Pao. H.E. Research Report No. 40, Washington, D.C.

United States Public Health Service. HANES: Examination Staff Procedures Manual for the Health and Nutrition Examination Survey, 1971-1973. Washington, D.C., 1972.

United States Dept. of Health, Education, and Welfare, Center for Disease Control. Ten State Nutrition Survey in the U.S. Preliminary Report to Congress. Washington, D.C., 1971.

Valenzuela, Rosario, E. "A Study on Nutrient Distribution Within the Family and Factors Affecting Nutrient Intake," in The Philippine Economic Journal, no. 36, v. XV11, 1973, pp. 168-184.

Wray, J.D. and A. Aguirre. "Protein-Calorie Malnutrition in Candelaria, Columbia. 1. Prevalence, Social and Demographic Causal Factors." Journal of Tropical Pediatrics, v. 15, 1969:76-98.

Appendix A

SAMPLING UNITS FOR EACH SAMPLING STAGE

Municipalities: No. of Barangays No. of Households:

FIRST STRATUM:

1) Alubijid	16	2,831
2) Cagayan de Oro City	80	39,506
3) Initao	16	3,807
4) Jasaan	14	4,076
5) Kinoguitan	15	1,240
6) Naawan	10	2,177
7) Tagoloan	10	4,284
Total	161	57,921

SECOND STRATUM:

8) Balingoan	9	1,045
9) Claveria	24	4,946
10) Gingoog City	71	14,550
11) Lagonglong	10	2,183
12) Libertad	9	1,312
13) Lugait	8	1,886
14) Opol	14	2,867
15) Salay	17	3,009
16) Talisayan	18	2,638
17) Villanueva	8	2,068
Total	188	36,504

THIRD STRATUM:

18) Balingasag	30	6,515
19) Binuangan	8	738
20) El Salvador	16	3,672
21) Gitagum	11	1,677
22) Laguindingan	11	2,159
23) Magsaysay	24	3,900
24) Manticao	13	3,094
25) Medina	19	3,247
26) Sugbongcogon	10	950
Total	142	25,952

Appendix B

LIST OF SAMPLE BARANGAYS

<u>Stratum 1</u>	<u>mij</u>	<u>Mij</u>	<u>Pij</u>	<u>Wijk</u>
1) Poblacion, Alubijid	27	430	.007	.00046
2) Barangay 2, Cagayan de Oro	3	48	.0008	.00005
3) Barangay 3, Cagayan de Oro	6	97	.001	.00010
4) Barangay 18, Cagayan de Oro	17	251	.004	.00029
5) Barangay 14, Cagayan de Oro	9	128	.002	.00015
6) Bonbon, Cagayan de Oro	23	346	.005	.00039
7) Catonico, Cagayan de Oro	8	128	.002	.00013
8) Bayabas, Cagayan de Oro	18	273	.004	.00031
9) Iponan, Cagayan de Oro	28	424	.007	.00048
10) Upper Jasaan, Jasaan	27	401	.007	.00046
11) Buko, Kinoguitan	11	158	.002	.00018
12) Esperanza, Kinoguitan	8	117	.004	.00013
13) Poblacion, Naawan	20	332	.005	.00034
2) Stratum 11				
1) Barangay 16, Gingoog City	25	368	.010	.00067
2) Barangay 19, Gingoog City	8	164	.004	.00021
3) Barangay 26, Gingoog City	15	292	.007	.00041
4) Talisay, Gingoog City	19	266	.007	.00052
5) Santiago, Gingoog City	13	208	.005	.00035
6) Mamaol, Lagonglong	7	112	.003	.00019
7) Piga, Lugait	17	244	.006	.00046
8) Calangahan, Lugait	10	147	.004	.00027
9) Bonbon, Opol	12	194	.005	.00037
10) Patag, Opol	12	200	.005	.00032
11) Looc, Salay	17	276	.007	.00046
12) Salay River Side, Salay	8	119	.003	.00021
13) Antonio, Balingoan	18	247	.006	.00049
3) Stratum 111				
1) San Francisco, Balingasag	7	107	.004	.00026
2) Calauag, Balingasag	10	144	.005	.00038
3) Poblacion, Binuangan	11	168	.006	.00042
4) Nabataan, Binuangan	3	43	.001	.00006
5) Valdeconcha, Binuangan	5	71	.002	.00019
6) Hinigdaan, El Salvador	10	159	.006	.00038
7) Ulaliman, El Salvador	6	94	.003	.00023
8) Ulab, Gitagum	5	81	.003	.00019
9) Kibungsod, Magsaysay	6	111	.004	.00023
10) Kauswagan, Magsaysay	22	330	.012	.00084

11) Cabalintian, Manticao	24	358	.013	.00092
12) Tuod, Manticao	23	338	.013	.00088
13) Ampiang, Sugbuncogon	5	101	.003	.00019

Appendix C

INTERVIEWER'S MANUAL

1. Tips for Interviewing

(a) Begin the interview by being friendly.

1. Be courteous.
2. Introduce yourself and inform the informant of the purpose and the reasons for the interview.
3. Make sure there is no distraction in the scene of the interview. Suggest a quiet spot if you cannot focus on the interview.
4. When an informant gets impatient, divert his attention by saying something complimentary (i.e., give a positive comment about the wall picture).
5. Familiarize yourself with the questionnaire so that you do not stammer in front of him.

b) Record the informant's answers correctly.

1. Do not ask leading questions.
2. Do not give comments about his answers.
3. Do not show emotion that may be noted in facial expression or in the voice tone.
4. Be pleasant, without expressing your feelings by words or gestures. Expression of praise or criticism influences the accuracy of the answers.
5. Check the answers for omissions, in terms of kind and amount required by the question. Ask probing questions.

c) End the interview gratefully.

1. Thank the informant for cooperating.

11. Selection Procedures of Informants

a) From the randomly chosen barangays, informants are systematically chosen. Using the updated listings of household heads, an interval is determined as to the ratio of the stratum population over the entire population. Within the first interval, a random start is chosen in the central office. The subsequent samples are picked employing the interval after the random start.

The wife of the household is selected as the informant. In cases where the wife is not available, the person who usually buys foods becomes the informant for the household.

b) In the case of a multi-households dwelling, a random selection can be done by listing the wives from the oldest

to the youngest and numbering them consecutively. Pick the sample whose number in the list corresponds to the last digit chosen in the random numbers table. In case the random number selected is different, try again until the particular number correspond to that in the list.

c) You are provided with the following materials:

- a) map of the selected barangay or barrio;
- b) interview schedules;
- c) in case of selection of dwellings in the field, a listing form and a random numbers table;

The map shows all the selected dwellings being marked by Xs in the spots that approximate their position on the ground. The listing form and random numbers table are used by you to select informants as samples in the field. You write all the heads of households with addresses. The list starts with the dwelling that is nearest to the Barangay leader's house, then proceed to list all the houses by connecting each dwelling with an unbroken line that is formed into a concentric circle. Then assign a serial number consecutively for each dwelling.

b) To randomly select an informant in the field, employ systematic selection with a random start and a constant number of 15 in each stratum. The random start begins by blindly choosing a number in the random numbers table with a pencil; the informant whose number corresponds to the number randomly chosen becomes the first sample. The next informants are randomly chosen from the list by picking every *i*th dwelling from the random start. Should you cover the whole tract without finishing the quota, continue counting every *i*th home until you finish, even if the chosen dwelling falls near the starting period. However, do not list any home that has been listed already.

c) In cases of refusals or vacant dwellings, take the first household with the same socio-economic status among the nearest homes as the substitute. Count the original home and not the substitute home in determining the interval for the next sample dwelling.

III. Pre-test

Before employing the data gathering devices, a pre-test is made in one place by randomly choosing 50 informants. The purpose of the pre-test is to reduce to a minimum, if not eliminate, the non-sampling errors of measurement. The non-sampling errors result from a biased measuring device, like the interview schedule or the 24 hour recall, from the informant's inaccurate responses, like understating income, and from coding, like error in calculations. There are var-

ious procedures and guides employed in the fieldwork in order to reduce to a minimum non-sampling biases. However, for this purpose, a major step undertaken during the pre-test is to reduce inaccuracies by informants.

An insight into the degree to which the collected data are subject to the inaccuracies of the informants is shown in the interviewer's comments. Household income and dietary intake information are believed to bring bias whether in terms of understanding or suppressing the data and recalling inaccurately. In this survey, the pre-test aims to show whether there are questions drawn that result in a greater or minimum bias from the informants. To attain this purpose, you are asked to evaluate the informant's interest and sincerity regarding the survey and to enumerate the parts of the questionnaire in which the informants have difficulties.

(Incidentally, following the same purpose but going beyond this pre-test, you are encouraged to report immediately any instruction or guide that is not clear and complete. All activities must follow specific instructions.)

IV. Field Survey

a) General Instructions

1) Preparation. Check all the materials you take along to make certain that they are complete before going out to interview. You must have with you a map, a random numbers table, questionnaire and sharpened pencils and ruler. Bring umbrella or raincoat with you to avoid getting wet in case of rain. Wear your most comfortable pair of shoes because you do a lot of walking. Finally, dress neatly and properly. Untidiness makes a poor impression on informants and is a drawback to establish rapport with them.

2) Precoded Response Categories. All the questions have precoded responses. You mark an X for the code that correspond to the informant's answer. When in doubt as to code, enter the answers verbatim on the blank space provided.

3) Non-responses. No question should be left unanswered. A blank question means negligence on the part of the interviewer. In case the informant does not answer the question, find out why she/he cannot answer. If she/he does not know the answer, write "DK" in the answer space, if she/he refuses to answer the question, write "RA".

