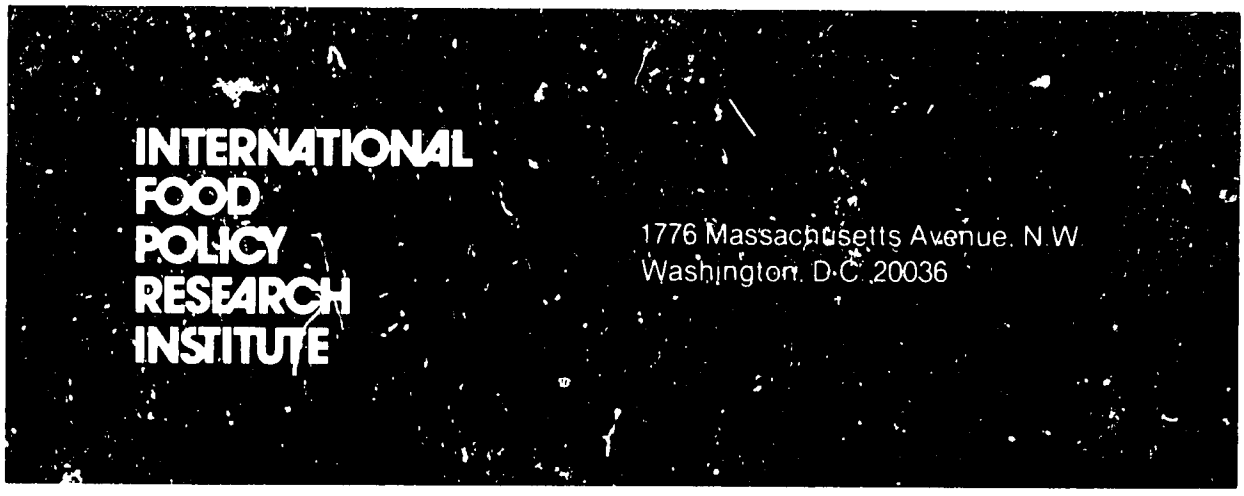
Household Food Distribution: Papers from the Food Policy Symposium Sponsored by the International Commission on Anthropology of Food (ICAF) and the International Food Policy Research Institute (IFPRI)

Papers by Ellen Messer, Shubh K. Kumar, Per Pinstrup-Andersen, Eileen Kennedy, Najma Rizvi, and Judit Katona-Apte

Reprinted from the
Food and Nutrition Bulletin
Vol. 5, No. 4, December 1983



HOUSEHOLD FOOD DISTRIBUTION: INTRODUCTORY REMARKS

The six papers that follow were prepared for the Food Policy Symposium at the Eleventh International Congress of Anthropological and Ethnological Sciences in Vancouver, British Columbia, Canada, 20-25 August 1983. The concept of the symposium developed as a result of an exploratory one-day conference on food policy issues in December 1982 sponsored by the International Commission on Anthropology of Food (ICAF) and the International Food Policy Research Institute (IFPRI), Washington, D.C., USA. ICAF was attempting to promote food policy studies among anthropologists by setting up a multidisciplinary research group, while IFPRI is one of the most active world centres of research on food policy analysis. The exploratory conference brought together anthropologists, nutritionists, economists, and policy analysts to identify, discuss, and further build upon those research areas of mutual interest. Among the topics discussed, intra-household food distribution emerged as a focus for attention for the Vancouver symposium.

The symposium papers discuss aspects of intra-household food distribution in the context of food policy issues. Each of the contributors has been doing research on the topic from the viewpoint of his or her own specialty and has encountered relevant issues needing the expertise of other disciplines. Although past researchers have contributed greatly to a knowledge of the factors and processes influencing household behaviour, understanding of intra-household decision-making processes and how they influence household responses to government policies and other external changes is still very limited. The papers presented at the symposium make a contribution in this direction. They present a literature survey (Messer), a framework for following up policy effects (Kumar), an analytic approach to estimating the nutritional impact of food policies (Pinstrup-Andersen), and a group of empirical studies and analyses (Kennedy, Rizvi, and Katona-Apte). As a group, these papers take stock of current knowledge and identify multidisciplinary priorities for nutrition-related aspects of food policy. At least one additional paper in this series "Time Allocation Surveys: A Common Tool to Anthropologists, Economists, and Nutritionists," by A. J. Berio, will appear in the next issue of the *Bulletin*.

R.S. Khare
P. Pinstrup-Andersen

THE HOUSEHOLD FOCUS IN NUTRITIONAL ANTHROPOLOGY: AN OVERVIEW

Ellen Messer
Center for Advanced Study in the Behavioral Sciences, Stanford, California, USA

INTRODUCTION

This paper will discuss some of the possible effects of various types of food policies on the domestic unit, in particular, on intra-household distribution of food. Anthropological and related social-historical studies in recent years have been examining in detail characteristics and distinctions between different types of "households" and "families" and evaluating their potential utility as units for analysis. By contrast, nutritional and health surveys using the "family" or "household" as their unit of record have in most cases not dealt with the complexities of domestic organization or considered how variable family and household social relationships affect nutritional and health outcome of domestic units. Social networks beyond the local co-residential group, which also share production and consumption activities relating to food, may affect the food intakes of individual members of such families or households. Economic, kinship, and other social rules and conditions, considered in conjunction with culturally appropriate attitudes toward giving and taking food, may furthermore affect composition of co-residential groups and who eats where, what, and with whom.

To begin to sort out some of these issues, this paper will first review the most recent summaries on the household – its structures and functions – as they might be relevant to nutritional studies. It will consider then how the household level of analysis has been included or excluded in the various branches of anthropology that deal either directly or indirectly with food and nutrition. Finally, it will suggest how the literature on the household, or at the household level of analysis, can contribute to the construction of more appropriate socio-cultural variables in food and nutrition policy studies, particularly those dealing with questions of the intra-household distribution of food.

ANTHROPOLOGICAL STUDIES OF THE HOUSEHOLD

Anthropologists in each of their subdisciplines and schools have been concerned with the definition as well as the functions of the household as the level of analysis intermediate between the individual and the society/culture. Since the origins of socio-cultural anthropological studies, the rules for food production, distribution, and consumption have formed an important part of the study of the organization of human groups, whether or not anthropologists focused directly on food quest and nutrition (1-3).

Whether taking as their unit of analysis
- a *society* (*social relations* and *social organization*) – the approach of social anthropology,
- a *culture* (the ideas and behaviour of a human group) – the approach of cultural including psychological anthropology,
- a *human population* (the biological and cultural attributes of a group of humans interacting with other populations and physical features in their local and regional environments) – the approach of ecological and biocultural anthropologists,
- or some socio-economic grouping – an economic anthropological approach,

anthropologists of different backgrounds in different historical periods have found that the relationships between people and their food resources are basic to their understanding of society, culture, and biocultural evolution, and anthropological questions must be addressed at the individual and household levels as well as at more aggregate levels of social groupings.

Yet how one is to study "the household level" has been a subject of ongoing controversy for anthropologists in all schools (4-7). Yanagisako (8) concluded her review of the literature on household and family with the observation that these are "odd job" terms that are useful for description but not productive as tools for analysis and comparison. Without careful clarification, the labels tend to obfuscate rather than clarify the comparability of domestic units, domestic relationships, and domestic activities from one socio-cultural group to the next. Universal definitions of families are vague and seem to rely on the mother-child bond and the constellation of vaguely defined functionally related individuals around them. For example, the *family* is said to correspond to the unit of reproduction and socialization, i.e., a co-residential group that shares some activities. Alternatively, *household* usually

This paper was written while the author was in the Department of Anthropology, Yale University, New Haven, Connecticut, USA.

refers to a group of individuals (sometimes only one) who live together and also share some form(s) of activities, usually "domestic activities," related to food production and consumption or sexual reproduction and child-rearing or some combination. Although most definitions of the household are based on notions of "propinquity," "kinship," or both, there is no reason to equate family ties or co-residence with household membership. Families may not form households, and households may not be composed of families. As an example, the corporate legal unit of the family, defined in terms of its rights to land, may be quite distinct from the common set of (usually) kin who live together and share a common set of obligations based on the other requirements set by co-residence. Yet the overlapping groups of people who participate in meal-sharing, gardening, other specified activities, and co-residence may be better described as a "domestic group" than a household or family. For such cases, one may be more interested in describing "that group of people, their relationships and activities, who acknowledge a common authority in domestic matters," a "budget unit," or "a group who have a common fund of material and human resources and rules and practices for exchange within it." Nutritional studies might more productively seek to identify and analyse such functional social groupings rather than simple co-residential or kinship groupings of men, women, and children.

Ordinarily, to understand domestic organization and the composition of residential groups in any society-culture and their implications for the nutrition of that group and its individual members — one must examine marriage rules, residence rules, and the social and biological processes leading to cycles of shared residence, work, and consumption of individuals and domestic units. How is labour recruited in different cultures? What are the rules for transmission of property between and across generations? What are the work requirements of households and individuals? What are the rules for food-sharing? What are the decision-making units of individuals at various points in the flow from food production or purchase, through preparation, distribution, and finally, consumption?

What is the sexual division of labour and what is the economic participation of women? To answer these questions it is necessary to examine the seasonal, sporadic, or permanent nature of female economic participation and to try to distinguish between household organizations that provide "backup" household labour so that women can work outside the home and those in which the organization adjusts to the demand for women's labour by changing form and/or personnel. Cultural rules for social relations and child-rearing as well as cultural attitudes towards women's inhouse versus external work may help predict such adjustments. On the other hand, cultural rules and attitudes about women's working may themselves be changing in response to economic conditions. In either case, nutritional studies should be concerned with how the changing organization of the household under different economic conditions will affect how food provisioning and other household maintenance tasks are accomplished.

One should also be concerned with how particular economic demands affect the emergence of the nuclear family. In many parts of the developing world, this is part of the more general problem of how socio-enonomic changes affect family and household structure. Following Yanagisako (8), it is probably more useful to begin by analysing the activities characteristic of domestic relationships and then turn to the structure and composition of the group involved in realizing a particular production/consumption style. The basic nutritional anthropological question is to determine the particular arrangements by which the tasks of living (eating, clothing, personal hygiene, and household maintenance) get done. These may involve more limited or more extended domestic groups, as well as different styles of domestic leadership and management particularly in these domestic arrangements run by women. On this last feminist point, many anthropologists have tended to simply equate "domestic" with the female domain, but it is important to distinguish to what extent women *do* limit themselves to a passive role in the home sphere, or take an active role in securing their and their offspring's socio-economic wellbeing. Studies of women's extended kinship networks (particularly in urban settings) as an extra part of the domestic organization are beginning to show the limits of family and household analysis for socio-economic as well as nutritional studies (9). Also, mothering may not be the most important aspect of a woman's role, and women may have far more power in economic decision-making than ordinarily conceived by men (8, pp. 190-196).

Wenner-Gren Conference on Households

Along these lines, many of the domestic forms and functions observed in contemporary ethnographic settings may be in the process of change. A recent Wenner-Gren conference on "Households: Changing Forms and Functions" (10) emphasized this perspective in focusing on what households do, what functions they perform, and how and why they alter through time (rather than continuing to debate on how to classify household systems in terms of genealogy and co-residence types). Participants continued to look at task-oriented, culturally defined groups in terms of kinship networks and co-residence that help define size, composition, and functions of households but also considered the processes of change in these dimensions as households adapt to socio-economic (environmental) perturbations. In lieu of further refining typologies, they addressed more questions of sampling within regions and communities to ascertain the range and

variations within household groups, given the evolution of the domestic cycle; also, they noted the great flexibility that exists in most household systems through which households can respond to changed conditions without changing accepted cultural form and composition.

Several perspectives contributing to the discussion were cross-cultural comparisons of "native" (*emic*) versus "statistical" (*etic*) household constructs, and of cultural values – including gender ideologies – that lead to or limit options in residence and work patterns. Critical to understanding the process of work and consumption group formation as well as individual survival strategies is the issue of power within the household – for example, do men make the rules, but women make the decisions? – and the manner in which households and individuals are linked to other units in the larger society. A key question of nutritional concern in this regard is the strategy of resort in times of food scarcity: To whom do individuals – of given age, sex, kinship affiliation – turn in times of dearth for sustenance, or for work? Was there ever a rule-governed moral economy (11) that assured people of emergency assistance but is now breaking down? If so, can the process of change in domestic groups and extended social networks be described in either native or statistical terms? In situations of demographic transition, what are the adjustments that task-oriented units make to the outmigration of males, young people, or women of child-bearing age? Alternatively, how does the push of insufficient employment and consumption standards within the local unit versus the pull of the city affect migratory decisions? What are the rules by which those who are no longer co-resident continue to contribute income to the home? At what point do they define themselves as no longer household members and, therefore, not subject to mutual work and exchange obligations?

