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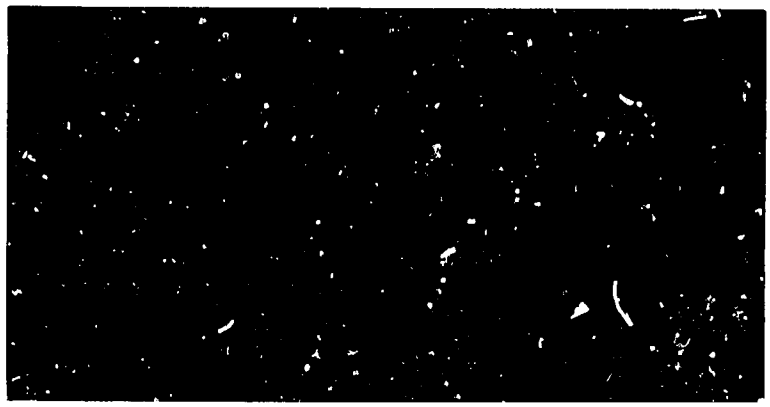

U.S. Department of Agriculture
Office of International Cooperation
and Development
Technical Assistance Division

IN
COOPERATION
WITH

U.S. Agency for International
Development
Bureau for Science and Technology
Office of Nutrition

NUTRITION ECONOMICS GROUP

The Nutrition Economics Group was created in 1977 with funding from AID under Project 931 "Nutrition: Economic Analysis of Agricultural Policies." The Group's full-time staff of economists and other social scientists is available to assist AID and developing country agricultural planners and analysts develop, implement and evaluate their food and nutrition programs and to evaluate the impacts of their agricultural policies and programs on people's food consumption and nutrition. With its location within the Technical Assistance Division of the U.S. Department of Agriculture, the Group is able to draw upon a wide variety of other agricultural specialists to complement its work.

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Intra-Family Food Distribution: Review of the Literature and Policy Implications

August 1983

NUTRITION ECONOMICS GROUP

Office of International Cooperation and Development
Technical Assistance Division

U.S. Department of Agriculture

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FORWARD

The Nutrition Economics Group was created in 1977 to assist AID's Office of Nutrition and is located within the Technical Assistance Division of the Office of International Cooperation and Development of the U.S. Department of Agriculture. It has a multidisciplinary staff of economists and other social scientists who assist AID in the implementation and evaluation of a program of applied research and technical assistance designed to assist developing countries integrate food consumption and nutrition concerns into their agricultural planning, programming and policy making processes. The Group is also concerned with AID agricultural projects and how to improve their consumption/nutrition impacts through better design, implementation and evaluation. In line with this objective, the Group has provided technical assistance to project design efforts in Burma, Guatemala, Indonesia and Panama. The Group also designed a curriculum and implemented a pilot workshop for training AID agricultural and rural development officers on food production/consumption linkages in project design and other programming uses.

The present study responds to a growing demand for information on the extent to which individual members of households will be positively affected by the increases in food availability that can be brought about as a result of improved government policies and/or specific agriculturual development programs and projects. Implicit in the design of most agricultural development projects, for example, is the assumption that increases in food production will benefit all farm household members equally. Such cannot be a foregone conclusion, however. Especially since it is also widely believed, for example, that differences in the distribution of food among household members accounts for the prevalence of malnutrition among women and children.

This report reviews the literature on the subject of how food is distributed within households in developing countries. It begins with a brief review of some examples of the types of information which are available on intra-family food distribution. This is followed by a general discussion of how food flows through a household and what factors influence its distribution at various stages. The report then reviews twelve dietary studies in detail and identifies several types of distribution patterns implied by these studies. The report concludes with a discussion of the policy and planning implications of intra-family food distribution and identifies needs for further research.

The report represents the collective efforts of several Nutrition Economics Group staff members. Most of the basic literature was pulled together for the Nutrition Economics Group by a consultant, Grace Horowitz. Linda Smith, a former member of the Nutrition Economics Group, is responsible for the discussion of the theoretical structures within households which influence the distribution of food within families and the classification and discussion of the patterns of intra-family food distribution uncovered by the dietary studies reviewed. Gary Smith, a Nutrition Economics Group economist, wrote the chapter on policy implications.

At the beginning of the study, we hoped that we would be able to say something more definitive about the importance of intra-family food distribution as an issue and whether, where and to what extent the inequitable distribution of food within families presents a major development problem. We also had hoped to be able to say more about the social, cultural and economic determinants of intra-family food distribution and "What policy changes would produce more equitable distribution of food and other family resources resulting in more adequate food consumption especially for the vulnerable groups in the population?"

The nature of the literature on this topic, however, precluded us from accomplishing most of our original objectives. Although we found a lot more literature related to this topic than we originally expected, very little of it provides any concrete information on the problem — its magnitude or determinants. Most of the literature is annecdotal, and what is available from more carefully designed and implemented studies often suffers from definitional and methodological flaws that limit the conclusions that can be drawn.

Our current aim is a more modest one — that the report will assist those who are interested in exploring this topic further to better organize and focus their efforts.

Roberta van Haeften
Leader, Nutrition Economics Group
August 1983

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INTRODUCTION

This report was written to raise the issue of intra-family food distribution among policy and program designers, implementers, and evaluators working in developing countries. The objective is to get people thinking about how and why food is distributed within families and how these patterns differ in different socio-cultural settings. The questions of how such patterns are influenced by economic development and what policy and program changes are likely to affect intra-family food distribution, both directly and indirectly, are also discussed. Again the objective is to get people thinking about which of their actions are likely to influence intra-family food distribution and whether these actions are likely to have positive or negative impacts.

The report begins with a brief review of the evidence on intra-family food distribution and, in particular, the evidence of inequitable distribution. This is followed by a general discussion of the structures within households which influence intra-family food distribution (IFFD hereafter). The report then examines some actual patterns of IFFD uncovered by selected dietary studies, discusses the policy implications of IFFD, and identifies needs for further research.

Background

Studies from as early as the mid-Nineteenth century have revealed problems of inequities in food distribution and consumption at the family level. In his estimation of English consumption patterns conducted in 1864, Dr. Edward Smith describes the pattern of differential distribution common in rural areas:

> The wife, in very poor families, is probably the worst fed of the household. On Sundays she generally obtains a moderately good dinner, but on other days the food consists mainly of bread with a little butter or dripping, plain pudding and vegetables for dinner or supper, and weak tea. She may obtain a little bacon at dinner once, twice, or thrice a week; but more commonly she does not obtain it. In counties where milk is abundant she adds it more freely

> to her tea, but when otherwise, she drinks tea without milk, and during a part or the whole of the week without sugar also.
>
> [The husband] . . . in the poorest agricultural families is certainly better fed than any other member of the family, for his labour being of the deepest importance to the family, the wife feels that he must be sufficiently fed if possible . . . Hence he obtains nearly all the meat or bacon, where there is but little, and the week's supply, after the moderately good Sunday's dinner for all, is reserved . . . [for him] . . . He must also have a larger share of the bread, and in Dorsetshire, where cheap cheese in great part supplants bacon, the cheese, also. The beer and cider, moreover, have some nutritive value, and they belong exclusively to him . . . (E. Smith, 1864a, quoted in Oren)

A. P. den Hartog, in an article entitled "Unequal Distribution of Food within the Household," recounts several historic studies of unequal food distribution[1] and reports:

> In Scottish mining families it was observed during the last World War that the meat ration for the family was consumed almost entirely by the father, while the children and the mother ate unrationed substitutes. A division of available food supplies favoring the father or wage-earner was found among U.S.A. mining families during the depression of the '30s (Ritchie, 1963). Until quite recently in several countries of Western Europe among low income groups, the best part of the food such as meat was reserved for the father. (den Hartog, p. 9)

More Recent Findings

More recent nutrition surveys have been conducted which clearly show differential nutrition status or food consumption between sex and/or age groups. For example, Jon Hitchings found the rate of malnutrition for girls from one to two years of age in Kenya was 50 percent higher than that for boys of the same age (Hitchings, I.3-1). Furthermore, among mixed sibling pairs, the female

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[1] "Unequal" food distribution means that some family members receive less than their proportional share of available family food in comparison with their need for essential nutrients as determined by such criteria as "Required Daily Allowances" (RDA's) established by the United Nations Food and Agricultural Organization (FAO).

child was typically more malnourished than the male child, thus indicating differential treatment within the family. In Colombia, the malnutrition rate for young girls was one third higher than for young boys (Drake and Fajardo).[2]

The National Nutrition Survey of Ghana found that food distribution in the family was very unequal. Adult men and women received from 80 - 100 percent of their energy requirements, while children received between 55 - 70 percent. In the forest zone of Ghana, protein consumption was about sufficient for adults, but 50 percent below requirements for the youngest children and 30 percent below for other children (Davey, 1962).

Similarly, the Liberian National Nutrition Survey " . . . indicated that the intrafamily distribution of protein-rich foods especially favored the adults at the expense of the child's food intake" (Goldman, p. 76). Among adults, it is not uncommon to find more clinical signs of malnutrition in pregnant and lactating women. Inequitable distribution often has a particularly detrimental impact on nutritionally "at risk" groups such as infants, children, and pregnant and lactating women.

Furthermore, IFFD poses a problem for nutritional status at the national level despite economic development. Heather Goldman, in her Liberian nutrition study, emphasizes that

> . . . often the available food supply [in a country] is simply inadequate. Nevertheless, the nutritional deficit may be aggravated in some cultures by a food distribution system at the household level whereby some household members do not receive their share of available foods. . . . Intra-family food distribution can also mean that economic development will not automatically lead to an improvement of the food supply at the household level. (Ibid., p. 80)

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[2] A distinction should be made between nutrition and consumption surveys. The main objective of nutrition surveys is to obtain medical and anthropometric data related to foods and nutrients consumed during a specified time. Consumption surveys seek data on quantities and kinds of foods consumed, expenditures for foods and other commodities, and consumer response to changing incomes and prices.

Some of the more advanced developing countries provide additional evidence of the truth of her statement. In a World Bank study of food distribution and nutrition intervention in Chile, Lloyd Harbert and Pasquale Scandizzo write:

> Chile is not a food-deficit country in the sense of many Asian or African countries. Calorie availability per capita (2,734 calories/capita/day in 1972-74) is well above average per capita requirements (2,400 calories/day). The problem is instead one of distribution both between households in different income groups and between the individual members of the family. (Harbert and Scandizzo, p. 13)

The patterns of IFFD are determined by a combination of cultural, economic, and family social dynamics. Different societies often have different IFFD patterns. Moreover, the patterns within a society may shift in the short run depending, for example, on the seasons of the crop cycle or periods of religious fasts and feasts. In addition, different patterns may coexist within the same society from one income level to another. Identification and understanding of these patterns can enable a nutrition planner to target and assist malnourished groups more effectively; conversely, lack of understanding of these dynamics can render ineffectual even extensively planned nutrition interventions. Finally, in the longer run both nutrition and overall agricultural and urban sector planning must be coordinated to insure consistency of supply of and demand for food at all levels as supply increases with advancing development.

INTRA-FAMILY FOOD DISTRIBUTION (IFFD): THEORETICAL STRUCTURES OF INFLUENCES ON FAMILY PATTERNS

The term "intra-family food distribution" is often used in a general way to indicate how food is allocated among members of a family without specifying whether or not this takes into account food obtained by family members, as individuals, outside the household. Often the amount of food actually received by individual family members differs from the amount of food they are allocated within the household. Food obtained and eaten outside the household can significantly augment an individual's consumption. In this paper, the abbreviation "IFFD" will be used to refer to intra-family food distribution. The term "household IFFD" will be used to refer to the distribution which takes place within the household, including the allocation of foods to individuals from meals, home snacks, and sack lunches. "Total IFFD" or simply "IFFD" will be used to refer to the broader concept.

Three major phases of the food and resource distribution process can thus be identified which affect the allocation and consumption of food by individual family members. The first is general household food availability which in large part is determined by household food production and income levels. The second is the household intra-family food distribution, and the third is the supplementary consumption by individual family members outside the household.[3] Each of these phases can be seen in greater detail in Figure 1, which is a simplified schema of the flow of resources to and within the family.

The lower half of Figure 1 is of most interest for this study. This portion is amplified in Figure 2. Figure 2 also shows some of the factors

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3 The assumption here is that household consumption is the main source of nutrients. This may not be true for certain family members or for a given day. Such possibilities might affect the analysis of IFFD patterns.

Figure 1:
Resource Flows Affecting IFFD

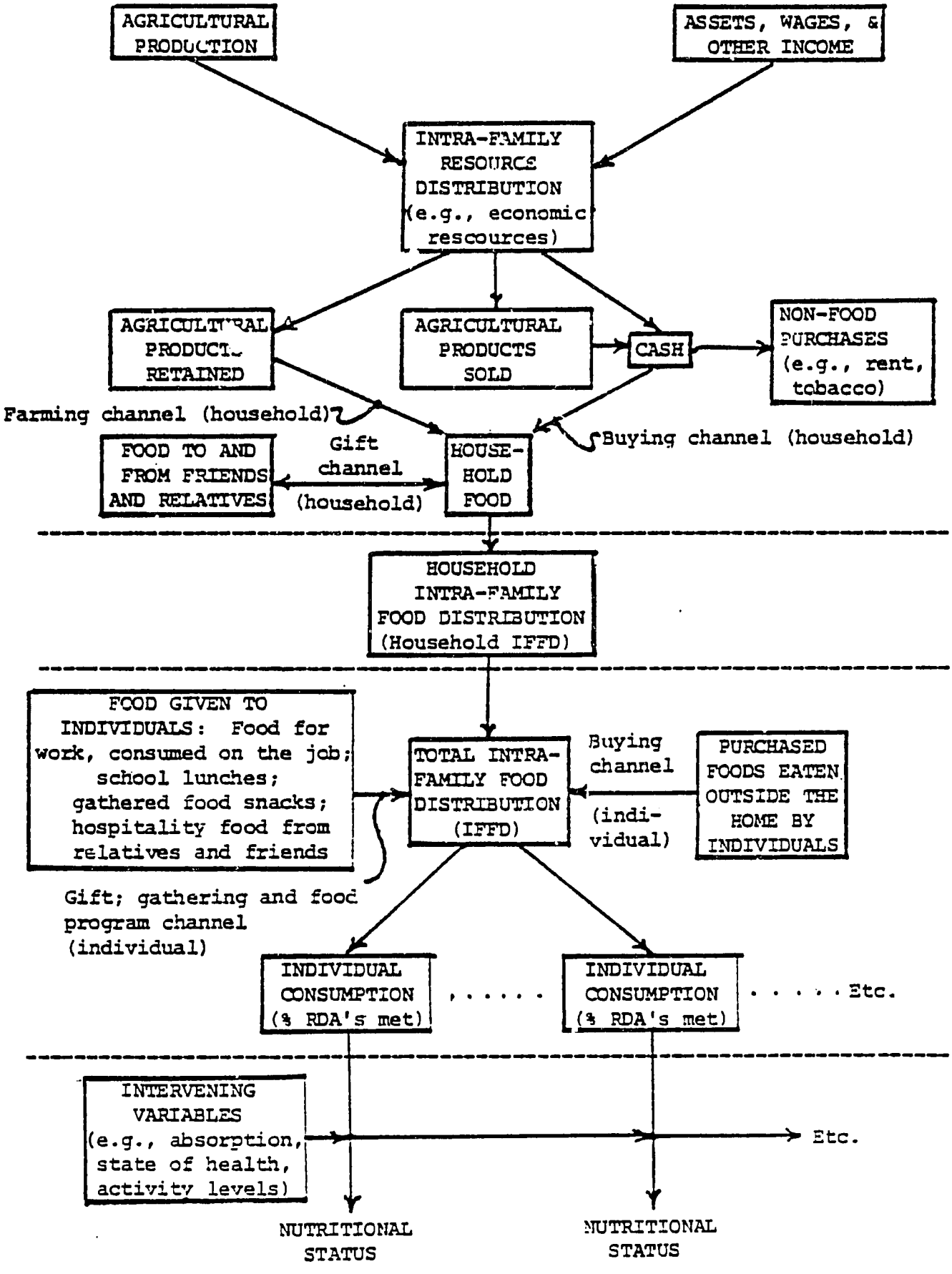
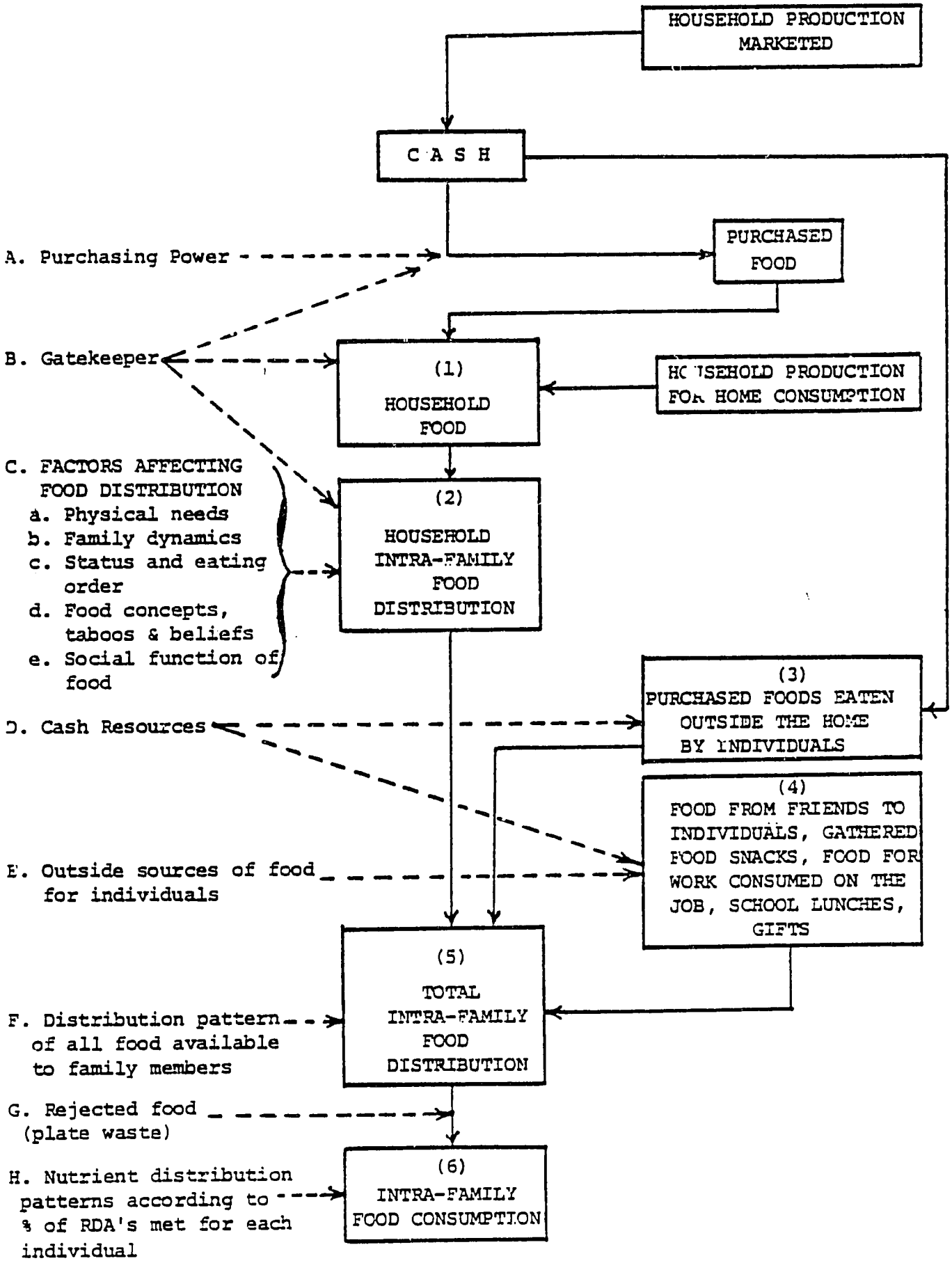


Figure 2

The Food Distribution/Consumption Sequence and Intervening Factors



having critical impacts on the steps of the IFFD process and the flow of resources (nutrients) from one step to another. These are discussed in more detail throughout the next sections.

Note that the distinction is made in both diagrams between total IFFD and household IFFD as defined above. Note also that the distribution of nutrients is not necessarily equal to the consumption of nutrients. Food left on the plate after a meal (which may not, however, be a common ocurrence in the lowest-income families) must be subtracted from the distribution portion of nutrients to obtain actual consumption.

Income/Resource Level, Household Food Availability, and IFFD

The income level of a family, including home food production (income in kind), delimits the amount of food resources that are available to be distributed. As consumption analyst and nutrition specialist F. James Levinson stresses, "There probably is no more important determinant of food intake for the population as a whole than income" (Levinson, p. 51). The key aspect of income relevant to nutrition is how much and what kind of food it will command: What total nutrients are available for the family? How discretionary or coercive is the purchasing context?

Refering to the three phases defined earlier, the first phase (general household food availability) precedes the family dining context, but can nevertheless affect the distribution of food. The variables here affect the overall family food stock and thus set the stage for family decisions about what pattern of IFFD will be followed.

In this context, an analyst can ask a series of questions: What is the family's total income level? How much money is available for food purchases?

How much food from the family's production is available for its own use? Who are the income earners, and does this affect whether the money is used for food or other purchases? What is the buying power of cash income? What season of the crop cycle is represented in data about the household, and how representative a crop year is it? All of these factors can significantly affect household food availability and force families to make decisions about who has eating priority.

One influential theory of decision-making concerning household food availability postulates "channels" by which food moves step by step to the dining table. Food is usually obtained by each household through one or two main channels: a buying channel and a production channel. A gift channel may also be added. Entrance into and distribution within a channel may often be affected by "gatekeepers" (Lewin, quoted in den Hartog). These are men or women who may control one or more of the channels.

Home food production and cash spent on food items contribute to the quantity and type of household food (represented by Box 1 of Figure 2). If food is produced at home, particularly with family garden plots, the person in charge of this can serve as a "gatekeeper." That person may make decisions which determine what types of crops are grown, when they are harvested, how much is to be sold on the market, what is kept for home consumption, and what quantity and combination of foods are to be picked and prepared for the day's meals. Each of these has implications for nutrient availability. The conversion of cash into food brought home is affected greatly by market purchasing power and the selection decisions of the purchasing "gatekeeper." Again, within budget constraints, this person may determine how much and what combination of nutrients are available in the household for meals. Often the pattern of foods selected changes as incomes rise and more expensive foods are purchased.

The person who prepares the meals may also be a "gatekeeper." This person makes decisions about combinations of foods served together, what is to be discarded when trimming and preparing foods, as well as about the form and duration of cooking. This can greatly affect the amount of nutrients lost, particularly from prolonged cooking, prior to serving the food to the family.

The income and food availability level may affect both the pattern of food apportionment within a family and the total volume of food reaching the distribution step, thereby determining whether or not inequitable IFFD will have serious consequences.

Intra-family patterns of food distribution may differ at different levels of income and food availability. Families at higher levels of income or food availability may distribute food differently than families at lower levels of income or food availability. Families may also change their distribution patterns as food becomes more abundant or scarce. At higher income levels or during excellent crop seasons, the total amount of food available may be more than sufficient to meet all of the family members' nutritional needs. In this case from a public policy standpoint, it may not matter if food is distributed inequitably -- except for the undesirable consequences of obesity[4] -- as long as all family members meet their minimum nutritional needs. In other words, IFFD patterns may be distinctive and/or inequitable but policy irrelevant if all family members are sufficiently nourished.

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[4] In food scarce societies, overconsumption in high income households may also affect the amount available or the price of food for other households, and thus indirectly affect IFFD patterns elsewhere.

At the lowest income levels where total food availability is inadequate for the household no matter how it is distributed, the IFFD considerations are quite different. First, it must be recognized that somebody (or everybody) suffers. At the level of severest consequence, decisions have to be made consciously or unconsciously about who lives or may die. Food deficient households may opt to increase the distributional inequity or decrease it. One distributional tactic is to lessen the food allocations to some members of the family so that others can survive. Often the youngest members of the family suffer the most, although it would take the smallest quantities of food to maintain their health. Frequently the wage earners are favored (sometimes with higher consumption than nutritionally necessary) so that continued income can be procured to feed the family. Another distributional tactic is to share the nutrient deprivation equitably in the hope that all can survive, though at a lesser level of activity and health.

At the intermediate economic levels where sufficient income and or food is available to meet all household nutritional needs, the questions of IFFD and whether to intervene and if so what policy and program interventions are appropriate may be posed somewhat differently but may be equally pertinent. Where some family members are deprived while others overconsume, further investigation is necessary. Is income diverted to non-food purchases that should go to increase food availability? If sufficient household food is already available but maldistributed, what underlies the inequities? Is there widespread ignorance of differing nutritional needs according to the ages of individual family members? Is any sex or age group favored over another, reflecting cultural values?

However, income and family food production levels only account for part of household nutrition problems. Actual IFFD and other important considerations ocurring within the household are discussed in the next section.

Food Distribution Within the Household

The second phase of food distribution contributing to IFFD includes what actually happens within the household as food is being apportioned. The variables here mostly involve the dynamics within the family but also are reflective of the culture. Is there favoritism in relation to age or sex? What is the knowledge level of nutritional needs, both in terms of stage of life and nutrient diversity? To what extent are cultural food beliefs followed within the family, and does this have a differential effect on certain family members?

At this stage of IFFD there are also "gatekeepers" who may play the major role in distributing the household food. The food preparer usually has control over any tasting or nibbling from the kitchen stewpot by her/himself or other family members, particularly children. In some cultures or family settings, one person serves the food for the whole family, and is thus also a type of "gatekeeper." This person would determine and serve the portions for each family member, giving larger portions or choice pieces to certain individuals. Even in cultures or family settings where each individual serves her/himself, it may still be necessary to obtain apporval for the serving size or additional servings from the "gatekeeper" or authority figure. Furthermore, someone (usually the mother) still must play a gatekeeping role and serve infants and small children. In a less tangible sense, "gatekeepers" also exist to oversee the appropriate food distribution according to cultural food avoidance beliefs. Taboos and food beliefs are often passed down by elders or other authority figures in the household and carried out under their watchful eyes.

In an important exploratory article about IFFD entitled "Unequal Distribution of Food Within the Household: A Somewhat Neglected Aspect of

Food Behavior." A.P. den Hartog points out that the actual distribution of food among members of a household has both a physiological and a socio-cultural basis. Aspects of each of these may be taken into consideration as food is allocated to different family members.

Considerations of Physical Needs

Individual physical need may be considered and estimated in distributing food among family members. The physiological considerations are "influenced by factors such as differences in sex, age, and physical activity " (den Hartog, p. 12).

However, since in so many developing countries there is a limited knowledge of what proteins, calories, and other nutrients are[5] -- let alone some idea of what each family member requires -- the consideration of physical need may not go beyond simple assessment of size and who does the hardest physical labor in the family. In a study of Tamil Nadu, the Sidney Cantor Associates suggest what they call the "silhouette hypothesis." Food is allocated within the family "according to the relative two-dimensional size of the different family members: i.e., height or length by width, or the face-on-body silhouette (USAID, Tamil Nadu, p. 103). According to this hypothesis, there is a lack of perception of additional needs

> . . . for growth and development, including pregnancy and lactation, the drecreasing requirements with advancing age in adulthood, and failure to understand or attempt to cope with the special problems affecting he weaning child. (Ibid., p. 106)

The silhouette hypothesis emphasizes that often IFFD is not decided on

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5 See, for example, F. James Levinson and USAID, Tamil Nadu. Respondents in both of these surveys displayed a limited knowledge of nutrition concepts such calories, proteins, vitamins and minerals.

the basis of correct nutritional needs, but it does not postulate what positive family norms are operative in the decision-making. Sheer size is one consideration, but many other family and cultural norms affect who gets what at the dinner table.

Cultural Factors Influencing IFFD

Katona-Apte stresses the need for analysis of the role of a wide variety of cultural factors which contribute to varying nutritional status among family members (Katona-Apte, 1977). She sketches a profile of current value systems concerning food and gives examples of cultural norms, taboos, and food beliefs existing across the Third World that have a detrimental impact on nutritionally vulnerable groups. Her examination

> . . . does not include data on the frequency with which the customs described are put into practice . . . [but] it nonetheless offers a possible explanation for the poor nutritional state of the pregnant and lactating woman and preschool-age child. (Ibid., p. 89)

She strongly emphasizes that this

> . . . type of analysis is also likely to be helpful in predicting the degree of acceptance and discerning the the nature of resistance to any systemic and developmental changes regarding diet and other food related health aspects. (Ibid.)

den Hartog points out that some of the most important socio-cultural factors influencing food distribution include the social position of the members of the household; who has the first choice of the food; the sequence in which meals are served; attitudes towards food; food as an expression of prestige and the obligations of hospitality (den Hartog, p. 8).

The major socio-cultural factors affecting IFFD thus can be categorized as follows:

(a) The prevailing concept towards food (e.g., What foods are to be avoided, what constitutes choice cuts of meat, what portions of fruits and vegetables should be discarded);

(b) The economic and social position of family members in the society and in their own household;

(c) The social function of food in society and in the household, (e.g., reciprocities/exchange manipulation, status and roles of individuals, structural relationships), (See den Hartog).