4) Accomplishment. The interviewer may use a lead pencil during interview in checking appropriate codes.

a) For questions answerable by "Others", always specify what those "Others" are.

b) Specific Instructions

1. Household Profile

a) It is important that you fill in the proper identification the time you begin the interview up to the PSU number. Be sure to fill in the time you begin and end the interview. The household number is found in your listing, the interviewer number is the number assigned to you, the barangay number is in the map and the barangay type is in the manual.

In questions 1 and 2, indicate the person who usually prepares food and who does most of the buying of foods. The answers that do not come from the precoded group must be specified and then coded.

In questions 3 to 5, ask whether there was any unusual event that happened in the last 24 hours. It is important to know any change in the family organization which may affect the usual diet.

Equally important is for you to fill in the record of calls at the household the date and time of the interview. In cases of non-interview, mark an X for the answers that apply, then sign your name in the proper column and fill in the date. Then make an appointment and be sure to keep the appointment. Make as many as five calls before giving up the sample as lost.

Reasons for non-interview:

- a. refusal - a household informant is not willing to cooperate.
- b. unknown - a household cannot be located.
- c. residence elsewhere - a household moved to another barangay.
- d. dwelling unit built after listing - a new household living in a sample area.
- e. out - responsible adult members of the household are absent during the interview.
- f. others- other possible reasons; they must be specified.

b) Socio-economic information

List all the household members from eldest to youngest. Indicate relationship to household head, age, and sex. Do not forget to include in the list other household members such as domestic helpers. Assign serial numbers to the household members by chronological order.

Encircle serial number of selected respondents. Make sure that you don't neglect to list members who are away from home and use proper notations.

Member number refers to the number of the line on which the household member is listed on the form.

Record name of all members, starting with the household head, husband/wife, unmarried children, married children and their members. Include also boarders, household help and others living under the same roof or not but eating from the same pot. The first line is definitely for the household head. Likewise, record names of visitors, if any. A visitor is one who is not a household member (described above) but partook any or all of the day's meal.

Definition of a household

A household consists of a group of people who sleep in the same dwelling unit and have common arrangements for the preparation and consumption of food.

Persons who sleep with a household but individually cook their meals or eat elsewhere are considered as separate households. If three generations found living in one dwelling unit are divided into two or more groups whose eating arrangements are independent from each other, each group is counted as a separate household.

A household may be institutional (Armed Forces camp, jail, leprosarium, T.B., sanitarium, hotel, dormitory, etc.) or non-institutional. For purposes of this survey of households, only private or family households are covered.

Usually a private or family household is composed of the members of the family forming the nucleus of the household, resident domestic servants, and other persons who may be living with the family. A person living alone will be counted as a separate household.

A household is broader than a family. A family includes only the head and members of the household who are related to the said head by blood, adoption or marriage (excluding domestic servants, boarders and guests related to him).

Absent member code (amc): List, too, all persons missing but members of the household. Appropriate notations are: AF - Armed Forces; S- School; W-Working; Others - Specify.

PSC refers to Physiological State Code:

This applies to all female members who are in the child-bearing age, usually 13-49 years of age. A female member may still be classified as lactating even if she is nursing a baby for more than one year.

The class of worker or employed person is defined as follows:

a) Wage and Salary Worker - is an employed person working for wages, salaries, commissions, tips, pay in kind or at piece rates for a private employer or for the government.

b) Employer - is a person who employs one or more paid employees in the operation of their business or trade. Thus, a person who employs a driver for a delivery truck is classified as an employer, but if the driver is employed as a family chauffeur, the person employing him would not be classified as an employer in the survey.

c) Self-employed - is a person who operates his own business and is not employed as a paid worker in the conduct of his economic activities. Farmers and sari-sari store operator constitute the most common type of self-employed workers.

It should be noted, however, that a farmer cannot be classified as an employer simply because he may hire some helpers at planting or harvesting time. In connection with farm operators, he would be an employer if he engages paid help on a regular or full time basis or employed paid workers during the reference period.

d) Unpaid family worker - is a member of the family who assists another member in the operation of the family farm or business enterprise and who does not receive any wage or salary for his work. Note that room and board and a cash allowance sometimes are given as incentives and are not counted as compensation for the family worker.

For the main occupation of each eligible member, describe the specific job or occupation as detailed as possible following the classification below. Enter the appropriate codes in the four columns. Note that the first three digits of the occupation code already appear opposite each subgroup below. The first column is for the occupational subgroup immediately following the main occupational group. The third column is for the labor classification as indicated in the main occupational group, subgroup:

SERVICE RELATED WORKERS AND ENTREPRENEURS

1. PROFESSIONAL, TECHNICAL AND RELATED OCCUPATIONS
(skilled)

- a) Architects, Engineers, and Surveyors
electrical and mechanical engineers

111

- chemical and industrial engineers
- civil engineers
- surveyors and geodetic engineers
- mining and metallurgical engineers
- other professional engineers (such as
agricultural engineers, textile, etc.)
- b) Chemists, Pharmacists, Natural and Agricultural
Scientists:
 - chemist
 - pharmacists
 - agronomists, horticulturists, and others
 - veterinarians
- c) Professors and Teachers
 - teachers, high school and elementary
 - college presidents, deans, school directors
 - professors and instrruuctors
 - teachers
- d) Physicians, Surgeons, and Dentists
- e) Nurses, Midwives, Professional Medical Workers,
NEC and Medical Technologists
 - Professional nurses
 - midwives
 - med. techs and medical x-ray operators
 - dietetians and nutritionists
- f) Clergy, Charitable, and Social Welfare Workers
- g) Lawyers and Jurists
 - Lawyers, fiscals, and prosecutors
 - Notaris and other workers lin legal occupations
- h) Artists, Writers, Entertainers, and Related
Workers
 - painters, sculptors, and related creative
Artists
 - authors, journalists, and related workers
 - musician and music teachers
- i) Draftsmen and Technicians, semi-professional
Workers.
 - draftsmen and cartograpers
 - Engineering technicians and aides
 - Laboratory and research technicians
 - Taxidermists, designers and other technical
workers.

ADMINSTRATIVE, EXECUTIVE, AND MANAGERIAL WORKERS (SKILLED9

- a) Elected Officials, heads of offices, and directors121
- b) Managers and Working Proprietors

CLERICAL WORKERS

- a) Bookkeeper, Accounting Clerks, and Cashiers 131
 - accounting clerks
 - Bill Collectors

- Bookkeepers
- Bank Tellers
- Cash Receivers and Change Makers
- Cashier's and Paymaster's Office
- b) Stenographers and typists (skilled)
 - Secretaries
 - typists
 - Stenographers
- c) Office machine operators (semi-skilled) 132
 - card punch, sorting, tabulating, and
 - calculating machine operators
- d) Clerical workers (semi-skilled)
 - office clerks

SALES WORKERS AND LARGE ENTREPRENEURS

- a) Working Proprietors, wholesale and Retail trade 141
 - (skilled)
 - salesman, insurance (including bondsmen, agents and brokers)
 - salesman, business services
 - salesman, securities (including agents and brokers)
 - appraisers and adjusters
- b) Insurance and real estate salesmen of securities (skilled)
- c) Travelling Salesmen and Manufacturer's Agents and Detailmen 142
- d) Salesmen and related workers (semi-skilled)
 - salesmen, wholesale and retail stores
 - route salesmen (including distributors of softdrinks, ice, dairy, etc.)

SMALL ENTREPRENEURS (semi-skilled)

- 1. FARM MANAGERS/OWNERS (semi-skilled) 212
 - seasonal laborers:
 - paragkiwa - hired either by tenants or owner operators to undertake land preparation. The work-duration is only for one cropping season, with the option of the owner to extend the paragkiwa's work till harvest time.
 - Katiwala - normally has a permanent employment (about 4 to 7 cropping season in duration) and has relatively fixed and regular compensation (3% of the net profit of each cropping season.)
- 3. FISHERMEN
 - 1. Commercial and large fishermen (semi-skilled) 312
 - 2. Subsistence/small fishermen (semi-skilled) 322
 - 3. Hired fishermen (unskilled) 333
 - a) regular crew members of commercial fishing boats.

b) Low income laborers such as fish processors, net makers/repairers, corral and marine products gatherers and fish vendors.	
4. OTHER WORKERS	
a. Hunters, loggers and related workers	412
Hunters and related workers	
loggers and other forestry workers	
2. Miners, quarrymen and related workers (semi-skill	422
mine foremen	
miners and quarrymen	
well drillers and related workers	
WORKERS IN TRANSPORT AND COMMUNICATION OCCUPATIONS	
a) deck officers, engineer officers and pilots, ship officers (skilled)	431
Engineer officers	
deck officers and pilots	
ship officers	
b) Deck and Engine room matings, ship barge crews and boatmen (semi-skilled)	432
c) Aircraft pilots, navigators and flight engineers	431
d) drivers, land transport (semi-skilled)	432
e) conductors, railway and road transport	
f) inspectors, supervisors, traffic controllers and dispatchers and other workers, transport traffic controllers, dispatchers, transport inspectors and supervisors, transport	
g) telephone, telegraph, and related telecommunications workers (semi-skilled)	432
radio-communications operators	
telephone, telegraph and teletype operators	
inspectors, traffic controllers and dispatchers,	
other communication workers	
postmen and messengers	
CRAFTSMEN, PRODUCTION PROCESS WORKERS AND LABORERS	
a) Spinners, Weavers, knitters, dyers, and other workers	
b) tailors, sewers, embroiderers, and related workers	441
c) Footwear makers and leather workers	442
d) Furnacemen, rollers, drawers, moulders and others	
e) Precision-instrument mechanics, watch repairers, etc.	
f) toolmakers, machinists, plumbers, welders, platers	
g) electrician and related electrical and electronic workers	
h) carpenters, cabinetmakers and related workers	
i) Painters	
j) Bricklayers, mason and others	
CRAFTSMEN, PRODUCTION PROCESS WORKERS AND LABORERS (semi-skilled)	452

- a) Compositors, pressmen, engravers, bookbinders, and related workers
- b) Potters, kilnmen, Engravers, bookbinders, and others
- c) Millers, bakers, brewers, and others
- d) chemical and related process workers
- e) tobacco preparers and tobacco product makers
- f) craftsmen and production process makers
- g) packers, labellers, and related workers
- h) Stationary-engine , excavating and lifting equipment operators

SERVICE, SPORTS AND RELATED WORKERS (semi-skilled) 462

- a) firefighters
- b) Housekeepers, cooks, maids and related workers 462
- c) Waiters, Bartenders, and Related workers
- d) Building caretakers, cleaners and related workers
- e) Barbrers, hairdressers, beautician and others
- f) Launderers, dry cleaners, and pressers
- g) Athletes, sportsmen, and related worker
- h) Photographers and related camera operators
- i) Service sports and related workers

COMMON LABORERS (unskilled) 473

- a) Stevedores and related freight handlers
- b) laborers

WORKERS NOT CLASSIFIED BY OCCUPATION

- a) housekeepers
- b) students
- c) pensioners, other retired persons

NO OCCUPATION

- a) workers not reporting any occupation
- b) other non-gainful activity or not activity reported

(Note: If a person worked at two jobs, enter the job at which he worked the more number of hours and/or wherein he earns more money.)