These are some of the household concepts and processes currently under study, in general, by anthropologists trying to understand the household factor in ecological, social, economic, and cultural studies that are, in today's world, mainly studies of adaptation and change. While most anthropologists have tried to describe domestic organization as a phenomenon *sui generis* existing at one point in time, most – at least since the 1930s – have been unable to avoid setting their analysis in historical context. Many household studies, directly or indirectly, suggest how government labour and tax policies have influenced domestic structures and functions. Some also suggest how household functions favour or interfere with individuals' participation in certain government work and health projects. In summary, anthropological studies at the household level have addressed mainly theoretical, but also practical concerns. We turn now to a consideration of household level analyses, and the insights they potentially provide for nutrition and food policy.

THE HOUSEHOLD FOCUS IN ANTHROPOLOGICAL AND RELATED STUDIES OF FOOD

To help clarify how a household focus has or could be used in food and nutrition studies, particularly those related to intra-household distribution of food, I review in this section how social anthropological, psychological anthropological, symbolic, ethnoscientific, and ecological studies have incorporated this level of analysis in their food-related research.

Social Anthropological Studies

British social anthropologists, working in pre-World War II colonial Africa, provided some of our earliest and most complete studies of the interrelationships between food supply, social organization, and nutrition. Although as social anthropologists they were interested in defining and analysing the basic units of socio-political organization, they found that the study of food and hunger were central to their understandings of the societies, social relations, and changing cultures disrupted by British rule. Richards, in her classic study of the Bemba of Northern Rhodesia (12), concluded that the reasons natives did not work harder (a primary concern for British mining and other economic interests) was not a question of sloth but of undernutrition. In this society, the men had been drawn away from their roles in local gardening production to the mines, and the women found it difficult to perform the heavy clearing tasks traditionally assumed by males in addition to their own cultivation and gathering roles.

Richards focused on the social relations of food production and consumption, the construction and maintenance of consumption units through common household work, and rules and practices for food sharing. She compared the effectiveness of different household heads (women responsible for the acquisition, storage, processing, preparation, and distribution of food) at common food-related tasks, noting the range and average durations of typical tasks, such as the time it took to pound a kilo of grain into flour, to gather the other ingredients, and in total to draw water, gather fuel, and prepare and serve the meal. In addition, she recorded work schedules, food classifications, and typical diets of different age and sex groups within the population. She noted how kinship relations were marked by prescribed rules of food-sharing and how these regulations of hospitality were systematically thwarted in times of dearth. In summary, she noted how production and consumption units were organized around women, now that the men were less in the production picture, and how insufficient energy intake – particularly in the planting season – by these women embedded the individuals and their households and community into an ongoing cycle of insufficient food, poor nutrition and health status, and poverty.

Other British social anthropological studies, while examining the household as part of the domestic cycle of social structure and social relations, also incorporated some comment on the variable use of food resources by different households, while not concentrating directly on food and nutrition. Fortes and Fortes (13), for example, reviewed the nutritional and productive practices of the Tallensi and stated that many households (indeed, the entire community) could do better agriculturally and nutritionally if they would spend as much time cultivating their cereal gardens as their tobacco patches and if they expended grain less liberally on beer festival socializing immediately after the harvest. Goody (14), in analysing the reasons for the breakup of polygynous (multiple-wife) consumption units among the La Dagaa of the Gold Coast, relied on native explanations of child-feeding customs to comprehend household fissioning. Not so much jealousies or personality incompatibility among co-wives but individual mothers' needs to supervise their children's food from separate rather than common pots caused households that formerly cooked and ate together to divide into mother-child units.

More generally, studies of polygynous households, mother-child residence rules, and particularly post-weaning residence rules for children provide important information for designing nutritional studies that seek to elucidate the social factors contributing to malnutrition (15). Other African studies have shown time and again that who eats with whom may not be a simple matter of residence. Not all persons who reside in a common homestead necessarily eat the same foods from a common pot. Tracing the routes of food across Ivory Coast villages can indicate the lines of kinship obligation, as well as the lines of infection stemming from food sharing. Examining at the household level which children (age, sex, birth order) eat together in a household and rules for sharing (or adult intervention in cases of inequities) can indicate further social factors in malnutrition where it is the case that youngsters grab what they can from a common pot.

Anecdotal information from social anthropologists provides some information about such eating customs that systematically neglect the very young and those unable to fend for themselves. Anecdotal reports also often indicate substantial variation in how mothers manage work in the fields and child care simultaneously. For example, one anthropologist noted distinct variations in mother-craft. Within the same culture, some mothers methodically placed and kept their young children in the shade and fed them at regular intervals with easily available vegetable and fruit resources, while others let their children linger hungrily in the sun most of the working day. More systematic reports on some of these factors might provide clues on what features of households and eating patterns, as well as women's work patterns and rules for child care, to seek in nutritional studies. Also, how available resources already cleverly used by some individuals within a culture might be taught to all to further their common nutritional well-being is an additional study area suggested by these reports (anecdotal communications provided by Timothy Weiskel for the Ivory Coast, and Jane Guyer for the Southern Cameroons).

Psychological Anthropological Studies (Cultural Food Habits)

By contrast, cultural anthropology in the United States, during the 1930s and 1940s and subsequently, focused less on social structure and more on how attitudes toward food (and other aspects of culture) were socialized in children at an early age, and affected their later social relationships, behaviour, and personalities. Studies like DuBois's classic ethnography on the Alorese (16) considered, among other things, the psycho-social nutritional dynamics between mothers and children and between older and younger children as part of the investigation of the structure and content of relations between males and females and personality formation. She focused particularly on the male-female units of mother-son and wife-husband and the sources of food anxieties, including behavioural consequences of such imaginary food shortages on those elemental social relationships. Other psychological studies also included complete descriptions of social relationships centering around food as part of their analyses of culture and personality, drawing heavily on primary data of food sharing at some specific household level (17, 18).

More focused food habit research within the United States during the 1940s, while aimed in part at understanding the formation of food habits as a part of culture (and personality), nevertheless reported less on this household level of observation in their studies of the food patterns of different ethnic populations within the United States. In addition to improving academic understanding of food as an aspect of culture, these studies were designed to clarify how cultural rules of food classification, dietary structure, and rules for food sharing, as well as the channels by which food reached households, influenced adequate nutrition within cultural communities and how food habits could be changed (19–23). While it is useful to go back to some of these early studies that describe how food attitudes are formed during the early years of childhood and under what circumstances of socialization they are easily amenable to change, for the most part they neglect household observations in favour of generalization based on respondent reports in their summaries of the food habits of individual ethnic groups.

Subsequent literature on cultural food habits, particularly studies done of the food habits of Third World societies, have been similarly lax in reporting what goes on at the

household level in terms of food-habit socialization or the contexts in which nutritional habits are engrained. Most of these surveys provide some notion of the major elements of the diet (e.g., primary and secondary carbohydrate-energy source, principal vegetable protein elements that complement the starchy staple) along with simple questions of who eats them (everyone, only men, only women, only adults, only children, only women and children) and of who eats together and who gets served first; but they do not go far enough in indicating how food is distributed within the household. These observations are particularly necessary to verify such responses as, for example, that children eat from a common pot and their implications for child nutrition (24). Nor do the average figures in which such food habits are reported allow for interpretation of individual household patterns that may be nutritionally superior within the general cultural food pattern. Finally, such studies give few insights into how food habits might be changed, given shortages of certain items or poor nutritional quality of the diet of certain status groups within the society (e.g., weanling infants, adolescent girls). The short summaries of the ethnic food habits of the United States in the 1940s, which include descriptions of the social networks of the ethnic groups addressed, go farther in suggesting practical measures in this area.

Cultural Symbolic and Cognitive (Ethnoscientific) Studies

Within cultural anthropology, symbolic and cognitive (ethnoscientific) studies have also contributed to our understanding of food habits, on the one hand, to studies of the attributes of particular foods or groups that enter into their classifications and rankings as food, on the other, to our comprehension of why particular social categories (e.g., groupings based on age, sex, or economic class) in particular cultures favour or reject particular foods or classes of food. Food with its multiple referents can be used or interpreted to symbolize (mark) social group membership, relative social status and social relations, prevailing dominant-subordinate relationships, or relative class or national position. symbolic anthropologists study the dimensions and resultant structures of contrasts.

Many of the studies of food symbolism *have* provided information on the intra household distribution of food in the course of examining symbolic food classifications, such as "hot-cold," "male-female," and "pure-impure" principles that structure acquisition, preparation, and distribution of foods in particular cultures. Such principles determine, in large part, whether access to certain classes of foods are restricted to certain social categories, such as children; menstruating, pregnant, or lactating women; or victims of particular illnesses. In each case, the food classifications, and the knowledge and attitudes that different members of the population have about them, can affect nutrient intakes and food allocations within households. Symbolic analyses of how people fight or of how they certify friendship or particular degrees of social relations with food also form parts of symbolic studies furthering information on intra- or inter-household food flows.

Less available are investigations at the household level identifying more precisely how people acquire particular food rules, or even more basic, particular tastes, taste preferences, and general ideas about edibility of food items. The extent to which such knowledge and rankings are shared within and between households or more extended kin networks demands further work. Among the areas for additional research at the household level are taste sensitivities and preferences within and between cultures, and their nutritional and health consequences. For example, Messer's study of sweetness preferences and consequent sugar intakes in a Mexican village (25) suggests that there may be substantial but describable variations in both, even within a single community. In view of modern medical concerns about high refined sugar intakes and diabetes, more careful studies of sweetness preferences and other cultural factors contributing to high sugar intakes are in order. Jerome (26), among others, has discussed some of the cross-cultural developmental issues in children's acquisitions of cultural tastes. Biological versus socio-cultural sources of preferences for higher or lower concentrations of sweetness and saltiness, as well as preferences for sourness, remain controversial topics for further nutritional investigation.

Similarly, there have been few ethnoscientific studies that explore native views specifically dealing with native food choices and with the dimensions or objective consequences of folk nutritional concepts and practices. DeWalt et al. (27) attempted to identify folk nutritional concepts and categories in one Mexican rural community study, but their food factors "arrived at by their own analysis of the preliminary data on food selections and preferences" were more their own than the people's categories. Potentially, ethnoscientific studies of diet could have informants sort elements into culturally meaningful dietary categories such as starchy staples and relishes, elicit the criteria, including costs, by which individuals, households, and larger cultural groupings choose among them; and evaluate the nutritional results of such choices.

Theophano (28) and Curtis (29), in their studies of Italian-American food habits, analysed patterns of food consumption and inter- and intra-household food exchange, utilizing categories of food (pasta, gravy) supplied by the people themselves. Their studies illustrate the potential usefulness of this approach for describing current food habits and tracing cultural change. Douglas (30) and Douglas and Gross (31) have also suggested structural approaches to describing food consumption and exchange patterns among households, using computer programs.

Their methods need further empirical examples, however, before they can be said to be useful.

Characterizing each of the food studies in these areas of food classification and symbolism is a need to combine interviews on food habits, classifications, and attitudes with observations of actual consumption before the studies can be said to be useful for nutritionists. Conversely, observations in nutrition surveys, for example, vitamin A deficiency epidemiologically limited to young males in South-East Asia (32), can sometimes lead the cultural anthropologist to prevailing cultural symbolic rules of potential nutritional deficit for a particular segment of a population, even in cases where people report an "old rule" they claim they are no longer following. On this note, one should add that there are usually multiple factors that govern whether or not particular food symbolism dominates decisions on food allocations within the household. In Bangladesh, for example, Rizvi (33) investigated whether the cultural rule for favouring male over female children in matters of nutrition and health, as well as other cultural concerns, was standard practice across social groups and classes. She found, not surprisingly, that other factors, such as birth order, number of children, and economic position of the household, were also important in determining intra-household food distributions. Again, combinations of interview and observation provided more accurate results than simple questions about attitudes toward the two sexes.