Prevailing Food Concepts Often family members or -- most critically -- those who prepare and serve the food, have no concept of what constitutes a balanced diet or that diet can promote good health. The privileged food consumers in the household may not even comprehend that they are depriving other members of essential nutrients. In some cultures, the main staple is thought to be sufficient, and all other food is considered to be unnecessary, but pleasurable, "extras." den Hartog summarizes some of these traditional prevailing food concepts:

> In tropical Africa . . . people think primarily in terms of staples such as millet, sorghum, maize, yam, or cassava. . . . Fish and meat are appreciated for their flavor. Meat is not always considered as a "food" by the population because, as Goody (1967) observed of Northern Ghana: 'meat cannot sustain a man in the way that Guinea corn does.' When children have received their staple food, parents believe they have fulfilled their duty and see no reason why they should also specially prepare and give the tasty morsels, such as meat, to the children and not keep these mainly for the adults. In the Korean language, 'rice' and 'food' are synonymous. Anything which is not rice is referred to as 'pan chan' which means side dish or accompaniment. Side dishes are regarded as a little more than condiments, so their significance in the diet is not really understood. (Ibid., p. 14)

Societal food beliefs and taboos play a special role in how food is allocated among family members. Food avoidances observed by the whole

household or culture limit what foods are used at the household level, but will not usually have a differential impact within the family. However, group-selective and temporary food avoidances may contribute to consumption differentials among family members, and food taboos can cut across kin groups, e.g., family clans, with possible consequences for IFFD. Group-selective taboos and food beliefs are imposed on or reserved exclusively for a group, category, or class of people within the culture. Historical examples include taboos restricting wild game meats to men only or beliefs that leafy green vegetables are only for women and children.

Temporary food avoidances may involve limiting an individual's consumption during a short-tem condition, such as not giving food to a sick child. Other temporary avoidances apply to groups of individuals during certain periods of the life cycle. For example, taboos may forbid pregnant women or infants from eating eggs. The groups that are the most frequent subjects of taboos and food beliefs which dictate withholding specific foods are women during pregnancy, breast-feeding, and menstruation; infants; children during the period of weaning; and adolescents going through puberty (see den Hartog; Vemury and Levine, 1978; and Katona-Apte). It is no coincidence that many of these categories of family members are among those classified by nutritionists as the most nutritionally "vulnerable."

Economic and Social Position of Family Members. The economic and social position of family members plays a strategic role in determining the household dynamics of IFFD. den Hartog points out that "Differences in position will generally lead to inequalities in the distribution of food" (den Hartog, p. 13)

The traditional economic role of a family member often influences his/her perceived position within the family, even in cases where roles are being redefined. den Hartog examines how this ties into differential food distribution:

> In some societies the well-being of the household depends to a large extent on the functions of the men, in doing the hard physical work and/or as protectors of the household. Food behavior is probably to a certain extent attuned to the physical requirements of these men by giving them the best parts of the available foods. This may be one of the reasons why not only in Europe among lower economic classes but also in other parts of the world the best portions of food were given to the breadwinner. As a result of economic development in several parts of the world, men are doing less physical work, women are doing an equal share or perhaps more, and the function of being a protector is taken over by the government. Despite these changes, in many societies men still claim the best part of the food--a food behavior which was perhaps justified once but not any longer. (Ibid.)

In many traditional African cultures, the women are the economic providers of the household food, whether through farming or through using their earnings to buy food supplies. Despite their economic position, they are not given priority in food service. This is either reflective of the fact that their economic position is socially valued less than other members' and/or that other social status aspects come into play.

The prestige of family members is important in the distribution of food during meals. As den Hartog states, "In most societies adults have more prestige than the young and this will be reflected in the food behavior since the members with more prestige in the family will receive their food first, leaving less for the other members." (Ibid.) The respect for elders and the elderly often results in greater portions of food for them. The ascribed authority of men over women and children or the esteemed value of men over other family members may result in greater and more nutritive

allocations to men in excess of their proportional nutrient requirements. "The better parts of the food are destined for the man as he also takes the leadership in the distribution. Thus meat is often considered as the husband's food," says den Hartog (Ibid.). Families may discriminate outright against the female members and young children as a reflection of general societal cultural values, while in other societies, children may be given clearly preferential quantities of food, despite their lesser nutritional requirements relative to adults, due to their special social and/or economic positions.

The traditional eating order usually follows the family social hierarchy and affects who gets what during family meals. Often guests, men, and adults are served first. In some cultures, the men eat separately from the rest of the family. Priority in an eating order may also mean priority in size of servings and selection of choice pieces. This does not necessarily equate into unequal distribution where first-served individuals willfully abstain from taking larger or choicer portions. Also, children may be served separately and before the rest of the family but not given priority foods.

Individual family politics related to position may also affect distribution patterns. Favoritism may be shown to a particularly endearing child which is concretely manifested by allowing the child bigger portions of food than other siblings. Another example would be the pushing and shoving of children around a common bowl. Here the older and stronger children would have an advantage in procuring sufficient food for themselves.

The Social Function of Food. The social functions of food in the household as well as the society can be divided into five main categories: (1) a means of cultural identity; (2) an expression of economic wealth and

status; (3) a religious and magic function; (4) a gastronomic or pleasurable function; and (5) a means of communication (den Hartog, p. 14). Of these functions, the expression of status and means of communication have perhaps the most influential relationship to food distribution within the home, as den Hartog points out:

> Members of a household who have a high social position are entitled to the best part of the food. Another aspect is that they need these foods as a means to maintain and reinforce their prestige. Women may give the best parts of food to the men and/or children as a means of expressing their affection or love. To keep back or give less of some highly appreciated parts of a meal such as meat to a husband may create the fear of not fulfilling one's duty as wife, with the danger of losing the affection of the husband. (Ibid.)

Many studies stop here with meals and snacks within or from the household in their attempt to assess food distribution and consumption by families. However, food allocations within the household often do not encompass the totality of what a family member has access to and consumes. The distributional pattern is not completed until opportunities for outside consumption are examined.

Access to Supplementary Consumption. The third phase contributing to total IFFD includes all of the opportunities for consumption outside the household that are available for individuals and not the family as a whole. Like the income-related phase, this third set of variables occurs outside the immediate family context. However, it has a direct selective impact on individuals within the family. Unlike the other phases, there are usually no gatekeepers that control key distribution points for the whole family. This stage is decentralized and determined largely by individual access opportunities. The extra food

can make an important difference in individual consumption levels, and sometimes affect the consumption levels of other family members.

Purchasing foods to eat outside the home presupposes the capability, the opportunity, and the cash resources to do so. Obviously, this avenue of procuring food is not open to infants and very young children unless conducted by an older family member. In societies with cultural restrictions on mobility or public appearance, certain classes or groups of people such as women in Muslim cultures, may have limited opportunity to augment their consumption through outside purchases. Even in less restrictive cultures, conditions such as family care obligations which tie women to the home may limit purchasing opportunities. Since cash resources and exposure to opportunities are necessary, wage earners are more likely to purchase food and beverages outside the home for their own personal consumption. Such consumption can have a negative impact on other family members to the extent that: (1) the money spent was needed to purchase general household food; (2) the prices paid for the foods were higher than comparable foods prepared at home, thus obtaining less nutrients per currency unit; and (3) less is consumed by the individual at home and more is left in the family pot to be distributed among the other family members.

Outside sources of food which do not involve cash transactions can also provide added nutrients for different family members, again dependent on different exposure opportunities which tend to favor certain members. In some cultures, children significantly augment their food consumption by begging or getting food treats from nearby relatives they visit. Berries and other wild gathered foods may provide impromptu snacks and thus needed nutrients. More formally, food may be provided on the job or at school for certain members of the family. Consequently, these individuals'

consumption may be augmented or better balanced, while other family members' consumption levels remain the same.

Total IFFD, Intra-family Food Consumption, and Nutritional Status

The sums of all food allocated within the household and all food otherwise procured outside the household are combined to derive the total amount of food available to family members. It is the individual members' portion of this total that would reflect distributional patterns according to family dynamics and access to food. Actual consumption is derived by subtracting plate waste and food discarded by the individual. This wasted food usually is by the decision of the individual and not a function of restricted access or family dynam_. Wasting food may be an ill-afforded luxury in some households.

A seemingly adequate individual consumption level, as evaluated by comparing it to the recommended daily nutrient allowances for that person, may not necessarily equate with good nutritional status. Many variables such as the state of health, parasitic infestation, infection, and incapability of absorbing certain nutrients intervene between an individual's consumption and his/her actual nutritional status.

PATTERNS OF INTRA-FAMILY FOOD DISTRIBUTION (IFFD)

The preceding chapter has elaborated on the factors which influence the patterning of food distribution. This chapter will describe actual patterns uncovered through dietary studies conducted in various Third World countries. The data and analyses of twelve major dietary surveys measuring individual intake were examined to detect common patterns of intra-family food distribution.

Six of these were studies with data on all individuals within a family or household, with the possible exception of nursing children (whose consumption is difficult to measure).(see Table 1). Such surveys provide the most comprehensive view of the total family distribution pattern. Five studies give the results of partial family comparisons, such as between two age groups or between one age group and the rest of the family as a block unit. Analysis of these is severely handicapped by the aggregation of data from groups with distinctly different consumption levels. Finally, one study intensively examines distribution patterns within a key nutritionally vulnerable cohort group. Generally, a study of such limited scope would be the least adequate, unless conducted with the great care and invaluable supplementary information found in this particular study.

Most of the studies examined here attempt to measure total consumption for the individuals surveyed. However, two measure meal nutrients only. Almost all of the surveys pair nutritional status data with the dietary intake measurements.

Three relatively simple patterns and several more complex patterns emerge. Basically, these can be categorized as: (1) Equal distribution

TABLE 1

Extent of Family Covered by Data Collection

DISTRIBUTION PATTERN	FULL FAMILY	PARTIAL FAMILY	COHORT GROUP
Equal Distribution:	Harbert & Scandizzo USAID-Calcutta		
Distribution by Age:	Nicol	Flores, et al.* Goldman* Selinus* Swanberg & Shipley*	
Distribution by Sex:	Nicol (one village)		Levinson
Complex Pattern:	Evanson, et al. Gurney & Omololu USAID-Tamil Nadu	McFie (over 4 years)	

*Young children's consumption contrasted with rest of family as an aggregate figure

according to need; (2) Unequal distribution with age as the dominant factor; (3) Unequal distribution with sex as the dominant factor; and (4) Unequal distribution with several major factors contributing to a complex pattern.

Few of the studies present much discussion of behavioral aspects affecting or determining food distribution patterns within the family (see Table 2). Most simply give static quantitative data with little or no examination of the family dynamics which account for the existing distribution pattern.

Equitable Distribution

Only two studies suggest that nutrients are relatively equally distributed among family members according to physical need. Both involve large-scale surveys.

TABLE 2

Extent of Cultural and Behavioral Information Related to IFFD

EXTENSIVE	SOME	LITTLE
Levinson	Evanson, et al.	Harbert & Scandizzo
Selinus, et al.	Flores, et al.	Gurney & Omololu
USAID (Calcutta)	Nicol	McFie
USAID (Tamil Nadu)	Swanberg & Shipley	

Chile: Harbert and Scandizzo

The 1974 Chilean National Nutrition Survey recorded food intakes for individual members of the family, in addition to dietary, anthropometric, clinical, and biochemical statistics on children (Harbert and Scandizzo). This study gives some indication of the critical importance in distinguishing household intra-family food distribution from total distribution by individual family members. The dietary portion of the survey only records in-house meal consumption and two snacks, omitting meals away from home and additional snacks. As a consequence, food intakes for the upper income classes, whose members dine out more frequently than those from lower income groups, were generally underreported. In fact, these amounts were lower than those reported for lower income classes. In an attempt to compensate for these omissions, the data analysts imputed meal values or eliminated the cases with missing values.

Harbert and Scandizzo find a distinct pattern of distribution among family members during meals:

> In general, allocation within the three major meals follows a hierarchical pattern with great regularity and has only a minor relation to the calorie requirement. . . Male adult

> family members (over 15 years of age) receive the largest portion of the meat even after propoer account has been made of their higher body weight and activitiy level (as reflected in the calorie requirement). They are followed by the female adults and then by the children (first males and then females) of decreasing age. (Ibid., p. 23)

The study then adds-in two "snacks of particular relevance for the very young children" (Ibid., p. 24). According to the results,

> . . . when the additional snacks are taken into account, however, the equation for total calories shows that the allocation is highly egalitarian and, if anything, tends to be skewed in the direction of younger children. In this equation, the bias in favor of the male members of the family is no longer statistically significant. . . . The distribution of nutrients among household members appears to follow quite strictly need as expressed by the adjusted FAO/WHO requirement and no significant sex or age biases emerge. (Ibid., pp. 23-24, 38)

India: USAID Calcutta

The United States Agency for International Development (AID) sponsored an extensive study of food habits in Calcutta, India (USAID, 1972). A random sample of 2,386 households[6] was selected for detailed interviews on household food consumption and consumer expenditure patterns. Three additional surveys were undertaken on a subsample of 280 households to collect seasonal data. The subsample was selected on the basis of proportiona representation of characteristics such as the presence of pre-school children, vegetarianism, occupation of the main income earner and per capita expenditure.

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[6] Since only households were targeted for this study, the large population of pavement dwellers was excluded. These people generally have the lowest consumption levels. By omitting this group, the values of the data gathered are likely to be higher than actual consumption figures. This should not affect the general societal patterns of IFFD, unless the lower income groups follow a different IFFD pattern.

Intake data were obtained through a one-day recall survey recording both at-home and outside consumption for all family members. Those eating outside the home were mostly male. However, the average outside meal expenditure for those who did eat out was roughly the same for males and females in the same income bracket.

Table 3 shows the mean nutrient intakes by age group. Table 4 shows the percentage of RDA fulfillment for the same nutrients. Figure 3 graphically shows the protein and calorie fulfillment levels according to age and sex (over 12 years of age only). From these data it can be concluded that a roughly equitable distribution of calories predominates, except for the infants under 6 months old. Calories are insufficient for all age groups. Table 5 shows, however, that more children under four have severe dietary deficiencies than do adults.

TABLE 3

Daily Nutrient Intake Per Capita (Calcutta)

Age Group	Calories	Protein (grams)	Vitamin A (i.u.)	Iron (m.g.)	Calcium (m.g.)
Under 6 months	172	5	332	1	250
6 months to 1 year	446	13	755	3	581
1 to 2 years	627	18	857	5	592
2 to 3 years	788	24	902	9	550
3 to 4 years	855	26	968	12	466
12 to 16 years (male)	1,446	46	2,097	28	489
12 to 16 years (female)	1,346	43	2,151	26	465
22 to 56 years (male)	1,696	54	2,564	33	594
22 to 56 years (female)	1,549	49	2,400	30	531

Source: USAID, Calcutta

Percentage of Recommendation (Calcutta)

Age Group	Calories	Protein	Vitamin A	Iron	Calcium
Under 6 months	27	47	25	19	46
6 months to 1 year	66	109	75	44	106
1 to 2 years	52	106	95	28	132
2 to 3 years	66	133	100	50	122
3 to 4 years	63	124	108	67	104
12 to 16 years (male)	58	87	70	112	75
12 to 16 years (female)	61	86	72	75	72
22 tp 56 uears (male)	61	98	85	165	132
22 to 56 years (female)	70	109	80	100	118

Source: USAID, Calcutta (calculated from tables, pp. 22-25)

TABLE 5

Percentage of Population with
Dietary Deficiencies (Calcutta)

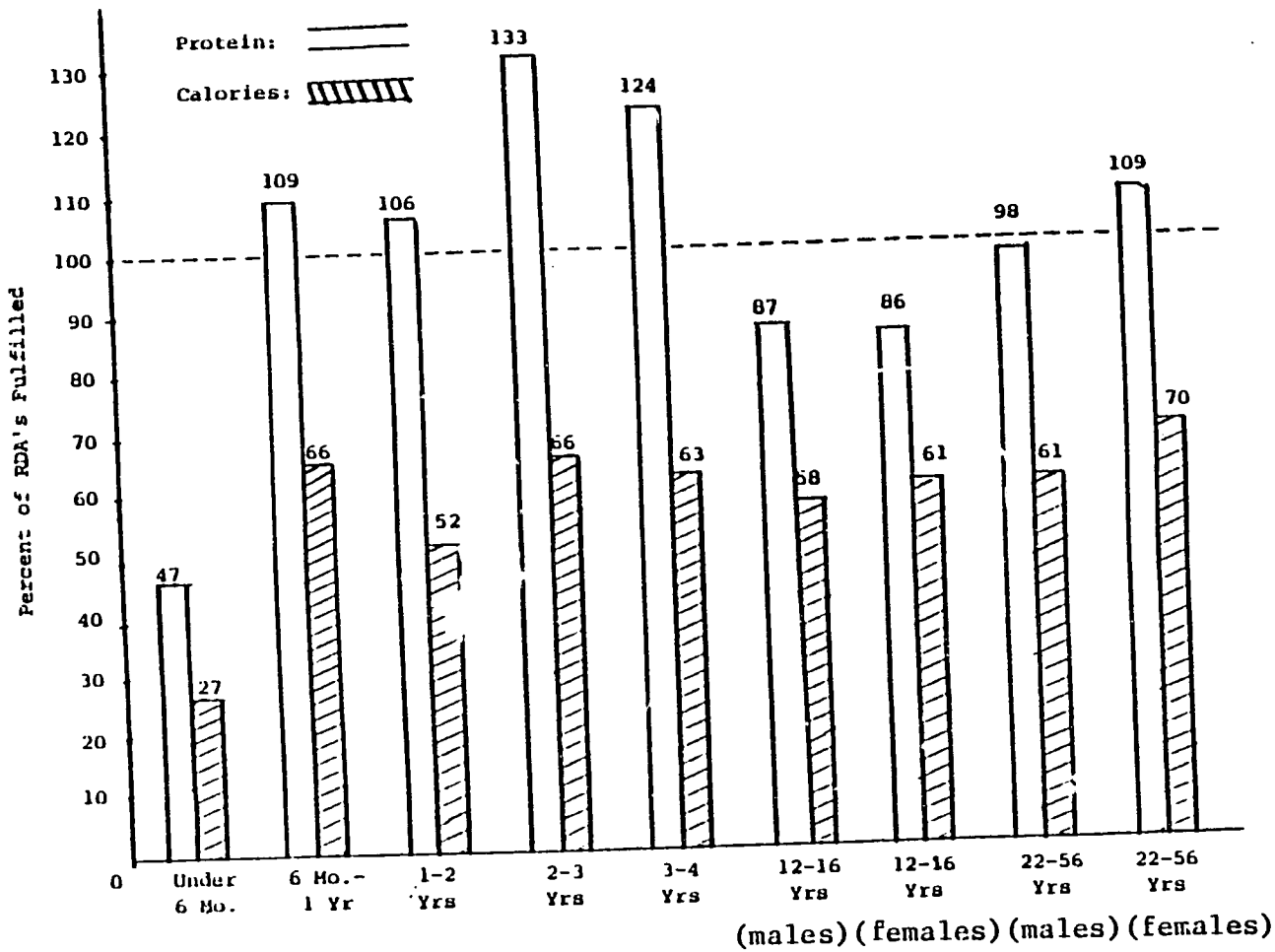
(by Magnitude)

	Calorie Deficiencies	
	Greater than 25 %	Greater than 50 %
Children under 4 years	81	33
Adults	92	7

Source: USAID, Calcutta

FIGURE 3

Daily Nutrient Intake by Age Group (Calcutta)
(% RDA's Fulfilled)



Source: USAID, Calcutta

No analytic breakdown is made between the sexes under age 12. For those over 12, consumption appears to be slightly better for females, although this is not statistically significant. It is not known, however, if the added consumption needs for pregnancy and lactation were taken into account.

Protein intake was sufficient for all groups except 12-16 year old boys and girls (86-87 percent of requirements met) and 22-56 year old males (98 percent of requirements met). The authors reported,

> Overall people are getting the required protein from their diet. Only one-third of the population in Calcutta -- !including! both pre-school children aged up to 4 years and adults -- do not get the required quantity of protein from the foods consumed every day. These people invariably fall in the lower economic strata. (Ibid., p. 23)

The study collected substantial income-related information, but the data have not been analyzed to discern any shifts in patterns of food distribution within the family at different income levels.

Age Dominant Distribution

The survey data from five dietary intake studies indicate a pattern of distribution with age as the dominant determining factor in those locations. Only one of these studies, undertaken by B.M. Nicol in Nigeria, offers a full family breakdown of consumption by age groups. The others all examine one or two age groups and compare them with aggregated data for the rest of the family. All except the study by Ruth Selinus, et al. (1971 a and b) in Ethiopia collected data on total consumption, including foods consumed outside the household. Three studies show roughly that the older the individual, the more food he/she receives in relation to his/her needs. Two studies show the reverse, i.e. preferential treatment is given to younger family members.

Nigeria: Nicol

Nicol's survey of calorie and protein intake was made in the mid 1950's in Nigeria. Members of seven agricultural communities, typical of the people living in the different vegetation zones of Nigeria were studied. The food intake of all the people in at least a third of the compounds was weighed for ten consecutive days in each of three seasons of the year. Family members were questioned about foods consumed between meals.

Intake was compared with FAO calorie and protein standards, which were adjusted to take into account weight, age, sex, mean annual external temperature, pregnancy (final trimester), and lactation.

The results of the survey showed an age-related preferential treatment in favor of adults and against children. Males and females over 12 years of age met caloric requirements, except in two cases where a crop shortfall occured (see Table 6). Apparently, even pregnant and lactating female adults had sufficient intake to compensate for their higher caloric needs. By weighing the adult women in all the villages surveyed, the author determined that food, which adult women ate from a common bowl in each compound, must have been distributed in such a way that sufficient weight was gained during pregnancy and undue loss avoided by lactating women. This was irrespective of the overall availability of food supplies.

Rarely, however, did children meet caloric requirements, even where the adults' diets were satisfactory. As Nicol reports,

> Children of age 4 - 12 years obtained from their diets a smaller percentage of their calorie requirements by FAO standards than did their parents. The parents in most of rural Nigeria do not realize the needs of growing children. The head of the family (followed by other men) tend to get priority for food over the women, and the children under the age of 13 years come last. (Nicol, p. 305)

No breakdowns by sex for age groups under 12 years of age were available to compare for sex bias. Also, data were not collected for children under four -- a particularly vulnerable age group nutritionally -- because of the difficulties of measuring breast milk consumption.

The analysis of protein intake showed that protein scores for men, women and children did not differ significantly (see Table 7). The mean fulfillment exceeded the FAO minimum requirements.[7] However, the incidence of protein malnutrition in children under nine years of age was from 2.2 to 5.3 percent. Only one adult, a woman in the last trimester of pregnancy, showed signs of protein malnutrition.

In the study by Nicol, two villages suffered from a shortfall of food during the time surveyed. These villages had less total food available per household for family distribution than the other villages. Among subsistence cultures this situation creates the equivalent of an income differential. One village showed a food distribution pattern similar to the non-famine villages, except that the levels of consumption were lower for all. Women also had a slight edge on consumption over men; women's calorie fulfillment level was 89 percent while men's was 85 percent. The other village showed a markedly different pattern of distribution which was more sharply skewed in favor of men. Nicol summarizes the situation:

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[7] Even in light of the calorie distribution inequities, this is not surprising. Protein needs are smaller in proportion to caloric requirements for the younger age groups, thus they would be more quickly filled. However, where caloric intake is insufficient, protein is used by the body to meet caloric needs. Thus actual satisfaction of protein needs would be less than the intake scores indicate. This situation is found throughout most of the studies examined here.

TABLE 6

Percentage of Caloric Requirements
Provided by Dietary Intake (Nigeria)

Village	4-6 years	7-9 years	10-12 years	Adult Females	Adult Males
Northern Regions:					
Jarawaji	87	-	-	134	116
Tanzaga	74	73	-	68	94
Bunga	96	94	82	10[illegible]	120
T. Maidubu	68	-	78	129	104
Langai	76	73	90	95	101
Southern Regions:					
B. Okuta	-	72	-	89	85
Mbanege	78	82	-	95	94

Source: Adapted from Nicol

TABLE 7

Percentage of Protein Requirements
Provided by Dietary Intake (Nigeria)

Village	4-6 years	7-9 years	10-12 years	Adult Females	Adult Males
Northern Regions:					
Jarawaji	220	-	-	250	240
Tanzaga	130	140	-	100	180
Bunga	220	210	150	160	220
T. Maidubu	200	-	150	260	250
Langai	170	160	160	200	240
Southern Regions:					
B. Okuta	-	80	-	70	80
Mbanege	70	80	-	80	90

Source: Adapted from Nicol

> In T ngaza, however, the millet crop had been poor and the people did not eat as much as usual during the last 3 months of the year. This shortage lowered considerably the mean daily consumption figures for the year as a whole. In spite of this shortage the Tangaza men's diet provided 94% of calculated requirement of calories . . . At the other end of the scale were the Tangaza women, suffering from a food shortage, whose diets supplied . . . only 68% of their calculated requirement. They lost 1.9 kg in weight during the year, and were doing very little unessential physical work in the hungry period. In Tangaza it was obvious that the men consumed more than their fair share of available food. (Ibid., p. 304)

Guatemala: Flores, et al.

The food consumption of pre-school children in three Guatemalan Indian communities was compared with that of their families in a study conducted by Marina Flores et al. (1964). A three-day mixed dietary survey was administered annually which included both recall and weighing. Households were visited once or twice a day and records made of the amounts of food consumed by the pre-school children and the rest of the family as a whole. No individual intake data on older family members was provided other than this aggregate figure. The portions served were estimated using household measures. Since visits were usually made at meal times, it was often possible to directly weigh the raw and cooked foods given to the pre-school children.

The nutrient content of the foods served was calculated using the Food Composition Table compiled by the Nutrition Institute for Central America and Panama (INCAP). The dietary intakes were compared with the recommended dietary allowances prescribed by INCAP for protein and by the U.S. National Research Council for other nutrients. Age, sex, weight, and meal attendance of each family member over pre-school age were summed together and compared with the sum for family intake to assess the level of adequacy. This method of calculation and comparison in essence "smooths out" the often

important variation in consumption between the sexes, at different age levels, and during pregnancy and lactation. In other words, much information is lost about distributional patterns between those members over five years old, although some idea of the treatment of pre-schoolers can still be gained.

The results of the survey showed relatively little variability in food intake from year to year and from family to family in these economically and socially homogeneous villages (see Table 8). The per capita intake for family members over five years averaged above the recommended allowances for all nutrients except vitamin A, vitamin C, and riboflavin (see Figure 4). The children's intakes were consistently lower than the RDA's for all nutrients except iron. The pre-school children met less than 70 percent of their calorie RDA's and about 50 percent of protein RDA's. The authors concluded,

> Mean nutrient intakes per child, compared with mean intakes over the whole family, are very low, which suggests that some members of the family are getting more than their share, and are, therefore, limiting the consumption of the small children. When sources of nutrients by food groups were calculated per child and per family, it was found that expensive foods like milk, eggs, and fruit tended to be given to children in preference to adults but, in spite of it, when the nutritive value of diets was compared with estimated requirements, the small children were found to be getting a smaller percentage of their requirements of calories and of every dietary constituent included in the calculation. (Flores, p. 292)

When animal protein intakes were averaged for families and children. it showed that

> . . .the mean intake of the children increased with increasing consumption by the family, but not in exact proportion . . . . If the family as a whole took more animal protein, the pre-school child did not benefit to the same extent. If families with a greater supply of animal food would learn the needs of the small child for this type food, the child would be in a better

TABLE 8

Mean Daily Intake of Calories and Nutrients by Guatemalan Indian Families and Children in Four Consecutive Years

	Santa Catarina Barahona				Santa Maria Cauque				Santa Cruz Balanya			
	1959	1960	1961	1962	1959	1960	1961	1962	1959	1960	1961	1962
Families (per head)												
Calories (kcal)	1956	2083	1703	1054	2234	2217	2384	2163	2133	2035	2070	1938
Total Protein (gm)	56.5	58.4	53.1	59.0	65.8	64.5	68.6	62.7	57.6	56.4	58.1	53.5
Animal Protein (gm)	3.5	4.8	6.3	6.2	5.0	4.8	5.0	6.3	2.7	3.1	3.8	4.5
Fat (gm)	19.0	20.0	16.0	20.0	17.0	17.0	19.0	.0	.0	14.0	14.0	14.0
Calcium (mg)	1085	1137	1006	1151	1216	1215	1311	1186	1303	1254	1243	1183
Iron (mg)	19.0	20.0	20.0	21.0	23.0	22.0	24.0	22.0	20.0	19.0	20.0	20.0
Vitamin A (i.u.)	2617	3120	3030	3867	2223	1920	2130	2750	3103	2493	2707	3977
Thiamine (mg)	1.1	1.2	1.1	1.2	1.4	1.3	1.4	1.3	1.2	1.2	1.2	1.1
Riboflavine (mg)	0.6	0.6	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6
Nicotinic Acid (mg)	12 9	13.3	11.6	12.3	13.1	12.7	14.1	12.4	11.9	12.0	12.2	11.5
Vitamin C (mg)	50.0	62.0	64.0	64.0	32.0	23.0	33.0	51.0	54.0	48.0	64.0	91.0
Pre-school Children												
Calories (kcal)	687	899	844	760	907	849	1043	778	836	800	944	818
Total Protein (gm)	19.2	22.8	22.7	20.2	23.1	22.9	29.0	22.3	21.8	20.1	24.2	21.8
Animal Protein (gm)	3.8	2.4	3.2	3.2	3.3	3.2	3.3	3.5	1.8	1.6	3.0	2.0
Fat (gm)	10.0	11.0	9.0	9.0	9.0	8.0	10.0	9.0	8.0	6.0	7.0	7.0
Calcium (mg)	352	397	434	374	445	442	561	414	498	447	560	474
Iron (mg)	7.0	9.0	9.0	8.0	9.0	8.0	10.0	8.0	9.0	7.0	9.0	8.0
Vitamin A (i.u.)	1473	1293	1427	1567	1037	967	907	813	1597	920	1307	1653
Thiamine (mg)	0.4	0.5	0.5	0.4	0.5	0.4	0.6	0.5	0.5	0.4	0.5	0.4
Riboflavine (mg)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.2
Nicotinic Acid (mg)	5.1	6.1	5.4	4.6	5.5	5.2	6.4	4.5	4.9	5.0	5.6	4.9
Vitamin C (mg)	31.0	33.0	38.0	33.0	21.0	18.0	16.0	26.0	32.0	20.0	34.0	40.0

Source: Flores, p. 287

> state of nutrition. . . . The deficient diet of the pre-school child is due not only to the shortage of good quality food, but also to prejudice and lack of knowledge about the feeding of small children. (Ibid., pp. 288, 292)

The authors note that with the recall method, mothers sometimes do not remember food children consume between meals. Thus, "the values presented . . . may . . . underestimate the true intake, at least so far as the children are concerned " (Ibid., p. 291).