1V COMBINED HOUSEHOLD INCOME

Take down the names of all income receivers of the family. The income should come from outside sources to be considered a household income. If a son or a daughter who works for the family land is paid a salary by the household head, do not include it as a salary.

For different sources of income, the list includes:

a. Wages and salaries - include here also drivers under "boundary system" and workers like harvesters, salemen, hostesses, etc. on commission, tip or piece rate basis.

b) enterprise of trading - include here also market vending, sidewalk vending, peddling, or any kind of wholesale or retail trade.

c) enterprise of manufacturing or processing or repair of articles and equipment - include here also small scale manufacturing like mat weaving, etc.

d) enterprise of transport - include here also operation of tricycle, calesa, push cart, etc. or ferrying of persons across rivers.

e) Other enterprises (restaurants, hotels, boarding houses, laundry shops, barber shops, beauty parlors, recreation halls, pawn shops, electric plants, real estate, etc.).

f) Practice of professionals or trade (lawyers, physicians, engineers, accountants, etc. in private practice of profession or trade.)

g) production during past year of articles primarily for own use.

h) income during past year from livestock and poultry raised by the household and from crops, fruits, and nuts harvested by household during the last year; net of farm operating expenses.

i) income from fishing, forestry, and hunting during last year.

j) household share of crops, fruits, and nuts, and livestock raised by others during last year.

k) income from other sources during last year as follows:

- 1) net rental from agricultural lands;
- 2) net rental from other lands, from buildings, rooms or spaces and other properties;
3. interest and dividends, including insurance dividends;
4. profits from sale of stocks and bonds;
5. pension and retirement; workmen's compensation;
6. backpay and proceeds from insurance;
7. gifts, support and assistance, relief;
8. net winnings in gambling or sweepstakes;
9. inheritance during past year in cash or converted into cash.

The amount each person gets should be for the period corresponding to the duration of her/his employment during last year. State the exact amount in pesos. If income is in kind, ask the informant to estimate the value of goods received.

Get the total amount of household income after you have itemized the income of all members. Note that each member may have more than one source of income. Use one line for each source. Similarly, if a member changed jobs during the past year, say, he quit his/her job where he was paid a salary and went into his own business buying and selling, enter (1) one line and (2) on the next line for that member. If there are two entries under "source", there should also be two entries for "period" and "amount."

V FERTILITY RATE

The intent of this section is to determine the fertility rate of the household. Children born alive must include those that come from the previous marriage, those children who later died, and those who are living elsewhere.

V1 DIETARY INTAKE

The intent of the questions in this section is to determine the items and amounts of foods consumed by each household. There are two types of questions: the closed type which specifies a definite sequence of answers and the open-ended type which asks: "What did you eat and drink in the past 24 hours starting from the most recent meal?" and, "What did you have in-between meals?" The specific questions intend to find out whether the meals taken were typical or not. It is important that the dietary intake during the last 24 hours was the usual meal of the household. In cases when any member is taking a special diet, looking for a substitute household. The procedure for looking a substitute is mentioned in section 111.

a) In asking questions for dietary intake, do not ask leading questions that suggest answers; do not put words into the informant's mouth by stating specific foods. Don't say, "Did you have an egg for breakfast?" Instead, after the mention of food, ask, "Did you have anything on the salad?" or "Did you have anything else to eat or drink?"

b) Clarify food description of kind, amounts, preparation methods as the food recall is recorded. Be specific in describing the food. Ask probing questions, "were the beans dried or fresh?" or "were the potatoes sweet or white?" Be sure to describe fully how much of each food was eaten. Be sure to include such items as butter, gravy, jam, salad dressing, sugar, etc., each time they are used.

c) The interview period covers food eaten from Mondays through Fridays because the food eating pattern during the weekend is believed to vary greatly. The 24-hour period,

regardless of the time of interview, must begin from midnight of the day before last to midnight of the previous day.

d) To help the subject make certain of the food consumed on the recall day, several means should be employed to aid him/her to remember accurately:

a) other household members can be asked to help with the interview. Efforts should be made to get the household member to think as a group.

b) to uncover snacks or between meals, review the individual's activity on the recall day. Ask an open-ended question, such as "What did you have between meals?"

AT THE END OF THE INTERVIEW, SINCERELY THANK YOUR INFORMANT FOR HER COOPERATION.

Appendix D

EDITING INSTRUCTIONS

- a) Proper Identification
- 1) make sure that there are no two households with the same number.
 2. Check that the interviewer number is consistent with the one assigned.
 - 3) Barangay number appears in the map.
 - 4) check that only one code is marked.
- b) Q 1 & 2
- 1) Make sure the person who prepares and buys food is the same. If so, she must be the informant. If not, the one who usually buys food becomes the informant.
- c) Q. 3-5
- 1) See to it that only one code is marked.
 - 2) Check whether all blocks have been filled up by either 1 or 0.
- d) General Info.
- 1) Check that the date and time of interview.
Follow the interview instructions.
 - b) See to it that the signatures belong to the persons referred to in the code.
- e) Household Info.
- Serial Number
- name of member
- RHC
- Sex
- Birthdate
- Civil Status
- Physiolog.status
- Highest grade completed
- Check legibility of written information.
Member number corresponds to number of the lines in which the member is listed.
Check the legibility
Check relation to head against sex and name of member.
Check against name and relation to head code.
Check that column have been completely filled up.
Check against PSC.
Check against age and against CSC.
Check that highest educational attainment tallies with age.
- F) Combined Household Income
- 1) Check member number carefully against Form 1V -General Household Information. All members who are 15 years old and over must be accounted for.
 - 2) Check the recorded sources of income codes to see if they confirm with the occupation reported.
Check the accuracy of the recorded amount.
It's not possible to earn P50,000.- a year from his wages alone.
- G) Fertility Rate
- 1) Check that there can be no date of death or DCC for those still living and

there's no date of birth or date of death for abortion/miscarriage/stillbirth.

H) Dietary intake

- 1) Check for the completeness of information gathered.
- 2) Check if the standard menu pattern has been followed.
- 3) Check carefully that each menu on the dish has representative food items.
- 4) Check carefully the translation or substitutions of the names of food items in the local dialect.
- 5) Be sure to check which food item was eaten as raw and as a whole.
- 6) Check carefully the description of each food item. If possible, description should be based on Food Composition Table description.
- 7) Check carefully that each food item has been given the proper meal code.
- 8) Check whether the code of every food item listed and used tallies with the last line number printed.
- 9) Check that all food items recorded have corresponding weight. Where possible, relate measures recorded to actual weight.
- 10) Check carefully that the code tallies with the actual description.
- 11) Check that the cost of each food item is recorded.

Appendix E
CODING SYSTEM

RECORD 1

Card 1

col.no	var no.	value label	code no.	valid code
1		Record Code	1	HH. Gen. Record
		1-HH. GEN. IDENTIFICATION		
2	X1	Stratum Code	1	stratum 1
			2	stratum 11
			3	stratum 111
3-5	X2	Sample Hh. no.		Direct Code
6-7	X3	Sample Barangay No.		Direct Code
8	X4	Type of Community Code		Direct Code
9	X5	Type of Political Unit Code		Direct Code
10	X6	Type of Census Category		Direct Code
11-12	X7	Card Number	01	Card Number One
13-14	X8	No. of Cards		List total no. of all cards
15-16	X9	No. of Sample barangays in stratum		Direct Code
17-18	X10	Total no. of sample barangay in st		Direct Code
		11 HOUSEHOLD PROFILE		
19-20	X11	Total no. of members in hh.		Count persons listed
21-22		Leave blank		
23-24	X12	No. of male members in hh.		count male member
25-26	X13	No. of female members		count female member
27	X14	Relationship of Info. to head of hh	1	head himself
			2	wife or spouse
			3	son
			4	daughter
			5	other relative
			6	maid
			7	not related
28	X15	Meal Unit Code	0	no meal eaten
			2	1 meal eaten
				for 3 meal pattern
			3	1 meal eaten for
				2 meal pattern
			4	2 meal eaten
			6	complete meals
				eaten
29	X16	Identification of Inf.	1	food buyer
			2	food preparer
			3	both buyer and

					preparer
				4	neither buyer
					ncr preparer
30		Leave blank			
		111 RECORD OF HH MEMBERS			
31-32	X17	1. First Member:			
		Line no. of member			Copy from hh info.
33	X18	Absent Member Code	1		Present
			2		Absent-AF
			3		Absent-school
			4		Absent-working
			5		Absent-others Spec
34	X19	Relationship to head	1		head
			2		spouse
			3		son
			4		daughter
			5		other relative
			6		maid
			7		not related
35	X20	Sex	1		male
			2		female
36-37	X21	Age			Direct Code
38	X22	Civil Status Code	1		single
			2		married
			3		others
39	X23	Physiological Status Code	1		pregnant-1st tri
			2		pregnant-2nd or
					4rd trimester
			3		lactating-1st 6
					months
			4		lactating next 6
					months
			5		lactating over
					1 year
			6		not applicable
40-41	X24	Highest grade completed	99		not applicable
			00		no grade completed
			11		elem. first grade
			12		elem 2nd grade
			13		elem 3rd grade
			14		elem 4th grade
			15		elem 5th grade
			16		elem 6th grade
			21		high school 1st
			22		high school 2nd
			23		high school third
			24		high school fourth
			31		college-1st year
			32		college 2nd year
			33		college 3rd year