Ecological and Biocultural Studies

Complementing analyses by ethnoscientists and symbolic anthropologists interested in how "culture comes from culture" have been studies by cultural materialists (34), ecological anthropologists (35, 36), and nutritional anthropologists (37) that have been more explicitly concerned with understanding the nutritional and environmental (including socio-economic) determinants and consequences of cultural practices (food habits) in material (scientific) terms. From the cultural materialist perspective, environmental conditions and subsistence needs are seen as directly or indirectly shaping cultural practices that maintain the material bases of society. In this view, culture – including social organization and symbolic and other aspects of cultural attitudes toward food – consciously or unconsciously serves ecological and economic ends. The units of analysis are objective measurements, sometimes nutritional such as quantities of energy (calories), protein, and other nutrients in foods. They are sometimes ecological, relating species within a local or regional ecosystem, and in other cases economic, involving financial calculations.

Most of these studies have dealt with culture, society, and the human population at the group rather than the household level. However, household analysis has been mentioned and is intrinsic to most descriptions of how subsistence systems are organized. For example, studies of the environmental resources, cultural food classifications, and patterns of food and information sharing among hunters and gatherers, such as the !Kung San of the Kalahari (38), have shown how the adaptations and food systems of even the simplest human societies involve a complex sexual division of labour and relatively precise knowledge about the locations and seasonality of upwards of eighty plants carefully classified into preferred and less preferred species. Such information is carefully taught, often within same sex groups (39-41). The organization of hunting tasks, including formation of co-operative groups, manufacture of tools, and time planning, is another aspect of hunting and gathering economies and social life that affects kinship and co-residential groups and the food intake of individuals. Water availability and the relative resource positions of other social units from which one can expect to give and receive food, other material goods, and friendship are additional aspects of the !Kung San environment that affect individual and household level nutrition. Between the level of the individual and the social group (human population), anthropologists more often discuss social networks based on age, sex, and kinship or males and females of different ages, than households, although the shift to household analyses may come as more and more re-studies of the !Kung take place on their newly settled reserves, where they consume a processed food diet.

Ecological studies

Most ecological anthropological studies at least describe the division of labour and consumption patterns at the household level, even if the adjustments that take place at this level do not enter very much further into their analyses. Rappaport (42), for example, considered the sexual division of labour and potential conflict between pigs and people at the household (gardening) level in his classic study of the role of ritual regulation of the pig populations kept by horticultural groups in the highlands of New Guinea. He offered a model that considered women's complaints that too many pigs were digging up their sweet potato gardens as the triggering mechanism for a wholesale ritual slaughter of pigs to complete the pig population's life cycle. Ecological studies of energy flow, that is, how energy inflow (intake) matches energy outflow (expenditures) within a given biological unit (regional ecosystem, local ecosystem, household, individual) have also examined the division of labour by sex and age at the household level to understand better how local human populations get by on limited resources. Thomas's classic study of highland Andean herding patterns (43) carefully measured how children's work saved the group energy. Brush (44), in another Andean location, considered how

the labour exchange patterns among households enable that socio-economy to subsist, documenting labour exchange within but also between co-residential and kinship units. None of these studies, however, has devoted equal time to a careful documentation of energy intake between and within households.

Biocultural studies

Biocultural studies, trying to understand the behavioural consequences of particular cultural health and nutrition practices, have documented how households adjust to nutritional deficiencies, such as iodine lack. Greene (45, 46) demonstrated how iodine-deficient communities in highland Ecuador managed to perpetuate themselves even with a high proportion of the population nically impaired by varying degrees of endemic goitre through extreme cretinism; he showed that the intellectual and physical requirements of ordinary tasks for living had been so reduced that even mild cretins could perform many of them and were thus productive individuals.

Biocultural studies of psychological disturbances in certain classes of societies (e.g., women) have also dealt incidentally with intra-household distribution of food, in that individual studies attribute some of these syndromes to protein or calcium deficiencies, brought about by food rules that discriminate against women (47). However, these studies, like the symbolic studies mentioned above, have never been successful in actually measuring insufficient intakes or the clinical nutritional deficiencies in the individuals supposed to be suffering from culture-bound syndromes.

ANTHROPOLOGICAL AND RELATED STUDIES OF NUTRITION AND ECONOMIC DEVELOPMENT

Among the topics that have been investigated for purposes of advancing economic development in developing nations have been the social organization of production at the household level and its relation to nutrition, health, and fertility. In particular, the role and nutritional consequences of women's work in food production, preparation, and distribution and women's time allocation to household maintenance and child care versus cash employment have been dealt with in any number of policy studies (48). At the household and community levels, the relationships between nutrition, productive behaviour, and reproductive behaviour have been reviewed by public health economists in a growing literature on women's and children's work, time allocation, and possible implications for nutrition (49) and fertility decision-making (50). Some studies seem to show that the extra income of the mother may be the main economic factor accounting for lower levels of malnutrition within populations where some mothers work as traders (51). Other studies suggest that the mother's time away from household responsibilities, in the absence of adequate supplementary domestic and child-care arrangements, may account for the poorer nutritional status of the child. This disadvantageous nutritional outcome may stem from economic demands on the mother's time, which leave her inadequate time to prepare a balanced diet to meet children's nutrient needs (49, 52). Alternatively, the child may suffer hunger, exposure, and illness while the mother works, and therefore be at greater nutritional risk than the child of a woman who is not working (52). As indicated above, the particular skill of the mother at managing work and child care, along with the cultural mechanisms for providing surrogate mothers of greater or lesser quality, are also significant factors in nutritional and health outcomes, and there may be significant intracultural variation in these matters.

Factors Determining Intra-household Food Distribution

The related questions of intra-household distribution of food under different working conditions for male, female, and juvenile household members have also been considered. Gross and Underwood (54), in their classic study of energy flow among sisal workers in Brazil, showed that male wage earners received preference in the allocation of calories within the household. They were fed first, in sufficient quantity to sustain their work, often at the expense of children and women, who received inadequate calories, eating what was left after the male's energy needs had been met. The impact of women's work and income on the nutrient intakes of household members, either because women allocate more of their income directly to the food budget or because they make the intra-household distribution of food more equitable when they contribute to the food budget, demands further study.

Recent evaluations of the significance of agricultural development projects for women's lives and the nutrition of households indicate that the socio-cultural factors determining whether and where women work in cash crop agriculture and the effects of such labour-force participation on their household diets are complex. Most agricultural cash crop projects seem to favour male over female enterprises, even where the reasons this is so have to do with the complex of socio-cultural rules governing women's access to land, labour, and technology. For each project, one must examine in great detail what activities (including food-producing activities) women forego by participation: Do they benefit or lose in terms of total income (what was the opportunity cost of work foregone, including income in kind)? Even if income is greater under the development project, do women *control* their earnings to the same extent that they did under the previous household labour arrangements? Finally, are women able to choose to

allocate more income to food of higher nutritional quality under the new economic conditions?

Participation of Women in Development Projects

All of these issues -- health considerations of child care notwithstanding -- will affect whether women choose to participate and, on balance with their offspring, benefit nutritionally from a development project designed to improve production and, by implication, their income and well-being. Any arrangement that decreases the amount of control women have over the returns for their labour (e.g., where they work in someone else's field rather than their own to produce the same crop income) donates some of the value of their labour (product) to another owner/manager. Similarly, if purchased food is always higher in price than food produced at home, then there must be compensation in women's income proportional to the relative food price differences to make up the difference in food available under the new versus the previous system. Particularly in farming systems where women work some fields while their husbands control others, projects must be extremely sensitive to the possible lowering in value of food that women can produce or buy with income earned at opportunity cost to home food production and recognize how such considerations interfere with women's desire to participate in development schemes and whether they should participate.

Also along these lines, one should try to anticipate seasonal effects on diet of particular patterns of labour force participation. Are women used to earning a small amount per day or week, say, through food processing? If so, plans to automate food processing will interfere with their daily economic earnings, and most likely, with the nutritional well-being of their offspring who count on their earnings for food. Are the crops that women garden ordinarily sold in small amounts, again, to meet immediate food budget needs? If so, then any scheme that concentrates earnings from crop harvests, even if the earnings are superior, will interfere with ordinary nutritional budgets in the absence of other kinds of steps to inculcate nutritional and economic planning. This is not to say that expenditure patterns and the division of labour in economic production and household decision-making, particularly in the area of the food budget, do not change over time. However, before a project is initiated, there has to be a careful study of the resources that various members of the household control at the outset of the project and how the project might interfere with that household division of resources and subsequent decision-making patterns (see Jones [55] for a relevant case study). While the study does not provide adequate information on actual effects on food budgets as they affect nutrient intake, it does provide information on the complex of factors involved in the sexual division of labour.)

In general, studies of women's participation in the labour force have shown the need to consider the varying ways in which income from different sources is acquired and used and the importance of seasonal and other fluctuations (55). However, the nutritional implications of sexual division of labour and decision-making related to income allocation are rarely drawn except by Cosminsky and Scrimshaw (57).

Socio-cultural Factors in Malnutrition

A final area that incorporates household analysis are studies, usually by nutritionists, on epidemiological factors in malnutrition. In particular, they have tried to isolate factors in residence rules, infant-feeding customs, and mothering (patterns of child care) that seem to contribute to higher or lower frequencies of malnutrition in children of specific age groups within the same culture or culture area. Household factors, material or ideological, that contribute to the decision to breast-feed or not (58) and household and extended family support networks that help a mother with nursing and other aspects of child care are among the household variables described in such instances. Feeding customs following or in addition to breastfeeding, the mother's use of time -- how much time she has to spend with the child -- and how well she supervises the child's nutrient intake and health also affect the child's nutritional status and health. See Popkin (49) for a review of this literature.

Weaning, child health, and behaviour

The time immediately following weaning is usually particularly important. Physical separation from the mother, as well as inadequate food, may contribute to cultural patterns of failure to thrive (59). The social organization of food provisioning and child care enter into the equation of whether the child thrives. Important issues are who feeds the child, how often, and in what quantities, what types of food are given, and who meets the child's emotional needs. How the mother manages her time, her money, and her children are aspects of mothercraft that contribute to some children's thriving and others failing to thrive in apparently the same environments (60-64).

The quantity and quality of parent-child interactions within household units are additional social factors affecting the child's nutritional status and well-being, although the relative contributions of the extra stimulation versus the extra nutrient intake are not clear. For example, intensive observations in a Mexican intervention study indicated that infants who received nutritional supplementation were substantially more active and interactive with their environments (including with their mothers and fathers) than their unsupplemented counterparts (65), although the effects of the extra stimulation in addition to the food

provided by the programme have contributed to this outcome.

Local understanding of and responses to moderate nutritional disorders and clinical nutritional disease also affect nutritional and behavioural outcome. In many cases, child-feeding customs and food classifications contribute to clinical deficiencies like protein-energy malnutrition and avitaminosis-A (15). Also, general sanitation conditions and particular sources of infections within the household or larger compound where a child traverses have impact on his nutritional well-being. Interactions among all economic, socio-cultural, and disease factors further condition how the child fares in nutrition, health, and other interrelated aspects of behavioural development (65). While there have been numerous studies attempting to link levels of childhood malnutrition with particular socio-economic factors, usually in household environments, simply quantifying the socio-economic factors within households may not be sufficient to understand the relationships between social factors and malnutrition. Rather, it is the way the various resources are organized, how adults manage their time in relation to child-rearing, and how a child learns to fend for himself within such environments that determine the nutritional outcome, measured in physical and functional terms.

DISCUSSION

Each of these anthropological or related studies suggests what investigation at the social level between the socio-cultural community or subcommunity and the individual can show us about individual and group nutrition. Prior to initiating a nutrition survey or nutrition intervention, one should begin by defining the groups and their members — by co-residence, kinship ties, tasks, food exchange, or some combination of relevant factors. By next investigating how such units conform to structural rules — and as Arnold and Netting point out (10), it may be the "flexibility" rules that are the most significant — one can chart the different patterns in social organization and resource use within cultural groups. From these patterns, one can begin to discuss how they facilitate the interpretation of the dynamics of eating patterns, eating habits (including socialization), and other aspects of household functioning that either favour or interfere with nutrition and health.