Ethiopia: Selinus, et al.

The two studies of dietary habits by Ruth Selinus, Abeba Gobezie, and Bo Valquist (1971 a and b) also point to age discrimination as a determinant of IFFD. Neither of these studies, however, contains sufficient data or analytic breakdowns to provide the reader with a complete picture of family food distribution.

Selinus et al. examined two rural communities in Northern Ethiopia and one in Southern Ethiopia. Food consumed within the home was weighed for seven days for a small random sample of the families in each area. These were "common bowl" cultures where the family members ate together out of the same large dish. Consequently, intake data was aggregated for those eating from the common bowl. In these communities, the children from six months to three years were served on separate plates, so it was possible to measure their individual consumption. In calculating the RDA's for the family units, the authors took the age, sex, pregnancy, lactation, and meal attendance of individual members into account. However, since the intake data was aggregated for all family members over three years of age, it was not possible to show the adequacy of food consumption according to these same categories.

The results of the two studies showed a:

> . . . grossly deficient diet . . . in 30% or more of the toddlers with respect to calories, protein, calcium, vitamin A, thiamin, riboflavin, niacin and ascorbic acid. Also with respect to iron, 20% of the toddlers had a grossly deficient intake. (Selinus, a, p. 186)

(see Figures 4, 5, and 6).

Not only were young children's diets inadequate, but they were also disproportionally smaller in amount compared to other family members' diets. In each community and for all nutrients, except for protein in Tigre and vitamin A in Begemder, the percentage of requirements met by the diet was less for children under three than for the older family members. In most cases, the diet of those over three years approached or exceeded adequacy. Notable exceptions were for protein in Southern Ethiopia and for vitamin A and ascorbic acid in Tigre and Begemder (Northern Ethiopia).

A note of caution must be expressed about the quantitative component of the studies. No attempt was made to assess the nutrients received by children from nursing. This is of consequence because of the prolonged period of breastfeeding in each of these areas. The authors acknowledge that the studies probably und estimated the true intake of calories and nutrients, but make this rejoinder:

> . . . even if breast feeding plays an important role in this region (for the ½ to 1½ year-old age group), the gross deficiencies in calories and nutrients are probably only in the exceptional case fully compensated by the consumption of breast milk. (Selinus, b, p. 171)

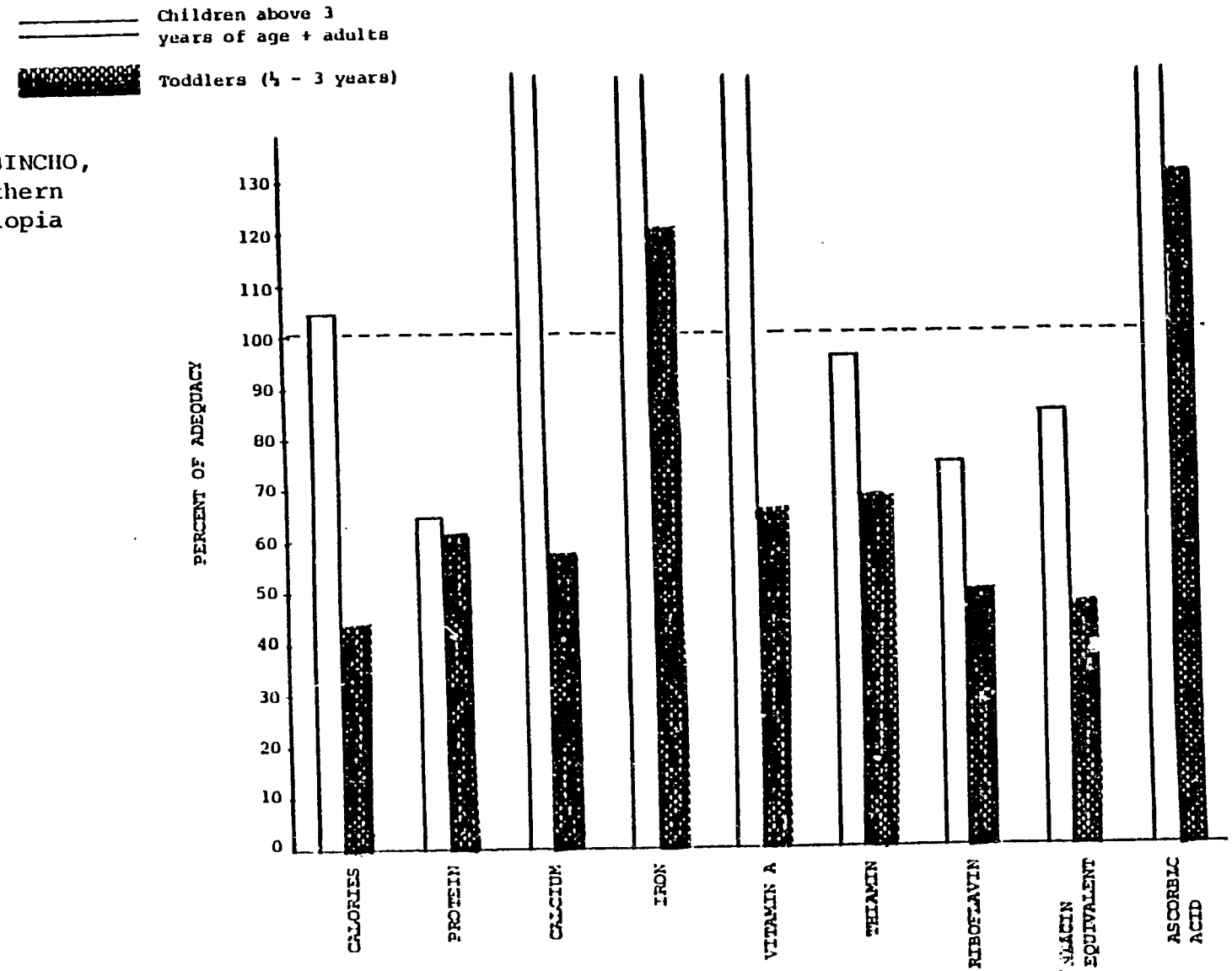
In addition, no record is made of consumption outside of the household. This could augment the figures for older family members, but probably would not significantly alter the toddlers' consumption levels.

Although the quantitative data from the study only allow analysis of evidence showing distributional discrimination against the younger family

FIGURE 4

Comparative Adequacy of Calories and Nutrient Intakes for Toddlers and Older Family Members (Ethiopia)

(% RDA's)



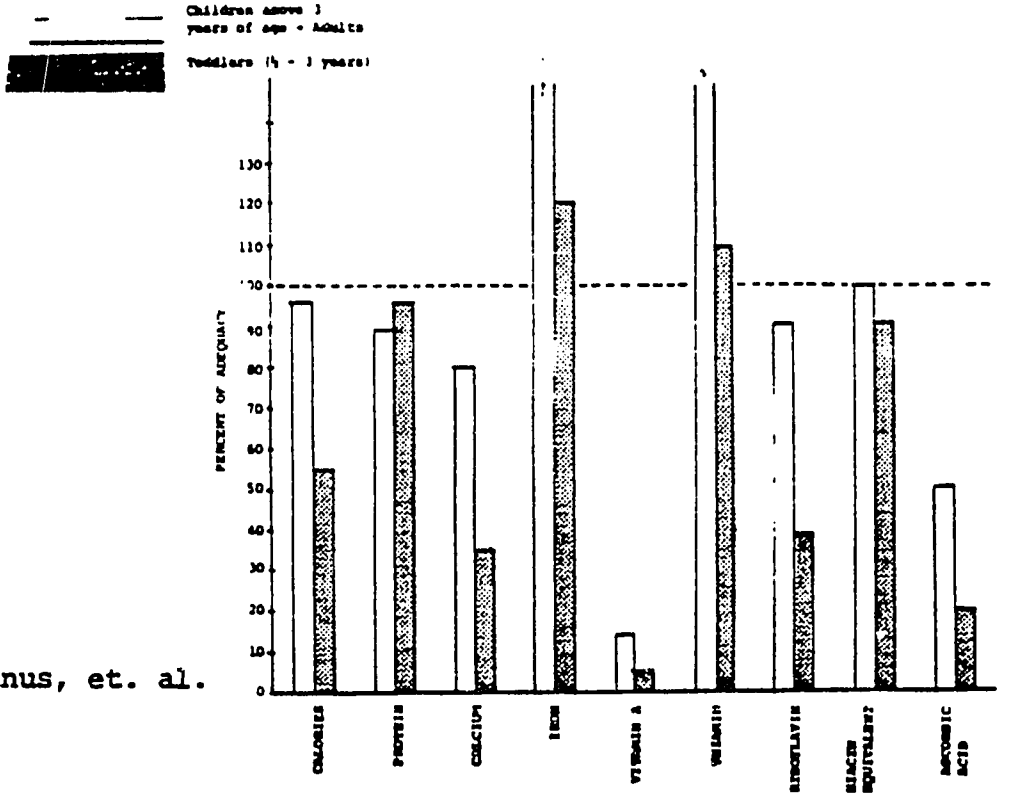
GARBINCHO, Southern Ethiopia

Source: Selinus, et al.

FIGURE 5

Comparative Adequacy of Calories and Nutrient Intakes for Toddlers and Older Family Members: TIGRE

TIGRE, Northern Ethiopia

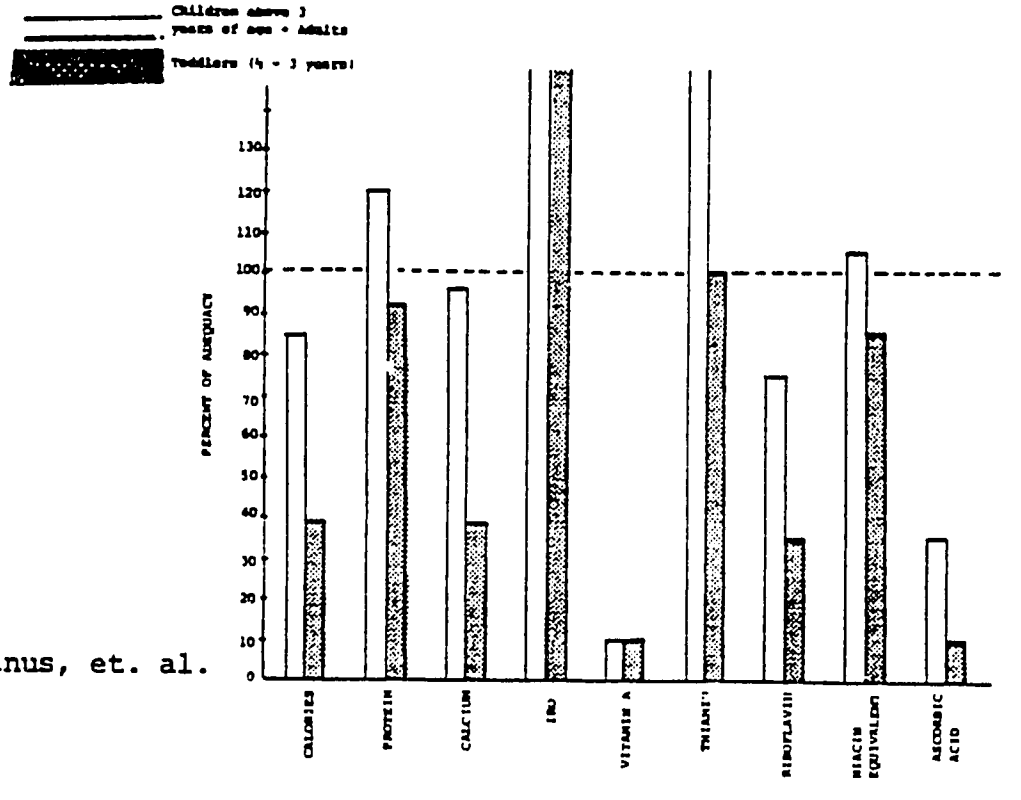


Source: Selinus, et. al.

FIGURE6

Comparative Adequacy of Calories and Nutrient Intakes for Toddlers and Older Family Members: BEGEMDER

BEGEMDER, Northern Ethiopia



Source: Selinus, et. al.

members, the study also presents observational information about other preferential treatment. By mentioning food taboos, fasting, food habits during pregnancy, and feeding habits of young children (particularly during the weaning process), the study contributes to a better understanding of who gets what and why.

Most of this points to additional preferential treatment of males at all ages. Children in general are breastfed up to one and one half to two years of age (three years in one area), but boys are often breastfed longer than girls. The villages in Southern Ethiopia have many large feasts with much overconsumption -- most of which goes to adult males. Selinus, et al. report

> The adult men are always in the privileged position with respect to the quality and quantity of the food. The women and children get what is left [which is] most often the more carbohydrate part of the dish. Thus, the adequacy of the diet is worse for the children and women than what the figures indicate [since they are calculated by simply subdividing the amount in a communal pot, a procedure which does not take qualitative differences of individual portions into account].(Selinus, a., p. 36)

The studies of Northern Ethiopia reveal the same priority treatment:

> . . .The men receive the food first and are therefore privileged to get the largest portion of the food, often also more valuable (higher in nutrients) parts. The women and children receive the leftovers and the more fibrous part. . . . (Selinus, b., p. 176)

Although the data from this study only show an age preference in food distribution, it is possible that a differently structured survey, better delineating age and sex groups would generate data demonstrating as strong -- or stronger -- sex-preference in the Ethiopian cultures.

The following dietary surveys show a converse age relationship of preferential treatment from those just examined. Here children's consumption significantly exceeds that for other older age categories. One study was undertaken by Heather Goldman (1979) in Liberia and the other by Kenneth Swanberg and Elizabeth Shipley in Colombia (1975).

Liberia: Goldman

Goldman conducted a combination weighing and recall survey of food consumption for non-nursing pre-school children and the rest of the family as a unit in the coastal areas of Liberia. The study included seven-day and 24-hour recall, a consumer expenditure survey, and anthropometric and biochemical measures for the pre-school children.

Family meals and children's meals and snacks were weighed for a period of seven days. A detailed food intake record was used for young children which included lists of food items for main meals, light meals, drinks, and snacks. Food consumed by young children in the absence of the interviewer was estimated through observation and recall by other household members. A 24-hour recall dietary survey was administered to a subsample of the larger survey population to serve as a validity check for the weighing data.[8]

As with the other studies comparing children's intake with the rest of the household as a unit, the average nutrient requirements were estimated for each household on a per capita basis by computing weighted nutrient requirements from the number of household members in each age group and then dividing by the total number of household members. However, though from 12 - 22 percent of the mothers surveyed were pregnant, no adjustment was made in the family requirements. The requirements are, therefore, "slightly low for these households," which

[8] The statistical comparisons of the two dietary survey methods have not yet been undertaken.

would appear to have a higher percentage of their needs met than is actually the case.

The results of the survey show that on an average annual basis, "pre-school children generally received more than their share of available food to the household" (Goldman, p. 146). (see Figure 7). Goldman points out that "the real magnitude of this difference depends on the degree to which the actual consumption of older household members who did not eat with the household during the day was underreported" (Ibid., p. 180).

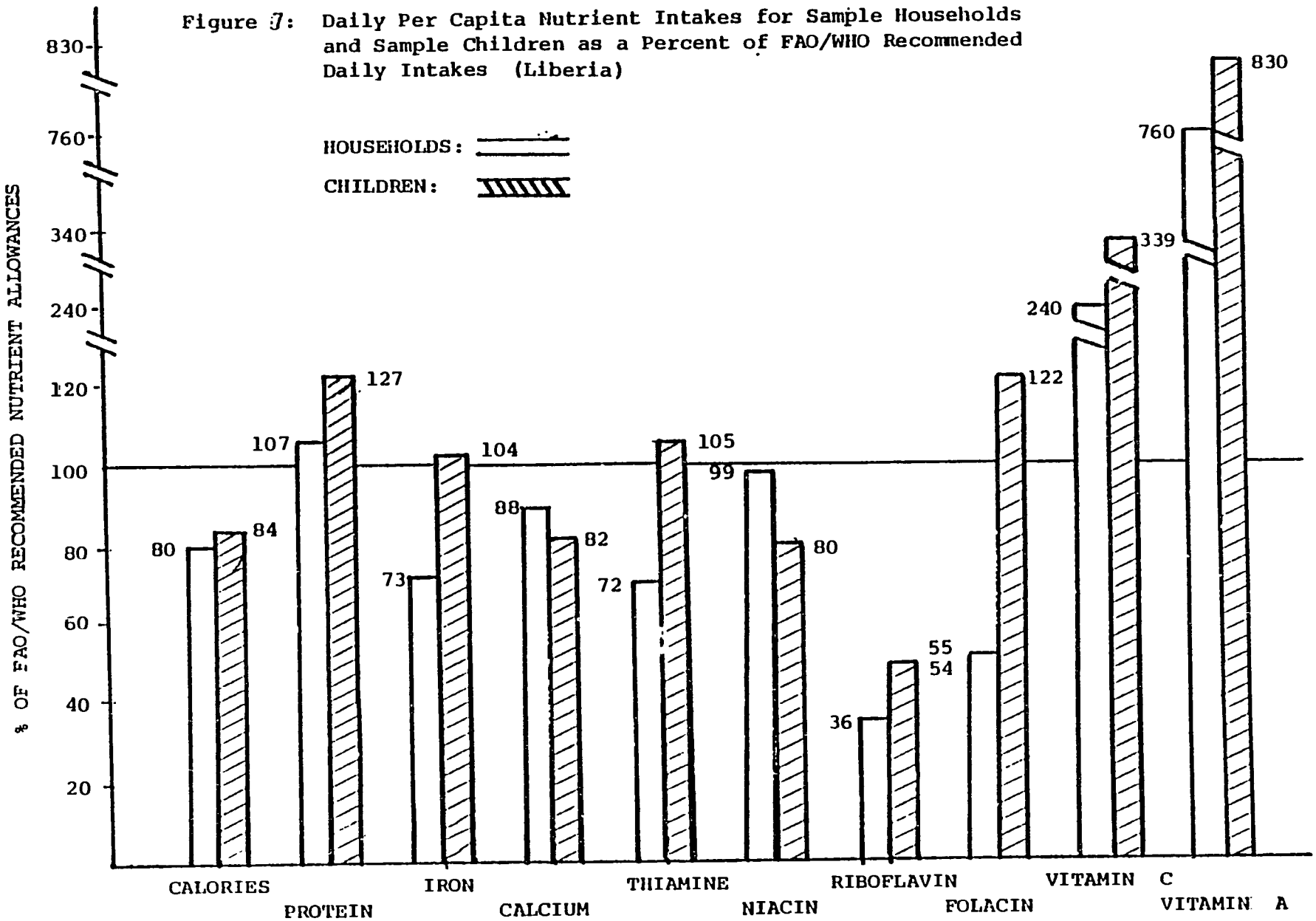
The data also show an age-related preference among the children surveyed. Goldman states, "Adequacy of caloric intakes were significantly different between age groups. In both seasons, children more than 3 years old ate significantly less calories proportionately than younger children" (Ibid., p. 122). This is not surprising, since protein requirements in relation to calories are less for the older children and thus are more quickly satisfied, though the overall proportional consumption of other nutrients is lower.

Goldman does sound a note of caution in comparing the recorded consumption of the different children's age groups. She states, "However, this measurement was determined from weighing food eaten in the house with other household members, so it is possible that not all the food consumed by older children in a week was weighed" (Ibid., p. 177).

In most cases where calorie intake was adequate, protein intake was also adequate (see Tables 9 and 10).

No sex-related preferential treatment was evident from the study results. Analysis of the dietary intake data showed there were "no significant differences in adequacy of protein and calorie intakes between male and female children" (Ibid., p. 122). The nutritional status data collected indicated

Figure 7: Daily Per Capita Nutrient Intakes for Sample Households and Sample Children as a Percent of FAO/WHO Recommended Daily Intakes (Liberia)



Source: Goldman, pp. 108-9.

TABLE 9

Adequacy of Protein and Calories in the Household Diet
(Percent of Total Population -- Liberia)

		Protein Level in Diet		
		Inadequate	Adequate	Row Total
CALORIES	Inadequate	51	42	93
	Adequate	0	7	7
	Column Total	51	49	100

Source: Goldman

TABLE 10

Adequacy of Protein and Calories in the Child's Diet
(Percent of Total Population -- Liberia)

		Protein Level in Diet*		
		Inadequate	Adequate	Row Total
CALORIES	Inadequate	34 (24)	45 (44)	79 (68)
	Adequate	2 (2)	19 (30)	21 (68)
	Column Total	36 (25)	64 (75)	100 (100)

* Figures in parentheses indicate percentages if 90 percent of recommended caloric and protein intakes are satisfied

Source: Goldman

> . . . no significant differences in degree of malnutrition between the sexes except that, in spite of slight un[der] sampling, more females suffered from moderate to severe acute malnutrition in the rainy season . . . . The results suggest that females had slightly poorer nutritional status than the males." (Ibid., p. 118)

Yet Goldman points out that "in the national nutrition survey (NNSS) the prevalence of chronic PCM (protein-calorie malnutrition) was significantly higher in males than females in the 6 - 36 month age group" (Ibid., p. 175). She concludes from these two major studies:

> Therefore, it appears that the effect of sex on nutritional status of pre-school children may be relatively minor or variable according to socio-cultural beliefs of different tribal groups which have not been equally sampled in the studies. . . . (Ibid., p. 175)

Goldman did find some other pertinent factors that appear to have an important influence on IFFD, although they do not alter the overall annual pattern. One involves the number of meals eaten per day, which is usually two for the majority of children. Goldman reports:

> The number of meals a child ate per day had a significant effect on the adequacy of a child's caloric intake but not on his nutritional status (defined by anthropometric indices). Children eating three meals per day ate significantly more calories than children eating twice a day . . . . The difference in meal times did not have an effect on nutritional status but it did have a significant effect on adequacy of the pre-school child's caloric intake. Children eating their main meal at midday ate more of the RDAs for calories than children eating their big meal at other times. . . . Children eating their main meal after 6 p.m. may be too tired to eat sufficient amounts of food, or their mothers may be too tired to feed them. (Ibid., p. 131)

In contrast to children's intake patterns, the "adequacy of average household caloric intakes was not significantly different for households eating their big meals at different times " (Ibid.).

Also of importance was the seasonal factor. Pre-school children ate significantly less in the rainy season (July and August) and in fact showed a marked decrease in their proportional share of the family intake. During this time the average per capita household consumption increased, but pre-schoolers' intakes plummeted sharply (see Figure 8). Goldman offers several possible explanations:

> This is a period of heavy agricultural labor. . . . Either there is insufficient time to prepare special food for young children, children are sicker at this time, or children who are too young to work on the farm must eat less to free calories for adult consumption if the food available to the household is virtually fixed. (Ibid., p. 146)

Also, more cassava is eaten in the rainy season, supplying a significantly greater proportion of the population's calories in the coastal region than during the dry season. However, cassava is bulky, and children may not be able to consume sufficient quantities at meals throughout the day to meet their caloric needs.

Furthermore, Goldman suggests that the RDA standards may be too low for older members of farming households during the rainy season. This time period coincides with the rice farming cycle and is consequently a season of large energy expenditure for working household members. They consume more to be able to perform strenuous tasks. If the RDA standards are too low during this period for all involved in the farm work, then with the increased consumption, they will appear to have a greater percentage of their daily nutrient needs met than is actually the case. This would also affect comparisons of their proportional intakes with those of children and bias the results to the apparent disadvantage of the pre-schoolers.

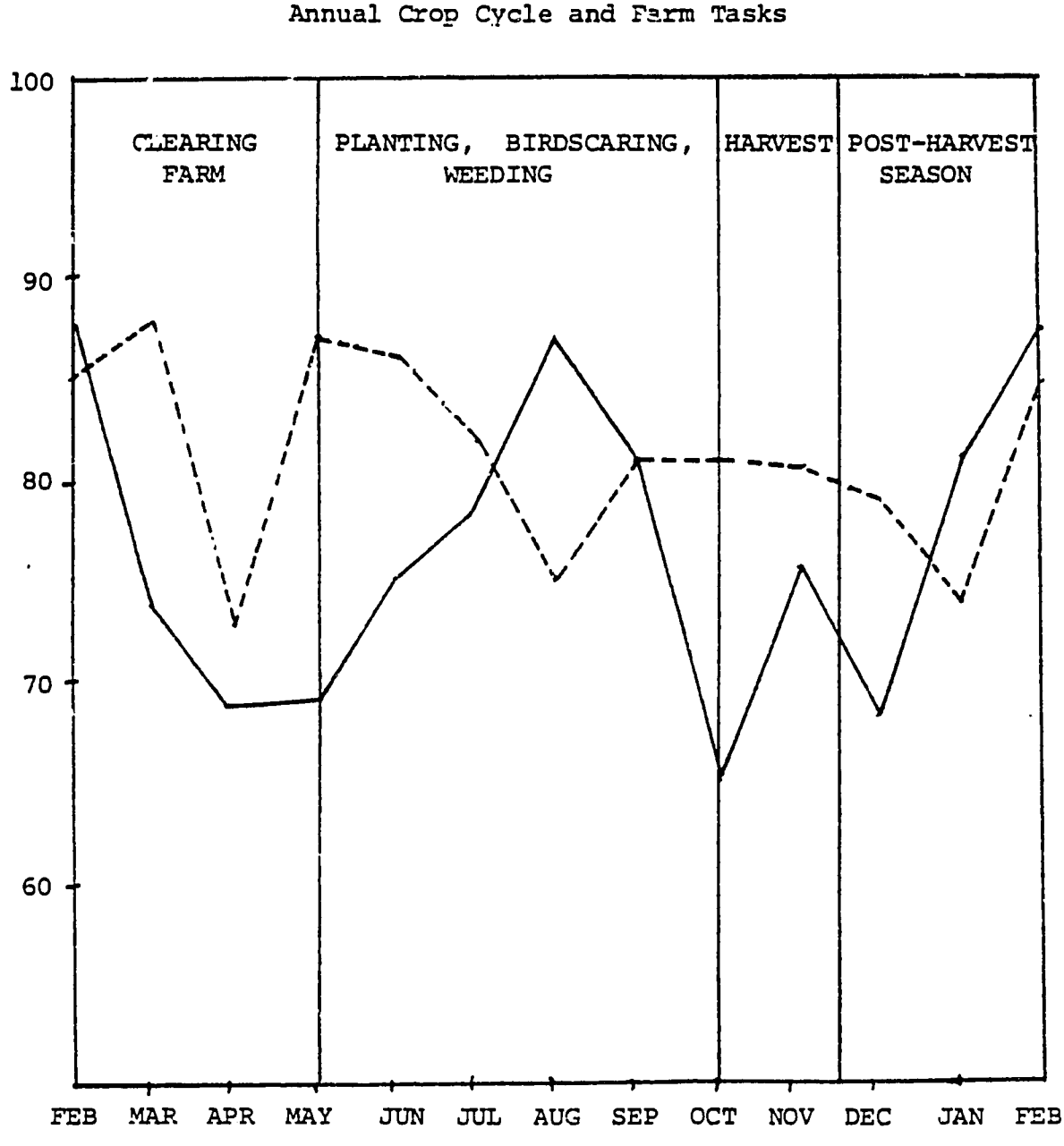
The main precaution in using this study to interpret IFFD relationships involves the possible underreporting of consumption outside the home for

FIGURE 8

Median Percent of Recommended Daily Caloric Intakes for Sample Households and Preschool Children by Months (Liberia, 1977)

---------- Preschool Child's Intake

———————— Average Per Capita Intake per Household



Source: Goldman, p. 148

older family members. Goldman herself points this out in saying, "It is not known to what extent teenagers and adult men ate between meals. Therefore, average intakes for families with several teenagers and adults may be underestimated if foods eaten between meals were not recorded." (Ibid., p. 105). If this outside consumption is extensive, then the consumption priority given to pre-schoolers would be more apparent than real.

Colombia: Swanberg and Shipley

The second study which shows preferential IFFD given to children instead of adults was conducted by Kenneth Swanberg and Elizabeth Shipley in Colombia. They examined the consumption patterns of pre-schoolers versus their families in both the rural potato and corn zones of East Cundinamarca. In general, the families in the potato zone were economically better off than those in the corn zone. The researchers expected that the different income levels would have an effect on the consumption patterns.

Swanberg and Shipley collected dietary information (using a 24-hour recall survey), height-weight measurements of pre-school children, household socio-economic data, and information on the food practices of the family. They calculated the recommended dietary intake per household adjusted for family size, age and sex of family members, and annual mean temperature. Whether household intakes were also adjusted for whether female members were pregnant or lactating is not known.