			34	college 4th year	
			35	college 5th year	
			41	bachelor degree	
			42	M.A. student	
			43	M.A. completed	
			<4	Ph.D. student	
			45	Ph.D. completed	
42-43	X25	Age group where member belongs	01	0-5 months old	
			02	6-11 months old	
			03	1-3 yrs old	
			04	4-6 yrs old	
			05	7-9 yrs old	
			06	10-12 yrs old	
			07	13-15 yrs old	
			08	16-19 yrs old	
			09	20-39 yrs old	
			10	40-49 yrs old	
			11	50-59 yrs old	
			12	60-69 yrs old	
			13	70-79 yrs old	
44-56	X26-X34	Second Member-Line no.	Same	code as First Member	
57-69	X35-X43	Third Member	Same		
70-74	X44	Household Cash Income		Direct Code	
75-76		Leave Blank			
77-79	X45	Total no. of sample hh		Direct Code	
80		Leave Blank			

(NOTE: Continue to next card until all members are listed)

RECORD 2 =HOUSEHOLD RECORD

1		Record Code	2	Hh socio-eco record
2-18		Hh identification		Same as in Rec 1
19-20	X51	No. of eligible members		Count persons 15 yrs and over
21-22	X52	No. of ineligible members		Count persons who are < 15 yrs old
23-24	X53	Total members of hh		Total of X51+X52
25-26	X54	No. of eligible members who completed h.s.		Count persons who completed h.s.
27	X55	No. of male eligible		Count
28	X56	No. of female eligible		Count
29	X57	No. of male employed		count
30	X58	No. of male unemployed		count
31	X59	No. of female employed		count
32	X60	No. of female unemployed		count
33-38	X61	Total hh real 1980 income		Direct code
39-40	X62	Major source of hh income	01	wages and

				salaries
			02	enterprise or trading
			03	manufacturing or processing
			04	transport
			05	other enterprise
			06	practice of prof or trade
			07	own production
			08	farm income
			09	fishing, forest hunting
			10	produced by other
			11	rental income
			12	rental from other
			13	interest income
			14	profits from stock sale
			15	pensions and ret
			16	backpay etc
			17	gifts and etc
			18	gamblings, etc
			19	inheritance
			20	others
41	X63	Source of income by type	1	Own hh operated activity
				1-farming
				2-gardening
				3-poultry
				4-livestock
				5-fishing
				6-own mfg
				7-retail st
				8-others
				2-Not own oper. activity
				1-sal & wages
				2-pensions, etc
				2-comm & tips
42	X64	HH main type of income	1	cash
			2	non-cash
43-44	X65	Hh. no. of mo. sourced of income		Direct Code
45-46	X66	Household size	1	1 member
			2	2 member
			3	3 member
			4	4
			5	5
			6	6

			7	7
			8	8
			9	9
			10	10
			11	11
			12	12 or more
47	X67	Household by SES (Madigan)		
		Urban:		
		000-9,599	1	
		9,600-17,999	2	
		18,000->	3	
		Rural:		
		000-5,999	1	
		6,000-11,999	2	
		12,000->	3	
48-49	X68	Total living live births		Count
50	X69	Total deceased live births		Count
51-52	X70	Total live births		Count
53	X71	Total infant's death		count
54	X72	Total abortion and Miscarr		count
55	X73	Total stillbirths		count
56	X74	Total deaths by illness		count
57	X75	Urban or rural household	1	urban
			2	rural
58-59	X76	Hh by 1980 Food threshold		
		Income:		
		hh size urban rural		
		1 2500 2000		
		2 3000 2500		
		3 4000 3500		
		4 6000 5000		
		5 8000 6500	1	if hh gets less
		6 10000 8000	2	if hh gets more
		7 12000 10000		
		8 14000 12000		
		9 16000 14000		
		10 18000 16000		
60	X77	Timing of child-bearing	0	na
			1	<-1 yr interval
			2	1-2 yrs int
			3	3-4 yrs int
			4	5-6 yrs int
			5	6-7 yrs int
			6	over 8 yrs
61-63	X78	Primary dependency ratio		Direct -
		-0-9 yrs/total elig.		
64-66	X79	Secondary dep. ratio-		direct
		10-above/total elig		
67-69	X80	Total dependency ratio		Sum of x78 + x79
70-71	X81	no. of children 0-4 yrs old		direct code

72-73 X82 No. of women 15-44 yrs old direct code
 74-75 X83 leave blank
 76- leave blank
 77-79 X84 No. of sample hh. in barangay
 80 leave blank
 (Continue to next card for next eligible members)

RECORD 3=PERSONAL RECORD OF MEMBERS 15 YEARS OLD AND OVER

1		Record Code	3	Personal Record of Members 15->
2-18		Household Identification		
19-20	X86	Person Code-First Member		Code 01 for per. no. 1
21-22	X87	Line no. of Eligible members		Copy from hh record
23	X88	Finished High School?	1	Yes
			2	No
24-27	X89	Usual occupation		See code for occupation
28	X90	Have work or had business last year?	1	yes
			2	no
29-31	X91	Present Primary Work		See code for occupation
32	X92	Class of Worker	0	non-gov't worker
			1	gov't wage worker
			2	employer
			3	self-employed
			4	unpaid worker
33	X93	Status in job	1	permanent job
			2	seasonal job
			3	daily or weekly
34	X94	Do you want to work anytime?	1	yes
			2	no
35	X95	Wanting work most of the time?	1	yes
			2	no
36-38	X96	What occupation wanted?		See code of occup.
39	X97	Looking for work?	1	yes
			2	no
40	X98	Why not looking for work?	1	old,ret or young
			2	schooling
			3	housekeeping
			4	believed no work is avail. or fact. is closed
			5	temp. illness or disability
			6	others, specify
41		Leave blank		
42	X99	Earning income?	1	yes

43	X100	Type of income	2	no
			1	cash
			2	non-cash
44-45	X101	Source of income		See code
46-47	X102	How many month been working		Direct code
48-52	X103	1980 Gross Income		Direct code
53-54	X104	Member living birth		Direct Code
55	X105	Member deceased live birth		direct code
56-57	X106	Member total live birth		Direct code
58	X107	Member's infant's death		direct code
59	X108	Number of abortion and miscarriage		Direct code
60	X109	number of stillbirth		direct code
61	X110	Number of deaths by illness		direct code
62	X111	Is this person food preparer or food buyer	1	yes
			2	no
63-64	X112	Age		Direct code
65	X113	Occupational status of hh head	1	nonfarm/non fish
			0	farm/fishing
66	X114	Is this married woman employed for salary/wage?	1	yes
			0	no
67	X115	Hh resides in poblacion/barrio	1	poblacion
			2	barrio
68	X116	Is female hh head a housewife solely?	1	also engaged in other works
			0	housewife solely
69-76		leave blank		
77-79	X117	No. of sample hh in sample bar.		
		(NOTE: Continue to next card until all eligible members are recorded.)		

RECORD 4= Household Food eaten out/shared record

1		Record Code	4	Hh Food Eaten out/shared
2-18		Household identification		
19	X121	Does has members with meals /snacks eaten out	1	yes
			2	no
20	X122	Member who ate cut-line no.		check the hh rec
21-23	X123	Meals eaten out	1	breakfast
			2	morning snack
			3	lunch
			4	afternoon snack
			5	supper
			6	late pm snack
24	X124	no. of meals/snack eaten out		direct code

25-28	X125	Cost of meals/snack eaten out			direct code
29-37		2nd member			
38-46		3rd member			
47-55		4th member			
56	X138	Hh with meals shared with visitors	1	yes	
			2	no	
57	X139	Visitor code	1	1 visitor	
			2	2 "	
			3	3 "	
			4	4 "	
			5	5 "	
58-60	X140	Meals shared	1	breakfast	
			2	lunch	
			3	supper	
61	X141	Total no. of meals shared			direct code
62-66	X142	2nd visitor			
67-71		3rd visitor			
72-76		4th visitor			
77	X151	no. of meals eaten out			direct code
78	X152	no. of visitors who shared meals			direct code
79		leave blank			
80		card no. of hh			

RECORD 5=FOOD CONSUMPTION OF HOUSEHOLDS RECORD

1		Record 5			Household Food Consumption Record
2-18		Household Identification			
19-20	X156	Line no. of food items			
21-22	X157	First Food Item			
23	X158	Meal Code	1	breakfast	
			2	a.m. snack	
			3	lunch	
			4	p.m. snack	
			5	supper	
			6	late pm snack	
			0	na	
24-27	X159	Food Item code with FCT			Direct Code
28-31	X160	Weight in grams			direct code
32	X161	RCC	1	RAF	
			2	REP	
			3	CAP	
			4	CEP	
33	X162	CMC	1	boiled	
			2	fried	
			3	sauteed	
			4	broiled	
			5	scrambled	
			6	na	

34	X163	Supply code	1	bought
			2	home produced
			3	given
35-36	X164	Plate waste in grams		direct code
37	X165	CMC		
38-39	X166	Given out in grams		direct code
40	X167	CMC		
41-42	X168	Left-over in grams		direct code
43	X169	CMC		
44-47	X170	Peso cost of Foods consumed		direct code
48-50	X171	Percentage of women's contribution to hh total income		direct cost
51	X172	Hh supply of food	1	bought
			0	otherwise
52-76		leave blank		
77-78	X173	Total no. of food items		direct code
79-80	X174	Card no. of hh food consumption record		

(NOTE: Continue to next card until all food items are recorded.)