Drawing on the general discussion of household form, function, and process of adaptation cited in the second section of this paper, and examples of how households have been used in food studies in the third, one can summarize the different conceptual units of domestic groupings — social groupings that enable individuals, in association, to perform the tasks of living — that may prove useful for future analysis:

1. *Eating units* — defined with respect to (a) production units (or common budget units); (b) residential groups, further defined according to whether (i) all members eat together or (ii) some eat together, with others eating outside and foraging outside according to fixed rules, and including (iii) non-co-residents who receive food from this co-resident hearth; (c) kinship linkages among people; (d) child-care units; (e) child-feeding habits, or rules for when, what, and how children should eat and who should feed them.
2. *Food budget units* — defined according to (a) who is responsible for seeing how a particular kinship, co-resident, or activity group or child/set of children are fed; (b) from whose earnings the food budget derives; (c) who makes the food-related decisions at every step from food production or acquisition to distribution and consumption.
3. *Child-rearing units* — in relation to (a) where a child eats; (b) what a child eats; (c) formation of food habits as part of enculturation, socialization, and personality formation.
4. *Social networks* — (a) those which in normal times provide flexibility and options for meeting food needs, and (b) those to which individuals resort in times of food scarcity and dearth. Among the conceptual questions to be investigated in each case are the rules and practices for (i) making demands on kinship relations, (ii) shuffling of household membership by out-migration of certain members at times of diminishing resources or on a more continual basis in search of improved food resources, or (iii) reorganization of eating and work groups although the residential group may remain the same.

Studies of eating and budgetary groups are essential for understanding social aetiological factors in malnutrition. Along with child-rearing units, they provide a context in which to understand the impact of socio-cultural food ideologies — and nutrition education — on child nutrition. It may be, given the social organization, that the individual mother's ideas are *not* entirely responsible for the food the toddler eats and the health environment in which he/she toddles, although most nutrition programmes are aimed at improving the mother's nutritional capabilities. Studies of the organization of resources according to eating units, food budget units, and child-rearing units are also critical to ascertain where and how a mother's work for income benefits or hampers her child's food intake, nutrition, and general health and educational well-being.

To summarize, this discussion suggests that nutritional anthropologists and other medical and social scientists examining social factors in nutrition revise their concept of the household as a focus in nutritional studies, and give greater emphasis to eating, budget, and child-rearing groups. On the basis of current household studies, anthropologists

can improve our ability to examine kinship and co-residential factors that contribute to the formation of these groups as they relate to other functional activity groups within a society and indicate how such patterns contribute positively or negatively to nutritional outcome. The task remains to incorporate such perspectives on domestic organization into the social factors standardly conceived by nutritionists and policy planners trying to ascertain current nutritional conditions and aetiological factors in the social fabric and how such conditions contributing to malnutrition might be modified in particular communities or social groups.

Additionally, social historical data on forms and functions of household units can help policy planners anticipate the adjustments that might be made at the household level to particular kinds of economic development initiatives, given structure, function, and flexibility/formation rules of a given society at a certain point in time. Socio economic changes taking place in both rural and urban environments indicate a pressing need to understand how men, women, and children allocate their productive time and arrange social obligations to ensure subsistence. Policy planners also need to know the contexts in which people in different cultures learn the nutritional values of different foods and how to care for themselves and others in order to design nutritionally effective policies.

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A FRAMEWORK FOR TRACING POLICY EFFECTS ON INTRA-HOUSEHOLD FOOD DISTRIBUTION

Shubh K. Kumar
International Food Policy Research Institute, Washington, D.C., USA

INTRODUCTION

In order to develop an understanding of policy impact on intra-household food distribution, it is imperative first to understand the dynamics in the functioning of households. Unfortunately, not much attention has been given to this by two major disciplines that have to date been involved in nutrition policies. Neither nutritional science nor economics has addressed the question seriously. At the very basis is the need for an explicit recognition of the diversity in structure, composition, and function of households under various socio-cultural and economic environments. Interesting insights have been provided by anthropological investigation into the various dimensions of household units. The paper by Messer in this issue shows some of the variations in household-provisioning mechanisms adopted by household units under diverse socio-cultural conditions. A recent review by Dwyer (1) shows, in addition, the need for a gender-differentiated approach to household behaviour.

The framework postulated here has as its core the nature of the provisioning mechanisms adopted by household units. It is suggested that these provisioning mechanisms are conditioned or even derived (the direction of causality here is not essential for the framework) from the social and cultural milieu, including the theological-legal environment. In addition, change in economic factors can influence these provisioning mechanisms directly as well as indirectly by inducing changes in the socio-cultural scene.

There are two possible ways in which intra-household food distribution is influenced by the household provisioning mechanism. First, by determining intra-household distribution of capital (both physical and human), division of labour, and resource/income generation, it affects intra-household control of resource allocation (including time). Second, it determines preference functions for intra-household investment in nutrition and health. This in turn provides the basis for an intergenerational transfer and exchange of resources and the start of the process all over again.

MAJOR COMPONENTS OF HOUSEHOLD PROVISIONING MECHANISMS

Access to Physical Capital

Ownership of or rights to land or other assets are a foremost determinant of how a household establishes its entitlements, since food and cash are primarily derived from agriculture for the majority of developing country populations. Socio-cultural and theo-legal factors are perhaps most important in traditional societies. In the process of change, land legislation and development programmes can introduce new ways of securing access to land. Ownership and rights of individuals in a household to land or other assets influence how households derive entitlements, how they use their labour in the process, and eventually what real income is available and how its allocation is controlled. A great deal of variation exists in conditions that have been documented across Asia, Africa, and Latin America. Those who have access to physical capital are likely to be the ones who derive entitlements from it for other household members (with their labour input as well) and are likely to be primarily engaged in its allocation.

Access to Human Capital

Human capital plays an important role in household provisioning. Both education and nutrition/health levels of individuals in a household are relevant. The levels desired and obtained are likely to be determined by employment opportunities and socio-cultural factors that influence who can or cannot perform certain activities and by returns expected for the household by alternative types and levels of human capital. Health, nutrition, and educational programmes can also influence levels desired by reducing the cost to households of making these investments. Children embody potential human capital for a household unit, and consequently household resources will be spent in raising them, which, under conditions of scarce resources, will depend on their expected benefit to the household.

When level of physical assets is lower, then the importance of human capital in household provisioning increases as a means of securing income. Depending on the type of employment opportunities and their relative rates of

return, different types of strategies may be adopted by households.

Income Generation

Households use their combination of physical and human capital in the production of income. In agriculture, decisions are made on the choice of crop mix and area, amount of household labour used, division of labour, choice of technology and inputs, and disposal of products. Policies in agriculture can influence each of these processes that lead to the production of real income in agriculture. Similarly, the production of non-farm income by self-employment or wages can be influenced by policies. Finally, time for converting the goods or cash represented by income into items of direct consumption or use by households is an important component of real income. Food consumption of children is especially dependent on mother's or substitute's time, and when it is short could influence intra-household food consumption.

The division of household labour among production/income activities and for its processing or consumption related activities is an important factor in the outcome of household provisioning. Not only does it determine the size and mix of components of income available to the household, but perhaps as importantly, it may provide a basis for control in allocation of income. It may then be argued that control over allocation of household income is influenced by (a) ownership of assets, physical or human, required in provisioning, and (b) time allocation in (i) the production and (ii) the processing of income for household consumption.

It is possible that there is a hierarchy of rights based on ownership and time spent among various household members that manifests itself in the allocation of income and intra-household distribution of consumption.

PREFERENCE FUNCTIONS FOR CONSUMPTION

Little is known about how households choose to allocate income among various goods and household individuals. The study of nutrition in today's Third World countries is a field of investigation barely 50 years old. It is characterized by paradigms of household behaviour that were at best proposed by the early Western scholars from their own experience. In this paradigm, the household is nuclear, with a male bread-winner and a female "home-maker" who makes decisions on how to allocate income for food consumption. Any deficiencies could be explained by ignorance of the finely tuned requirements for nutrients by the body. Consequently, those household members with proportionately greater nutritional needs, such as infants, children, and pregnant and lactating mothers were expected and found to receive a lower share of their food consumption requirements. Singular emphasis on nutrition education programmes aimed at women were a natural outcome of these early theories in the 1950s and 1960s.

In the case of economic analysis of consumption there has been little scope for studying intra-household questions. Neither micro- nor macro-economic theories have looked within households. Micro-economic theories are geared to individual behaviour of a firm or household whether in making production or consumption decisions. Intra-household distribution of food can only be a manifestation of a single combined household utility or preference function. No attention has been paid to how this is derived, and little has been given to "the profound problem in, on the one hand, internalizing all the family members' satisfactions in one utility function and, at the same time, using this same utility function to determine the number and 'quality' of the family members themselves" (2). While accumulating anthropological evidence suggests a more complex phenomenon in the allocation of household income that cannot be examined with only a single household utility, there may be some scope within a single utility function for examining the fertility-nutrition trade-off in aggregate child investments by a household (3).

It seems clear, however, that a better understanding of the intra-household dimension of household preference functions is necessary for understanding intra-household food distribution and how policies can influence it.

A MODEL EXAMINING POLICY IMPLICATIONS

In figure 1 a simplified framework is proposed as a basis for examining policy implications on household provisioning mechanisms (intra-household factors). Among the components in the process of household provisioning we can identify a socio-cultural dimension and an economic dimension. Intra-household access to physical and human capital and the sexual division of labour can be seen as being largely a part of the socio-cultural dimension (this will hold in respect of the sexual division of labour for larger population groupings, even though subgroups may respond to economic pressures by modifying their sexual division of labour), while the actual activities undertaken in the income generation process are part of the economic dimension in that they are primarily influenced by such policies. Development programmes and policies can influence any of the components of household provisioning.

In addition to influencing the generation of household incomes, policies can also influence preference functions involved in the allocation of household resources. Education, advertising, etc., are the most obvious examples of how preferences can be modified. There is an obvious

ESTIMATING THE NUTRITIONAL IMPACT OF FOOD POLICIES: A NOTE ON THE ANALYTICAL APPROACH

Per Pinstrup-Andersen
International Food Policy Research Institute, Washington, D.C., USA

Food policies are rarely assessed for their effect on human nutrition. Yet, such assessment, if properly done, would facilitate the incorporation of nutrition goals into the choice and design of these policies with the likely result of improving nutritional impact. The degree to which expected nutritional effects should influence the choice and design of policies with multiple objectives would ideally be determined on the basis of: the importance of the nutritional problem relative to other problems towards which a given policy is aimed and the cost of achieving a certain nutritional improvement through the particular policy relative to the cost of achieving such improvement by means of the least-cost alternative policy or programmes. Clearly, certain nutrition problems are most efficiently dealt with through direct nutrition intervention and/or health programmes, while others should be approached through broader food policies. However, in order to select the most appropriate approach it is important to understand not only how the various programmes and policies affect nutritional status, but also how the impact is transmitted.

Many, although by no means all, past evaluations of nutrition programmes have attempted to assess the impact on selected indicators of nutritional status while partially or totally ignoring the intermediate steps or relationships that brought about the impact as well as other factors that might have exercised impact simultaneously with the programme being evaluated.

If the sole purpose of a given study is to evaluate, ex post facto, the impact of a particular programme on the nutritional status of a particular group of people during a particular time period and within certain environmental influences, such an approach may suffice. A caricature of an evaluation of this nature is shown in figure 1. No attempts are made to analyse the mechanism by which the impact is transmitted, i.e., it is unknown what happened inside the "black box." The study merely compares a situation where the programme is present to a situation where it is absent, either over time for the same population group or at a given point in time across population groups.

But if analyses of past and current programmes are to be truly useful for the choice and design of new programmes and policies and modifications or termination of current ones, it is necessary to know not only by *how much* but also *how* nutritional status is influenced by the various programmes. We must understand *why* some programmes and policies are more or less effective than others. This requires understanding of the mechanisms by which nutritional status is affected and how this mechanism and its key components link immediate programme effects to nutritional impact. The process components must be identified and their interaction understood. The job of evaluating a given programme then becomes one of tracing programme impact through the relevant processes while estimating the impact on each of the relevant components.