In the analysis of the results, pre-schoolers (under six years of age) were compared to the rest of the family, with no breakdown by sex (see Tables 11 and 12 and Figures 9 and 10). The results showed that

> The average nutrient intake of the pre-school child in both zones is better than that of the family average and met all nutritional requirements at an acceptable level except for vitamin A and calcium. . . . The major conclusion to be

TABLE 11

Comparative Consumption of Families and Preschoolers in the Corn Zone of Colombia

	Recommendation		Consumption		Adequacy*	
	Families	Pre-Schoolers	Families	Pre-Schoolers	Families	Pre-Schoolers
Calories	2,145	1,420	1,486	1,264	69	89
Protein (gm)	57.9	33.0	40.2	32.5	69	99
Calcium (mg)	680	700	436	446	64	64
Iron (mg)	12.5	8.8	12.6	10.3	101	117
Vitamin A (i.u.)	4,183	2,200	1,172	1,487	28	68
Thiamine (mg)	0.90	0.54	0.98	0.77	109	143
Riboflavin (mg)	1.31	0.84	0.88	0.82	67	98
Niacin (mg)	13.4	9.3	10.0	7.6	75	82
Vitamin C (mg)	43	40	112	118	261	295

* Consumption as a percent of recommendation

Source: Swanberg and Shipley.

TABLE 12

Comparative Consumption of Families and Preschoolers in the Potato Zone of Colombia

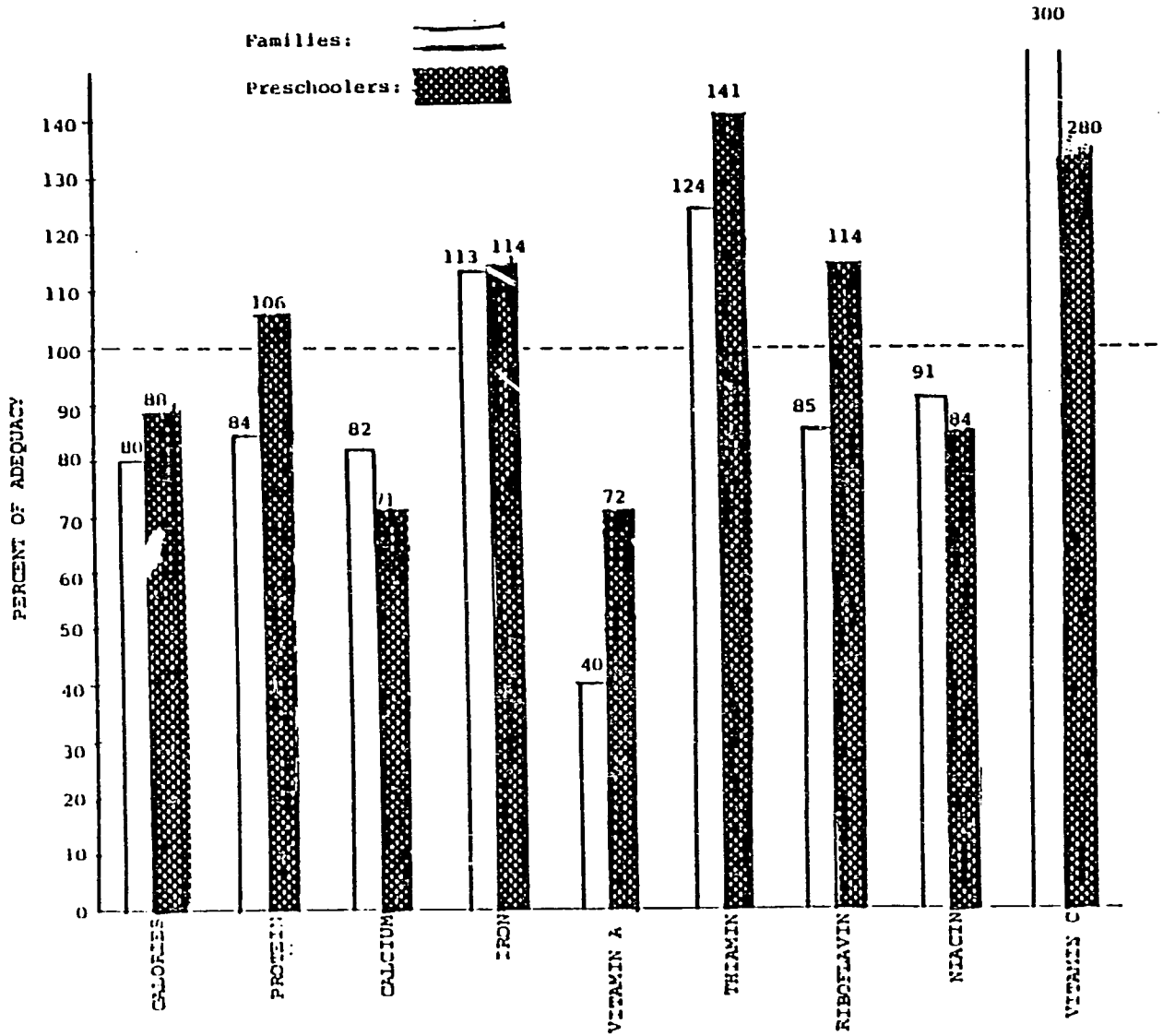
	Recommendation		Consumption		Adequacy*	
	Families	Pre-Schoolers	Families	Pre-Schoolers	Families	Pre-Schoolers
Calories	2,176	1,420	1,734	1,252	80	88
Protein (gm)	57.8	33.0	48.4	35.1	84	106
Calcium (mg)	696	700	572	494	82	71
Iron (mg)	12.6	8.8	14.3	10.0	113	114
Vitamin A (i.u.)	4,179	2,200	1,677	1,585	40	72
Thiamine (mg)	0.90	0.54	1.12	0.76	124	141
Riboflavin (mg)	1.32	0.84	1.12	0.96	85	114
Niacin (mg)	13.2	9.3	12.0	7.8	91	84
Vitamin C (mg)	43	40	129	112	300	280

* Consumption as a percent of recommendation

Source: Swanberg and Shipley

FIGURE 9

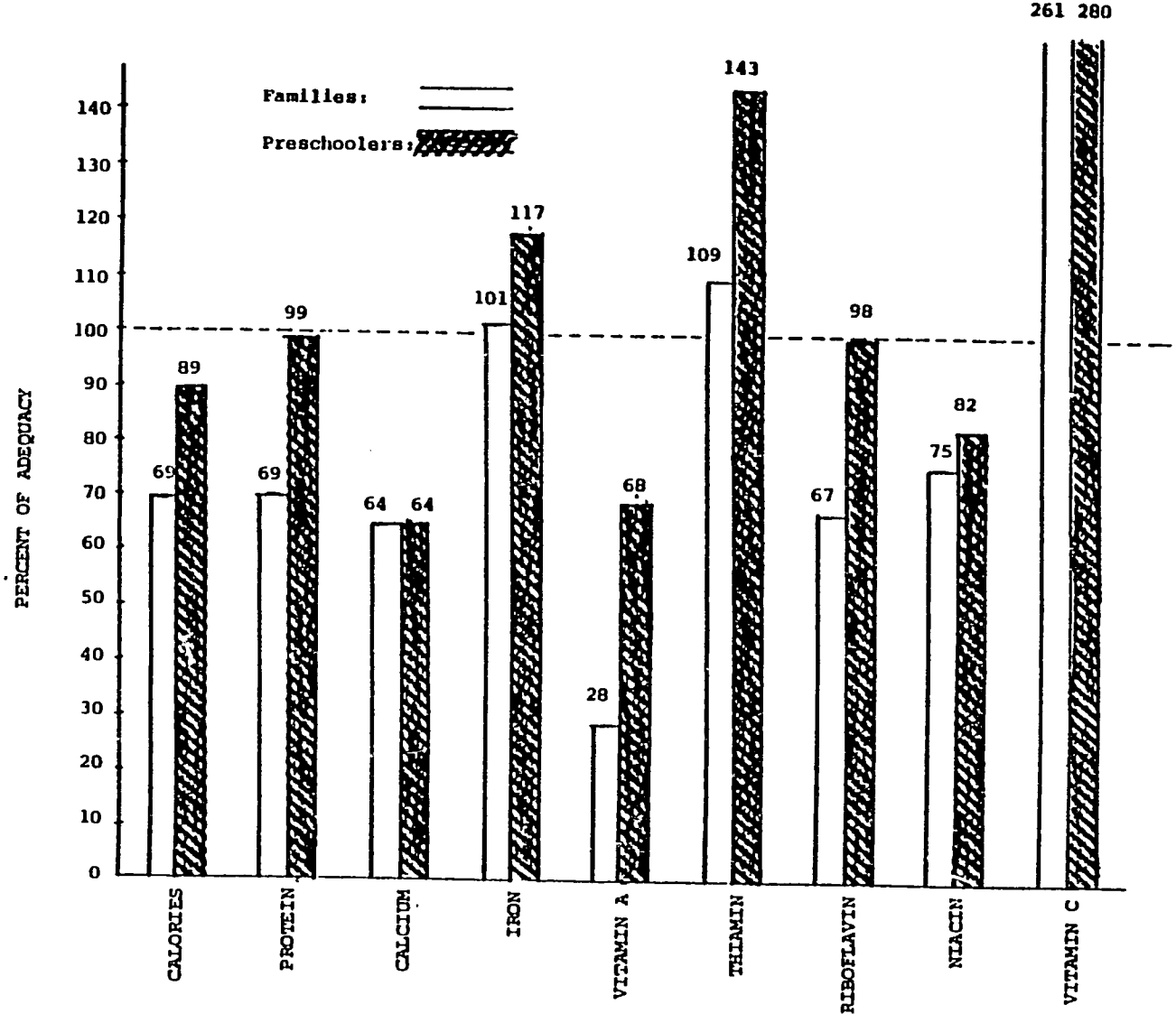
Nutrient Consumption of Families and Preschoolers
in the POTATO Zone of Colombia



Source: Swanberg and Shipley

FIGURE 10

Nutrient Consumption of Families and Preschoolers
in the CORN Zone of Colombia



Source: Swanberg and Shipley

> drawn at this point is that apparently despite lower incomes in the corn zone, children are equally well provided for in both communities with respect to most nutrients, protein, and calories, but that calcium and vitamin A are equally short in both zones. . . . The rural family appears to take care to meet the consumption needs of its children before satisfying adult requirements regardless of income level. (Swanberg and Shipley, pp. 119, 124)

Among differences in consumption between the two age groups, Swanberg and Shipley's findings show that:

> Animal protein ratios are markedly higher for the pre-school groups than for the family groups, particularly in the potato zone. It is noteworthy that legumes contribute less protein than dairy products in all diets. Nevertheless, they are significant sources of protein even for pre-schoolers. The major source of proteins for all groups except pre-schoolers in the potato zone is the cereals. Pre-schoolers consume relatively greater quantities of milk, eggs, and fruits, and lesser quantities of legumes than the rest of the family. (Ibid., p. 115)

Swanberg and Shipley also tested two income related hypotheses which have implications for IFFD. They hypothesize that the state of nutrition of an individual or population is highly correlated with the level of income. As a result, they expected to find nutrient intakes in the higher-income potato zone to be more nearly adequate than intakes in the lower-income corn zone. Their second hypothesis is that the consumption of calories and protein is more highly correlated with income than is vitamin and mineral consumption and that consumption of vitamins and minerals is more closely related to food practices. A third, implied hypothesis, is that children of lower income families are more likely to suffer from inadeaquate food intake than children of higher income families.

To test the first two hypotheses, Swanberg and Shipley estimated the linear correlation between total food expenditure and intakes of calories and each of the other nutrients. They found that:

> . . . the regression coefficients . . . are highest for calories and protein intake and lowest fof calcium, vitamin A and riboflavin. This suggests that protein and calorie consumption is directly related to expenditure, while the consumption of calcium, vitamin A, and riboflavin is more related to regional food habits. . . . It also indicates that only some kinds of malnutrition can be reduced through increasing the incomes of rural families. Others must be attacked through nutrition education in order to change the food consumption patterns. (Ibid., pp. 121-122)

The coefficients for pre-school children in the corn zone (the poorer zone) were low for calories and protein, indicating that these expenditures for children are made despite lower incomes

As might be expected, the nutritional quality of the diet was in general higher in the potato zone than in the corn zone (see Table 13). However, Swanberg and Shipley report that:

> The difference was slight for the pre-school group. The diets in the potato zone also cost more -- 7.66 pesos per

TABLE 13

Nutritional Adequacy of the Daily Diet of Families in East Cundinamarca, Colombia

(% RDA's)

	Corn Zone	Potato Zone
Calories	69	80
Protein	69	84
Calcium	64	82
Iron	101	113
Vitamin A	28	40
Thiamin	109	124
Riboflavin	67	85
Niacin	75	91
Vitamin C	261	300

Source: Swanberg and Shipley, p. 116.

> person per day for the family average and 5.64 pesos for the pre-school group -- than in the corn zone -- 6.25 pesos for the family average and 5.21 pesos for the pre-school group. Nevertheless, it appeared that the difference in the dietary values for the pre-school group between the two zones was not statistically significant, whereas the difference in dietary values for the family average groups was significantly different at the 5 percent level. Expenditure levels can be expressed in another way: the pre-school diet cost 74 percent as much as the family average diet value in the potato zone, whereas it cost 74 percent as much in the corn zone. The rural family appears to take care to meet the consumption needs of its children before satisfying adult requirements regardless of income levels. (Ibid., pp. 123-124)

Despite preferential treatment within the family, a large percentage of the children were shown by the anthropometric and nutritional status portion of the survey to be malnourished. (No data was collected for the other family members to allow intra-family comparisons.) Thirty-five percent of the pre-schoolers in the corn zone and 49 percent in the potato zone suffered from some degree of malnutrition. However, "little significant correlation existed between the health index based on height-weight measurements of pre-schoolers and variables such as wealth, income, and nutrient consumption" (Ibid.. P. 124). The authors conclude that the children may have been growing normally at the time that the measurements were taken, but suffered from the effects of an earlier period of retarded growth.

Little information on the survey methodology is available to help assess the study. In particular, it is unknown if consumption outside the home was measured. If outside consumption were in fact omitted, the data collected would, of course, underreport the intakes of the older family members in favor of young children.

In summarizing the study, Swanberg and Shipley draw some policy-related conclusions:

> This study has shown that food consumption in general is highly related to income while the consumption of some critical nutrients and the diets of some groups are not so income-dependent. Hence, nutrition programs which are not income-generating have a potential for creating significant nutritional impacts. (Ibid.)

Sex-Dominant Distribution -- India: Levinson

Preferential treatment according to the sex of family members is shown in almost all of the dietary studies examined here. Only one study shows sex to be the main factor in determining differences in consumption within a family, however.

An exceptionally careful and thorough dietary study was conducted by F. James Levinson in Morinda, India. He examined the dietary intake and nutritional status of all boys and girls from 6 - 24 months of age in 17 Punjabi villages. He also systematically recorded data on the food beliefs of the children's mothers. The study sheds relatively little light on the question of IFFD, since only one cohort is examined, with no attempt to compare the intakes of this group with the rest of the family. Within the cohort group examined, however, information is given which indicates that preferential treatment is given to children of one sex. Levinson also includes information on family food beliefs and income levels (generally represented by caste) which helps in drawing policy conclusions about IFFD patterns.

Levinson undertook the difficult task of measuring the dietary intake of young children, many of whom were still nursing. Breast milk quantities and nutrients were calculated by the age of the child from earlier empirical

research conducted by the Indian National Institute of Nutrition. Dietary recall methods were used with the person feeding the child to gain information on quantities of other types of foods consumed by the child. Calorie, protein, vitamin A, and iron intakes were calculated from the child's total intake and compared with the RDA's for the appropriate age.

The children included in the survey came from three socio-economic groups: (1) the Jats, the land owning class or caste and the dominant group in terms of resources and power, (2) the Ramdasias, the class of landless, agricultural laborers (most of whom were considered "outcasts" in the Indian caste system) and (3) a heterogeneous group that economically falls between the Jats and the Ramdasias (see Table 14). For the purposes of the study, this latter group is labled "Other."

TABLE 14

Average Monthly Income of the Nuclear Families of Sample Children (Morinda, India)

Group	Average Monthly Family Income
Jats	RS. 336*
Ramdasias	RS. 150
Others	RS. 241
Total Average	RS. 241

*Significantly different from the Ramdasia figure at the .95 level of statistical significance

Source: Levinson, p. 27

The average daily consumption figures in the Levinson study "clearly indicate the quantitative inadequacy of the diets " (Levinson, p. 32). (See Table 15.)

TABLE 15

Average Percentages of Nutrient Allowances
by Caste Grouping (Morinda, India)

Group	Calories	Protein	Vitamin A	Iron
Jats	63.6*	87.0	86.1	38.0
Ramdasias	59.2	83.3	83.2	35.1
Others	60.7	85.5	85.6	36.8
Total	61.3	85.3	84.9	36.7

* Significantly different from the Ramdasia figure at the .95 level of statistical significance

Source: Levinson

Regression analysis showed that

> The most significant determinant [of caloric intake] for the population as a whole is beliefs, followed by income. . . . Sex emerges as a significant determinant of caloric intake, but at a lesser level (.9) of statistical significance. (Ibid., p. 51)

Food beliefs, particularly regarding weaning, affect what and how much a child is fed. Income plays a role in determining how much food is available to the family as a whole. However, the Levinson study was not structured to provide information on how income and food beliefs affect the distribution of available food among family members, other than between children of different sexes.

The impact of income and food beliefs is especially evident in relation to the use of supplementary milk. It is more frequently used by the upper income Jats. Levinson explains,

> Given the status connotation of milk in Punjab as elsewhere

> and its high relative price, these caste differences in milk consumption would seem to suggest an income relationship. The lower income Ramdasia mother who cannot afford as much supplementary milk for her child compensates in part by breastfeeding the child somewhat longer and providing a larger proportion of the child's calories with cereals. Because of the caloric density of the cereals, she may in fact be allocating her resources more efficiently than her Jat counterpart with respect to the child's nutrient intake. Some Jat mothers believe they are meeting their feeding responsibilities to the child by providing this high-status, expensive milk, when in reality, given the quantitative inadequacy of the diet, they could better use their resources for cereal preparations. (Ibid., pp.32-33).

The heavy reliance by Jats on supplementary milk and the Ramdasias' earlier use of solid foods with higher caloric density partially explain why there are no major caste differences in nutrient intakes although expenditure levels are higher for Jats.

Food beliefs had an important impact on when children were first given solid food. After a child reaches the age of six months, breast milk and supplementary milk no longer are sufficient to meet his/her nutritional needs. However,

> . . . delay in the introduction of solid food . . . was the norm regardless of economic or social class. Almost no children received solid food before the age of 6 months . . . . The average ages of initiating solid food among 'Other' and Jat children respectively were 9.8 and 10.5 months, as opposed to 10.8 months for Ramdasias. (Ibid., p. 31).

When solid food is introduced to young children, it usually is the same food that adults eat. The preparation of food especially for children is rare.

The sex of the child is the key factor that determines preferential treatment within the household, since "the greater premium placed on sons than on daughters clearly results in major differentials in their care and upbringing " (Ibid., p. 57). The sex factors interact in an interesting pattern with caste/income groups and mistaken food beliefs. Levinson points out that whil

> . . . sex is not a significant determinant of caloric intake among Jats, it is important among Ramdasias where major differentials in caloric intake exist between male and female children. Given particularly tight income constraints and major demands on the time of a Ramdasia woman, coupled with the much higher premium placed on male children, even near adequate feeding of a young female child is the exception rather than the norm. (Ibid., p. 64)

Levinson explains this further:

> The most serious male-female differentials in the explanatory variables occur at the lower end of the income spectrum, among the Ramdasias. This indicates the severe resource and time constraints at that income level resulting in serious consequences for the young female child who may not have been wanted in the first place . . . . When resources and time are no longer serious constraints, as in the case of many Jat families, the young girl can be cared for adequately, although there still will be male-female differences in the quality of that care and, interestingly, in the length of breast feeding. Apparently both Ramdasia and Jat mothers feel obliged to breast feed male children somewhat longer, believing it will increase the likelihood of their survival and well-being. (Ibid., p. 59)

In fact, the Jat female ends up being better off by the shortened time of breast feeding and the earlier introduction of solid foods. The diet available for her more than compensates for the shorter period of breast feeding. She is given almost as many calories, more protein, more iron, more supplementary milk, and more cereal than the Jat male. Such a diet, which is more costly than breast feeding, is not available for the lower income Ramdasia female. Levinson reports,

> The Ramdasia female child not only is breastfed for a shorter time period that the Ramdasia male, but consumes less supplementary milk and less solid food, begins consuming solid food later, and receives less of each of the nutrients. (Ibid., p. 59) (See Table 16)

Although generalizations cannot be made about the relationship between income/caste and the food distribution pattern for the whole family, the allocation of nutrients does appear to be more equal among the sexes at the higher income/

TABLE 16

Profile of Jat and Ramdasia Sample Children by Sex-Caste Grouping (Morinda, India)

	Sex-Caste Group			
	Jat		Ramdasia	
	Male	Female	Male	Female
Number of Cases	111	98	98	96
Average percent of caloric allowance	64.4	62.7	62.6 ---	55.7
Average percent of protein allowance	86.1	88.0	84.9	81.7
Average percent of vitamin A allowance	89.7 --	81.9	86.0	80.4
Average percent of iron allowance	35.1	41.3	37.5	32.7
Percent breast fed	84.0 --	70.0	87.0	82.0
Percent receiving supplementary milk	88.0	93.0	91.0 ---	80.0
Percent receiving solid food	72.1	81.6	79.6	67.7
Average age of initiating solid food (months)	10.5	10.3	10.5	11.1
Average supplementary milk consumption (gm)	204	217	164	146
Average cereal consumption (gm)	22 ----	31	27	25
Average pulse consumption (gm)	8.5	8.7	6.2	9.3
Average vegetable consumption (gm)	10.8	7.1	9.2	4.4
Average fruit consumption (gm)	15.7	14.5	15.7	10.0
Average percent reference weight for age	84.2 --	73.5	77.8 ---	69.0
Average percent reference height for age	95.5 --	91.3	9 .4 ---	89.9
Average percent weight for height	90.1 --	85.3	87.0 ---	84.0
Average number of major diseases	0.91	0.75	1.08	0.89
Average diarrheal infection rating	1.52	1.98	2.38	2.21

--- indicates figures significantly different at the .95 level of statistical significance

Source: Levinson, p. 58

caste/group (see Table 17).

Further evidence of the preferential treatment of male children can be deduced from the nutritional status data collected by the study. Regression analysis showed that "the most statistically significant determinant of nutritional status is sex. In other words, a child's sex per se would more consistently account for variations in nutritional status than any of the other variables " (Ibid., p. 57).

Grouping the children according to the Gomez Classification[9] shows that

> . . . 'normal' children consume 25 percent more calories than those with 3rd degree malnutrition, have less than a third of the diarrheal infection, and have had about a third as much major disease morbidity. In addition, the 'normal' children average 5½ months younger than those with 3rd degree malnutrition,[10] and their family incomes are roughly 50 percent higher. Even more striking are the sex differences. While females constitute 19 percent of the normal children, they account for over 87 percent of those with 3rd degree malnutrition. Similarly Ramdasias constitute less than 20 percent of the normal cases but almost 60 percent of the 3rd degree cases. (Ibid., p. 48)

Complex Distribution Patterns

Four studies describe complex distribution patterns that do not reflect proportional equality or patterns where age and sex factors are dominant. These studies are more likely to have captured the complexities of IFFD because of the survey structures used and their data breakdowns. Similar IFFD patterns may exist in some of the cultures previously discussed, but may not be apparent in the studies because only some of the data on age, sex, and reproductive status was collected and/or analyzed. Each of the following four research studies look at the whole family (infants excepted in some) and total consumption.

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[9] According to the Gomez Classification, children are "normal" if their weight-age falls within 90 percent of a reference standard; children suffering from " degree protein-calorie malnutrition are those falling below 60 percent of the st

[10] The younger age bracket has more "normal" children because of the decreased n tional status of older children still on extended breastfeeding or going throug weaning process.

TABLE 17

Comparative Intakes Within Castes and Between Sex Groups
(Morinda, India)

	Jat Male (Average % of Allowance)	Jat Female (Average % of Allowance)	Jat Female Difference from Male (percentage points)	Ramdasia Male (Average % of Allowance)	Ramdasia Female (Average % of Allowance)	Ramdasia Female Difference from Male (percentage points)
Calories	64.4%	62.7%	-1.7	62.6 ----------	55.7	-6.9
Protein	86.1	88.0	+1.9	84.9	81.7	-3.2

----- Indicates figures significantly different at the .95 level of statistical significance.

Source: Adapted from Levinson, p. 58.

India: USAID, Tamil Nadu

The Indian Institute of Public Opinion carried out a major consumption survey of 2,800 households in Tamil Nadu, India which was funded by AID. It was administered quarterly and consisted of a 24-hour dietary recall survey, the examination of children for clinical signs of malnutrition, a survey of consumer expenditures and monthly household income in cash and in kind, and a gathering of information on food beliefs and taboos.