Appendix F

LOCAL FOOD GROUPS AND THEIR MEASUREMENTS

<u>categories:</u>	<u>Description:</u>	<u>Measurement:</u>
a) <u>CEREALS AND CEREAL PRODUCTS:</u>		
1) Corn grits	white or yellow	1 leche = 250 gms. 1 salmon = 315 gms.
		1 Nescafe glass = 200 gms.
2) Pancit	fresh	1 cup = 125 gms.
3) Maggi Noodles	Processed	1 pack = 70 gms. P 1.80
4) Utap	Processed bread	1 pack = 200 gms P4.10
5) Bihon		1 big package = 450 gms. 1 small package = 200 gms.
b) <u>FISH, MEAT AND POULTRY:</u>		
1) Tabarong		17 1/2 X 5 cm = 110 gms.
2) Moong		11 X 4 cm = 50 gms.
3) Tabilos		15 X 3 cm = 30 gms.
4) Olan-olan		9 X 3 1/2 cm = 30 gms.
5) Hawol-hawol		25 X 5 cm = 150 gms. 30 X 6 1/2 = 250 gms.
6) Pandawan		17 X 7 1/2 cm = 200 gms.
7) Bugsawan		26 X 7 cm = 600 gms. 20 X 6 cm = 400 gms.
8) Tigi		18 X 7 cm = 200 gms.
9) Borot		27 X 6 1/2 cm = 300 gms.
10) Lambo		14 X 2 1/2 cm = 10 gms.
11) Katambak		18 X 4 cm = 40 gms. 24 X 5 1/2 cm = 80 gms.
12) Goso	Seafood	P 1.00 = 100 gms.
13) Lato	Seafood	P 1.00 = 240 gms.
14) Tulingan (Bariles, panit)		19 X 2 1/2 cm = 200 gms
15) Malasuge		19 X 2 1/2 cm = 200 gms.
16) Tabas		14 X 8 cm = 80 gms.
17) Pidlayan		23 X 6 cm = 250 gms.
18) Pulhoan		70 X 6 1/2 cm = 350 gms.
19) Taraballas		12 X 3 cm = 50 gms.
20) Andohaw		16 2/1 X 5 cm = 150 gms.
21) Danggit		17 X 6 cm = 110 gms.
22) Bangsi		13 X 3 1/2 cm = 50 gms.
23) Gisaw		15 X 4 cm = 100 gms.
24) Bangsi	dried fish	11 X 3 1/2 cm = 40 gms.
30) Taraballas	Dried fish	6 X 4 cm = 30 gms.
26) Sap-sap	Dried fish	6 X 4 cm = 25 gms.

27) Karaho	Dried fish	14 X 3.5 cm = 70 gms.
28) Andukaw		15 X 5 cm = 120 gms.
29) Barot		10 X 2 cm = 40 gms.
30) Susu	Seafood	1 mile can = 950 gms.
31) Penahon		16 X 6 1/2 cm = 200 gms.
32) Budloy		12 X 4 cm = 50 gms.
33) Pugot		8 X 2 cm = 10 gms.
		15 X 4 cm = 20 gms.
34) Amag		14 X 6 cm = 68 gms.
35) Liplipan		16 X 6 cm = 200 gms.
36) Sihag-sihagon		1 salmon = 400 gms.
37) Balu		60 X 5 cm = 250 gms.
		90 X 7 1/2 cm = 500 gms.
38) Molmol	Dried fish	12 X 4 1/2 cm = 30 gms.
39) Kitong		16 X 6 cm = 70 gms.
40) Tel-ugon		12 X 5 cm = 50 gms.
41) Torta		6 X 2 cm = 20 gms.
42) Tabarong		16 X 4 1/2 cm = 100 gms.
43. Sunpride Pork Adobo		1 can = 240 gms
44) Corned Beef Special		1 can = 200 gms.
45) Purefoods Corned Beef		1 can = 400 gms.

C) VEGETABLES AND FRUITS:

1) White Beans		1 salmon = 300 gms.
		1 nescafe glass = 150 gms.
2) Baguio Beans		1 pack = 430 gms.

D) MISCELLENECUS:

1) Tuba	Coconut wine	1 cup = 240 gms.
2) Talangka		1 plate = 150 gms.
3) Tanglad		1 pc. = 10 gms.
4) Tabon-tabon		1 pc = 125 gms

c

Appendix G

LIST OF VARIABLES USED IN THE RESEARCH

<u>Variable No.</u>	<u>Description of Variable</u>
x24	Highest grade completed by household member.
x44	Total household cash income.
x51	Number of eligible members in a household (hhi).
x52	Number of ineligible members in a hhi.
x53	Total number of members in a hhi.
x54	Number of members who completed high school.
x55	Total eligible male members in a hhi.
x56	Total eligible female members in a hhi.
x57	Number of male members employed.
x59	Number of female members employed.
x61	Total household real income.
x62	Major sources of income.
x63	Source of income by type.
x66	Household size.
x67	Household socioeconomic status.
x68	Total living live births.
x76	Total household food threshold income.
x77	Timing of child-bearing.
x78	Primary dependency ratio.
x79	Secondary dependency ratio.
x80	Total dependency ratio.
x81	Number of children 0-4 years old.
x82	Number of women 15-44 years old.
x92	Class of workers.
x93	Individual status in a job.
x113	Household head occupation status.
x114	Whether married woman is employed for salary or not.
x171	Per cent married women's contribution to hhi income.
Hopem	Var x51/Var x53.
Hoed	Var x54/var x51.
Homap	Var x57/var x55.
Hofap	Var x59/var x56.
ratio	Var x81/var x82.
Pcg1	Percentage sufficiency of aggregated foods consumed.
Pc1	Percentage sufficiency of cereals and cereal products consumed.
Pc8	Percentage sufficiency of fish, meat, and poultry consumed.
Pc13	Percentage adequacy of calorie intake.
Pc14	Percentage adequacy of nutrient intake.
Pc15	Percentage adequacy of iron intake.

Sx170 Total peso cost of foods consumed.

Appendix H

SPECIFIC COMPONENTS OF FOOD GROUPS

Food and Nutrition Research Institute

Metro Manila, Philippines

Food Group	Food Item
1. CEREALS AND CEREAL PRODUCTS	
1.1 Rice	
1.1.1 Ordinary	Bigas Mapula Pinawa Bigas, Puti, pinawa
1.1.2 Special	Pirurutong Pirurutong, sinaing
1.1.3 Fancy	
1.1.4 Glutinous	
1.2 Rice Products	
1.2.1 Noodles	Bihon
1.2.2 Cakes	
1.2.3 Others	
1.3 Corn	
1.3.1 Milled	
1.3.2 On the Cob	
1.3.3 Others	
1.4 Corn Products	
1.4.1 Corn Starch	
1.4.2 Others	
1.5 Other Cereal Products	
1.5.1 Bread	
1.5.2 Cookies/Biscuits	
1.5.3 Cakes, Pastries	
1.5.4 Noodles	Manok, Mami Manok, sopas (Noodle Soup) Beef Noodle (Royco) Makaroni (Soup) Pancit Canton Pancit Canton, Bihon Pancit Guisado Pancit Luglug Spaghetti (Cooked dish) Strained Chicken Noodle

Strained Beef Egg Noodle

1.5.5 Flour

1.5.6 Others

Oatmeal

Wheat Rolled dry

Bulgur Trigo

Mike, Wheat, puffed

Oatmeal boiled

11 STARCHY ROOTS AND TUBERS

2.1 Sweet Potatoes, Tubers, and Products

Camote

Camote que

2.2 Potatoes and Products

Potato Chips

2.3 Cassava and Products

Suman Kamoteng Kahoy

Kamoteng Kahoy Bibingka

Linupak, kamoteng kahoy

2.4 Other rootcrops

111 SUGARS AND SYRUPS

3.1 Sugars

3.1.1 Refined

Sugar 2nd class

3.1.2 Brown

3.1.3 Crude

3.2 Jams and Other Sweets

including sherbet

Karamelo

Icedrops

Icedrop, Sherbet

Hard Candy

Fondant

Sampalok Candy

Honey

3.3 Softdrink

1V DRIED BEANS, NUTS, AND SEEDS

4.1 Mung Beans and Products

Mungo, guisado with malunggay

Mungo, sprout with carrot

Lumpia, fried (toge with shrimp)

Sotanghon

Sotanghon, linuto

Gallina con sutanghon

Sotanghon, Pancit

4.2 Soybeans and Products

- Utaw, gatas may tsokolate
- 4.3 Other Dried Beans, Seeds, and Products
 - Baboy may abitsuelas
- 4.4 Nuts and Products
 - Bunga

V GREEN LEAFY AND YELLOW

VEGETABLES

- 5.1 Green Leafy Vegetables
 - 5.1.1 Sweet Potato tops
 - 5.1.2 Kangkong
 - 5.1.3 Malunggay
 - 5.1.4 alughati tops
 - 5.1.5 Petsay
 - 5.1.6 Gabi leaves
 - 5.1.7 Other Green Leafy Vegetables
 - Mustasa inasnan
 - Gulay, bicol ginatan
 - petsay guisado
 - pickled kangkong
 - pinakulo kangkong
 - Burong mustasa
- 5.2 Squash Fruit
 - Squash, ginataaing malunggay
 - strained squash
- 5.3 Other yellow vegetables
 - karot
 - karot, linuto
 - strained carrots