The key elements in most or all of the policies and programmes are relatively few, and many of them are common to different kinds of policies and programmes. On the other hand, there is an almost unlimited number of possible policies, programmes, and programme combinations that may be designed. If we understand how a given policy and programme affects the key elements and in turn how these key elements affect nutritional status within clearly specified or identified environments, we can design effective policies and programmes by selecting and combining the elements that are most appropriate for that environment. The number of key elements in any of the

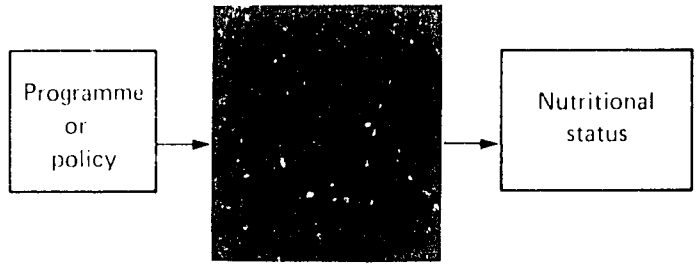
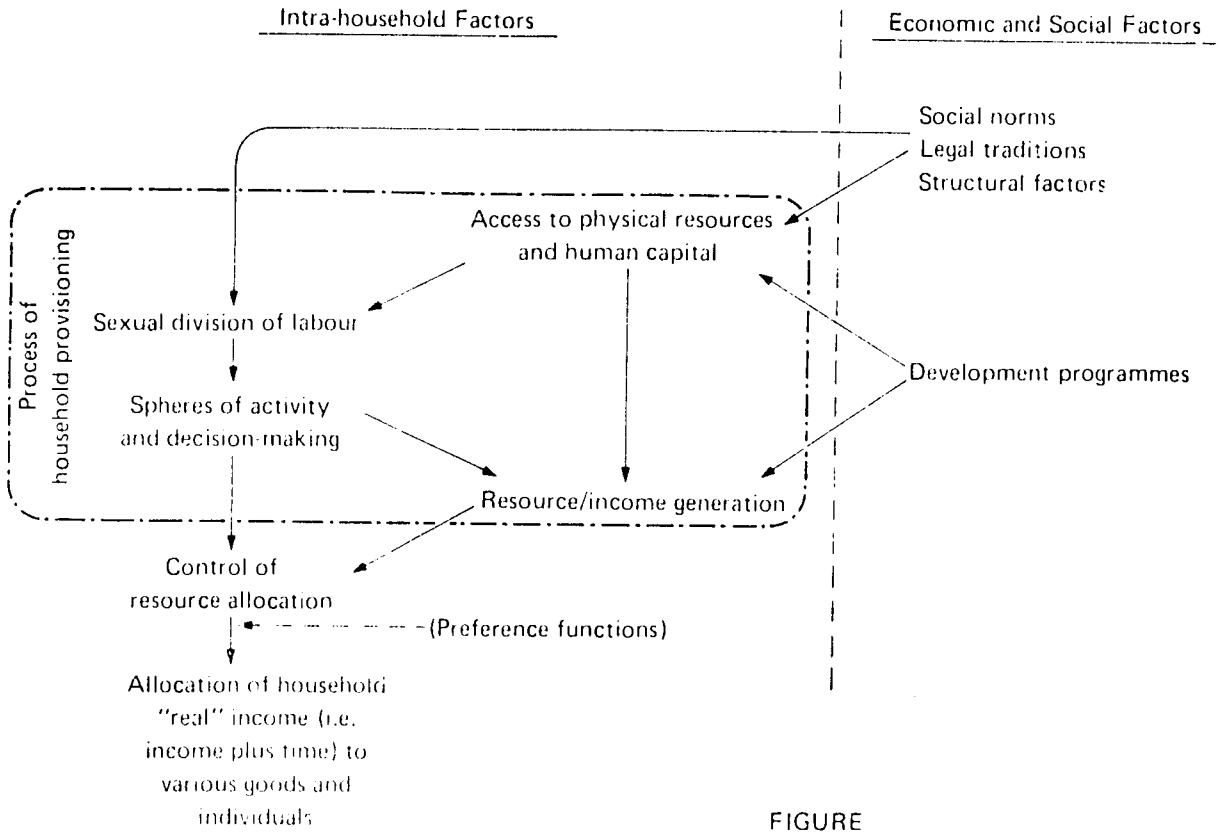


FIG. 1. The "Black Box" Approach to Programme and Policy Evaluation. Often all the multiple factors and processes through which programmes and policies influence nutritional status are ignored and only nutritional impact is measured.



FIGURE

intra-household dimension in preference functions since it is linked to decision-making. Further understanding of intra-household decision-making can provide a valuable basis for examining preference functions. Recent work in Nepal has shown that decision-making in allocation of household income is closely related to the individual's role in the generation of the income (4).

INFLUENCE OF POLICIES ON INTRA-HOUSEHOLD DISTRIBUTION OF RESOURCES

How an individual policy measure interacts with household provisioning strategy will determine the outcome on intra-household distribution. The same policy measure can have very different repercussions under varying circumstances or characteristics of how households provide their entitlements. Consequently, policy analysis needs to be made within a stated context. In order to do this, more attention must be given to understanding better the underlying socio-cultural and economic dimensions of household provisioning set out in figure 1. Ultimately, the objective of the policy analysis should be:

- to discern whether there are any changes in the intra-household control of household income;
- to discern any change in the level of household "real" income components – the value of cash and in-kind income and the time available for its processing into consumable items;
- to discern whether there are any changes in internal factors (e.g., the intra-household control of income mentioned above) or external factors that influence household preference or utility functions (if, for example, the price of women's time increases, then the income elasticity of demand for investing in child health/nutrition or education could rise relative to the income elasticity for additional number of children; and, if so, it could favour a proportionately greater allocation of household resources to health/nutrition or education for some or all of the children),
- to apply the knowledge of preference functions to determine the impact of the various changes on the allocation of household resources.

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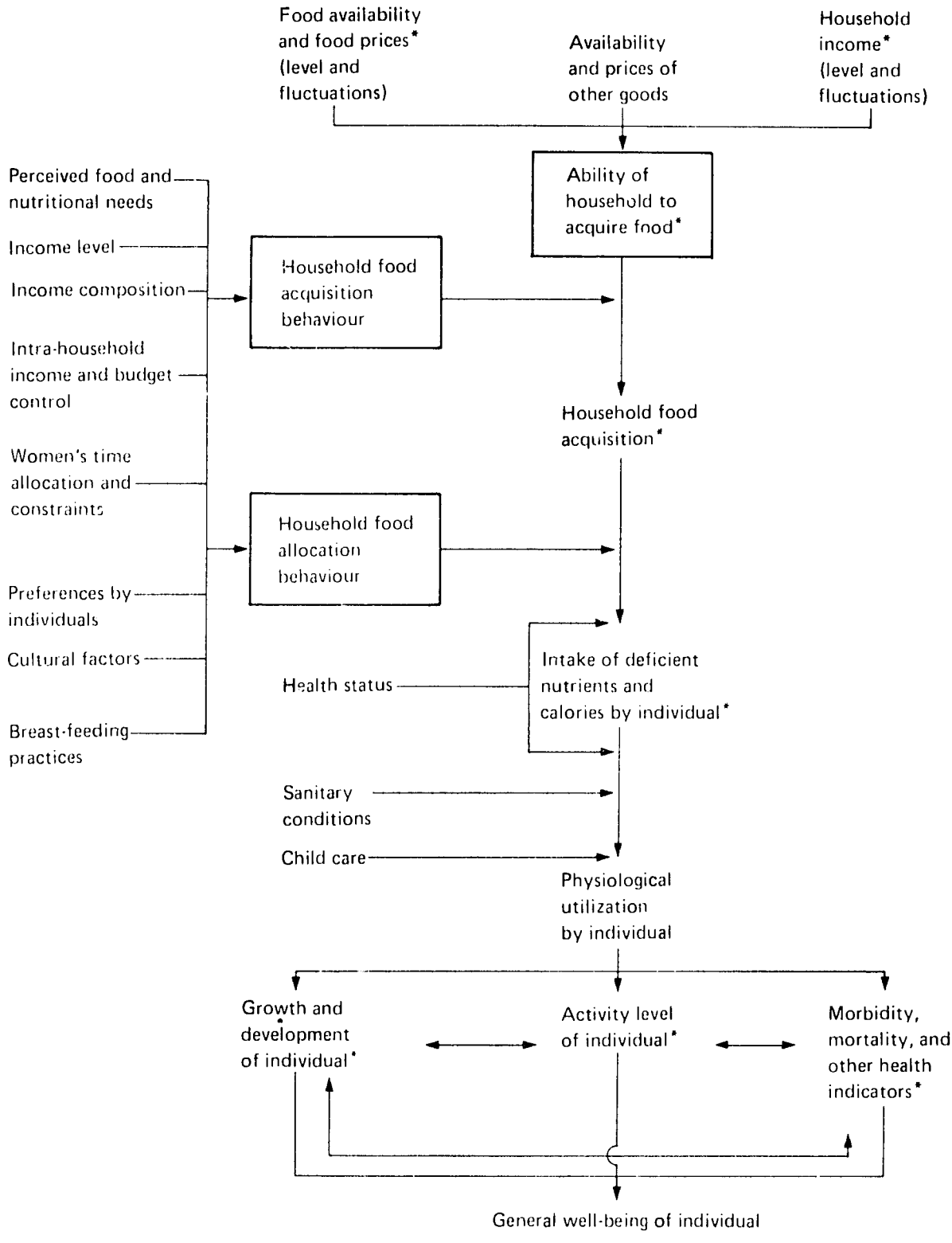

FIG. 2. Factors and Processes Influencing Nutritional Status. This simplified analytical framework for determining the processes by which programmes and policies affect nutritional status replaces the "black box" of figure 1. The items marked with an asterisk (*) are sometimes used as indicators of nutritional impact.

programmes is obviously smaller than the number of possible combinations of these elements in programmes. Thus, it is more effective to study the elements than the programmes. But to assure immediate programme relevance, a study of the elements should take place within a policy or programme framework..

Furthermore, the effects of factors other than those directly affected by a given policy or programme, including those falling into what is here called the environment, must be understood and quantified. In the case of a food price policy or a supplementary feeding programme, for example, it is important to know not only how nutrient intakes by the malnourished are affected, but also how the utilization of the additional food is affected by sanitary conditions and health factors, and how changes in sanitary conditions, health, and educational levels of parents may contribute to a better utilization of the food. While such factors may be assumed constant for the purpose of the evaluation of a single programme, such an assumption will not be valid in the case of using the project findings for the design of new policies and programmes under different circumstances.

A PROPOSED ANALYTICAL FRAMEWORK

The processes that determine the nutrition effects of programmes and policies are complex. This complexity, together with insufficient data and lack of appreciation for the utility of generalizing study findings beyond a particular programme, population group, time period, and environment is the most common reason why evaluation studies often avoid an analysis of the processes, thus leaving the black box partially or totally untouched. To change this situation, an appropriate analytical framework must simplify the complexity by identifying the most important factors, relationships, and data needs and demonstrate that these factors and relationships are not programme-specific and that empirical findings may be generalized across programmes and policies. In the context of previous jargon, the black box must be opened, but rather than emptying everything out – and thus overwhelming even the most ambitious researcher or evaluation officer – we must select the most important parts for study and clearly identify what is left inside.

A set of factors and relationships that might be used to make up such a simplified analytical framework is proposed in figure 2. The intent of the framework is not that *all* programme and policy assessments should estimate empirically every causal relationship shown in the figure. Rather, the purpose of the framework is to help identify the key factors and relationships for a particular programme and policy and the data needs for tracing the programme/policy effects through these relationships to the final impact on the specified nutrition indicator.

The framework shown in figure 2 contains three main factors through which food and nutrition programmes and policies may eventually influence nutrition: (a) the ability of households with malnourished members to acquire food, (b) household food acquisition behaviours, and (c) intra-household distribution of food. These three factors may be influenced by programmes and policies through changes in a number of other factors (fig. 2) and may, in turn, influence nutrition through changes in the acquisition of food by households and individuals and the utilization of food by these individuals.

Ideally, analyses would focus on the estimation of the co-efficients that explain the magnitude and strength of each of the causal relationships found in the processes of interest, thus linking quantitatively the various steps through which a given policy or programme affects nutritional status.

The most appropriate specification of the analytical model depends on a number of issues, including (a) the type of policy or programme and how it is expected to influence nutritional status, i.e., the first step in the process, (b) the population groups whose behaviour is most important in determining nutritional effects, and (c) which of many nutrition indicators will be used. Each of these issues is briefly discussed below.

Policy and Programme Types

Food and nutrition policies and programmes may influence nutritional status through their impact on any of the factors shown in the top row and the left column of figure 2. Food supply and rural development programmes and policies influence human nutrition primarily through changes in the ability of malnourished households to acquire food. This ability is influenced through changes in food availability on the farm, food prices, and rural incomes as well as the fluctuations in these factors.