Tables 18 and 19 show the calorie and protein intakes determined by the study. The authors summarize the intake pattern among family members:

> . . . [There is a] sharp drop at the 7 and 18 month period [for calorie intakes] which identifies the primary target group. Recovery to near average level during the balance of the preschool years is then followed by a continuous decline in nutritional status during the adolescent years. Calorie need fulfillment then improves steadily with age, although overall dietary adequacy tends to level off from age fifty onward, to a small relative decline in protein need satisfaction . . . [The] percentages of caloric requirements met are far below average among the younger pregnant women, lactating mothers of all ages, and children of both sexes between the ages of six months through four years and, most particularly, children in the 7 to 18 month group. Protein deficiencies . . . follow the same pattern, but at higher percentage levels of need satisfaction. It must be remembered, however, that under severe calorie deprivation the higher percentage of protein need met is more apparent than real because the protein is used as pespiratory substrate (calories) rather than protein functions as such. (USAID, Tamil Nadu, Vol. I, p. 79)

The study examines intake patterns across different income groups (See Figures 11 and 12) and at different levels of total household food availability. There is a "striking similarity" which :

> . . . show[s] clearly the operation of a broad pattern of intrafamily food allocation as a fundamental aspect of the general culture. The pattern remains constant even though the level of family nutrition varies markedly. (Ibid., p. 100)

TABLE 18

Calorie Requirement and Intake Per Day Per Individual by Age, Sex and Reproductive Status*
(Tamil Nadu, India)

Months	Male			Female			Pregnant			Lactating		
	Calories		Need Met	Calories		Need Met	Calories		Need Met	Calories		Need Met
	Need	Intake		Need	Intake		Need	Intake		Need	Intake	
0 - 6	530	445	88%	530	445	88%	---	---	---	---	---	---
7 - 18	980	635	65%	980	635	65%	---	---	---	---	---	---
19 - 30	1100	790	72%	1100	790	72%	---	---	---	---	---	---
31 - 59	1230	945	77%	1230	945	77%	---	---	---	---	---	---
Years												
5 - 9	1530	1225	80%	1530	1225	80%	---	---	---	---	---	---
10 - 14	2150	1635	76%	2150	1615	75%	---	---	---	---	---	---
15 - 19	2875	1985	69%	2560	1895	74%	2850	1654	58%	3465	2070	60%
20 - 24	2830	2120	75%	2400	1920	80%	2680	1955	73%	3250	2080	64%
25 - 29	2660	2100	79%	2255	1985	88%	2520	2115	80%	3055	2110	69%
30 - 39	2500	2150	86%	2120	1885	89%	2365	1985	84%	2870	2040	71%
40 - 49	2370	2110	89%	2010	1910	95%	---	---	---	2725	2015	74%
50 - 64	2230	1965	88%	1890	1795	95%	---	---	---	---	---	---
65+	2090	1925	92%	1770	1715	97%	---	---	---	---	---	---

*Data calculated by individual from the 24-hour food recall question in the third round of the Food Habits Survey

Source: USAID, Tamil Nadu Nutrition Study, Vol. I, p. 81

TABLE 19

Protein Requirement and Intake Per Day Per Individual by Age, Sex and Reproductive Status*
(Tamil Nadu, India)

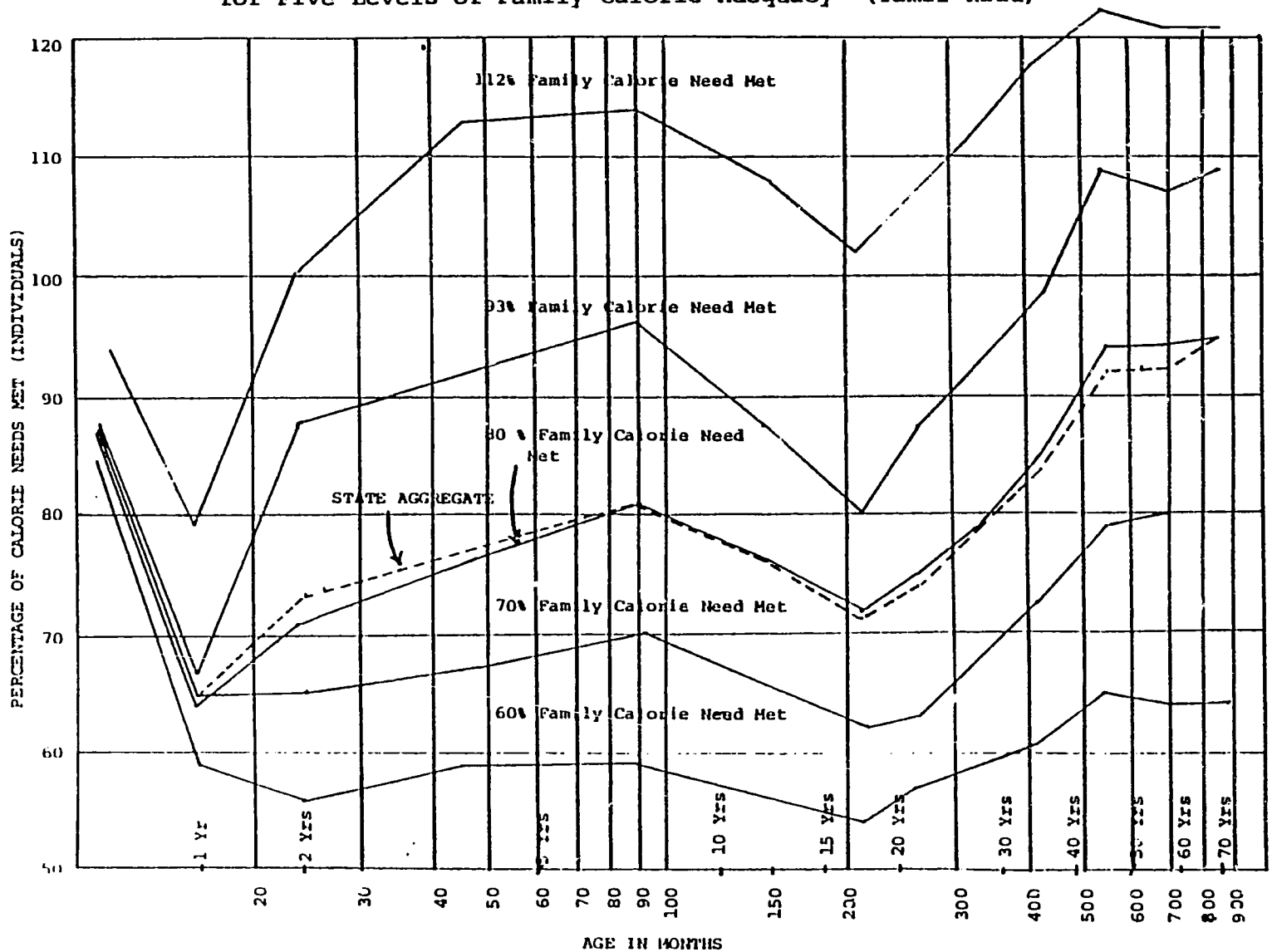
	Male			Female			Pregnant			Lactating		
	Protein		Need	Protein		Need	Protein		Need	Protein		Need
Months	Need	Intake	Met	Need	Intake	Met	Need	Intake	Met	Need	Intake	Met
0 - 6	8.5	8.1	95%	8.5	8.1	95%	---	---	---	---	---	---
7 - 18	12.0	10.3	86%	12.0	10.3	86%	---	---	---	---	---	---
19 - 30	13.0	13.1	101%	13.0	13.1	101%	---	---	---	---	---	---
31 - 59	15.0	15.9	106%	15.0	15.9	106%	---	---	---	---	---	---
Years												
5 - 9	20.0	21.6	108%	20.0	21.8	109%	---	---	---	---	---	---
10 - 14	30.0	29.4	98%	30.0	29.1	97%	---	---	---	---	---	---
15 - 19	43.0	36.6	85%	38.0	35.0	92%	42.5	33.2	78%	51.5	39.1	76%
20 - 24	45.0	39.0	87%	38.0	36.9	97%	42.5	38.3	90%	51.5	39.1	76%
25 - 29	45.0	40.5	90%	38.0	38.0	100%	42.5	39.1	92%	51.5	41.2	80%
30 - 39	45.0	41.9	93%	38.0	37.2	98%	42.5	38.3	90%	51.5	40.2	78%
40 - 49	45.0	41.9	93%	38.0	38.0	100%	---	---	---	51.5	41.2	80%
50 - 64	45.0	39.6	88%	38.0	36.1	95%	---	---	---	---	---	---
65+	45.0	41.1	92%	38.0	35.0	92%	---	---	---	---	---	---

*Data calculated by individual from the 24-hour food recall question in the 3rd round of the Food Habits Survey, Protein is Modified FAO Reference Protein

Source: USAID, Tamil Nadu Nutrition Study, Vol. I, p. 82

FIGURE 11

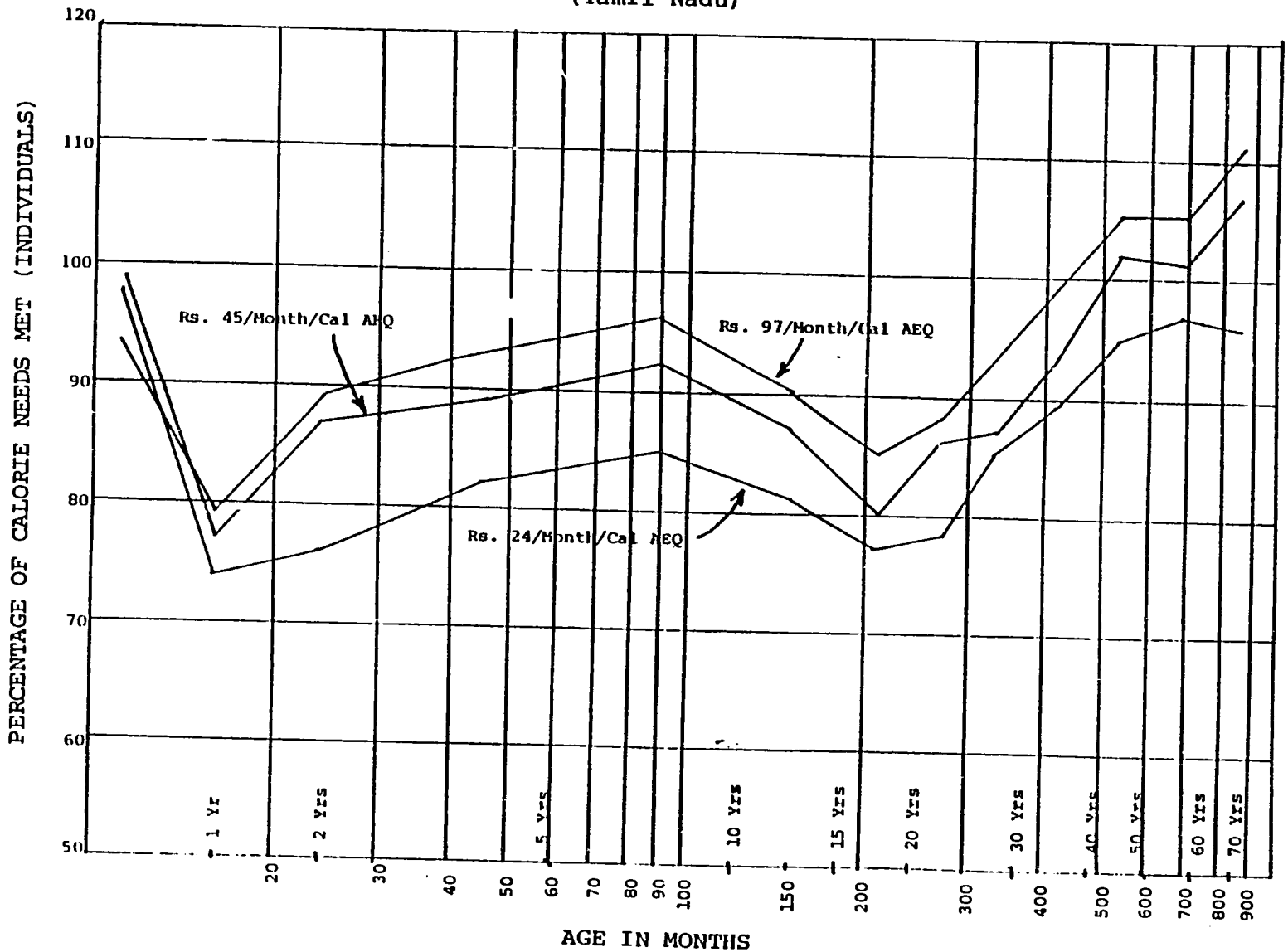
Percentage of Individual Calorie Needs Fulfilled, by Age for Five Levels of Family Calorie Adequacy (Tamil Nadu)



Source: USAID, Tamil Nadu Nutrition Study, Vol. 1, P. 107

FIGURE 12

Percentage of Calorie Needs Fulfilled, by Age
for Three Levels of Family Total Expenditure
(Tamil Nadu)



Source: USAID, Tamil Nadu Nutrition Study, Vol. I, p. 102

This distinctive pattern is not a simple age or sex-dominant IFFD. The authors explain most of it in terms of the "silhouette hypothesis" (See Figure 13). Families often only recognize nutritional need of individual family members in relation to their sheer body sizes. However, needs vary at different stages of life. The Tamil Nadu study points out the

> . . . lack of perception of additional food needs for growth, for reproductive functions in the female, and variable needs according to body weight and activity provides an explanation consistent with the degree of malnourishment of different sex and age groups studied. (Ibid., p. 106)

The authors additionally point out the cultural aspects affecting child nutrition in Tamil Nadu. The characteristic pattern shows the 7 - 18 month-old age group always, with few exceptions, having the lowest levels of fulfillment of both calorie and protein needs. They state:

> In particular, it [the Tamil Nadu study] identifies and amplifies the cultural aspect of child malnutrition wherein the weaning child is inadvertently placed in jeopardy regardless of family income, education, occupation, caste and social status. In the overall view, it appears that this child is relatively and uniformally deprived by everyone. (Ibid., p. 97)

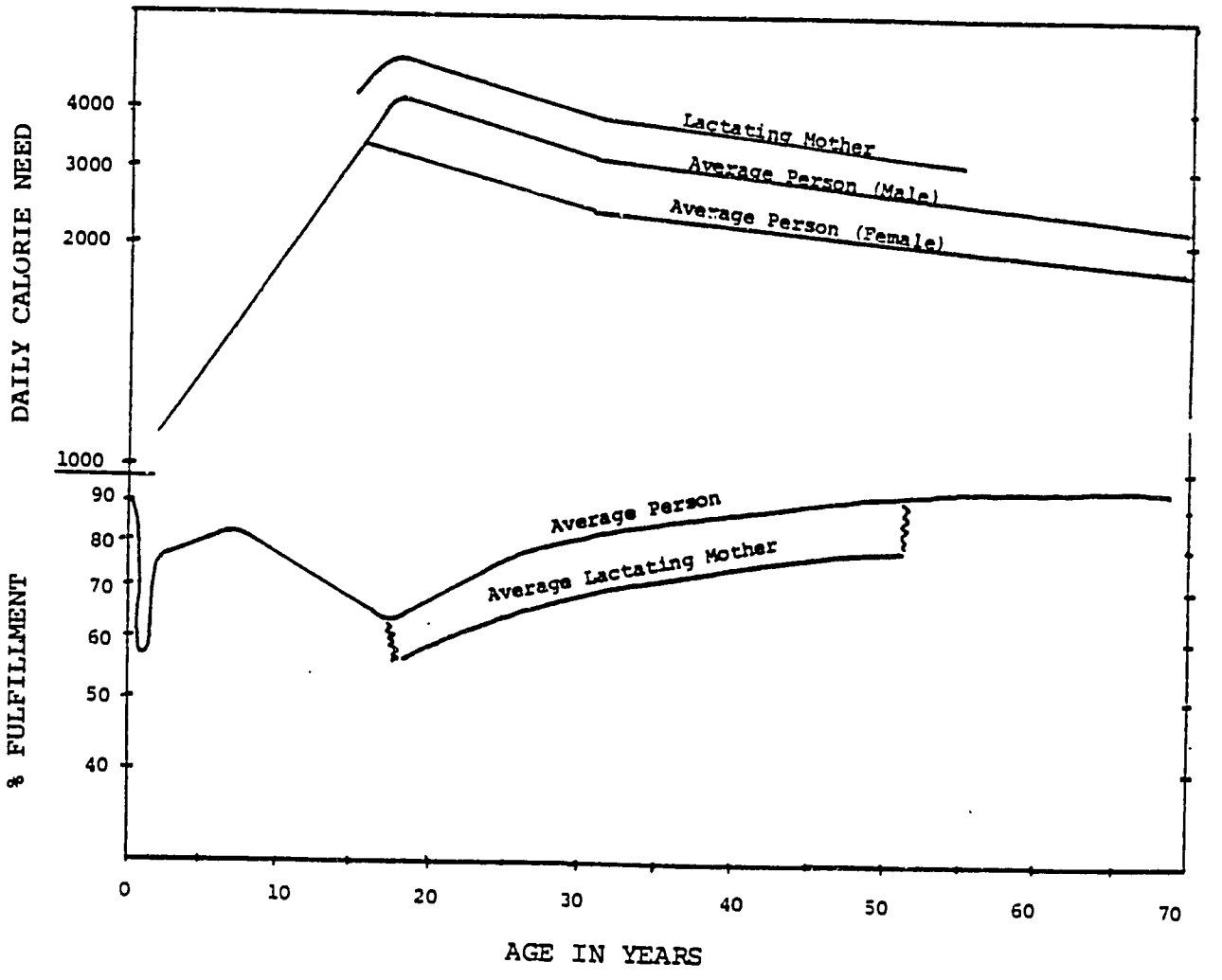
This behavior and resulting problem is further explained:

> During most of the first six months of life, breast feeding provides sufficient nourishment for the child, but thereafter, for the succeeding six months to one year, rapidly diminished breast milk supply coupled with none, or at best, insufficient supplementary feeding, throws the child into a condition of severe calorie deprivation. It is very likely that any amount of breast feeding after six months is mistakenly considered to be adequate in many households, with the result that supplementary feeding is delayed and the child's malnutrition increases . (Ibid.)

The study concludes, "there can be no doubt that the principal target groups for nutrition intervention in Tamil Nadu are the weaning child (age 6

FIGURE 13

Comparison of Daily Calorie Need (Upper Graph)
and Percentage Fulfillment of Calorie Need (Lower Graph)
(Tamil Nadu)



Source: USAID, Tamil Nadu Nutrition Study, Vol. I, P. 83

to 20 months), pregnant and lactating women, and adolescent girls from the time of menarche onward " (Ibid., p. 96).

Nigeria: McFie

A study of individual food intake, clinical signs of malnutrition, and body weights of individuals from predominantly lower income households in Lagos, Nigeria was undertaken by John McFie. Individual portions of at-home meals and plate waste were weighed for a seven-day period. McFie notes that in Lagos a prevailing custom is to buy ready-cooked food from food sellers. Among the families surveyed, 47 percent of the meals were purchased in this manner and usually brought home for consumption. Where such foods were eaten outside the home, the quantities were inferred from their costs. Also, samples were purchased to assess the proportions of ingredients and the moisture content.

Table 20 summarizes mean nutrient intake by the age/sex groups. Table 21 and Figure 14 show the percentage of RDA's fulfilled for each nutrient. McFie reports:

> The values for adult females, in relation to requirements, were not significantly lower than those for adult males and may in fact have been higher. The [mean] nutrient intake of lactating females was higher than that for other adult females. However, their intake was not sufficient to maintain normal weight during lactation, as was shown by the body weight portion of the survey. (McFie, p.260)

The overall pattern shown by the McFie study is similar to that in Tamil Nadu. The "silhouette hypothesis," in other words, would appear to fit here also.

McFie also confirms the same general trend as Nicol's Nigeria study that intakes, relative to requirements, are higher for adults than for children. McFie reports:

> The unequal distribution of food within the family noted among

TABLE 20

Daily Nutrient Intakes of People in Lagos, Nigeria

Age Group	Calories (kcal)	Protein (gm)	Calcium (mg)	Iron (mg)	Vitamin A (i.u.)	Thiamin (mg)	Riboflavin (mg)	Nicotinic Acid (mg)	Ascorbic Acid (mg)
Adult males	2,010	71	355	12.3	16,700	0.9	0.6	14.1	107
Adult females	1,610	54	314	10.7	11,400	0.8	0.5	10.0	86
Pregnant and lactating women	2,062	63	379	15.0	16,900	1.1	0.6	12.3	116
Children:									
4 - 6 years	1,134	30	202	7.8	12,300	0.6	0.3	5.4	69
7 - 9 years	1,207	33	201	7.6	13,600	0.7	0.4	6.3	77
10 - 12 years	1,141	31	193	7.0	11,400	0.6	0.3	5.8	61

Source: McFie, p. 262

TABLE 21

Daily Nutrient Intakes of People in Lagos, Nigeria
(As a percentage of requirements)

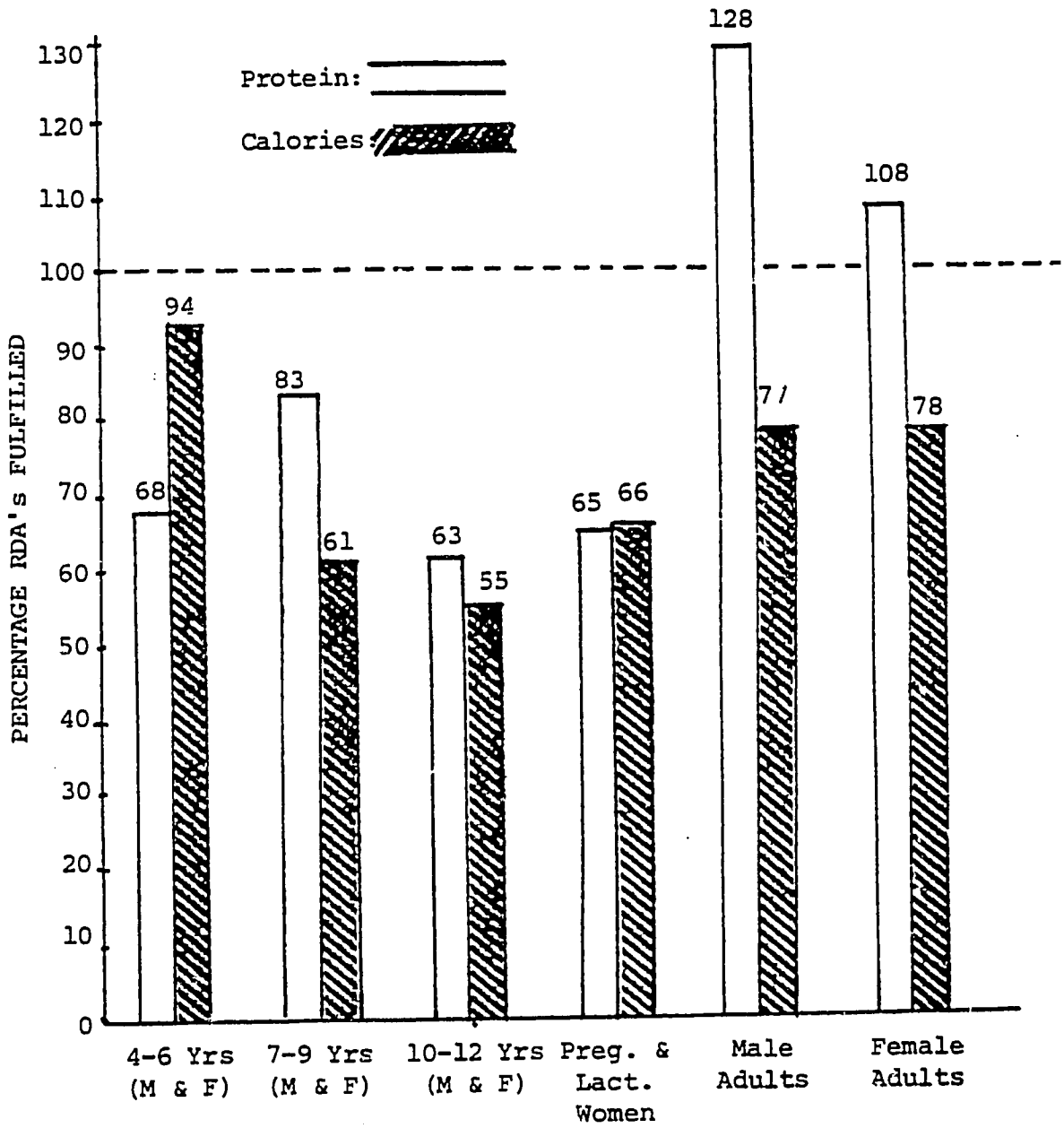
	Calories	Protein	Calcium	Iron	Vitamin A	Thiamin	Riboflavin	Nicotinic Acid	Ascorbic Acid
Adult Males	77	128	88	154	330	75	33	108	530
Adult females	78	108	78	134	230	80	33	100	430
Pregnant and lactating women	66	65	38	100	240	84	30	95	230
Children:									
4 - 6 years	68	94	50	97	490	75	25	68	138
7 - 9 years	61	83	40	76	390	70	27	63	128
10 - 12 years	55	63	32	58	250	50	20	48	102

Source: McFie, p. 262

FIGURE 14

Daily Nutrient Intakes (Lagos, Nigeria)

(% of RDA's)



Source: McFie

> rural populations by [Nicol] is at least as marked in the urban groups, with the consequence that the nutrient intake of children falls below recommended levels for a number of nutrients. Since the average adult diet tends to be lower, in relation to requirements, in calories than in protein, this disparity is even more marked in the children's diets. (Ibid., p. 267)

An exception to the pattern of adult-child disparity was a group of pre-school children of Northern Nigerian origin who were given quantities of milk each day. A comparison of relative consumption of the different age groups of children shows that among them "diets of younger children (4 - 6 years of age) tended to be more nearly adequate than those of the older ones (10-12 years) (Ibid., p. 261).

While all the families were generally from the lower income stratum, one group was poorer than the others. Table 22 shows the differences in consumption between residents of Northern origin and those of Western origin. The Westerners were generally poorer. Their nutrient consumption was markedly lower than the Northerners' but was more equal across age groups and sexes. The Northerners exhibited wide variations across age and sex groups.

However, children's intakes, relative to requirements, were likely to be lower than adult's intakes irrespective of the family's region of origin. As McFie points out,

> These variations determine the relative nutrient values of the household diets; within the family, however, from whichever region, the distribution of the food is such that the children usually obtain a smaller percentage of their requirements than do the adults. (Ibid., p. 266)

Nigeria: Gurney and Omololu

J.M. Gurney and A. Omololu conducted a nutrition survey in two selected sites in Southwestern Nigeria at the beginning of harvest following three months of relative dietary insufficiency. The study included a seven-day dietary survey , including weighing food, examination for clinical signs of disease and

TABLE 22

Nigeria:
Daily Nutrient Intakes
by Region of Origin
(% requirements)

Age Group	Northerners living in Obalonde		Westerners living in Lagos Island	
	Calories	Protein	Calories	Protein
Adult Males	89	152	65	82
Adult Females	128	175	67	84
Lactating Females	-	-	65	59
Children				
6–15 years	66	87	55	75
2–5 years	104	114	56	70

Source: McFie, p. 264

malnutrition, and anthropometric measurements.

The dietary portion of the survey collected intake data for all family members, with the exclusion of children under two years because of the immeasurability of their breastmilk consumption. Food consumed at meals in one cooking unit of the sample family compounds was weighed. Some attempt was made to estimate consumption of food which could not be weighed, but no information is available as to whether this included all snacks consumed away from the cooking unit. Such a question has particular importance in the culture examined here because of the prevalence of polygamy. A household often contained several cooking units according to the number of wives, and frequently the husband and children would eat or snack at more than one stewpot during the course of the day. Since the dietary survey only weighed consumption in one cooking unit per household, the consumption of men and children may be underreported.

The results of the data analysis showed that "both mean protein and caloric intakes were inadequate in all groups except the women " (Gurney and Omole p. (See Table 23.) Adolescents and pregnant and lactating women clearly have the lowest consumption levels, which would tend to fit the silhouette hypothesis Figures 15 and 16). Sex categories are not distinguished in the lower age brackets, and the combined data may conceal consumption differences between boys and girls.

Little correlation was found between the dietary data and the anthropometric measurements. The authors point out that the latter is an index of past influences while the former measures current intakes. The divergence between the two is not surprising in light of the seasonal timing of the survey, which immediately followed an extended period of low consumption.

TABLE 23

Mean Dietary Total Caloric Intakes, Nigeria

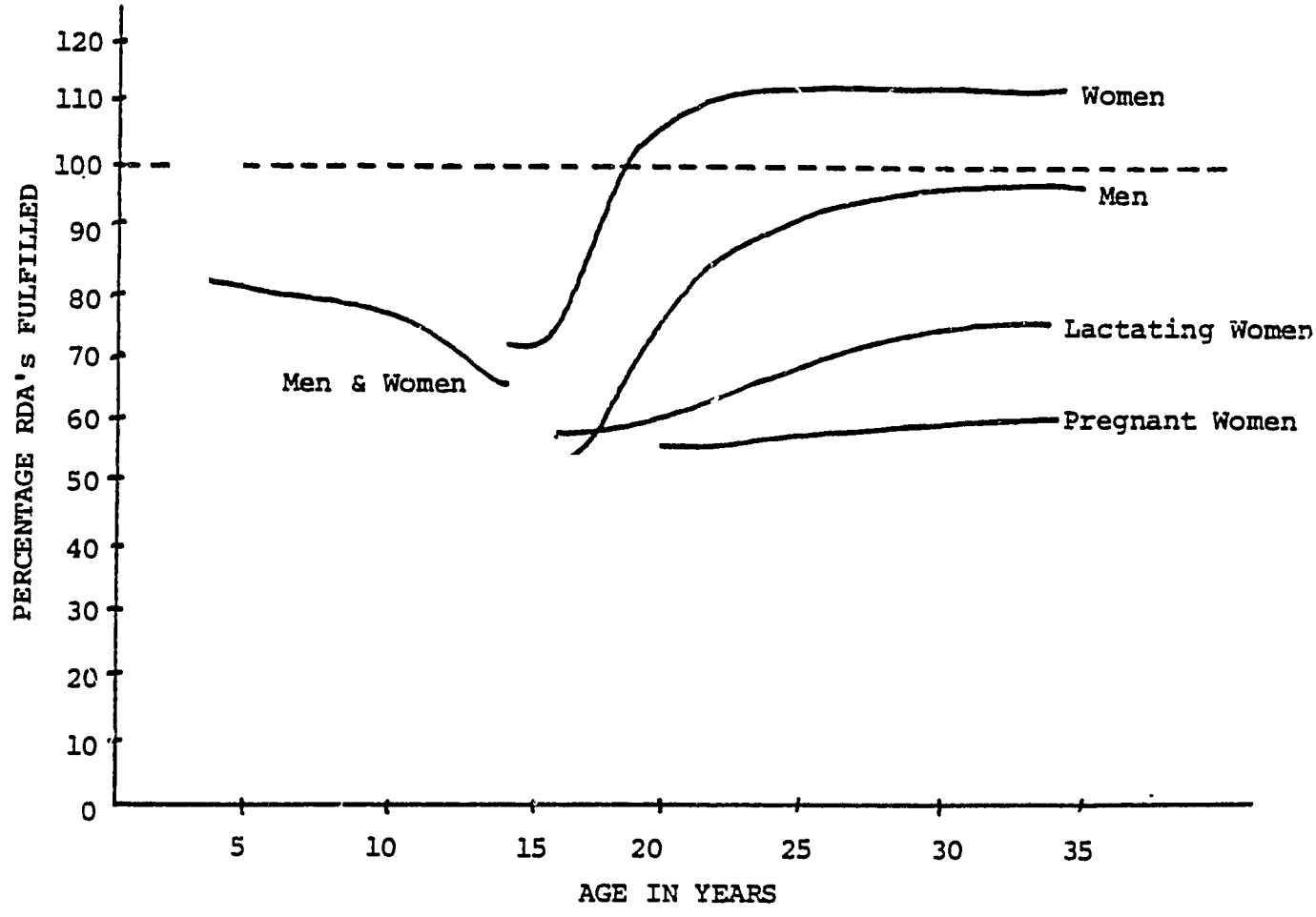
	Mean CAL/Day		Mean PRO/Day		% Req. Met	
	Intake	Req.	Intake	Req.	Cal.	Prot.
2 - 4 years	1113	1344	15.0	21.8	83	69
5 - 9 years	1465	1839	19.8	27.4	80	72
5 - 12 years	1518	1969	20.5	29.5	77	69
Preadolescents	1612	2325	21.8	34.9	69	63
Adolescent Boys	1637	3171	20.9	47.5	52	44
Adolescent Girls	1645	2267	19.9	34.0	73	58
Young Adult Males	2367	2815	34.0	42.2	84	81
Young Adult Females	2224	2036	33.0	30.5	109	111
Older Adult Males	2270	2370	40.0	36.0	96	90
Older Adult Females	1860	1655	27.0	25.0	112	108
Pregnant--Over 20 years	1308	2297	25.0	44.0	57	57
Lactating-Under 20 years	1914	3244	29.0	61.0	59	48
Lactating-Over 20 years	2288	3114	28.0	43.0	73	65

Source: Gurney and Omololu, p. 61

FIGURE 15

Caloric Fulfillment by Sex and Age
In Southwestern Nigeria

(% RDA's)

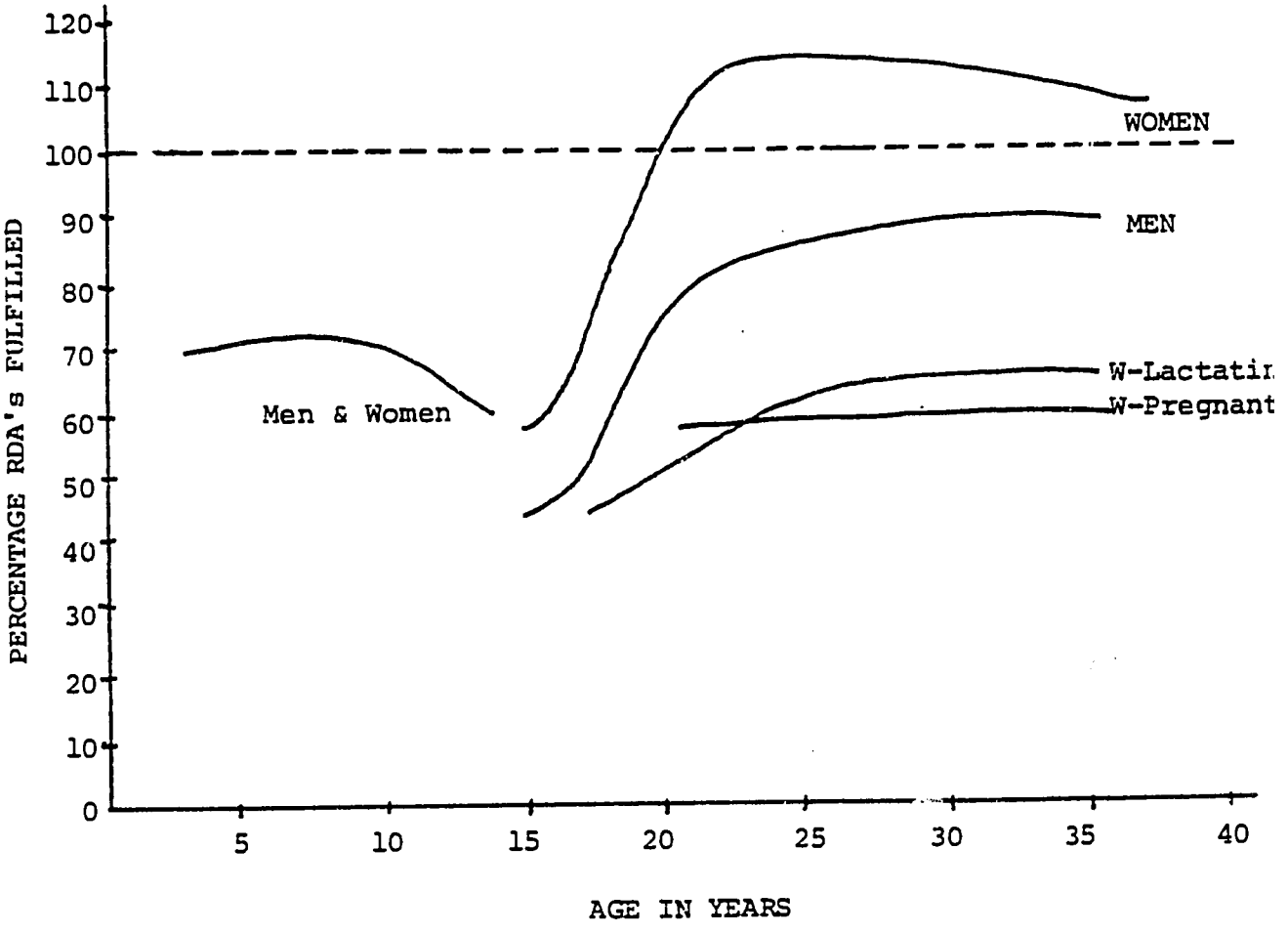


Source: Gurney and Omololu

FIGURE 16

Protein Fulfillment by Sex and Age
in Southwestern Nigeria

(% RDA's)



Source: Gurney and Omololu

Philippines: Evenson, et al.