V1 VITAMIN C-RICH FOODS

- 6.1 Tomatoes
- 6.2 Mango (green, semi-ripe, ripe)
 - strained mangoes papaya
- 6.3 Papaya (semi-ripe, ripe)
 - Strained mangoes papaya
- 6.4 Citrus Fruits
 - kubayaw
 - Suha
 - orange, sunkist
- 6.5 Other Vitamin C-rich fruit
 - dayap, balat
 - limon, balat

V11 OTHER FRUITS AND
VEGETABLES

- 7.1 Other Fruits
 - 7.1.1 Bananas
 - Banana que
 - Turon saging

- 7.1.2 Watermelon
- 7.1.3 Melon
- 7.1.4 Jackfruit
- 7.1.5 Pineapple
- 7.1.6 Young Coconut
- 7.1.7 All other Fruits
- 7.2 Other Vegetables
 - 7.2.1 Eggplant
 - Eggplant omelet
 - 7.2.2 Fresh Leguminous pods
 - 7.2.3 Jackfruit (unripe)
 - 7.2.4 Gourd (Bottle and Sponge)
 - Upo, gisado
 - 7.2.5 papaya (green)
 - 7.2.6 Cabbage
 - 7.2.7 Banana heart
 - 7.2.8 All other vegetables
 - Sibuyas bombay
 - Sibuyas bombay linuto
 - sibuyas, tagalog
 - Bawang
 - Labanos
 - Labanos, linuto
 - Luya
 - Singkamas
 - 7.2.9 Cooked Mixed Vegetables
- 7.3 Canned and Processed Fruit and Vegetables
 - 7.3.1 Other Canned and Processed Fruits
 - Pruns
 - Dried Kamyas
 - Dried Dates
 - Fig Bars
 - Figs Dried
 - Fruit Cocktail canned
 - Peaches canned with syrup
 - Cherry
 - 7.3.3 Canned and Processed Vegetables
 - kabuti, tuyo
 - kabuti, nakalata
 - likyam
 - luya, tuyo
 - atsara, papaya
 - strained dinner mixed vegetable

V111 FISH, MEAT, AND
POULTRY

- 8.1 Fresh Fish
 - 8.1.1 Tulingan
 - 8.1.2 Bangus

- 8.1.3 Galunggon
- 8.1.4 dilis
- 8.1.5 Alumahan
- 8.1.6 Other Fresh Fishes
 - Baksat
 - Bangus en Tocho
 - Fish Ball with Pechay
 - Inon-onan
 - Pesang Dalag with Miso
 - Sinanglay
 - Sinigang na Ayungin
 - Sinigang na Talakitok
 - Sinigang na Bangus
 - Sinigang na Bitilya
- 8.2 Dried Fish
 - Daing Lapu-lapu
- 8.3 Processed Fish
 - 8.3.1 Bagoong (fish only)
 - 8.3.3 Patis
 - 8.3.3 Others
 - Salmon, nakalata
 - Sardinas, canned in oil
 - Tinapa, sardinas na sa lata
 - Tinapa, Tamban
 - Tuna, nakalata
 - Bagoong, fish roe canned
 - Sardinas spanish
 - tunsoy, smoked
- 8.4 Crustacean and Mollusks
 - 8.4.1 Fresh
 - Alamang
 - Alimango lamang
 - Alimango, laman, linuto
 - hipong tagunton
 - Pugita
 - Pusit
 - Pusit, Malaki
 - Pusit, Linuto
 - hipon, sipitan
 - Shrimp, big
 - Shrimp, suahe
 - kuray-alimango
 - kabutan, Pusit-malaki
 - 8.4.2 Dried and Processed
 - Tuyo, pusit
 - Pugita, dried
 - Pusit, canned luto
 - 8.4.3 Bagoong
 - 8.4.4 Others (cooked)
- 8.5 Fresh Meat

- 8.5.1 Pork
- 8.5.2 Beef
 - Baka, sinuso
 - Baka, ulo
- 8.5.3 Carateef
- 8.5.4 Chevon
- 8.5.5 Others
- 8.6 Cooked Meat
 - Baboy at Bangus
 - Baboy at manok adobo
- 8.7 Organ Meat
 - 8.7.1 Pig
 - Baboy, bituka maliit
 - baboy, dila
 - baboy, lapay
 - baboy, lapay, linaga
 - baboy, litsonin puso
 - baboy, litsonin sikmura
 - baboy, pancreas
 - 8.7.2 Cow
 - Baka, dila
 - Baka, dila, nilaga
 - baka, dugo
 - baka, librilyo
 - baka, puso
 - baka, goto
 - 8.7.3 Carabao
 - kalabao, бага
 - kalabaw, lapay
 - kalabaw, sikmura
 - kalabaw, dugo
 - 8.7.4 Goat
 - Kambing, Bituka, maliit
 - 8.7.5 Chicken, and Other Poultry
 - Chicken, blood
 - 8.7.6 Others
 - 8.7.7 Cooked Organ Meat
- 8.8 Processed Meat
 - Beef, Tapa
 - Carabao, Tapa
 - Usa, Tapa
 - Chicken, Canned meat only
 - Palaka, laman, dried
 - Pork, tapa med. fat
- 8.9 Poultry
 - 8.9.1 Chicken
 - chicken broth
 - Tinolang manok
 - Strained Cream Chicken soup
 - Meat Dinner Strained Chicken

- 8.9.2 Others
- 8.10 Others
 - Balang, including salagubang
 - Strained juice from duedenum
- 1X EGGS
 - 9.1 Hen's eggs
 - 9.2 Duck's eggs
 - itlog, pato, puti
 - 9.3 Others
 - itlog, bayawak
 - Itlog, pawikan, buo
 - itlog, pawikan, pula
 - Scrambled egg with cabbage
- X MILK AND MILK PRODUCTS
 - 10.1 Fresh Whole Milk
 - 10.2 Evaporated Milk (Filled recombined)
 - 10.3 Evaporated Milk (whole)
 - 10.4 Powdered Milk (whole and skimmed milk)
 - 10.5 Condensed Milk
 - 10.6 Milk Products
 - custard, baked
- X1 FATS AND OILS
 - 11.1 Cooking oil
 - 11.2 Coconut grated
 - 11.3 Pork drippings and lard
 - 11.4 Butter
 - 11.5 Other Fats and Oils
 - Baboy sitsaron
 - Aseyte
 - margarina
 - peanut butter
 - latik sp 1 X11 MISCELLANEOUS
 - 12.1 Salt
 - 12.2 Coffee
 - Peanut coffee
 - coffee ground
 - 12.3 Tuba*
 - 12.4 Vinegar
 - 12.5 Vetsin
 - 12.6 Alcoholic Beverage
 - Beer, cervesa*
 - wine, dessert*
 - Wine, table*
 - 12.7 Cacao
 - cacao, buto binusa
 - 12.8 Other Beverages
 - Chocolat, beverages with milk

Ovaltine
 Milo
 Sikulate, tablea
 Sikulate, Sweetened
 hemo
 Sunskist, punch, powder
 Coffe with sugar
 Grape, fruit drink, concentrate
 Orange, Fruit, concentrate 12.9

Others

Darak
 Kasubha
 Niyog, tubig
 Linga
 Yeast, torula
 Yeast, Strawberry
 Dilaw, Tuyo, Powdered
 Tabasco, Sauce, Toyo
 Chocolate, Candy with Milk
 Chocolate, cream
 Chocolate, Milk with peanut
 Baking Powder
 Bubble Gum
 Chewing Gum
 Sago, Palamig
 Gulaman, palamig

* Factor to apply to ingested alcohol, 6.93 calories per gram.

Appendix I

Madigan's SES Schedule

a) Urban Barangays:

Lower SES :	₱ 000 - 799 per month
Middle SES:	800 - 1,499 per month
Upper SES :	1,500 - over per month

b) Rural Barangays:

Lower SES :	₱ 000 - 499 per month
Middle SES:	500 - 999 per month
Upper SES :	1,000 - over per month

Father Madigan suggests the foregoing income breakdown for the three SES groupings. This breakdown is realistic in Misamis Oriental.

Appendix J

HUMAN AND ENVIRONMENTAL RESOURCES MANAGEMENT
College of Agriculture, Xavier University
Cagayan de Oro City, Philippines 8401

HOUSEHOLD QUESTIONNAIRE

A. GENERAL INFORMATION

Time Begun _____
Household Number _____
Interviewer Number _____
Barangay Number _____
Barangay Name _____
Address of Dwelling _____
Stratum Code _____
Type of Community _____
Type of Political Unit _____
Type of Census Category _____

1. Record of call(s) at the household:

	1st	2nd	3rd	4th	5th
Date	:	:	:	:	:
Time	:	:	:	:	:

2. Reason for noninterview:

1. refusal 3. transfer of residence 5. out
2. unknown 4. dwelling built after survey
6. other - specify

B. HOUSEHOLD PROFILE

INTRODUCE YOURSELF: (to the responsible person in the house.)

Hello, my name is _____ and I am working for Xavier University, College of Agriculture. I am talking to people to help plan for community services. Everything you will tell me will be kept confidential.

Do you have a few minutes to talk to me? I have some questions I would like to ask you.

1. Who usually prepares food?

(Kasagaran, kinse man and gaplano sa inyong pagka-on?)

1. wife 4. daughter
2. servant 5. husband
3. grandmother 6. other - specify

2. Who does most of the buying of foods?

(Kasagaran, kinse man and gapaniyanggi or gapamalit sa inyong pagka-on?)