While household food acquisition behaviour determines the extent to which ability results in actual household food procurement, these policies and programmes may also have a direct impact on behaviour through changes in income composition, intra-household income and budget control, and women's time allocation. The nutrition impact of consumer-oriented food price policies (e.g., food price subsidies), food-linked income transfers (e.g., food stamp programmes), and food transfer programmes also occurs primarily through changes in household ability to acquire food.

The impact of a particular programme depends on its nature, including its limitation to certain commodities, rations, and/or target groups. If programme rations are inframarginal with no purchase requirements, the effect is

expected to be determined by the real income embodied in the transfers. In other cases some substitution between programme commodities and other goods is expected to take place. If the intra-household control of incomes from these programmes is distributed differently from that of other incomes, and if the marginal propensity to spend on the particular foods varies among household members, a direct impact on household behaviour may occur. Food transfer programmes are frequently targeted to certain household members, e.g., malnourished children or pregnant women. Except for certain programme types, such targeting is likely to fail because of adjustments in food consumption by all members and/or adjustments in food acquisition from other sources. Such failure is usually referred to in the nutrition literature as "leakage." Whether, in fact, leakage of this nature should be considered a serious failure of the programme is, of course, open to debate. In spite of large leakages, most food supplementation programmes still attempt targeting on particular individuals by imposing various types of restrictions on the use of transferred food.

Nutrition education and awareness programmes influence human nutrition through household acquisition and allocation behaviour related to food, health, and sanitation. Perceived needs for food, nutrients, and health and sanitary services may change, as may child care and breast-feeding practices. Food fortification programmes may influence nutrition through the ability of the household to acquire deficient nutrients. Two opposing effects may occur: first, fortification may result in a higher content of particular nutrients in a given quantity of food, and second, it may result in a higher price per unit of food. Similar effects would be expected in programmes using formulated foods.

Population Groups and Their Behaviour

The nutrition impact of a particular programme or policy depends not only on the programme or policy design, but also on the behaviour of the various groups or individuals acting within the processes illustrated in figure 2. These "actors" may enhance or reduce the intended nutrition impact. In some cases they may purposely oppose programme objectives. At the time of programme design, ignoring the possibilities for conflict between programme goals and the goals of the various actors is likely to lead to disappointing programme results. Furthermore, as substantiated below, programme evaluation that assumes that programme goals are shared by all relevant actors is likely to add little to our understanding of why programmes perform as they do. The principal actors are:

- the consumer household,
- the individual household member,
- the food producer/supplier,
- national government agencies,
- local power structure.,
- the programme implementation body and the individuals within it,
- marketing agencies and individuals.

The importance of each of these actors varies among programme and policy types. The behaviour of households, programme implementation bodies, and the local power structure are of particular importance for all programmes and policies and are further discussed below.

Household Behaviour

In-depth understanding of household behaviour as it relates to acquisition and intra-household distribution of food is essential to successful programme and policy design. Household food acquisition and allocation behaviour determines the extent to which changes in household ability are reflected in food intakes by the malnourished.

Demand parameters such as commodity-specific price and income elasticities go a long way in explaining or predicting the relationships between changes in household food acquisition ability and the resulting change in household food consumption. Since the concern is for households with malnourished members, the parameters must be relevant for these households. In societies with a very skewed income distribution and considerable malnutrition, average estimates are not likely to represent the behaviour of households with malnourished people. Thus, the relevant parameters must be estimated by income group. Reliable estimates of such parameters are of recent origin and their use in food policy design has been very limited indeed. During the last few years, however, there has been a considerable increase in research efforts to estimate demand parameters by income stratum.

Data scarcity is the principal barrier to direct estimation of such disaggregated parameters. Cross-sectional data sets may provide an acceptable basis for the estimation of income parameters and, thus, the income effects of price changes. However, they may not serve for reliable estimation of price parameters or the substitution effect of price changes unless they refer to various points in time or various geographical locations and therefore provide for sufficient and relevant price variation. Periodic and directly comparable household surveys over a number of years would alleviate the data constraints.

In addition to reliable estimates of demand parameters related to household incomes and food prices, the ability to predict with a high degree of precision household food acquisition and allocation behaviour and the household's reaction to food policies and programmes depends on a better understanding of other behavioural factors. Changes in the demand for women's time, intra-household budget control, income composition, the range of foods and

services competing for the household budget, the degree to which incomes are considered transitory or permanent, and other changes brought about by public policies and programmes all influence behaviour. Also, structural changes such as rural to urban migration or transformation of subsistence farming areas into an exchange economy may have a direct impact on household food acquisition and allocation behaviour and thus either make existing income and price parameters invalid or incapable of explaining household food acquisition behaviour.

Past research on the impact of these factors on food acquisition and allocation is relatively limited. It appears plausible, on the basis of available evidence, that a number of unexplained behavioural issues reflect the influence of factors such as those mentioned above. However, additional empirical research is needed to provide information in this area that will be useful for policy and programme design.

PROGRAMME IMPLEMENTATION AND THE LOCAL POWER STRUCTURE*

The process by which national government programmes and policies are implemented or translated into action at the local level is a key ingredient in their success or failure. Yet little is known about the determinants of a "successful" implementation process. To date, relatively few efforts have been made to analyse how the black box at the local level influences the outcome of specific national programmes. Until recently it was erroneously assumed that the black box at the local level was largely passive in nature, i.e., content to replicate policy decisions made at higher levels. However, recent studies have suggested that in many cases what the national government orders or commands is not necessarily what the local level actually does. It may indeed be true that local-level forces lack the power and resources to determine national policy. Yet, since national decisions at the local level must be implemented by or through local forces, these forces possess an important power to constrain or deflect the character of national programmes. Local-level forces act as a critical filter or prism capable of screening, altering, or even impeding the implementation of national health and nutrition programmes.

One of the central problems associated with policy implementation at the local level is that of leakage. One type of leakage occurs when nutritional programmes designed for lower income groups fail to reach their targeted groups. Leakage is produced by a variety of factors, such as weaknesses or inadequacies in the delivery mechanism at the local level. Yet the net effect of this type of leakage is always the same, namely a significant difference between the promise of national government programmes and the reality of local-level delivery.

In many rural areas the problem of leakage is directly related to the dynamics of local power structure. The skewed distribution of land and economic resources in these areas means that many poor peasants are economically and socially dependent upon the patronage services provided by rich peasants. These services include the provision of agricultural employment, emergency loans, and intercessionary services with officials. On the one hand, such patronage services are quite important because they ensure the daily survival of large numbers of poor peasants. Yet the importance of these patron-client ties serves to complicate greatly the process of local-level project implementation. By virtue of their control over human and material resources at the local level, rich peasants *expect* to dominate all local delivery mechanisms established by the national government officials whose power is typically not grounded in the economic structure of the local community.

In most cases, local government administrators simply lack the resources and will-power needed to assure that programme benefits reach the target groups. At the same time, poor peasants, fearful of alienating the rich peasants on whom they depend, are most reluctant to press for access to national health and nutrition programmes. From the standpoint of the typical poor peasant, national programmes and policies that come and go are not to be trusted or pursued at the expense of antagonizing the local elite. As a consequence, the benefits associated with national programmes and policies are often captured by rich peasants and their favoured clients.

NUTRITION INDICATORS

The choice of indicator of nutrition impact varies among studies and is a function of (a) the particular programme or policy being assessed, (b) data availability, (c) cost and time considerations, (d) the disciplinary orientation of the researcher or evaluation officer, (e) implied or assumed relationships among process components, and probably a number of other factors.

The choice of indicator is reflected in the degree of penetration of a particular study into the process, as illustrated in figure 2. In general, data requirements and magnitude of the study increase with greater penetration. The least penetration is illustrated by the use of programme and policy impact on total food availability as an indicator. Although grossly ineffective and often misleading, this indicator is frequently used in food production programmes and policies. A slightly greater degree of penetration is

* Richard Adams, of the International Food Policy Research Institute, contributed to this section.

provided by the impact on the ability of households with malnourished members to acquire food. While a greater improvement over total food availability, this frequently used indicator is still unlikely to be closely associated with the ultimate criteria because it ignores factors and relationships downstream in the framework, e.g., the effects of household food acquisition behaviour (and possible programme input on this behaviour), food distribution among well and malnourished members, and health and sanitation issues.

Use of actual household food acquisition as a nutrition indicator is a further improvement because it takes into account household behaviour. This indicator is widely used in assessments of food policies and as an indicator of existing malnutrition and its distribution in a given population. Use of estimates of intakes by malnourished individuals provides yet another improvement over household food acquisition data. However, although sometimes used to evaluate food supplementation programmes, particularly those targeted to particular household members, the use of such estimates is not nearly as frequent as estimates of total household food acquistion because of difficulty in obtaining reliable data.

Anthropometric measurement of growth and development is a very commonly used indicator of the impact of nutrition intervention programmes on the nutritional status of children. This is a relatively convenient approach that, if currently applied, yields reliable estimates of the extent to which the physical development of a particular child deviates from the norm. However, except for severely malnourished children, it may be difficult to separate the effect of nutritional improvements from other effects such as genetic variation. As opposed to the various food-related indicators mentioned above, anthropometric indicators reflect both food- and health-related factors.

The activity level of an individual is another possible indicator of nutritional effect. This indicator is based on the premise that individuals suffering from insufficient energy intakes tend to reduce energy usage by lowering the activity level. Such lower levels may affect the development of children and reduce labour supply and productivity. Except for a few studies of the impact of food supplementation on labour productivity, the use of this indicator has been rare. The limited usage is due, at least in part, to the severe difficulties of measuring activity levels with sufficient accuracy.

The rate of mortality and morbidity have also been used as indicators of nutritional impact. They are probably good indicators of the impact on severe malnutrition provided that (a) programme impact can be separated from that of other factors, (b) the sample from which data are drawn is sufficiently large, and/or (c) these rates were relatively higher before the programme began. Finally, clinical and biochemical methods are sometimes used as indicators. While the former are used mainly for severely malnourished individuals, the latter are sometimes used in relation to extensive household surveys.

DETERMINANTS OF FAMILY AND PRESCHOOLER FOOD CONSUMPTION

Eileen Kennedy
International Food Policy Research Institute, Washington, D.C., USA

INTRODUCTION

The assumption in many previous nutrition interventions has been that increases in food expenditures improve family caloric intake and ultimately increase child energy consumption and improve a child's nutritional status. An intervention that has a positive, significant effect on any one of these linkages is presumed ultimately to improve child health and nutritional status. For example, food stamp programmes assume that by increasing a family's food purchasing power, the family diet will improve and a part of this nutritional benefit will be passed on to the child. Similarly, a supplementary feeding scheme is based on the assumption that provision of food – either to a specific individual or to a family – will ultimately lead to an improvement in the recipient's nutritional status.

Existing data sets from four countries were used for the analyses in this paper. The Thai data were collected as part of a nation-wide survey (1). The Mexican data refer only to Mexico City and were collected in May 1978 as part of an evaluation of the CONASUPO milk subsidy programme (2). Similarly, the Sudan data were collected only for an urban population (Khartoum) as part of an evaluation of the government's wheat subsidy programme (3). The Malaysia data were generated from an evaluation of the World Bank irrigation project in the Muda Region (4).

Specifically, this paper is concerned with three questions:
- What is the effect of increases in income on the caloric intake of a population?
- What are the determinants of household caloric intake?
- What effect does family food intake have on a preschooler's caloric intake?

Data from Thailand, Malaysia, and the Sudan were used to answer the first question. Data from Mexico City were used to provide answers to the second and third questions.

EFFECT OF INCOME ON CALORIC INTAKE

The first analyses were directed toward the issue of the effect of income on the caloric intake of a population. Data from Thailand were used to examine the impact of increasing income on caloric intake of both urban and rural groups. Malaysian expenditure data for a rural sample and Sudan income data for an urban population were also analysed. As can be seen from tables 1 to 3, as income increases the mean caloric intake within a population also increases. This is true for both rural and urban areas. However, in Thailand, at each level of income, urban groups show consistently lower caloric intakes per capita than do rural groups in that country (table 1). This could reflect one of two situations. First, the data could be interpreted to mean that energy intakes as a proportion of requirements at any given level of income for urban groups are lower than for their rural counterparts. However, an equally plausible explanation is that activity levels are lower in urban areas and thus urban populations have adjusted their caloric intake downward to reflect their decreased energy needs. Without data on actual activity patterns, it is difficult to substantiate this latter hypothesis.