Robert Evenson, Barry Popkin, and Elizabeth King-Quizon conducted a combination weighing and recall dietary survey of 97 households in Laguna, Philippines (1979). Food consumption was recorded seasonally for all members of the households over one- to two-day periods.[11] All food was weighed for the three main meals. Where family members were served their individual portions, each plate was weighed before and after eating. Where members helped themselves to food at the table, the serving plate was weighed each time food was taken. Data on between-meal snacks and meals eaten outside the home was obtained through recall. When necessary to aid in the calculation of nutrient content, the interviewer sought out the source of the food (such as street vendors or schools) and obtained more complete information on the food items.

Rosario Valenzuela analyzed portions of the Laguna data set to examine nutrient distribution within the family (see Table 24). The results are graphically represented in Figure 17. As can be seen, a smaller percentage of the nutrient requirements are met for females than males at all ages, except for the one case of parity among adult offspring for calorie fulfillment. There is a wider differential in protein fulfillment than for calories.

The nutrient fulfillment of parents was generally higher than that of their offspring. Valenzuela reports the results of the data analysis of food distribution between parents and offspring:

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[11] Initially the survey was carried out for two days in each household. No significant variation in the quantity and quality of food intake was found between the two days, so the remainder of the survey was conducted for one day only in each household.

TABLE 24

Mean Nutrient Intake and Diet Rating of Family Members in Laguna, Philippines

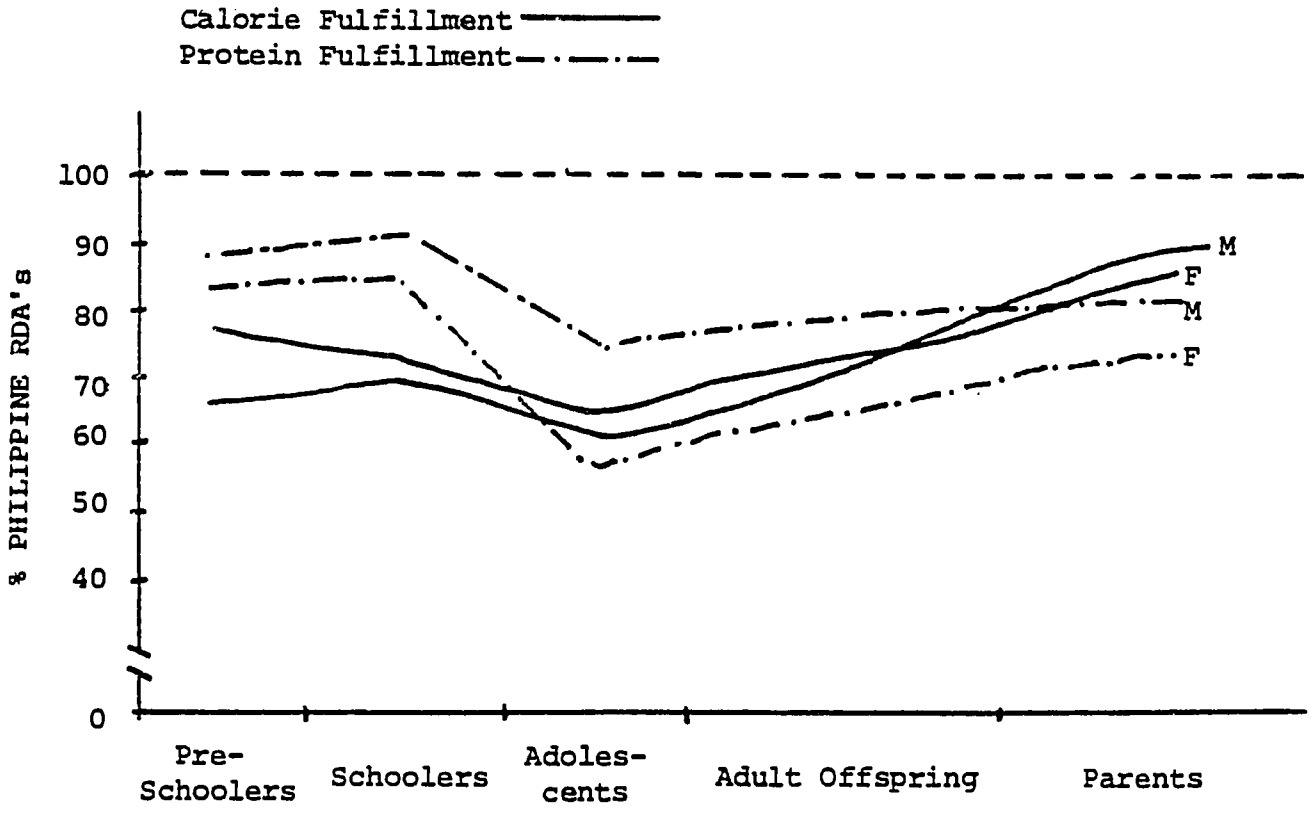
	Nutrient Intake Expressed as % RDA*				
	Calories	Protein	Vitamin A	Vitamin C	Diet Rating
Fathers	80	83	30	88	60
Mothers	87	73	27	59	56
OFFSPRING BASED ON:					
1. Sex					
Males	73	85	20	53	52
Females	67	77	20	58	50
2. Sex-Age					
M - Pre-Schoolers	78	89	22	86	55
F - Pre-Schoolers	67	83	22	63	51
M - Schoolers	73	91	19	46	53
F - Schoolers	69	84	20	64	52
M - Adolescents	66	74	20	31	48
F - Adolescents	61	58	15	42	43
M - Adults	74	79	19	27	51
F - Adults	74	65	25	44	49

* Philippine Recommended Daily Allowance

Source: Adapted from Valenzuela, 1978, p. 171

FIGURE 17

Mean Nutrient Intake of Family Members
According to Sex (Laguna, Philippines)



Source: Evenson et al.

> Compared to parents, the nutrient intake and diet rating of both male and female offspring was generally lower, except for the protein intake of male offspring which was the highest among all sex groups. The intake of male offspring differed significantly ($p \leq 0.01$) from that of fathers for all nutrients except protein. The differences in the intake of mothers and male offspring differed significantly for protein at the 1 percent level, and for calorie and vitamin A consumption at the 5 percent level, but not for vitamin C ingestion. Female offspring and fathers consumed significantly different ($p \leq 0.01$) amounts of nutrients, while only calorie and vitamin A consumption differences between female offspring and mothers were found. The calorie and protein intake of male offspring was significantly higher than that of female offspring. The amount of vitamin A consumed is not different while the vitamin C consumption of female offspring was higher but not significantly so . (Valenzuela, p. 170)

As can be seen in Figure 17, the curves follow a basic pattern with parallel variation according to the age group. They appear to follow the outlines of the silhouette hypothesis. There is great variation by age in the percentage of RDA's met, but also evidence of a consistent life-long differential treatment according to sex.

Valenzuela constructed a diet rating index based on the Laguna data for nine nutrients (see Table 24, last column). Ratings were calculated for each age-sex group from the formula

$$\frac{\text{mean nutrient intake expressed as \% RDA}}{\text{\# of nutrients}} \times 100$$

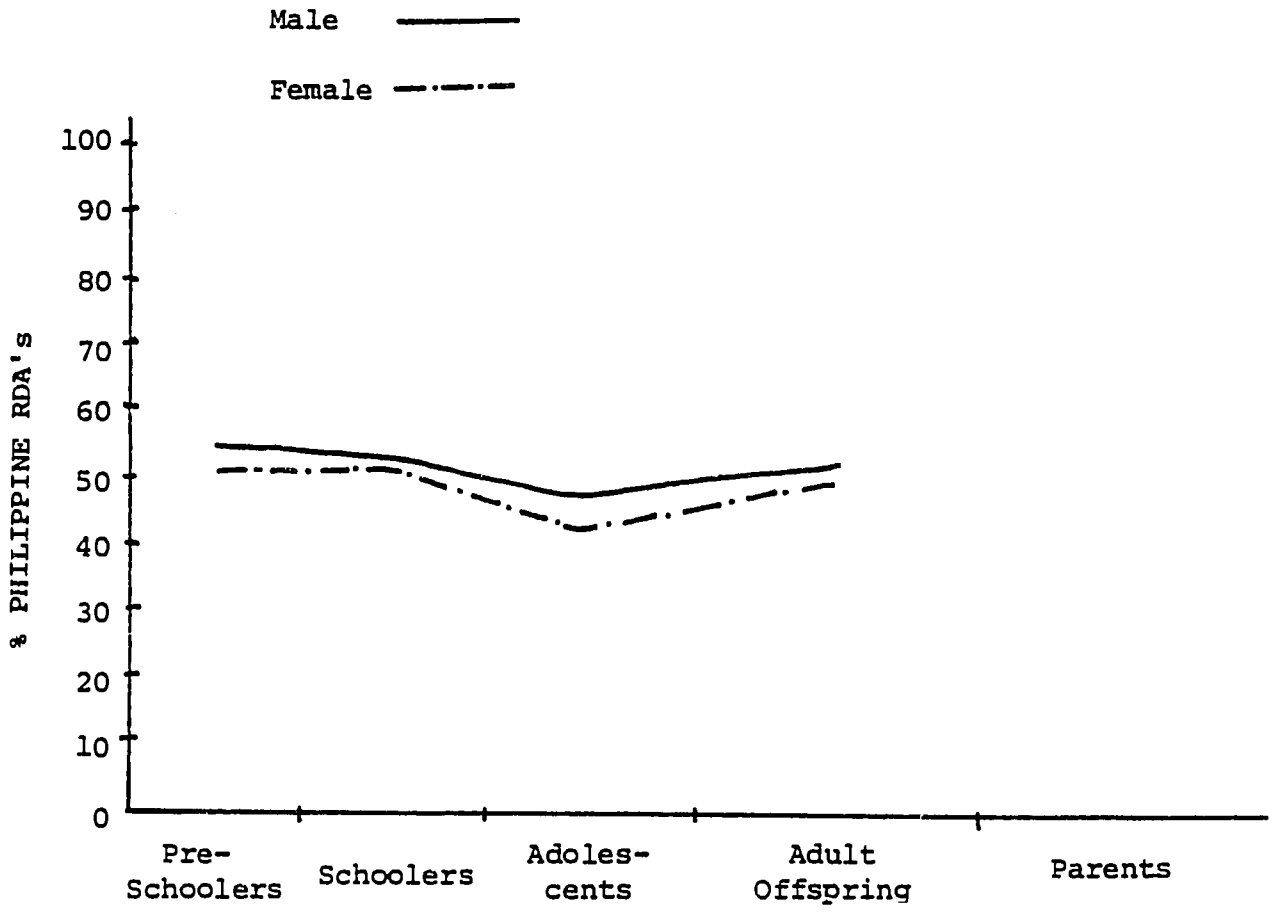
Comparison of the diet ratings showed that they were

> . . .highest among fathers and lowest among female offspring. It varied significantly ($p \leq 0.01$) between fathers and mothers, and between parents and offspring. The difference between male and female offspring was significant at the 5 percent level. These low levels of diet rating in all sex groups indicated a poor quality diet among all respondents. (Ibid.)

Figure 18 graphically shows the male-female differential, with a dip in both curves during the adolescent period.

FIGURE 18

Diet Rating of Family Members
(Laguna, Philippines)



Source: Evenson et al.

The Laguna survey also collected anthropometric data for young boys and girls.

> Examination of this data shows they are consistent with the dietary findings. In regression analysis of factors associated with weight of pre-schoolers, percent of standard weight-for-age was 3.05 percentage points lower for girls aged 6 - 83 months than for boys of the same age. This difference was significant at the 1 percent level. (Evenson, et. al., pp. 45-46).

The Laguna survey collected considerable income related data. This data has yet to be analyzed to explore the possible relationships between IFFD patterns and income. Further analysis would show whether the IFFD data falls into different patterns according to family income levels.

Summary

At best the derivation of IFFD patterns from the above studies represents a piecemeal approach. Virtually every study omits key areas of inquiry necessary for a total picture of IFFD patterns. The most serious omissions are those of outside consumption, data collection for all ages and sexes of family members, analysis of patterns by income level, the examination of the effects of cultural aspects such as food beliefs regarding intake, and the proferring of explanatory behavioral rationales for the IFFD patterns observed.

Further studies, with careful attention to IFFD-relevant design and analysis, are necessary to see more clearly IFFD patterns, understand why they exist, and thus respond with appropriate policy interventions. The final chapter deals with the latter and offers suggestions regarding directions for further research.

POLICY IMPLICATIONS

In spite of their diversity of approach the studies summarized in the preceeding chapter clearly confirm that systematic factors influencing the distribution and individual consumption of food within households can and do significantly affect the nutrient intake of family members in adverse ways. In times of limited resource and food availability, these factors, which themselves are the outgrowth of cultural, economic, and ecological influences, serve to prioritize the allocation of the family's food stock according to the family decision-maker's perceptions of what family members should consume (normative criteria) and what they must consume (economic criteria).

Normative and economic influences upon food selection, production, and distribution interact in complex ways, and policies designed to deal with them should reflect an understanding of this interaction. In this chapter we will review the policy and program tools potentially available to the development planner concerned with incorporating food consumption issues generally, and IFFD issues specifically into strategies for national agricultural development. We begin with a detailed review of the rural household as a joint production and consumption unit in order to indicate key points of policy intervention. Following this, a typology of possible agricultural development policies and nutritional intervention measures is outlined, together with a brief indication of how each policy type may affect IFFD, with reference to some of the patterns discussed in Chapter III. Finally, areas and methodologies for future research are outlined.

The Household as a Production/Consumption Unit

In Chapter II the flow of food through various household channels as influenced by "gatekeepers" was discussed in order to demonstrate the centrality of the food distribution process (see Figures 1 and 2). In Figure 19 these flows are shown in greater detail in combination with production and marketing channels. Instead of "food" flows, however, the flow of a specific nutrient "calories" is shown to emphasize the nutrition effects and the especially important role of human energy as an essential input to production and household maintenance and the major link connecting the family's production, consumption, and investment activities.

The right-hand side of the diagram illustrates the household's major function as a producer of calories as embodied in the various kinds of foods harvested. The total stock of calories produced at time t-1 is denoted by W_{t-1} and is destined for sale in the market, X_{t-1}, gifts outside the household, V_{t-1}, and consumption by household members, A_{t-1}.

Calories produced by the household for its own consumption become part of total calories available in the next time period, t, and is denoted by A_t. Total calories available in time t, E_t, is the sum of home production from the previous period, calories from foods purchased in the market, B_t, foods eaten away from the household, C_t, and food gifts to the household, D_t. Foods from sources A, B, and D are placed in storage, E. Foods eaten away from home are consumed immediately by definition and thus contribute to the nutrient flow at a later stage.

From storage to family members' plates, calories (and other nutrients) may be lost due to improper storage, I_t (e.g., spoilage, rodent and insect infestation), the processing and preparation of food, J_t (e.g., discarding

fat from meat, skins from fruits and vegetables), and cooking practices, K_t (e.g., discarding juices, pan drippings).

In the diagram, unequal distribution of food at mealtime is represented by larger flows for adults and male children, H_t. Following the distribution of food, further calories may be lost due to plate waste, L_t. Additional calories may be consumed away from the household (purchased or eaten in the fields), and this input, C_t, is shown immediately following H_t.

Calories consumed are transformed through physical absorption, M_t, into physical work performed via allocation of labor as shown by the flows labelled "calories absorbed" and "expenditure of calories." This work results in the production of calories in time t, W_t, and the various household tasks shown which jointly will result in calorie acquisition, storage, processing, etc. in the next time period, T+1, thereby closing the loop. Absorption mutually interacts with the family's health status, BB_t, illustrating the synergistic relationship between nutrition and infectious disease.

A number of points should be emphasized here. From both nutritional and economic standpoints, absorption of nutrients, M, occupies a central position. For male and female household members and for both children and adults, absorption plays a critical role in determining the quality and quantity of labor available for proper functioning of the household. In economic terms, food consumed to support productive labor represents the rural household's equivalent of productive investment. In times of plenty, it may be possible for the household to consume more nutrients than the minimum needed to maintain its income-generating production, and this surplus may be termed "consumption" or "profit" as the terms are used in conventional microeconomic theory. But in times of scarcity or when market prices are seasonally depressed, the family's intake of foods and nutrients may fall to

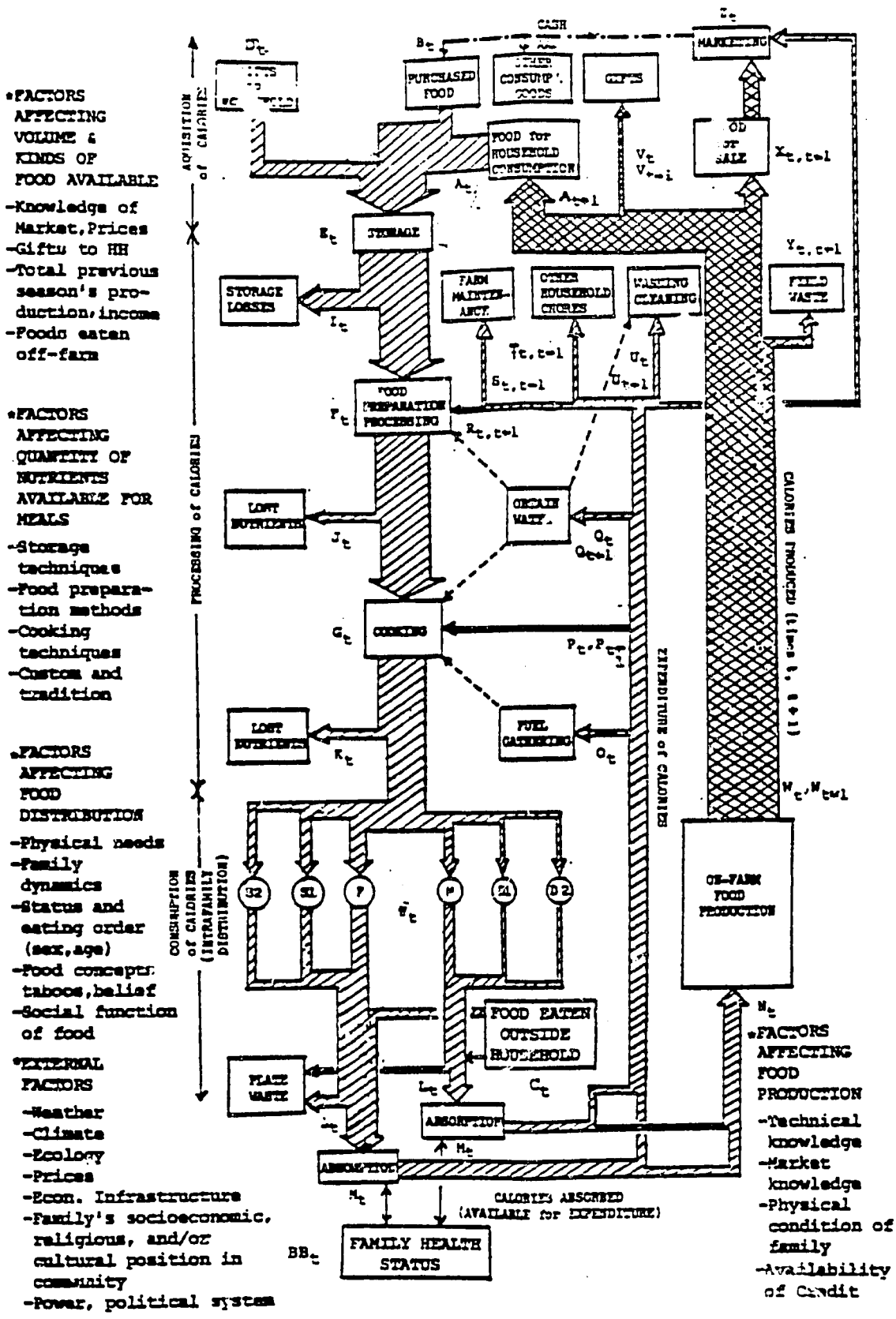


FIGURE 19

Intra-Family Production and Consumption of Calories

or below the minimum level for maintaining the next season's output. If absorption is subnormal due to inadequate food availability, inappropriate IFFD, and/or poor health, future production will be reduced with adverse consequences for the next consumption/production cycle. This simply underscores the inseparable interdependence of food consumption (both quantitatively and qualitatively) and food production in any balanced strategy for agricultural development, a point sometimes missed by "supply-oriented" planners. Here, whenever the term "consumption" is used, therefore, it will mutually apply to the concepts of "consumption" and "investment" as traditionally used by economists.

Figure 19 additionally shows some of the principal factors governing the "calorie flow" at various points. These provide clues to appropriate points of policy intervention and to appropriate kinds of policies which might be employed.

Towards an Appropriate Policy Blend

In Chapter II a distinction was made between food availability and food distribution. Many conventional agricultural development programs address the former, evidently under the assumption that if food quantity is large enough, food quality and distribution will not remain important problems. This position might be termed the "supply-approach" to food policy. At the other extreme are clinical nutrition professionals, health personnel, anthropologists and others who focus upon individual communities and households, concerning themselves with detailed attitudes, customs, and activities. At this level, recommendations regarding food policy tend to reflect a more explicit "distribution approach." Before examining policies in detail, let us briefly examine the problems associated with each "approach."

Supply Versus Distribution Approaches to Food Policy

At the risk of oversimplification, a purely supply-oriented approach to a developing country's food problems may be sketched as follows. First, total current food production (assuming reasonably reliable data is available) is divided by total current population to estimate present per capita consumption averages. Unless extensive surveys have been made of both consumption and production of all important foods consumed in the country, calculations are usually limited to a few major staples, some of which may also be imported. Second, the rate of population growth is applied to present production and imports of food to project increases in supply (and the necessary resources) needed to keep pace. Third, if nutrition is considered at all, a desireable level of per capita consumption is posited and compared with the calculated national or regional averages to discover the "nutrition-gap." Projected production levels of food are revised upward in order to "close the gap" within some contemplated time period.

Assuming that such a strategy is successful to the extent that production of the target foods does in fact increase in response to appropriate rural income, employment, marketing, etc. programs, there will be more food available for rural people to eat. From Figure 19, it is clear that an increased volume of nutrient flow, say from E to G may yield greater nutrient flows at the distribution point H; although the proportional distribution of foods may or may not change, each family member would be able to consume a larger absolute amount of food.

Aside from the well known danger of estimating a country's nutrition status on the basis of production/population averages, it is apparent from Figure 19 that a pure supply approach would be wasteful. Increasing the

total amounts of nutrients available for distribution (H) will also increase the amount of loss through preparation, cooking, and plate waste, too, in the absence of concurrent programs designed to reorient thinking about food. Such waste would become increasingly intolerable with continued population growth and would sooner or later become a major constraint upon further nutritional improvement.

Nor is there any guarantee that distribution would not be adversely affected. Increases in available food may be disproportionately given to family members already favored. Moreover, the family may already have been consuming as much as it wished, given the calorie density or lack of it of its traditional foods. Especially in the case of children, increased availabilities may not lead to increased consumption if they are eating as much as they can hold of cassava, tortillas, or beans to begin with. Older family members would consume the excess or attempt to market it.

Finally, food volume is not the same as food quality, even if the increases in production are used to obtain additional cash income, since the family may purchase such nutritionally dubious items as liquor, soft drinks, sweets, and highly processed foods from commercial sources.

In many developing countries, of course, a "distribution approach" does exist parallel with a "supply approach." However the two approaches are only rarely coordinated. Nutrition-oriented organizations such as the Nutritional Institute for Central America and Panama (INCAP) and the Caribbean Food and Nutrition Institute (CFNI) attempt to identify specific nutrition problems, and many countries have active health ministries and nutrition councils. Nevertheless, activities tend to become concentrated in specific areas and/or communities at specific times; rarely are the nutrition and consumption impacts of other kinds of development activities evaluated or taken into account in devising national development strategies.

Unless patterns of national food production eventually are altered to reflect patterns of nutritionally desirable consumption, improvements acheived in individual communities or regions are not likely to be sustainable in the long run.

Thus, increasing the total supply of food, on the one hand, and improving the distribution of food to individuals in specific instances, on the other hand, are both necessary conditions for sustained improvements in a country's nutrition/health status. But neither, individually, is sufficient. Any realistic total strategy for nutritional improvement must take into account both production and distribution simultaneously at all social and economic levels.

A Typology of Policies

Table 25 lists the major kinds of development policies and programs which can be expected to influence the supply and distribution of food to rural sector families, either directly or indirectly. Many of these, of course, would also affect the consumption of food in the urban sector.

To avoid conceptual confusion at the outset, it is useful to distinguish between short-intermediate-term policies and long-term policies. Presumably, the principal goal of economic development is permanent, self-sustained improvement in the well-being of both rural and urban inhabitants. A fundamental assumption is that this can be achieved mainly through increased per capita real incomes (which permit greater command over goods and other material amenities of life), and education (which reorients per capita demand in directions deemed to be beneficial by decision-makers). To acheive greater incomes, however, resource productivity, total production, and employment opportunities must be expanded. The latter three objectives constitute essential prerequisites for increased incomes. As such, they are means to an end, not ultimate

TABLE 25
Principal Types of Development Policies and Programs
Affecting the Supply and Distribution of Food

SHORT-AND INTERMEDIATE-TERM POLICIES/PROGRAMS	LONG-TERM POLICIES/GOALS
Agricultural Development:	
Agricultural Research Agricultural Extension Rural Credit Input Subsidies Output Price Stabilization Soil Conservation and Irrigation Food Export Promotion Food Import Substitution	Directly increase production, income, and employment of rural families
Transportation Infrastructure Marketing Infrastructure Cooperative Promotion Rural Colonization Land Reform	Support of Direct Programs Exploit economies of scale Expand rural resource base
Rural Wage Regulation Agroindustry and Artisan Industries Expand Women's Role Urban Services for Rural Towns	Increase rural employment and incomes
Food and Health:	
Health and Medical Care Home Economics Training Potable Water Food Imports and Food Aid Sanitation	Improve family health, nutriti Improve quality of labor Improve quality of life
Nutrition:	
Nutrition Education Food Supplements Food-for-Work School Lunches Direct Feeding	Improve health, nutrition Improve quality of life Improve quality of labor
Industrial and Urban Development:	
Promote Processing and Consumer Industry Expand Banking and Finance Expand Wholesale and Retail Business Encourage Foreign Direct Investment	Increase market for rural good Mobilize rural savings Reduce cost of processed food and other consumer goods

ends in themselves. At one further remove are the items listed in the left-hand column of Table 25. These may be regarded as alternative means to acheive the objectives of the longer-term policies listed in the right-hand column. They are called "Short-and Intermediate-Term Policies/Programs" here, because the words "policy" and "program" are often used interchangeably to characterize them. Whichever term is used, they represent activities--and the intentions of the country's decision-makers embodied in them -- which operationally promote long-run policy priorities. Whenever the term "policy" is used in this chapter, it refers to them.