1. wife 4. daughter
2. servant 5. husband
3. grandmother 6. other - specify

3. In the past 24 hours, was there anyone who was ill?

(Sa miaging 24 ka oras, aduna bay nasakit nga sakop sa inyong pamilya?)

1. Yes 2. No

4. Yesterday, was there anyone who died?
(Kagahapon, aduna bay namatay nga sakop sa imong pamilya?)
1. Yes 2. No
5. Yesterday, was it a special celebration?
(Kagahapon, aduna bay mahinungdanon nga okasyon sa inyong panimalay?)
1. Yes 2. No

(If anyone in the household died or was ill or if yesterday was a special celebration, you come back three days after.)

C. Socio-economic Status

Section I. Household Information

NOW LET ME ASK (the wife or the substitute who usually buys food)
TO HELP ME FIND OUT ABOUT THE HOUSEHOLD CHARACTERISTICS.

6. What are the names of all the persons who live here?
(Palihug, nganli and tanang tawo nga kasagaran nagapuyo niini nga panimalay.)
(List all persons from oldest to youngest in the next page. Encircle serial number of respondent.)

HEIRM - Form I All Persons		HOUSEHOLD INFORMATION (15 years old and over)										
W U M B E R (1)	Name of Members of Households (2)	A M C (3)	R H C (4)	S E X M F (5)	Age of	C	P	M	Highest Usual		Chk. if wom- an has job/ bus. (11-1)	Did you ever work Mrd. or have a bus. last year? 1. Yes 2. No (12)
					Last Birth Day Enter Code (6)	S C (7)	S C Enter Code (8)	U C (9)	'Grade 'Occupation 'during last pleted 'year Enter Code (10)	(11)		
1.												
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17.												
18.												
19.												
20.												

Code for Col. 3 - Absent Member Code (AMC)

AF = Armed Forces
S = School
W = working

Code for Col. 7 - Civil Status Code (CSC)

1 - Single
2 - Married
3 - Others

Code for Col. 8 - Physiological Status Code (PSC)

1 - Pregnant - 1st trimester
2 - " - 2nd or 3rd trimester
3 - Lactating - 1st 6 months
4 - Lactating - next 6 months
5 - Lactating - over 1 year
6 - Not applicable

Code for Col. 10 - Highest Grade

00 - No grade completed
11 - Elementary 1st grade
12 - " 2nd grade
13 - " 3rd grade
14 - " 4th grade
15 - " 5th grade
16 - " 6th grade
21 - High School - 1st year
22 - " 2nd year
23 - " 3rd year
24 - " 4th year

Code for Col. 4 - Relationship for HH
(RHC)

01 - Head himself/herself
02 - Wife/Spouse
03 - Son
04 - Daughter
05 - Other relative
06 - Maid/Helper
07 - Not related

Code for Col. 9 - Meal Unit Code

0 - No meal eaten
2 - 1 meal eaten for a3 meal pattern
3 - 1 meal eaten for a2 meal pattern
4 - 2 meals eaten for a3 meal pattern
6 - Complete meals eaten

31 - College 1st year
32 - " 2nd year
33 - " 3rd year
34 - " 4th year
35 - " 5th year
For college graduates specify the Bachelor's
degree completed.

Section III. Fertility Level

NOW, I HAVE SOME QUESTIONS TO ASK ABOUT FERTILITY LEVEL.

14. How many live-births did (for each woman of age 15 and above) experience; (Be sure to include those from previous marriage, those who have died, and those living elsewhere.)
 (Palihug, nganli and imong mga anak nga natawong buhi (kada babaye/inahan edad 15 ug labaw pa) gikan sa kamagulangan hangtod sa kamanghoran?)

HERM - Form III.

List of Pregnancies

Name of Child (1)	PO : Date of Birth			:Deceased			: DCC	: Name of Mother (10)
	: (2)	: Mo. : (3)	: Day : (4)	: Year : (5)	: Mo. : (6)	: Day : (7)		
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14.								
15.								
16.								

Code of Pregnancy Order (PO):

- 01 - living live birth
- 02 - deceased live-birth
- 03 - abortion
- 04 - miscarriage
- 05 - stillbirth

(Note: no data for stillbirth/abortion/miscarriage)

Code for DCC (Death Cause Code)

- 1 - Abortion/Miscarriage
- 2 - Stillbirth
- 3 - Others (death caused by illness, accidents, old age, etc.)

15. Did you have any child not mentioned already?

(Aduna pa ba sa imong mga anak ang wala napil sa atong listahan?)

1. Yes (continue) 2. No (skip to Q. 17)

16. If yes, who? When? (Kon OO, kinsa man? Kanus-a natawo?)

17. If no, a) What about the _____ child? (Kung wala miagi ka pa ba sa pag-abdos sa wala pa natawo ang kamagulangan ni/niya anak?)
 b) What about after the youngest child? (Anun sa kamangha ka pa ba sa pag-abdos?)
 c) What about in-between some _____ children? (Examined carefully between each pair and mention each pair if more than 1 year difference/gap in year).

G. Nutrition Status
 NEXT, I WANT TO ask some questions about your food consumption.

18. Is there anybody who is following a special diet? (Aduna bay sakop sa imong pamilya gumam sa pagdiyeta?)

1. Yes 2. No

19. If yes, what is it? (Unsa man kini?)

1. low calories 2. diabetic 3. other - specify

20. Is what you ate yesterday typical of your real pattern? (Ang imong naka-on kagahapon, kasagaran ba nga gumam sa oras sa pagka-on?)

1. Yes 2. No

21. What did you eat and drink in the past 24 hours starting from the most recent meal? (Sa miaging 24 ka-oras, sukad sa imong ulahing pagka-on, unsa man ang imong naka-on ug na-inom?) (Fill up MRRM Form IV.)
22. What did you have in between meals? (Fill up Form IV.) (Unsa man ang imong gakan-on sa dili pa ang hustong oras sa pagka-on? Sugdi pagpangutana ang panihapon kagabii ngadto sa panahaw kagahapon.)

HERH - Form IV - continued

1	2	3	4	5	6	7	8	9	10	11	12	13	14
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				38									

225

Code for Col. 5 - Meal Code:

- 1 - Breakfast
- 2 - A.M. Snack
- 3 - Lunch
- 4 - P.M. Snack
- 5 - Supper
- 6 - Late P.M. Snack
- 0 - Not applicable

Code for Col. 10 - Cooking Method Code (CMC):

- 1 - Boiled
- 2 - Fried
- 3 - Sautéed
- 4 - Broiled
- 5 - Scrambled
- 6 - Not applicable

Code for Col. 9 - Raw Cooked Code (RCC)

- 1 - RFP
- 2 - RBP
- 3 - CAP
- 4 - CEP

Code for Col. 11 - Supply Code:

- 1 - Bought
- 2 - Home-produced
- 3 - Given-in

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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					62									

Code for Col 5 - Meal Code:

- 1 - Breakfast
- 2 - A.M. Snack
- 3 - Lunch
- 4 - P.M. Snack
- 5 - Supper
- 6 - Late P.M. Snack
- 0 - Not Applicable

Code for Col. 9 - Raw Cooked Code (RCC)

- 1 - RA P 3 - CAP
- 2 - REP 4 - CEP

Code for Col. 10 - Cooking Method Code(CMC):

- 1 - boil 1
- 2 - Fried
- 3 - Sauted
- 4 - Broiled
- 5 - Scrambled
- 6 - Not Applicable

Code for Col. 11 - Supply Code:

- 1 - Bought 2 - Home-Produced 3 - Given-in

Appendix K

Food and Nutrition Research Institute, NSDB
Taft Pedro Gil, Manila

Table 1. Recommended Dietary Allowances for Filipinos Per Day for Specific Nutrients

Reference Person	Body Wt. Kg	Energy Kcal	Protein Gm	Calcium Gm	Iron mg	Vitamin A Activity		Thiamine mg	Riboflavin mg	Niacin (mg equi- valent)	Ascorbic Acid mg	
						Retinol Equivalent mcg	I.U.					
Reference Man:												
20-39 yrs.	56	2580	63	0.5	10	650	4500	1.3	1.3	17	75	
40-49 yrs.	56	2450	63	0.5	10	650	4500	1.2	1.2	16	75	
50-59 yrs.	56	2320	63	0.5	10	650	4500	1.2	1.2	15	75	
60-69 yrs.	56	2060	63	0.5	10	650	4500	1.0	1.0	14	75	
70 and over	56	1810	63	0.5	10	650	4500	0.9	0.9	13	75	
Reference Woman:												
20-39 yrs.	48	1920	54	0.5	18*	550	3800	1.0	1.0	13	70	
40-49 yrs.	48	1820	54	0.5	18*	550	3800	0.9	0.9	13	70	
50-59 yrs.	48	1730	54	0.5	8	550	3800	0.9	0.9	13	70	
60-69 yrs.	48	1540	54	0.5	8	550	3800	0.8	0.8	13	70	
70 and over	48	1340	54	0.5	8	550	3800	0.7	0.7	13	70	
Infant:	6-11 mos.	9	970	25	0.6	9	250	1800	0.5	0.5	6	30
Child:	1-3 yrs.	13	1310	26	0.5	6	250	1800	0.7	0.7	9	35
	4-6 yrs.	18	1640	32	0.5	8	325	2300	0.8	0.8	11	45
	7-9 yrs.	24	1870	37	0.5	7	400	2800	0.9	0.9	12	55
Boy:	10-12 yrs.	32	2270	43	0.7	11	500	3500	1.1	1.1	15	65
	13-15 yrs.	44	2510	59	0.7	12	550	4300	1.3	1.3	17	75
	16-19 yrs.	55	2700	67	0.6	13	650	4500	1.4	1.4	18	90
Girl:	10-12 yrs.	35	2170	48	0.7	18*	500	3500	1.1	1.1	14	70
	13-15 yrs.	44	2200	59	0.7	18*	550	4300	1.1	1.1	15	75
	16-19 yrs.	48	2060	59	0.6	18*	550	4300	1.0	1.0	14	80

Note: It is preferable that amounts with asterisk (*) be higher than indicated.
Supplemental iron is recommended during pregnancy.