Because family income is often difficult to measure precisely in large-scale surveys, we used total monthly expenditures as a proxy for income to determine if the pattern of caloric intake per capita was different from that shown in tables 1 to 3. For Thailand (table 4) and the Sudan (table 5), as total expenditures increase there is a concurrent increase in caloric intake. Here again for Thailand, rural households at each level of expenditure have consistently higher per capita caloric intakes than do the urban groups.

TABLE 1. Mean Caloric Intake per Capita by Decile of Monthly Income – Thailand, Urban and Rural

Decile	Urban		Rural	
	kcal	N	kcal	N
1	936	39	1,446	1,083
2	1,105	111	1,664	1,012
3	1,261	126	1,769	993
4	1,324	199	1,847	927
5	1,367	282	1,871	839
6	1,380	383	1,949	740
7	1,448	440	2,000	684
8	1,610	538	2,112	584
9	1,711	611	2,194	512
10	2,010	705	2,476	417

TABLE 2. Mean Caloric Intake per Capita by Decile of Monthly Income – Khartoum, Sudan

Food Group	Decile*									
	1 (484)	2 (487)	3 (472)	4 (498)	5 (488)	6 (485)	7 (489)	8 (488)	9 (445)	10 (518)
Bread	539	602	622	717	751	813	926	1,015	1,229	1,523
Sorghum	471	497	579	549	627	641	694	757	946	875
Wheat	131	127	140	140	165	166	176	194	195	210
Other cereals**	60	64	57	56	56	54	49	70	70	118
Cereals***	481	521	600	537	602	587	581	576	648	511
Mutton	128	99	123	131	141	131	183	207	286	370
Meats	112	117	136	149	155	169	182	198	238	252
Fresh vegetables	122	126	144	154	180	185	211	224	286	371
Milk	150	161	165	201	224	236	245	292	350	441
Oils	318	333	368	420	474	474	515	581	670	833
Sugar	235	249	267	298	328	348	365	396	467	575
Other foods	372	396	437	472	523	535	583	612	737	863
Total kcal	2,276	2,432	2,684	2,902	3,215	3,285	3,580	3,759	4,529	5,300

* Figures in parentheses N.
** Millet, corn, rice, and macaroni.
*** Weighted average (families consuming one cereal may not be consuming others).

TABLE 3. Calories Purchased per Capita by Decile of Expenditure Group* – Malaysia

Decile	$\bar{X}$ kcal Intake	N
1	2,262	88
2	2,185	83
3	2,103	84
4	2,150	84
5	2,359	84
6	2,190	84
7	2,512	84
8	2,605	84
9	2,618	84
10	2,742	80

* Total expenditures used as a proxy for income.

TABLE 4. Mean Caloric Intake per Capita by Decile of Monthly Total Expenditure – Thailand, Urban and Rural

Decile	Urban		Rural	
	kcal	N	kcal	N
1	1,490	50	1,531	1,072
2	1,334	91	1,731	1,031
3	1,433	140	1,820	985
4	1,357	212	1,858	907
5	1,425	282	1,853	843
6	1,421	374	1,955	759
7	1,494	454	1,952	658
8	1,598	528	2,001	594
9	1,654	609	2,059	515
10	1,914	694	2,278	427

TABLE 5. Mean Caloric Intake per Capita by Decile of Monthly Total Expenditures – the Sudan

Food Group	Decile									
	1	2	3	4	5	6	7	8	9	10
Bread	376	502	611	681	776	830	941	1,113	1,264	1,654
Sorghum	416	500	523	563	583	649	672	851	992	964
Wheat	93	117	134	156	164	160	159	182	255	225
Other cereals*	33	57	46	59	55	50	58	66	82	133
Cereals**	431	511	532	565	554	567	563	649	692	542
Mutton	63	80	107	112	146	170	179	209	281	393
Meats	89	118	131	144	156	167	171	204	246	281
Fresh vegetables	89	113	131	146	166	187	212	244	299	407
Milk	119	154	174	189	211	240	246	291	352	489
Oils	236	314	355	388	458	486	519	600	736	884
Sugar	184	239	264	291	320	349	358	422	503	604
Other foods	282	367	415	457	504	544	581	682	787	937
Total Calories	1,734	2,252	2,543	2,801	3,093	3,344	3,565	4,190	4,828	5,746

N = 489 in each decile.
* Millet, corn, rice, and macaroni.
** Weighted average (families consuming one cereal may not be consuming others).

TABLE 6. Mean Caloric Intake per Capita by Decile of Monthly Total Expenditures – Urban Thailand

Food Group	Decile									
	1	2	3	4	5	6	7	8	9	10
Non-glutinous rice	970	811	914	872	906	836	894	934	973	1,136
Glutinous rice	263	268	260	203	192	229	191	186	172	120
Cassava flour	1	1	0	0	1	0	0	0	1	1
Noodles	3	3	5	5	6	7	8	10	12	13
Bread	0	1	1	3	2	2	1	2	4	8
Bean curd	0	0	0	0	1	0	0	1	1	1
Pork, lean	46	46	45	51	59	68	78	91	100	130
Pork, fat	27	15	21	18	30	26	34	35	40	45
Spare-ribs	3	4	4	6	8	8	10	10	13	16
Beef	18	12	11	13	13	16	16	14	20	20
Chicken	4	6	3	5	6	7	8	12	13	16
Duck	0	0	0	0	0	0	0	0	0	0
Freshwater fish	12	11	12	12	12	12	14	13	16	19
Marine fish	9	9	7	7	9	8	8	8	10	12
Prawns	0	0	0	0	0	0	1	1	1	1
Fermented fish	2	4	2	2	2	3	2	2	3	2
Milk	0	0	0	0	0	0	0	0	1	2
Hen's eggs	2	3	2	2	4	5	7	6	7	16
Duck's eggs	22	18	22	27	28	33	31	39	40	48
Salted eggs	0	0	0	0	0	0	1	1	1	1

Lard oil	50	52	63	59	69	71	77	87	92	119
Coconut oil	0	0	1	0	1	0	1	1	0	0
Vegetable oil	0	0	0	0	0	0	0	0	0	0
Bananas	2	5	4	6	4	5	7	7	9	11
Pineapple	0	0	0	0	0	0	1	1	1	1
Kale	1	2	2	2	2	3	3	4	4	5
Chillies	3	2	3	3	3	2	3	4	4	5
Ground-nuts	1	1	1	0	1	2	2	3	2	6
White sugar	34	43	36	40	39	37	43	49	57	70
Curry plate	6	9	3	4	7	12	10	15	11	30
Noodle plate	8	8	12	17	21	28	45	33	46	72

TABLE 7. Mean Caloric Intake per Capita by Decile of Monthly Total Expenditures – Rural Thailand

Food Group	Decile									
	1	2	3	4	5	6	7	8	9	10
Non-glutinous rice	664	710	810	937	991	1,029	1,147	1,242	1,258	1,332
Glutinous rice	746	869	815	689	579	596	446	311	300	324
Cassava flour	0	0	1	1	0	2	1	2	2	1
Noodles	0	0	0	0	3	2	4	3	5	8
Bread	0	0	0	0	0	1	1	1	1	2
Bean curd	0	0	0	0	0	0	0	0	0	0
Pork, lean	21	20	27	36	42	56	55	74	78	120
Pork, fat	8	9	15	17	26	30	32	48	54	54
Spare-ribs	0	0	1	1	2	3	3	4	5	9
Beef	9	12	14	14	16	18	20	24	28	32
Chicken	3	4	4	4	4	7	6	8	9	13
Duck	0	0	0	0	0	0	1	1	0	0
Freshwater fish	14	18	20	21	22	25	24	27	30	32
Marine fish	3	3	4	5	5	6	7	7	9	8
Prawns	0	0	0	0	0	0	0	0	0	0
Fermented fish	13	16	17	13	14	14	11	10	10	9
Milk	0	0	0	0	0	0	0	0	0	0
Hen's eggs	1	1	1	1	2	2	2	4	5	10
Duck's eggs	8	8	12	17	20	23	26	35	40	54
Salted eggs	0	0	0	0	0	0	0	0	0	1
Lard oil	19	27	37	45	56	63	65	86	98	121
Coconut oil	0	0	0	0	0	0	0	1	0	1
Vegetable oil	0	0	0	0	0	0	0	0	0	0
Bananas	2	2	4	4	5	6	6	7	8	10
Pineapple	0	0	0	0	0	0	1	1	1	1
Kale	0	0	0	1	1	1	2	2	2	3
Chillies	3	3	4	4	4	5	4	5	5	6
Ground-nuts	1	1	1	3	4	5	6	7	7	9
White sugar	23	27	31	45	49	51	69	70	76	79
Curry plate	0	0	0	1	1	2	3	5	4	8
Noodle plate	1	2	3	6	7	9	12	19	25	32

TABLE 8. Caloric Intake per Capita in Each Major Food Group by Decile of Total Expenditures -- Muda Region, Malaysia

Food Group	Decile									
	1	2	3	4	5	6	7	8	9	10
Polished and glutinous rice	1,257	1,259	1,196	1,215	1,332	1,251	1,236	1,452	1,454	1,474
Maize	2	2	2	2	3	3	3	4	5	5
Wheat flour	83	77	82	76	91	78	94	118	89	82
Potatoes and other roots	11	12	13	13	19	14	18	16	17	18
Fresh vegetables	13	13	12	13	14	13	14	16	16	23
Fresh local fruit	19	22	23	30	33	32	41	44	58	63
Meats	7	10	9	11	13	14	13	16	26	52
Milk	3	3	4	6	6	6	5	6	7	12
Oils	159	144	147	147	159	136	166	180	163	173
Sugar	283	246	224	236	262	237	265	274	273	272
Fresh fish	96	93	98	92	105	98	110	108	113	134

TABLE 9. Cross-classification of Households on the Basis of Income Level and Caloric Intake -- Thailand, Urban and Rural

Caloric Intake per Adult	Urban			Rural		
	Income level*		Total households	Income level*		Total households
	< B 291.14	> B 291.14		< B 205.15	> B 205.15	
< 2,500 kcal	313	1,221	1,534	1,591	1,841	3,432
> 2,500 kcal	186	1,226	1,412	1,085	2,618	3,703
Totals	499	2,447	2,946	2,676	4,599	7,135

* The division of income levels is based on the urban poverty line of 291.14 baht and the rural poverty line of 205.15 baht.

Source. Trairatvorakul (5).

In general, for these three countries -- Thailand, Malaysia, and the Sudan -- caloric intake increases as one moves from the lowest to the highest income and/or expenditure group.

We were also interested in the effect of income on the amounts and types of food consumed. Tables 6 to 8 show the relative contribution of major food groups to caloric intake, broken down by expenditure group in Thailand and Malaysia. The results are similar for the two countries. The relative contribution of calories from the various food groups is fairly stable across each of the ten income groups. In Thailand there is some shifting of calories between glutinous and non-glutinous rice. What these data suggest is that in these countries, as income increases, people are consuming more of the same diet rather than changing to a different mix of foods.

If the data were analysed simply this way, the results would suggest that low income is a good indicator of households that are likely to have inadequate caloric intakes. However, a cross-classification of households using income levels and caloric intake (table 9) shows that some high-income households, both urban and rural, have inadequate caloric intakes (5).

These data suggest that the income criterion does not identify all households with an inadequate food intake. Some high-income families appear to consume too few calories. Conversely, not all poverty level households have insufficient caloric intakes; in rural Thailand, approximately 40 per cent of all the low-income families consume a nutritionally adequate diet. But why? The following section attempts to identify the key determinants of family food consumption.

DETERMINANTS OF FAMILY AND PRESCHOOLER CALORIC INTAKE

From the previous analyses we have seen that caloric intake increases as income increases; the magnitude of this change may differ by urban/rural location and may also differ by country. While this income/caloric relationship is of interest, what is of more interest to many policy-makers is the effect of increased family income on the dietary status of the household and of individuals within the household. We were interested in the effect of an increase in income on the family's caloric intake as well as the energy intake of preschoolers within the household.

In order to explore the income/family consumption/preschooler nutritional status linkages, two data sets were used — from Malaysia and from Mexico. The results of the analyses for each country will be presented first, followed by a discussion of the results.