An additional point is that from one developing country to another the policy mix can be expected to vary according to local needs, and the emphasis upon, and the nature of individual policies will differ. To put it another way, collectively some combination of these policies is a necessary condition for successful development for some country, but no individual policy per se need be.

Agricultural development policies are those which relate directly or indirectly to the objectives of increasing rural production, productivity, employment and income. Some policies support others; for example, land reform, aside from equity issues, presumably increases unit land productivity, thereby rendering extension and credit programs more effective.

Food and health policies ultimately improve the quality of rural labor and lengthen life spans, thereby justifying investments in education and, in the longer run, aiding in the expansion of the rural market for urban industrial and consumer goods.

Similarly, nutrition programs improve the quality of labor and ultimately reduce the cost of curative medical and health care.

Finally, industrial and urban development expands urban incomes, thereby stimulating demand for rural goods and employing mobilized rural savings.

Figure 20 is a simplified version of Figure 19, showing principal food (nutrient), labor, and income flows through the rural household. Figure 21 superimposes some of the policies from Table 25 upon these flows in order to emphasize the interrelatedness or development strategies.

Policies Directly Influencing IFFD. We have seen that custom and tradition are among the most important influences on IFFD. If these influences result in a distribution of food consistent with each family member's needs according to state of health, sex, share of family labor, and other such criteria, so much the better. If not, then they must be changed somehow in any development strategy which includes improved nutrition and health as priorities.

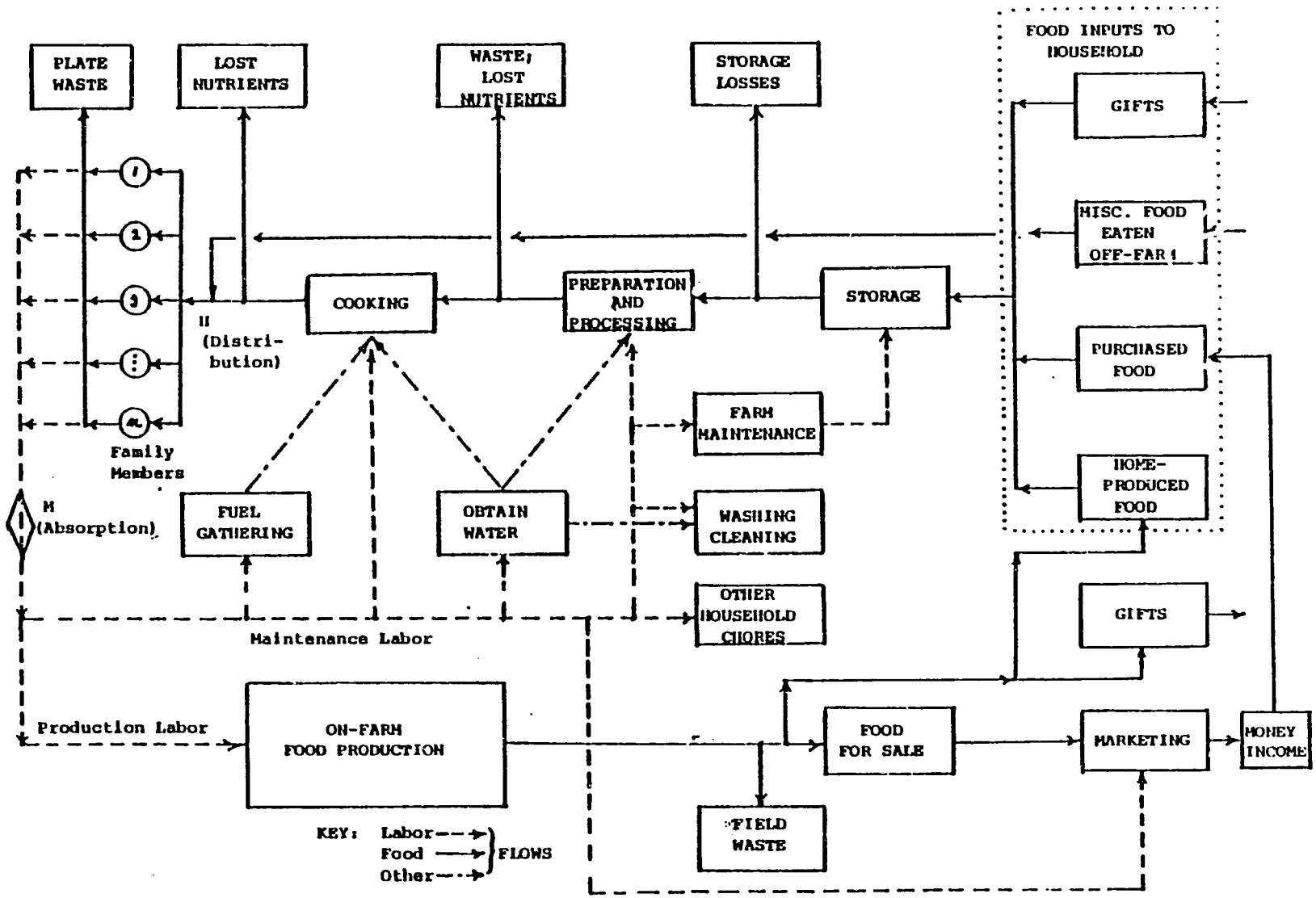
"Custom" and "tradition" are simple terms referring to very complex phenomena. While the studies we have discussed make their roles governing IFFD clear, they do not probe deeply into the linkages between belief and food practices in ways which would guide the policy maker. Where unbalanced IFFD is merely a matter of ignorance about differing needs among men and women, adults and children, pregnant and non pregnant women, consistent programs of instruction about nutrition and home economics within individual households or in the form of community meetings may be sufficient.

Where unbalanced IFFD is additionally rooted in religious precept and/or strongly held beliefs about social status and class, more than basic instructional techniques will be needed. The cooperation of secular and religious community leaders may be essential, and the minimum scale of nutrition education programs should be at the community or regional levels, so that individual families will not feel isolated in undertaking significantly changed eating habits.

Nutrition education, home economics training, and health/nutrition intervention programs all can influence IFFD directly in the short run by focusing attention upon the present adverse effects upon disadvantaged family members,

FIGURE 20

Simplified Intra-Family Food, Labor, and Cash Flo



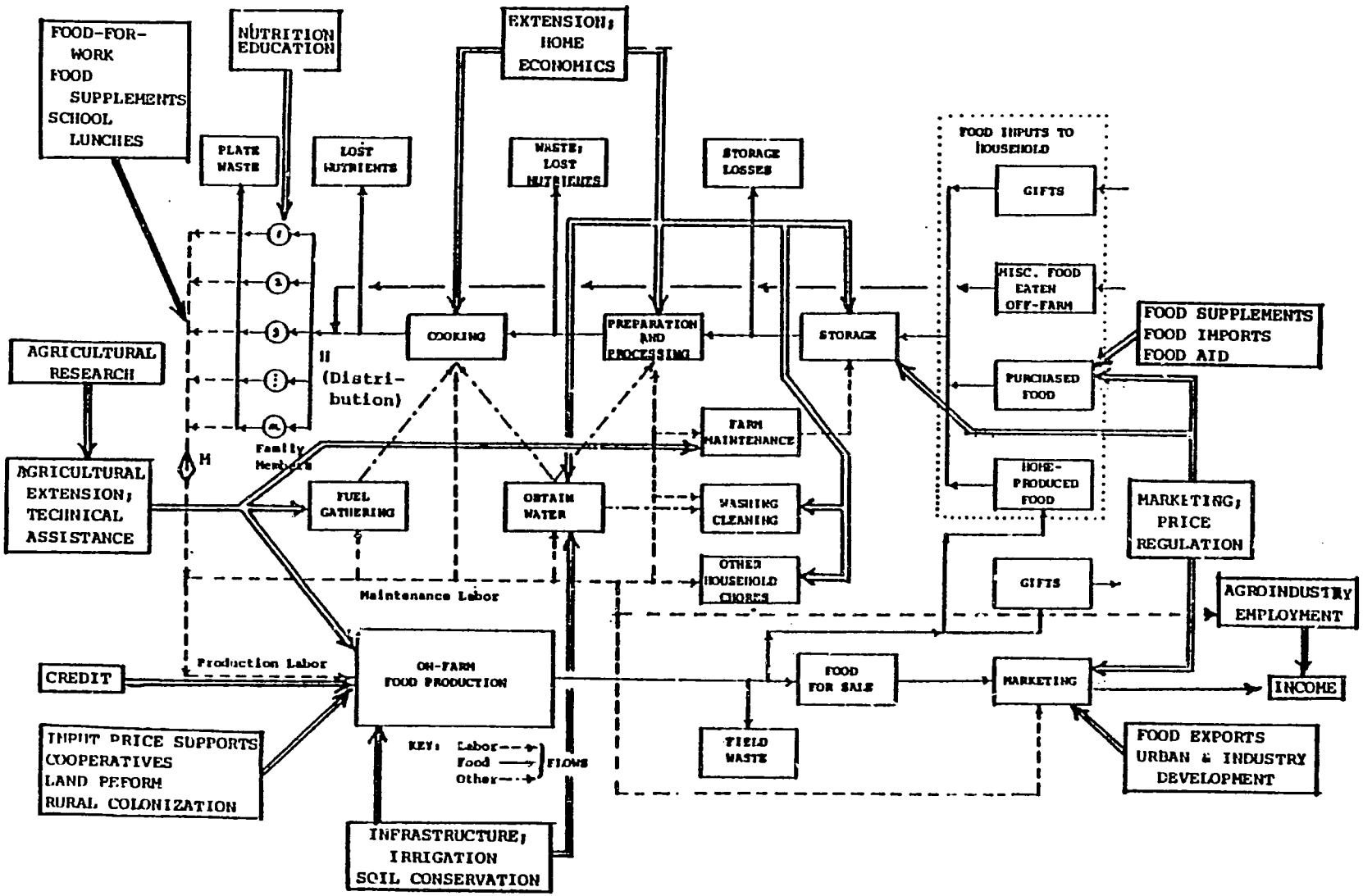


FIGURE 21

Intersection of Major Development Policy Types and Intra-Family Flows

and in the long run by altering family decision makers' thinking about food. They are complementary with "supply approach" policies in two key areas: selection of foods to purchase in the market and choice of foods to produce at home. In the former case, market information, price regulation, and market infrastructure programs not only may increase the total availability of food to households, but can have a decisive influence upon the patterns of food availabilities. If these patterns at least partially reflect the nutritional needs of the population, then rising demand for nutritionally desirable foods engendered by nutrition-oriented training programs will be matched by appropriate shifts in the food supply mix: desirable foods will be relatively more abundant (cheaper) than less desirable foods.

Extension programs can also directly complement nutrition programs by emphasizing improved techniques for producing nutritionally valuable foods (e.g., vegetables, poultry, eggs) for both home consumption and for sale.

Both food-for-work and school lunch programs have been mentioned as directly affecting food consumed by specific individuals. Such programs are of questionable value, however, from the standpoint of long run change. Food-for-work schemes are usually associated with specific kinds of projects (e.g., road construction) requiring substantial labor input; they rarely outlive the related project and are difficult to administer on a large scale. School lunch programs are effective in proportion to the length of time a family's children remain in school, and, in the absence of programs designed to change thinking about food, the child fed at school may receive less food at home. In general, food subsidy programs may be viewed by households as ways of freeing family resources for other than food purposes.

Policies Indirectly Affecting IFFD. All policies which affect agricultural production, employment, and income will influence total food availability within the household directly via increased incomes, altered prices of food relative to other commodities, and increased outputs per unit labor and land input. Although further research is needed, these changes may be reflected in altered IFFD, too.

The most likely influence upon IFFD may arise with changing roles within the household and associated reallocation of family labor as development proceeds. Greater labor intensity required by certain crops (e.g., vegetables versus grains) might dictate a greater relative share of family food for those working in the fields. Mothers and daughters might have to spend more time working in the fields, thereby devoting less time preparing meals and feeding children, a possibility suggested by Goldman's Liberia study showing a decline in children's consumption during the busy harvest season.

New or enhanced sources of income for individual family members may influence IFFD, especially in the case of the wife (and mother) as income earner. Programs to stimulate food processing activities in the rural sector and to expand markets for small-town enterprises (often managed by women), by creating employment opportunities for women and girls would increase their relative command over food availabilities, either purchased in the market or produced at home.

New crop patterns, new foods, increased incomes, and changes in relative food prices can combine to alter traditional thinking about foods, sometimes in unpredictable ways. Certain foods may become identified with "progressivism" or "modernism" and others stigmatized through association with "old fashioned ways" and/or times of relative poverty. Such changes in household criteria for food choices may or may not have beneficial effects on IFFD. As Levinson's study shows, for example, the status accorded by upper class mothers to

certain relatively expensive foods (e.g., milk) may actually diminish the quality of meal shares for some family members as compared with their counterparts in lower class families.

Virtually any of the policies shown in Table 25 might influence IFFD to a greater or lesser degree, favorably or adversely, depending upon the particular circumstances existing in each developing country or region. Generalizations are difficult, and the need for further research is clear.

The Need for More Information and Further Research

A truly balanced strategy for pursuing increased agricultural incomes and improved nutrition simultaneously in the face of severely limited initial resource levels, will be possible only if decision-makers understand what their resource constraints are, where health and nutrition problems are most severe, and what factors are most likely to impede change. Resource constraints govern the rate with which physical inputs and processes can be brought to bear upon food and nutrition; the profile of food consumption and malnutrition across a country permits prioritization and focusing of scarce resources; impediments to change limit the growth of consumption and desirable nutrition from the demand side.

Incorporation of nutrition goals generally and IFFD issues specifically into long-term development strategies requires three broad kinds of information:

(1) Data concerning food production and rates of change in production by food type, geographic region, incomes, and technological practices by producers.

(2) Data on consumption by food type, income and price levels, region, specific family members.

(3) Information about attitudes and beliefs related to food and its preparation, to health and sanitation, to social and institutional change.

The first class of data is the most commonly sought by planners and development assistance agencies; it is most relevant to the "supply approach" to national food adequacy discussed earlier. Within limits, models suitable for forecasting future supplies and supply elasticities can be generated from it, but production data alone, even together with population information, say little about the "fine structure" of nutrition within a country, as we have seen.

Consumption data, especially in conjunction with production and health data permit association of food consumption with malnutrition and infectious disease and can yield both demand and supply elasticities for food and embodied nutrients. This combination permits a reasonably good picture of the current nutritional status of a population, and forecasts of expected future demand for food can be made which can be compared with anticipated levels of future food supply. Unfortunately, consumption and health surveys useful for nutrition policies are undertaken much less frequently than production surveys in less developed countries, and surveys designed to capture both consumption and production activities within the same group are very rare.

Even where consumption and production information are available for a given population, calculation of price and income elasticities of demand for (and supply of) food, for example, tells us little about situations in which it may be desirable to change the factors conditioning food demand/supply factors which include demand and supply elasticities themselves. It is the sort of information listed under (3) above which would provide insight

into why people eat what they do and why food is distributed the way it is in particular kinds of households. It is this type of information which we found to be lacking in the essentially descriptive studies examined in this paper. These studies collectively represent a necessary first step towards an understanding of IFFD: they identify where different patterns of IFFD can be found and they describe some of the most prevalent patterns. The second step, however, is to delve more deeply into the determinants of patterns found in given countries, regions, communities, households. Only with this kind of knowledge can strategies for changing IFFD patterns be devised in instances where external factors such as incomes and relative prices alone are insufficient to guarantee minimum acceptable nutritional improvement. More concretely, future research on IFFD should address such issues as these:

-Social and religious antecedants of sex and age bias in IFFD; penalties (physical, psychological) arising from violation of such biases.

-Role of community and/or peer pressures in inhibiting changes in observed IFFD patterns.

-Role of religious and secular leaders as arbiters of change related to food consumption and IFFD.

-Changing roles of family members, especially women, as development alters production and household maintenance patterns; the mutual interrelationship between changed roles and IFFD from the standpoint of (a) social and religious impact, (b) labor allocation, and (c) energy requirements.

-Attitudes towards "unproductive" members of the household: preschool children, elderly relatives, females.

-Specific kinds of foods specified for children versus adults, men versus women, pregnant and lactating women versus childless women.

-The roles of kinship and extended families in collective food distribution.

-Principal motivators of change in communities and within households: demonstration effects, education, desire for material betterment, conception of (and attitudes towards) time, work, money.

-Determinants of beliefs about medicine, health, and sanitation in relation to food and physical well-being of family members.

-Determinants of existing patterns of labor distribution within the household as a production unit.

-Factors governing the tradeoff between home produced food for market versus that for home consumption.

-The social function of marketing and the relative values (status) placed upon foods.

All of these issues directly or indirectly involve the internal dynamics of a rural household. Many of them would be difficult to quantify in any meaningful way within the framework of traditional economic development theory. Given the wide range of variation among the cultures of developing countries, qualitative research into IFFD will necessarily be highly country specific. Nevertheless such research can help provide sensible answers to certain basic questions applicable to any country: Can price and income changes alone induce needed improvements in the health/nutrition status of all family members in the target population? Will increases in employment opportunities, especially for women, change IFFD patterns in desirable ways? What changes in crop mix (and related input mixes) are needed to insure both adequate quantities and appropriate quality of foods deemed essential for proper nutrition? How much of what kind of resources should be devoted to technical versus educational programs for development? Within what time frame

Conclusions

In summary, the following points should be stressed. The studies reviewed in this paper confirm that a wide range of distribution patterns exist within households among differing cultures. Some of these patterns discriminate adversely against certain family members on the basis of age, sex, and possibly other criteria. Other patterns are either mixed or discriminate in ways which may or may not be adverse. In all cases, however, there is a need for more information about the roots of each kind of IFFD pattern encountered before confident forecasts can be made about the impact of development strategies incorporating nutrition goals for specific countries. Only by simultaneously taking the determinants of supply and demand into account can development planners expect to make significant long-term progress towards both economic and social goals.

BIBLIOGRAPHY 1/

ACC Sub Committee on Nutrition. Nutrition: The Response to External Agencies to Requests from Developing Countries, August, 1979.

Ahmed, Raisuddin. Foodgrain Supply, Distribution, and Consumption Policies Within a Dual Pricing Mechanism: A Case Study of Bangladesh, International Food Policy Research Institute (IFPRI), Research Report No. 8, Washington, D.C., 1979.

AID, Office of Nutrition. Consumption Effects of Agricultural Policies, Project Paper, Washington, D.C., September 1978.

Andrews, Margaret., and Moore, John R. An Integrated Production-Consumption Farm Model for the Dominican Republic, Agricultural Experiment Station, MP 899, University of Maryland, College Park, Maryland, August 1976.

Barnum, Howard N., and Squire, Lyn. A Model of an Agricultural Household, World Bank Staff Occasional Papers No. 27. Baltimore and London: John Hopkins University Press, 1979.

Bell, C.L.G., and Hazell, P.B.R. "Measuring the Indirect Effects of an Agricultural Investment Project on Its Surrounding Region," American Journal of Agricultural Economics, February, 1980, pp. 75-86.

Benus, J., Kmenta, J., and Shapiro, H. "The Dynamics of Household Budget Allocation to Food Expenditures," The Review of Economics and Statistics, Vol. LVIII, No. 2, May 1976, pp. 129-138.

Berg, Alan. The Nutrition Factor, Washington, D.C.: The Brookings Institution, 1973.

Berg, Alan, Scrimshaw, Nevin S., and Call, David L. (editors). Nutrition, National Development and Planning, Cambridge, Massachusetts: The MIT Press, 1973.

1/ In addition to the references shown, the report has drawn on a number of internal World Bank reports.

Biswas, Margaret R. Nutrition and Agricultural Development in Africa, IIASA, Rm- 78-61, Laxenburg, Austria, 1978.

Bruce, Colin, and Kimaro, Young. An Economic and Social Analysis of the Chao Phya Irrigation Improvement Project II, World Bank Staff Working Paper No. 299, Washington, D.C., October, 1978.

Chernichovsky, Dov. The Economic Theory of the Household and Impact Measurement of Nutrition and Related Health Programs, World Bank Staff Working Paper No. 302, Washington, D.C., October, 1978.

Christensen, Lars, sen, Jorgen Hojmark, and Schaumburg - Muller, Henrik Food Production and Malnutrition, Report from Kenya, Tanzania, and India, Danida, Copenhagen, 1980.

Chutikul, Kavi. Implications for Faculties of Agriculture in Introducing Nutrition into their Teaching and Research, ACC/SCN Working Symposium, Rome, March 2, 1981.

Cleaver, Kevin M. Economic and Social Analysis of Projects and of Price Policy: The Morocco Fourth Agricultural Credit Project, World Bank Staff Working Paper No. 368, Washington, D.C., January 1980.

de Janvry, A., Bieri, J., and Nunez, A. "Estimation of Demand Parameters Under Consumer Budgeting: An Application to Argentina," American Journal of Agricultural Economics, Vol. 54, No. 3, 1972, pp. 422-430.

den Hartog, A.P. "Unequal Distribution of Food within the Household: (A Somewhat Neglected Aspect of Food Behavior)," (Xerox), FAO, Rome, 1973, 17 pp.

Evenson, Robert E., Popkin, Barry M., and King-Quison, Elizabeth. Nutrition Work and Demographic Behavior in Rural Philippines Households: A Synopsis of Several Laguna Household Studies, Center Discussion Paper No. 308, Economic Growth Center, Yale University, 1979.

FAO. Guidelines for the Introduction of Nutritional Considerations Into Development Projects, Rome, 1978.

FAO. Nutrition in Rural Development Planning - Kenya, Rome, 1979 (b).

FAO. Review of Food Consumption Surveys, Vol. 2: Africa, Latin America, Near East, Far East, Rome, 1979 (c).

Fleuret, Patrick. "Nutrition, Consumption and Agricultural Change, A Review of Community-Level Trends and Policy

Implications," (Xerox) Agency for International Development, PPC/PDPR/HR Background Paper, Washington, D.C., July 20, 1979, 27 p + background.

Flores, Marina, Garcia, Berta, Flores, Zoila, and Lara, Marta Yolanda. "Annual Patterns of Family and Children's Diet in Three Guatemalan Indian Communities," Brtish Journal of Nutrition, Vol. 18, No. 3., 1964, pp. 281-293.

Foster, Phillips. Agricultural Policies and Rural Malnutrition, AID, Occasional Paper No. 7, Washington, D.C., 1978.

Gavan, James D., and Chandrasekera, Indrani Sri. The Impact of Public Foodgrain Distribution on Food Consumption in Sri Lanka, IFPRI Research Report No. 13, Washington, D.C., 1979.

George, P.S. Public Administration of Foodgrains in Kerala - Income Distribution Implications and Effectiveness, IFPRI, Research Report No. 7, Washington, D.C., 1979.

Goldman, H.W., and Ranade, C.G. Food Consumption Behavior by Income Class in Rural and Urban Philippines, Occasional Paper No. 90, Department of Agricultural Economics, Cornell University, November, 1976.

Goodwin, Joseph D., and Brandt, Jon A. "An Empirical Comparison of 'Frisch' and 'Time Series' Demand Price Elasticities for Individual Commodities," Canadian Journal of Agricultural Economics, Vol. 28, No. 1, 1980.

Green, Richard., Hassan, Zuhair A., and Johnson, Stanley R. "Price Elasticity Estimates from Family Expenditure Data: An Application of the Extended Linear Expenditure System," Canadian Journal of Agricultural Economics, Vol. 27, No. 1, 1979, pp. 41-52.

Gross, D.R., and Underwood, B.A. "Technological Change and Caloric Costs: Sisal Agriculture in Northeastern Brazil," American Anthropologist, Vol. 73, No. 3, June 1971.

Gurney, J.M., and Omololu, A. "A Nutritional Survey in South-Western Nigeria: The Anthropometric and Clinical Findings," Environmental Child Health, June 1971, pp. 50-61.

Guyer, Jane I. Household budgets and women's incomes, Working Paper No. 28, African Studies Center, Boston University, Boston, Massachusetts, 1980.

Gwatkin, Davisdson, R. "Food Policy, Nutrition Planning and Survival: The Cases of Kerala and Sri Lanka," Food Policy, November, 1979, pp. 245-258.

Hakim, P., and Solimano, G. "Nutrition and National Development: Establishing the Connection," Food Policy, Vol. 1, May 1976, pp. 249-259.

Harberger, Arnold C. On the Use of Distributional Weights in Social Cost-Benefit Analysis, Paper presented at a Conference on Research in Taxation, Stanford, California, 1976.

_____. "On the Use of Distributional Weights in Social Cost-Benefit Analysis," a supplement to Journal of Political Economy, April 1978.

_____. Basic Needs Versus Distributional Weights in Social Cost-Benefit Analysis, Background notes for a seminar, World Bank, 1979.

Hayami, Yujiro, and Herdt, Robert W. "Market Price Effect of Technological Change on Income Distribution on Semi-Subsistence Agriculture," American Journal of Agricultural Economics, Vol. 59, No. 2, 1977, pp. 245-256.

Holmberg, Johan. Guidelines for the introduction of nutritional considerations into development projects - A field test applied on Momap on Mozambie, FAO, Rome 1980.

Horwitz, Abraham. "Increasing the Capacity of the International Agencies for Policy Formulation and Programme or Project Preparation in Nutrition," Food and Nutrition Bulletin, Vol. 1, No. 4, August 1979, pp. 11-14.

Hulse, J.H., and Pearson, O.E. "How Nutrition Priorities Can be Integrated Into Crop Improvement Programmes," Food and Nutrition Bulletin, Vol. 2, No. 1, January 1980, pp. 7-10.

IFPRI. Recent and Prospective Developments in Food Consumption: Some Policy Issues, Research Report No. 2, Washington, D.C., 1977.

Interamerican Development Bank. Una Metodolgia Para Cuantificar Y Registrar los Efectos Distributivos de los Proyectos que Forman Parte de la Cartera Del Banco, Washington, D.C., 1979.

Jelliffe, Derrick B., and Jelliffe, E.F. Patrice. "Approaches to Village - Level Infant Feeding: How Breast Feeding Really Works (Facts vs Medical Folklore)," Environmental Child Health, June 1971, pp. 62-64.

Johnston, Bruce F., and Meyer, Anthony J. "Nutrition, Health and Population in Strategies for Rural Development," Economic Development and Cultural Change, Vol. 26, No. 1, October 1977, pp. 1-23.

Joy, Leonard, and Payne, Philip. Food and Nutrition Planning, FAO, Nutrition Consultants Reports Series 35, Rome, 1975.

Jul, Mogans. Unexpected Benefits From a Dairy Project, paper presented at the XI International Congress of Nutrition, Rio de Janeiro, Brazil, August 27 - September 1, 1978 and reprinted in Food and Nutrition Bulletin, Vol 1, No. 3. 1979, pp. 15-19.

Katona-Apte, Judit. "The Socio-Cultural Aspects of Food Avoidance in a Low-Income Population in Famillnad, South India," Environmental Child Health, April 1977, pp. 83-90.

King, Robert P., and Byerlee, Derek. Income Distribution, Consumption Patterns and Consumption Linkages in Rural Sierra Leone, African Rural Economy Paper No. 16, Michigan State University, East Lansing, Michigan, 1977.

Knudsen, Odin, and Scandizzo, Pasquale. Nutrition and Food Needs in Developing Countries, World Bank Staff Working Paper No. 328, Washington, D.C., May 1979.

_____. Role of the Household Economy in Determining Child Nutrition at Low Income Levels: A Case Study in Kerala, Occasional Paper No. 95, Department of Agricultural Economics, Cornell University, Ithaca, New York, November 1977.

Lehmann, David. "Workshop on Impact of Food-Price Policies on Nutrition: Political Framework for Nutrition Policies," Food and Nutrition Bulletin, Vol. 1, No. 1, 1978, pp. 27-28.

Levinson, F.J., and Call, D.L. Nutrition Intervention in Low Income Countries: A Planning Model and Case Study, Department of Agricultural Economics, Cornell University, Ithaca, New York, 1971.

_____. Incorporating Nutrition in Agricultural, Food and Health Policies and Programs in South Asia, paper presented at the Regional Seminar on an Integrated Approach to Population, Food and Nutrition Policies and Programs for National Development, Bangkok, July 24-31, 1979.

McCarthy, F. Desmond, and Taylor, Lance. "Marco Food Policy Planning: A General Equilibrium Model for Pakistan," The Review of Economics and Statistics, February 1980, pp. 107-121.

McFie, John. "Nutrient intakes of urban dwellers in Lagos, Nigeria," British Journal of Nutrition, Vol 21, (1967), pp. 257-268.