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Reprinted, April 1981

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Table 1. Recommended Dietary Allowances for Filipinos Per Day for Specific Nutrients

Reference Person	Energy Kcal	Protein Gm	Calcium Gm	Iron mg	Vitamin A Activity		Thiamine mg	Riboflavin mg	Niacin (mg equi- valent)	Ascorbic Acid mg
					Retinol Equivalent mcg	I.U.				
Pregnant: (2nd and 3rd trimesters)										
13-15 yrs.	2630	73	1.0	18	625	4300	1.5	1.5	18	120
16-19 yrs.	2490	73	1.0	18	625	4300	1.4	1.4	17	120
20-39 yrs.	2350	68	1.0	18	575	4000	1.4	1.4	16	120
40-49 yrs.	2250	68	1.0	18	575	4000	1.3	1.3	16	120
Nursing: (1st 6 months)										
13-15 yrs.	2750	87	1.0	18	975	6800	1.4	1.7	19	120
16-19 yrs.	2610	87	1.0	18	975	6800	1.3	1.6	18	120
20-39 yrs.	2470	82	1.0	18	975	6800	1.3	1.6	17	120
40-49 yrs.	2370	82	1.0	18	975	6800	1.2	1.5	17	120
Nursing: (next 6 months)										
13-15 yrs.	2640	75	1.0	18	800	5600	1.4	1.5	18	120
16-19 yrs.	2500	75	1.0	18	800	5600	1.3	1.4	17	120
20-39 yrs.	2360	70	1.0	18	800	5600	1.3	1.4	16	120
40-49 yrs.	2260	70	1.0	18	800	5600	1.2	1.3	16	120
Per Capita/day ^{1/}	2016	50	0.6	12	520	3612	1.0	1.0	14	67

^{1/} Based on 1977 population structure (NCSO low assumption)

Food and Nutrition Research Institute, NSDB
Taft-Pedro Gil, Manila

Table II. Recommended Dietary Allowances for Filipinos Per Day for Specific Food Groups

Reference Person	ENERGY FOODS					BODY-BUILDING FOODS						REGULATING FOODS					
	Cereals (rice)	Kamote/ Potatoes/ etc.		Sugar	Fats/ Oils	Whole Milk	Fish/Meat/ Poultry		Eggs		Dried Beans/ Nuts/Seeds	Leafy/ Yellow Vegetables		Vitamin C-Rich Foods		Other Fruits/ Vegetables	
	A.P./E.P. ² gm	A.P. gm	E.P. gm	A.P./E.P. gm	A.P./E.P. gm	E.P. gm	A.P. gm	E.P. gm	A.P. pc.	E.P. gm	E.P. gm	A.P. gm	E.P. gm	A.P. gm	E.P. gm	A.P. gm	E.P. gm
Reference Man:																	
20-39 years	460	85	70	35	35	-	195	120	½	20	20	110	70	65	50	150	100
40-49 years	440	70	60	30	30	-	195	120	½	20	20	110	70	65	50	150	100
50-59 years	410	60	50	30	30	-	195	120	½	20	20	110	70	65	50	150	100
60-69 years	350	50	40	20	30	-	195	120	1	40	20	110	70	65	50	150	100
70 and over	280	35	30	20	20	200	195	120	1	40	-	110	70	65	50	150	100
Reference Woman:																	
20-39 years	330	50	40	20	30	-	175	110	½	20	20	110	70	65	50	150	100
40-49 years	320	50	40	20	20	-	175	110	½	20	20	110	70	65	50	150	100
50-59 years	310	50	40	20	20	-	175	110	½	20	20	110	70	65	50	150	100
60-69 years	270	50	40	20	20	-	175	110	1	40	20	110	70	65	50	150	100
70 and over	230	25	20	20	10	150	175	110	1	40	-	110	70	65	50	150	100
Infant 6-11 mos.	70			25	10	480	50	30	½	20	10	25	15	25	20	30	20
Child: 1-3 years	160	60	50	25	25	240	65	40	½	20	10	40	25	40	30	50	35
4-6 years	230	60	50	25	30	240	80	50	½	20	10	45	30	50	40	75	50
7-9 years	320	60	50	20	25	150	95	60	½	20	10	45	30	65	50	150	100
Boy: 10-12 years	390	120	100	20	30	100	160	100	½	20	15	80	50	65	50	150	100
13-15 years	450	120	100	20	30	-	175	110	½	20	30	110	70	130	100	150	100
16-19 years	460	120	100	30	40	-	195	120	½	20	30	110	70	130	100	150	100
Girl: 10-12 years	370	120	100	20	25	100	160	100	½	20	15	80	50	65	50	150	100
13-15 years	370	120	100	20	30	-	175	110	½	20	20	110	70	130	100	150	100
16-19 years	350	60	50	20	30	-	175	110	½	20	20	110	70	130	100	150	100

cont. Table II. Recommended Dietary Allowances for Filipinos Per Day for Specific Food Groups

Reference Person	ENERGY FOODS					BODY BUILDING FOODS						REGULATING FOODS						
	Cereals (rice)	Kamote/ Potatoes/ etc.		Sugar	Fats/ Oils	Whole Milk	Fish/Meat/ Poultry		Eggs		Dried Beans Nuts/Seeds	Leafy/Yellow Vegetables		Vitamin C-Rich Foods		Other Fruits/ Vegetables		
		A.P. / E.P. gm	A.P. gm				E.P. gm	A.P. / E.P. gm	A.P./ E.P. gm	E.P. gm		A.P. gm	E.P. gm	A.P. pc.	E.P. gm	E.P. gm	A.P. gm	E.P. gm
Pregnant: (2nd & 3rd trimesters)																		
13-15 years	390	120	100	25	35	200	210	130	1	40	20	110	70	195	150	225	150	
16-19 years	370	60	50	25	35	200	210	130	1	40	20	110	70	195	150	225	150	
20-39 years	350	60	50	25	35	200	210	130	½	20	20	110	70	130	100	225	150	
40-49 years	340	60	50	25	25	200	210	130	½	20	20	110	70	130	100	225	150	
Nursing: (1st 6 months)																		
13-15 years	420	120	100	25	35	200	260	160	1	40	20	155	100	195	150	225	150	
16-19 years	400	120	100	25	35	200	260	160	1	40	20	155	100	195	150	225	150	
20-39 years	380	120	100	25	35	200	260	160	1	40	20	155	100	130	100	225	150	
40-49 years	370	120	100	25	25	200	260	160	1	40	20	155	100	130	100	225	150	
Nursing: (next 6 months)																		
13-15 years	390	120	100	25	35	200	210	130	1	40	20	155	100	195	150	225	150	
16-19 years	370	60	50	25	35	200	210	130	1	40	20	155	100	195	150	225	150	
20-39 years	350	60	50	25	35	200	210	130	1/2	20	20	155	100	130	100	225	150	
40-49 years	340	60	50	25	25	200	210	130	1/2	20	20	155	100	130	100	225	150	
Recommended Intake*																		
Gm. per capita per day ³	334	73	61	24	28	82	151	94	½ pc.	21	17	89	57	74	57	134	89	
Kg. per capita per year ³	122	27	22	9	10	30	55	34	183 pc.	8	6	32	21	27	21	49	32	
Food Wastage**																		
Gm. per capita per day	15.4	10.9	9.1	<0.1	0.1	<.1	3.7	2.3	-	<0.1	0.1	1.3	0.8	0.5	0.4	3.8	2.5	
Kg. per capita per year	5.6	4.0	3.3	<0.1	<0.1	<.1	1.4	0.8	1/5	<0.1	<0.1	0.5	0.3	0.2	0.2	1.4	0.9	

NOTE: To meet iron, B1 and B2 requirements, use internal organs 2-3 times a week.

*Excluding edible wastage

**For planners, food waste from pots and pans, plates, etc. should be added to recommended intake.

¹A.P. as purchased

²E.P. edible portion

³Based on 1977 population structure (NCSO low assumption)

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Nutrition and Social Scale:

The Impact of Social Differentiation on Dietary Intake

by Josefino M. Magallanes

Abstract

This study takes as its basic problem the understanding of the influence of community structure upon the dietary intake of families. The principal hypothesis is that a group of households having higher social characteristics, in terms of the level of household income, occupation and education, is associated positively, and in terms of household size, is associated negatively, with adequate food intake.

To determine the existence of such relationships, a multi-focused survey, stratifying populations into three strata, and selecting random samples in a two-stage design, was employed. The logic of this design proceeds from the assumption that the strata correspond to three different social changes that had happened to them. These social changes that have occurred in varied ways are the principal uncontrolled factors influencing their social behavior differentially; the other disturbing factors are assumed to have affected them equally.

The results of the study showed that the strata had been essentially different in relevant variables during the

survey. By the logic of the design, such hypothesized differences between strata are attributed to the social factors of income, occupation, education, and household size. Against this logical background, food intake was examined to ascertain whether there is a concomitant increase observed in stratum 1. Indeed, higher average food intake, nutrient status, and food expenditures, were observed in stratum 1, relative to other strata.

Because of the weakness of the design, further multivariate analysis using multiple regression as the method of study was conducted. The conclusion in this section was the same, such that in areas of households with high level of income, education, occupation, and small household size, there was also an increase in average food intake, nutrient status, and food costs. In addition, an important insight coming from multivariate analysis is that household size has been found to influence food and nutrient intake most significantly and that household real income has shown to have the strongest influence in food costs only.