Mellor, John W., and Lele, Uma J. "Growth Linkages of the New Foodgrain Technologies," Indian Journal of Agricultural Economics, Vol 28, No. 1, January-March, 1973.

_____. "Nutrition and Agricultural Policy," in Nutrition and National Policy, edited by Beverly Winicoff, Cambridge, Massachusetts: The MIT Press, pp. 461-477.

Muscat, Robert J. "Food Consumption and Nutrition Targets," Food and Nutrition Bulletin, Vol. 1, No. 4, August 1979, pp. 3-7.

Nakajima, C. "Subsistence and Commercial Family Farms: Some Theoretical Models of Subjective Equilibrium," in Subsistence Agriculture and Economic Development edited by Clifton R. Wharton, Jr., Chicago: Aldine Publishing Co., pp. 165-185.

National Research Council. World Food and Nutrition Study, Supporting papers, Vol. 4, National Academy of Sciences, Washington, D.C., 1977.

Nicol, B.M. "The Protein Requirements of Nigerian Peasant Farmers," British Journal of Nutrition, Vol 13, No. 3, 1959, pp. 307-320.

_____. "The Calorie Requirements of Nigerian Peasant Farmers." British Journal of Nutrition, Vol. 13, No. 3., 1959, pp. 293-306.

Olayide, S.O., and Olayemi, J.K. "Economic Aspects of Agriculture and Nutrition: A Nigerian Case Study," Food and Nutrition, Vol. 1, No. 1, 1978, pp. 32-39.

Origbo, Bede N. Introducing Nutritional Considerations into Research and Training in Farming Systems, ACC/SCN Symposium, Rome, March 2, 1981.

Payne, P.R. "Nutritional Criteria for Breeding and Selection of Crops: With Special Reference to Protein Quality," Plant Foods for Man, No. 2, 1976, pp. 95-112.

_____. "Nutrition Planning and Food Policy," Food Policy, February 1976, pp. 107-115.

Pines, J.M. "The Impact of Nutritional Goals on Agricultural," Food and Nutrition, Vol. 2, No. 1, 1976, pp. 2-4.

Pinstrup-Andersen, Per, Ruiz de Londono, Norha, and Hoover, Edward. "The Impact of Increasing Food Supply on Human Nutrition: Implications for Commodity Priorities in Agricultural

Research and Policy," American Journal of Agricultural Economics, Vol. 58, 1976, pp. 131-142.

Pinstrup-Andersen, Per. "Decision Making on Food and Agricultural Research Policy: The Distribution of Benefits from New Agricultural Technology Among Consumer Income Strategies," Agricultural Administration, Vol. 4, 1977, pp. 13-28.

_____. Incorporating Nutritional Goals Into Agricultural Sector Planning, Paper presented at the XI International Congress of Nutrition, Rio de Janeiro, Brazil, August 27-September 1, 1978.

Pinstrup-Andersen, Per, and Caicedo, Elizabeth. "The Potential Impact of Changes in Income Distribution on Food Demand and Human Nutrition," American Journal of Agricultural Economics, Vol. 60, 1978, pp. 402-415.

Pinstrup-Andersen, Per. Metodos Para Estimar las Implicaciones Nutricionales de Politicas Agrarias en Costa Rica, Sistema de Informacion en Nutricion, San Jose, Costa Rica, 1979.

Poleman, Thomas T. Quantifying the Nutrition Situation in Developing Countries, Agricultural Economics Staff Paper No. 79-33, Cornell University, Ithaca, New York, 1979.

Reutlinger, Shlomo, and Alderman, Harold. The Prevalence of of Calorie Deficient Diets in Developing Countries, World Bank Staff Working Paper No. 374, Washington, D.C., March 1980.

Rosenberg, Ellen M. "Demographic Effects of Sex-Differential Nutrition" in Nutritional Anthropology: Contemporary Approaches to Diet and Culture, edited by Norge W. Jerome, Randy F. Kandel, and Gretel H. Pelto, Pleasantville, New York: Redgrave Publishing Co., 1980, pp. 181-203.

Ryan, James G., et al. Human Nutritional Needs and Crop Breeding Objectives in the Semi-Arid Tropics, Occasional Paper 4, Economics and Statistics Unit, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India, October 1974.

_____. Human Nutritional Needs and Crop Breeding Objectives in the Indian Semi-Arid Tropics, IRISAT, Hyderabad, India, September 1977.

Ryan, James G., and Asokan, M. Effect of Green Revolution in Wheat on Production of Pulses and Nutrients in India, ICRISAT, Hyderabad, India, October 1977.

Sai, F.T. Systematic Considerations of Health and Nutrition in Agricultural and Rural Development Program and Projects. ACC/SCN Symposium, Rome, March 2, 1981.

Sarma, J.S., Roy, Shyamal, and George, P.S. Two Analyses of Indian Foodgrain Production and Consumption Data, IFPRI Research Report No. 12, 1979.

Scandizzo, Pasquale, and Knudsen, Odin K. The demand for calories in developing countries, AGREP Division Working Paper No. 26, World Bank, Washington, D.C., 1979.

Scandizzo, Pasquale L., and Knudsen, Odin K. "One Evaluation of the Benefits of Basic Need Policies." American Journal of Agricultural Economics, February 1980, pp. 46-57.

Schmitt, Bernard A. Protein, Calories and Development: Nutritional Variables in the Economics of Developing Countries, Boulder, Colorado: Westview Pess, 1979.

Schofield, Theodore, ed. Economics of the Family: Marriage, Children and Human Capital, Chicago: University of Chicago Press, 1974.

Scrimshaw, Nevin S., and Behar, Moises, ed. Nutrition and Agricultural Development, New York: Plenum Press, 1976.

Scrimshaw, Nevin S., and Lockwood, Richard. "Interpretation of Data on Human Food Availability and Nutrient Consumption," Food and Nutrition Bulletin, Vol. 2, No. 1, January 1980, pp. 29-37.

Selinus, Ruth, Gobezie, Abeba, and Vahlequist, Bo. "Dietary Studies in Ethiopia. III. Dietary Pattern Among the Sidamo Ethnic Group: A Study on Villagers in the Enset Monoculture Area in S. Ethiopia with Special Attention to the Situation in Young Children," Acta Societatis Medicorum Upsaliensis, Vol. LXXVI, Nos. 3-4, 1971, pp. 158-178.

Selinus Ruth, Awalom, Guenet, and Gobezie, Abeba. "Dietary Studies in Ethiopia. II. Dietary Patterns in Two Rural Communities in N. Ethiopia: A Study with Special Attention to the Situation of Young Children," Acta Societatis Medicorum Upsaliensis, Vol. LXVII, No. 1-2, (1971) pp. 17-38.

Selowsky, Marcelo. Balancing Trickle Down and Basic Needs Strategies: Income Distribution Issues in Large Middle-income Countries with Special Reference to Latin America, World Bank Staff Working Paper No. 335, Washington, D.C., 1979.

_____. "Target Group Oriented Food Programs: Cost Effectiveness Comparisons," American Journal of Agricultural Economics, Vol. 61, No. 5, December 1979, pp. 988-994.

Singh, Parmeet (ed). "Child Nutrition in Rural Kenya," Central Bureau of Statistics, Ministry of Economic Planning and Community Affairs, UNICEF, Nairobi, Kenya (No date-after 1978).

Singh, Inderjit, and Squire, Lyn. A Model of the Agricultural Household: Some Implications for Nutrition Policies in Rural Areas, Paper presented at the Conference on The Economics of Nutrition-Oriented Food Policies and Programs, Bellagio, Italy, August 1977.

Sistema de Informacion en Nutricion. Plan detallado para renglon a sistema de informacion, San Jose, Costa Rica, 1978.

Smith Victor, E. "Agricultural Planning and Nutrient Availability," Nutrition Reviews, Vol. 28, No. 6, June 1970.

_____. Efficient Resource Use for Tropical Nutrition: Nigeria, International Business and Economic Studies, Michigan State University, East Lansing, Michigan, 1975.

Smith, Victor E., and Yaghooki-Rahmatabadi, Hossein. The Nutritional Efficiency of Improved Methods in Nigerian Agriculture, Econometric Workshop Paper No. 7302, Michigan State University, East Lansing, Michigan, 1973.

Smith, Victor, and Liedholm, Carl. Household-firm Models for Rural Families in Sierra Leone, September 1, 1977 (Mimeo).

Smith, Victor E., et al. Household Food Consumption in Rural Sierra Leone, Rural Development Series, Working Paper No. 7, Michigan State University, East Lansing, Michigan, 1979.

Squire, Lyn, and van der Tak, Herman G. Economic Analyses of Projects, A World Bank research publication. Baltimore and London: The Johns Hopkins University Press, 1975.

Srinivasan, T.N. "Development, Poverty, and Basic Human Needs: Some Issues," Food Research Institute Studies, Vol. 6, No. 2, 1977, pp. 11-28.

_____. Malnutrition: Some Measurement and Policy Issues, World Bank Staff Working Paper No. 373, Washington, D.C., February 1980.

Sukhatme, P.V. Malnutrition and Poverty, Ninth Lal Bahadur Shastri Memorial Lecture, January 27, 1977, Indian Agricultural Research Institute, New Delhi.

Swaminathan, M.S. Introducing Nutritional Considerations into Agricultural and Rural Development, ACC/SCN Symposium, Rome, March 2, 1981.

Swanberg, Kenneth G., and Shipley, Elizabeth. "The Nutritional Status of the Rural Family in East Cundinamarca, Colombia," Food Research Institute Studies, Vol. 14, 1975, pp. 111-125.

Taylor, Lance. "Research Directions in Income Distribution, Nutrition, and the Economics of Food," Food Research Institute Studies, Vol. 16, No. 2, 1977, pp. 29-45.

_____. Price Policy and the Food that People Consume, Paper presented at Workshop on the Impact of Food Price Policies on Nutrition, Mexico City, March 23-25, 1978.

Thodey, Alan R. Food and Nutrition in Korea, 1965-1974, Korean Agricultural Sector Study, Special Report 11.

Timmer, C. Peter, and Alderman, Harold. "Estimating Consumption Parameters for Food Policy Analysis," American Journal of Agricultural Economics, Vol. 61, No. 5, December 1979, pp. 982-987.

UN/FAO World Food Programme. "Second Interim Evaluation of WFP-assisted Project India 618 - Milk Marketing and Dairy Development," 1975.

United Nations Industrial Development Organization. Guide to Practical Project Appraisal, New York: United Nations, 1978.

Valenzuela, Rosario. "A Study of Nutrient Distribution Within the Family and Factors Affecting Nutrient Intake," The Philippine Economic Journal, Vol. XVII, Nos. 1 & 2, 1978, pp. 168-184.

Winikoff, Beverly, ed. Nutrition and National Policy, Cambridge, Massachusetts: The MIT Press, 1978.

World Bank. Nutrition, Basic Needs and Growth, Agriculture and Rural Development Department, Washington, D.C., January 1979.

World Food Council. Mexico Declaration.

World Food Council. Toward a World Without Hunger: Progress and Prospects for Completing the Unfinished Agenda of the World Food Conference, Report by the Executive Director, WFC/1979/3, 23 March 1979.

World Food Council. Hunger and Malnutrition, and Greater Equity in Distribution of Food, Report by the Executive Director, WFC/1979/6, 9 April 1979.

World Food Council. "Formulating a Food Sector: Suggestion for Preparation and Content", Draft, Rome, February 1980.

World Food Council. Progress Towards and Prospects of Achieving the Objectives of the United Nations World Food Conference (1979-1980), Report of the Executive Director. WFC/1980/7. February 14, 1980.

World Bank Council. "Food Strategies," ACC/SCN Symposium, Rome, March 2, 1981.

ANNOTATED BIBLIOGRAPHY

Adelman, Irma & Cynthia Taft Morris. Economic Growth and Social Equity in Developing Countries. Stanford, California: Stanford University Press, 1973.

Quantitative investigation of the interaction among economic growth, income distribution, and social equity in noncommunist developing nations. Forceful presentation of the thesis that economic development is one of the prime causes of income inequality.

Anderson, Mary Ann, James E. Austin, Joe D. Wray, Marian F. Zeitlin. Nutrition Intervention in Developing Countries, Vol. II. Washington, D.C.: Agency for International Development, 1979.

Summary of nutrition intervention designs, evaluations, and case studies. Includes data on sharing of food supplements within the family.

Berg, Alan. The Nutrition Factor: Its Role in National Development. Cambridge, Massachusetts: M.I.T. Press, 1973.

Classic work examining malnutrition as an impediment to national development, assessing means available for dealing with malnutrition, and suggesting a future course of action.

Boserup, Ester. Woman's Role in Economic Development. London: George Allen & Unwin, 1970.

Classic work on the relationship between women's social and economic roles and economic development in Latin America, Africa, and Asia.

Burk, Marguerite C. & Eleanor Pao. "Methodology for Large Scale Surveys of Household and Individual Diets." Home Economics Research Report No. 40. Washington, D.C.: U.S. Department of Agriculture, U.S. Government Printing Office, 1976.

Survey of alternative procedures used to measure individual and household food consumption. Literature reviewed is mostly studies in the U.S. and other Western countries.

Buvinic, Mayra & Nadia Youssef with Barbara Von Elm. "Women-Headed Households: The Ignored Factor in Development Planning." Washington, D.C.: Agency for International Development, 1978.

Statistical and socio-economic study of de facto women-headed households. Concludes that economic development increases the incidence of households headed by women.

Chambers, Robert. "Health, Agriculture, and Rural Poverty: Why Seasons Matter." Sussex, UK: University of Sussex, Institute of Development Studies, 1979.

Excellent presentation of evidence on effect of seasonal fluctuations in work and food availability on health and nutrition of women and pre-school children.

Consortium for International Development. The International Conference on Women and Food. Washington, D.C.: Agency for International Development, 1978.

Papers and proceedings of a conference on the role of women in meeting basic food and water needs in developing countries, focussing on the UN World Food Conference resolution on women and food.

Deere, Carmen Diana. "Changing Social Relations of Production and Peruvian Peasant Women's Work," Women in Latin America: An Anthology from Latin American Perspectives. Riverside, California: Latin American Perspectives, 1979, 26-46.

Socio-economic survey in Highland Peru finding that the transition from feudal to capitalist production is progressive in terms of the nature, duration, and intensity of women's work.

Drake, William D. & L. F. Fajardo. "The Promotora Program in Candelaria: A Colombian Attempt to Control Malnutrition and Disease, 1968-74." Cali, Colombia: Community Systems Foundation, 1976.

Analysis of a primary health care and education program which dramatically reduced the rate of malnutrition for young children, with the reduction for girls much greater than for boys.

Eide, W. B., E. Skjonsberg, A. Bathley & A. O. Pala. "Women in Food Production, Food Handling and Nutrition with Special Emphasis on Africa." U.N. Protein Advisory Group, June 1977.

Major study of changes in women's role in food-related activities in Africa.

Evenson, R. E., B. M. Popkin, E. King-Quizon. "Nutrition, Work, and Demographic Behavior in Rural Philippine Households: A Synopsis of Several Laguna Household Studies." New Haven, Connecticut: Yale University Economic Growth Center, 1979.

Report on a major study of 676 rural households, including household and individual dietary data and data on nutritional status, income, and time allocation.

Fine, Seymour Howard. "Segmentation Research in the Marketing of a Social Cause: Malnutrition in Developing Countries." Unpub. Ph.D. Diss., Columbia University, 1978.

Analysis of data from the USAID Tamil Nadu Nutrition Study for the explanation of family strategies for distributing food among members.

Fleuret, Patrick & Anne Fleuret. "Nutrition, Consumption and Agricultural Change," Human Organization. Summer 1980.

Excellent review of the literature on community level factors influencing the nutritional effect of agricultural change.

Flores, M., B. Garcia, Z. Flores & M. Y. Lara. "Annual Patterns of Family and Children's Diet in Three Guatemalan Indian Communities," British Journal of Nutrition. 1964, 281-293.

Methodology and results of a four year survey finding diets of young children much inferior to family diets despite preferential feeding of milk, eggs, and fruit.

Flores, Marina. "Dietary Studies for Assessment of the Nutritional Status of Populations in Modernized Societies," American Journal of Clinical Nutrition, 11 (1962), 344-355.

Useful survey of the literature of dietary surveys.

Fox, Helen C., Versada S. Campbell & H. G. Lovell. "A Comparison of Dietary Data Obtained in Jamaica by 24-Hour Recall and by Weighing," Archivos Latinamericanos de Nutricion, 18 (1963), 81-97.

Methodology and results of weighing and 24-hour recall dietary studies of 665 young children finding underreporting in the recall, but no significant differences in mean weights of foods obtained.

Freyhold, M., K. Sawaki & M. Zalla. "Field Studies: Moshi District," The Young Child in Tanzania. Dar Es Salaam, Tanzania, UNICEF Liaison Office: Tanzania National Scientific Research Council, 1973, 166-240.

Interviews, village observations, case studies, and women's group discussions among the Chagga people in a rural district in Tanzania, focussing on position of women and children within the family.

Friedman, Robert L. "Nutritional Anthropology: An Overview." Ed. Thomas K. Fitzgerald. Nutrition and Anthropology. Amsterdam, Netherlands: 1977, 1-23.

Introduction to the field of nutritional anthropology, with a brief history, some case studies, and a discussion of the future of nutritional anthropology.

Goldman, Heather Warrack. The Nutrition of Children in a Coastal African (Liberian) Food Economy. Unpub. Ph.D. Diss. Cornell University, 1979.

Unusually careful study of (1) distribution of home-consumed food between pre-school children and other members of the household and (2) nutritional status of pre-school children.

Grewal, T., T. Gopaldas, V. J. Gadre, S. N. Shrivastava, B. M. Paranjpe, B. N. Chatterjee & N. Srinivasan. "A Comparison of Weighment and Questionnaire Dietary Survey Methods for Rural Preschool Children," The Indian Journal of Nutrition and Dietetics, 11 (1974), 224-232.

Very useful discussion of methodologies used for the evaluation of the effectiveness of Project Poshak supplementary feeding and education program in Central India.

Gross, Daniel & Barbara Underwood. "Technological Change and Caloric Costs: Sisal Agriculture in Northeastern Brazil," American Anthropologist, 73 (1971), 725-740.

Important, though methodologically flawed, study of the impact of agricultural change on nutritional status, dietary intake, and intra-familial food distribution.

Gulati, Leela. "Profile of a Female Agricultural Labourer," Economic and Political Weekly, 13 (March 25, 1978).

Case study of a family in Kerala, including work, income, expenditures, and individual food consumption.

Gurney, J. M. & A. Omololu. "A Nutritional Survey in South-Western Nigeria: The Anthropometric and Clinical Findings," Environmental Child Health, June 1971.

Anthropometric, clinical, and dietary findings from one urban area and one rural area. Dietary methodology is not detailed.

Hanger (formerly Wills), Jane & Jon Morris. "Women and the Household Economy." Ed. Robert Chambers and Jon Morris. Mwea: An Irrigated Rice Settlement in Kenya. Munich: Weltforum Verlag, 1973, 209-244.

Analysis of the changes in women's economic functions and ability to provide food for their families brought about by resettlement in the Mwea irrigation scheme.

Hitchings, Jon. Child Nutrition in Rural Kenya. Nairobi, Kenya: Republic of Kenya, Central Bureau of Statistics, Ministry of Economic Planning and Community Affairs, 1979.

Important study of nutritional status of pre-school children, including comparisons by sex indicating inferior nutrition of girls.

Kumar, Shubh K. "Role of the Household Economy in Determining Child Nutrition at Low Income Levels: A Case Study in Kerala." Occasional Paper. Ithaca, New York: Department of Agricultural Economics, Cornell University, 1977.

Study of pre-school child nutritional status and socio-economic characteristics in 48 low income households, finding much higher impact of mothers' earnings than earnings of father or other household members on pre-schoolers' nutritional status.

Lechtig, A., C. Yarbrough, R. Martorell, H. Delgado & R. E. Klein. "The One-Day Recall Dietary Survey: A Review of its Usefulness to Establish Protein and Calorie Intake," Archivos Latinamericanos de Nutricion, 26 (1976), 243-274.

Major review of dietary studies finding no significant difference between validity and reliability of recall and record surveys for periods of one to seven days.

Levinson, F. James. Morinda: An Economic Analysis of Malnutrition Among Young Children in Rural Punjab. Cambridge, Massachusetts: Cornell/M.I.T. International Nutrition Policy Series, 1974.

Very useful study presenting data on nutrient intake, nutritional status, morbidity, and mortality rates for all children aged 6-24 months in 17 villages of Punjab. Data presented by sex, caste, and income, reveals wide gaps in nutrition indicators favoring boys over girls, and in many cases, lower caste and lower income boys over higher caste and higher income girls.

Lewin, Kurt. "Forces Behind Food Habits and Methods of Change," The Problem of Changing Food Habits. Washington, D.C.: National Research Council, 1942, 35-65.

Study investigating determinants of food habits. Posulates a theory of channels of entrance of food to the family table, each channel controlled by a gatekeeper.

Linusson, E., D. Sanjur & E. Erickson. "Validating the 24-Hour Recall," Archivos Latinoamericanos de Nutricion, 24 (1974), 277-294.

Evaluation of the validity of the 24-hour recall by comparing recall with weighing of food consumed in an institutional setting. Finding that the recall method is not highly valid for ascertaining quantity of food consumed.

Loose, Edna E. "Women in Rural Senegal: Some Economic and Social Observations." Paper prepared for the Workshop on Sahelian Agriculture, Department of Agricultural Economics, Purdue University, February 1-2, 1979.

Study of the socio-economic impact of an innovation in grain processing and storage methods primarily benefitting women.

Madden, J. Patrick, S. Jane Goodman & Helen A. Guthrie. "Validity of the 24-Hour Recall," Journal of the American Dietetic Association, 68 (February 1976).

Analysis of dietary intake for 76 elderly persons finding that 24-hour recall respondents tend to report intakes close to a presumed ideal, making impact of feeding programs statistically difficult to detect.

May, J. M. & Donna L. McLelland. The Ecology of Malnutrition: Studies in Medical Geography. 10 vols.

Review of the literature on malnutrition, including data on intra-familial food distribution from three continents. Summaries tend to be superficial without information or critique of methodology and draw from a variety of sources, including journalistic observations.

McFie, J. "Nutrient Intake of Urban Dwellers in Lagos," British Journal of Nutrition, 21 (1967), 257-268.

Study of diets of city dwellers from three regions in Nigeria finding that children and pregnant and lactating women suffered most in intra-familial food distribution.

Montgomery, Edward. "Social Structuring of Nutrition in Southern India." Ed. L. S. Greene. Malnutrition, Behavior, and Social Organization. New York, New York: Academic Press, Inc., 1977.

Comparison of nutritional status by sex and age groups in a village in South India. Study flawed by methodological problems.

Nicol, B. M. "The Calorie Requirements of Nigerian Peasant Farmers," British Journal of Nutrition, 13:3 (1959), 293-306.

Dietary and anthropometric survey using weighing and recall, finding that with normally available food supplies, people in seven communities were able to meet caloric requirements, but children seldom met their caloric requirements.

Nicol, B. M. "The Protein Requirements of Nigerian Peasant Farmers," British Journal of Nutrition, 13 (1959), 307-320.

Dietary and anthropometric survey using weighing and recall, finding that the adequacy of protein intake did not differ significantly for men, women, and children.

Oren, Laura. "The Welfare of Women in Labouring Families in England, 1860-1950," Feminist Studies, 1 (1973), 107-125.

Review of family food consumption surveys and other socio-economic data finding that women and children were seriously undernourished relative to men.

Palmer, Ingrid. The Nemow Case. Case Studies of the Impact of Large-Scale Development Projects on Women: A Series for Planners. New York, New York: The Population Council, 1979.

Analysis of two actual development cases for their effect on women. Although it does not reveal the identity or location of the cases studied, it is a good summary of the broad range of impacts on women.

Pan American Health Organization. National Food and Nutrition Survey. Washington, D.C.: Series, 1972-1976.

Anthropometric surveys with data on food production, household food consumption, and young child feeding for several countries in Latin America and the Caribbean.

Pinchbeck, Ivy. Women Workers and the Industrial Revolution, 1850-1950. London: Frank Cass & Co., 1969.

Excellent study of the effect of the Industrial Revolution on the role and status of English working class women.

Popkin, B. M. "Women, Work, and Child Welfare." Washington, D.C.: International Center for Research on Women, Women in Poverty Conference, 1978.

Using data on dietary intake, nutritional status, time allocation and socio-economic setting, Popkin concludes that mothers' market participation increases pre-school children's dietary intake, but lowers nutritional status.

Reiter, Raina (ed.). Toward an Anthropology of Women. New York, New York: Monthly Review Press, 1975.

Excellent collection of articles examining women's conditions and roles in a wide variety of societies.

Remy, Dorothy. "Underdevelopment and the Experience of Women: A Nigerian Case Study." Ed. Raina Reiter. Toward an Anthropology of Women. New York, New York: Monthly Review Press, 1975.

Case studies, based on interviews with wives of Nigerian factory workers, of conditions of women's work force participation in Zaria, a city in Northern Nigeria.

Reutlinger, Shlomo & Marcelo Selowsky. Malnutrition and Poverty: Magnitude and Options. Baltimore, Maryland: Johns Hopkins University Press, 1976.

Presents the conclusions of the first large-scale research effort in the World Bank to determine the global dimension of malnutrition in low income countries and to investigate the economic dimensions of selected policy interventions.

Ritchie, Jean A. S. "Impact of Changing Food Production, Processing and Marketing Systems on the Role of Women," Proceedings: The World Food Conference of 1976. Ames, Iowa: Iowa State University, 1976, 129-144.

Brief survey of the negative impact of agricultural and industrial development on land available for subsistence farming by women, women's share of family income, women's economic independence, and women's increased workload in Africa.

Rubbo, Anna. "The Spread of Capitalism in Rural Colombia: Effects on Poor Women." Ed. R. Reiter. Toward an Anthropology of Women.

Study of economic status of women in the Cauca Valley, Colombia, on peasant farms and middle class and lower class women in small towns.

Safilios-Rothschild, Constantina. "The Role of the Family: A Neglected Aspect of Poverty." Background Paper for the World Development Report, 1980. Washington, D.C.: International Bank for Reconstruction and Development, 1980.

Analyzes the role of the family in the context of absolute poverty, with special reference to the implications for anti-poverty and human development policy. Excellent analysis of the women in development literature.

Sanjur, Diva. Socio-Cultural Aspects of Nutrition. New Jersey: Prentice Hall, 1980.

Extremely useful textbook explanation of data collection, analysis, and interpretation for food consumption surveys.

Scrimshaw, Susan C. "Infant Mortality and Behavior in the Regulation of Family Size," Population and Development Review, 4 (1978), 383-404.

Presents thesis that infant mortality in some societies may be a way, conscious or overt, of attaining a given family size. Summary of the literature on the prevailing assumption that high fertility is a response to high mortality.

Selinus, Ruth, Guenet Arvalone & Abeba Gobezie. "Dietary Studies in Ethiopia. II. Dietary Pattern in Two Rural Communities in N. Ethiopia: A Study with Special Attention to the Situation in Young Children," Acta Societatis Medicorum Upsahensis, 76 (1971), 17-38.

Selinus, Ruth, Abeba Gobezie & Bo Vahlquist. "Dietary Studies in Ethiopia. III. Dietary Pattern Among the Sidamo Ethnic Group: A Study on Villagers in the Enset Monoculture Area in S. Ethiopia with Special Attention to the Situation in Young Children," Acta Societatis Medicorum Upsahensis, 76 (1971), 158-178.

Study of dietary habits comparing food consumption of children from six months to three years with overall family consumption. No attempt is made to quantify breast milk or eating outside the home.

Swanberg, Kenneth G. & Elizabeth Shipley. "The Nutritional Status of the Family in East Cundinamarca," Food Research Institute Studies, 14 (1975), 111-124.

Twenty-four hour recall of food consumption of pre-school children and family; height and weight measurement of the pre-school children. Food consumption of the pre-school children was found to be better than for the family as a whole. Detailed explanation of methodology is omitted.

U.S. Agency for International Development. A Study of Food Habits in Calcutta. Calcutta, India: Hindustan-Thompson Associates, 1972.

Report of a seasonal food habits survey of 2,386 households selected randomly in the city of Calcutta, including individual and household food consumption and food expenditures.

U.S. Agency for International Development. The Tamil Nadu Nutrition Study. Washington, D.C. USAID, 1973.

Presentation of methodology and some findings from a study of household and individual food consumption and nutrition in South India based on lengthy interviews with housewives.

U.S. Agency for International Development. National Nutrition Survey. Washington, D.C.: Series, 1975-1979.

Series of surveys of nutritional status and food practices focussing on pre-school children with presentation of findings by sex in several of the studies.

U.S. Department of Health, Education, and Welfare, National Institutes of Health (U.S. Interdepartmental Committee on Nutrition for National Defense). Nutrition Survey. Bethesda, Maryland: Series, 1958-1968.

Nutrition surveys in various parts of the world including data on anthropometric, biometric measurement, and clinical signs. Limited data on household and individual food intake, child health patterns, and family characteristics.

Vemury, Merlyn & Howard Levine. Beliefs and Practices that Affect Food Habits in Developing Countries: A Literature Review. New York, New York: CARE, Inc., August 1978.

Extensive survey of the literature on food beliefs and practices presented separately by region for ten regions of the developing world.

"Women and National Development," Signs, 3 (Autumn 1977).

Selected papers from a major conference held at Wellesley College in 1976.