Anthropometric measurements — weight, age, and length or height — were used to assess preschooler nutritional status in each of the data sets. In order to be able to aggregate each of the anthropometric measurements across age groups from birth to five years, a Z-score for weight for age and height for age was computed for each observation. The 1976 National Center for Health Statistics Growth Standards (6) were used as the standards for weight and height. The mean Z-scores for weight/age and height age were -.3664 and -.4336 for Malaysia and -.1474 and -.6178 for Mexico. The more negative the Z score, the more it deviates from the median standard for that age. Thus, the more negative a particular Z-score is, the more malnourished, on average, is the group of children. What is apparent from these aggregate scores is that the problem in these areas is one of chronic malnutrition as evidenced by the low height/age scores across the two countries.

Initially we were interested in the effect of family level variables, in particular, household incomes, on the nutritional status of the child. Tables 10 and 11 show that for both Malaysia and Mexico household income* is not significantly associated with any of the Z-scrores. For both countries, family level factors explain little of the variance in preschooler nutritional status — either weight or height. The R^2 for each of these equations is amazingly low, and therefore the equations have no utility in predicting preschooler nutritional status.

An additional analysis exploring the income/family caloric intake relationship was done for Mexico. Family energy intake was measured using a 24-hour recall of total household food consumption, including food eaten away from home. Family caloric intake is positively and significantly affected by increments in household income (table 12). Interestingly, participation in the milk subsidy programme in Mexico City also significantly increased the number of calories consumed within the family; programme participation was associated with an approximately 1,700 calorie increase in family energy intake. The family benefited as a result of participation in the milk subsidy programme.

* For Malaysia, total expenditures are used as a proxy for household income

TABLE 10 Z-Score Weight and Height Regressed on Family-Level Variables—Malaysia

	Weight B Coefficient	Height B Coefficient
Total yearly family expenditures*	−.13-05 (1.1)	.57-06 (.296)
Years in project	−.94-02 (.103)	.17 (2.12)**
Group (participation/non-participation)	.32 (.672)	−.57 (1.33)
Intercept	.31	−.42
R^2	.004	.01
F-statistics	.52	1.7

N = 424
t-statistics in parentheses
* Proxy for income
** Significant at 5% level

TABLE 11. Z-Score Weight and Height Regressed on Family-Level Variables – Mexico

	Weight B Co-efficient	Height B Co-efficient
Weekly family income	.39-04 (.629)	.47-04 (.813)
Family size	−.16-01 (.675)	.31-02 (.138)
Group	−.16 (1.28)	−.12 (1.0)
Intercept	−.52-02	−.63
R^2	.008	.005
F-statistics	1.07	.64

N = 374
t statistics in parentheses

TABLE 12. Regression for Daily Family Caloric Intake – Mexico

	Co-efficient
Weekly family income	.399 (2.04)*
Family water supply	974 (.99)
Sanitation	427 (1.08)
Type floor	2910 (1.2)
Family size	309 (5.75)
Group (participation/non-participation)	1708 (2.85)**
Intercept	4304
R^2	.12
F-statistic	8.618

N = 384
t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Having determined from the Mexican data that increased family income improved family caloric intake, we were interested in the effect of income on the preschoolers' calorie consumption. Table 13 shows the mean caloric intake for preschoolers participating and not participating in the Mexican milk subsidy programme; both groups have average energy intakes below the recommended level. Milk contributed significantly more to caloric and protein intake of the subsidized children than of the children from non-subsidized households.

TABLE 13. Mean Caloric Intakes for Programme and Non-programme Children – Mexico

	$\bar{X}$ Caloric Adequacy (%)	Contribution of Milk to Caloric Intake (%)	Contribution of Milk to Protein Intake (%)
Milk-programme preschoolers	86.1	24.0*	35.9
Non-milk-programme preschoolers	92.2	19.3	25.5

* p = .01

TABLE 14. Regression of Child Caloric Intake on Family-Level Variables – Mexico

Family Income		Caloric Intake	
Variable	Co-efficient	Variable	Co-efficient
Age (in months)	2.67 (1.29)	Age	3.05 (1.55)
Weekly family income	–.26 - 01 (.63)	Family size	–66.7 (3.18)*
Family size	15.4 (.92)	Number of children under six years	–35.0 (.817)
Sex (0 = male, 1 = female)	–26.0 (.36)	Sex (0 = male, 1 = female)	–42.0 (.61)
Number of children under six years	–96 (2.11)*	Family caloric intake	.42 - 01 (5.55)*
Group (participation/ non-participation)	34 (.43)	Group (participation/	62 (.82)
R^2	.03	R^2	.11
F-statistic	1.87	F-statistic	7.11

t-statistics in parentheses
* Significant at 1% level

However, table 14 shows that the preschoolers' caloric intake is not significantly associated with weekly family income. In addition, unlike what we observed for family energy intake, the child's caloric consumption was not significantly increased by participation in the milk subsidy programme. So, although the programme children consumed more milk, their caloric intake was not significantly increased as a result of the milk subsidy scheme.

The data from table 14 also indicate that family caloric intake has a positive, significant effect on the preschoolers' energy intake.

DISCUSSION AND COMMENT

The results given in the section on the effect of income on caloric intake indicate that, in general, as income increases, caloric consumption also increases. However, the Thailand data (table 9) also indicate that there are high-income households who fail to achieve caloric adequacy. The reasons for this are unclear. Clearly, income is only one determinant of family caloric intake.

The Mexican results show that as income increases, the caloric intake of the family is improved. All else being equal, higher-income families are more likely to have an adequate dietary status than low-income households. However, in Mexico, increased income is associated with an increased energy intake in the child only to the extent that the income is used to purchase additional family calories. There was no direct effect of income on preschool nutritional status as judged by weight and height for age for either Mexico or Malaysia. This finding is consistent with other recent studies. For example, a study (7) in Nicaragua found that income was not a significant factor in explaining child anthropometric status.

We know that aggregate supply of food or nutrients within a country is not a sensitive measure of household food consumption. It now appears from these data that caloric availability within the household may not be a precise indicator of a child's nutritional status. It is only to the degree that children receive a portion of the incremental calories within the family that preschooler energy intake will improve.

The Mexico milk subsidy did increase the caloric intake of the household by 1,708 calories, or the equivalent of 248 calories per individual household member. Why did this 248 calories not make a significant net addition to the diet of the preschool child? There are two plausible explanations. First, the malnutrition problem in the Mexico study sample is predominantly mild/moderate chronic malnutrition. It is not the type of wasting and stunting that would be visually diagnosed by the family. It may very likely be that there is not the perception on the part of household members that the preschool child needs more calories. If all children in the community are stunted, the programme child looks just like every other preschooler.

Second, there may be a lack of demand for food on the part of the child. If the child appears satiated – whether because he is satisfied or because of a general anorexia – there would be no reason for the family to assume the child needs or wants more food. This last point has been given little attention in earlier studies and needs to be explored in future work.

What the present analyses suggest is that higher income is not necessarily sufficient to ensure adequate caloric intake within the household or by individual family members. In addition, family-oriented nutrition intervention may not be the most effective means of achieving nutritional goals for the specific household member. Future work on this latter point is needed.

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EFFECTS OF FOOD POLICY ON INTRA-HOUSEHOLD FOOD DISTRIBUTION IN BANGLADESH

Najma Rizvi
International Centre for Diarrhoeal Disease Research, Dhaka, Bangladesh

INTRODUCTION

Bangladesh, a country of more than 90 million people living in an area of about 55,000 square miles, is a food-deficit country. Therefore, achieving self-sufficiency in food has always been a national concern. The need for having a food policy has been recognized for a long time, but it was not until the Second Five Year Plan that a food policy known as the Food Security Plan was developed by the Ministry of Food in August 1980. The main goal of this food security plan is to ensure people the minimum desirable level of consumption.

The present paper will discuss the major characteristics of Bangladesh's food policy and show its effects on household food availability and the food distribution pattern. The approach of both economists and anthropologists and their different perspectives in studying food-related behaviour will be discussed in reference to food policy formulation, and the need for having a broader perspective in food policy formulation will be emphasized.

CHARACTERISTIC FEATURES OF THE FOOD SECURITY PLAN OF BANGLADESH

The Food Security Plan was formulated on the basis of per[illegible] food need and the gap between production and [illegible]imated to be 1.5 million tons of rice and wheat. The major thrust of the food policy rests on increasing cereal production from 13.4 million tons in 1979/80 to 20 million tons in 1984/85. This is to be achieved by expanding the high-yielding variety (HYV) rice acreage from 3.08 million to 7.9 million acres and wheat acreage from 0.99 million to 2.50 million acres during this same period. Since increasing HYV rice and wheat acreage/production will require greater availability of chemical fertilizers and irrigation facilities, the Government has made attempts to ensure adequate and prompt supply of these agricultural inputs at competitive prices.

In addition to stimulating increased cereal production the Food Security Plan involves procurement of food at a price that gives incentive to farmers and an open market sale of rice (also wheat) during lean periods to alleviate market pressure. The resale of procured grain in the open market is believed to bring down the price level, making the grain easily available to the great majority of landless customers. Along with the open market sale of procured grain, the Government plans to reduce its subsidy to the statutory ration system operating in the city so that it becomes less attractive to the well-to-do population who have been the major recipients of this rationing. The withdrawal of rice from statutory rationing will increase government stock for open market sale and make food (mainly wheat) available for a public distribution system aimed at the welfare of the poorer class.

Other strategies used to help feed the poor include (a) modified rationing, (b) distribution of relief foods for the disadvantaged, and (c) food for work. Modified rationing is available to rural households only. The existing tax classification is used as the criterion for selecting households. The rural households belonging to groups A and B, who pay no tax or pay a yearly union tax of up to 3 takas (20 takas = US$1), are eligible to draw rice, sugar, and oil, whereas groups C and D, paying 3 to 8 takas or more, can buy only sugar and oil from the ration. The price of rice and wheat is approximately 6.50 takas per seer (1 kilogram), and wheat flour, including milling costs, comes to about 4.35 takas per seer. Wheat is more frequently available than rice.

While foods distributed through modified ration have to be purchased, relief foods are free, mainly to households headed by women and widows who have little or no other financial support.

Food for work, another arm of the public food distribution system, which receives food under Title III (PL 480), pays food as wages for work related to development projects such as building roads, dams, and other public works. A worker generally receives 15 seers of wheat for a week's work, i.e., 40 hours of heavy manual labour. Like other wage work, food for work is temporary and therefore does not ensure a continuous supply of wheat.

To summarize, the Food Security Plan operates under the

TABLE 1. Rice, Wheat, and Pulse Acreage (in thousands of acres) and Production (in thousands of tons) in Bangladesh, 1971-1981

	Rice		Wheat	Pulses	
	Acreage	Production	Production*	Acreage	Production
1971/72	22,975	9,775	–	888	281
1972/73	23,795	9,930	–	777	222
1973/74	24,410	11,721	–	704	209
1974/75	24,196	11,108	–	765	223
1975/76	23,974	10,700	–	754	220
1976/77	25,525	12,561	93	823	230
1977/78	24,420	11,567	310	835	238
1978/79	24,779	12,763	437	838	226
1979/80	25,105	12,539	729	819	214
1980/81	25,474	13,662	1,350	804	208

* No data on acreage available

Sources: *Statistical Yearbook of Bangladesh*, 1981; Administrative records of the Ministry of Food and Monthly Statistical Bulletin

TABLE 2. Per Capita Food Intake by Source, 1962-1964 and 1975-1976

Source	1962-1964		1975-1976		Change, 1975-1976 (%)
	g per person per day	% of total intake	g per person per day	% of total intake	
Cereals	545.8	62	523.0	65	– 4.3
Animal protein	56.5	6	44.0	–5	–22.1
Vegetables and pulses	283.7	32	240.3	30	–15.3

TABLE 3. Per Capita Nutrient Intake in Bangladesh, 1962-1964 and 1975-1976

	1962-1964	1975-1976
Calories (kcal)	2,301	2,094
Protein (g)	57.9	58.5
Fat (g)	15.8	12.2
Vitamin A (IU)	1,870	730

assumption that by increasing food production and price support policy and public food distribution it can meet the food needs of its people. Given such a policy, it is important to see what effect it has on household food availability and on the distribution system.

HOUSEHOLD FOOD AVAILABILITY

Food available to a household is dependent on what the household grows, its purchasing power, and food preferences. The great majority of Bangladesh villagers are landless (more than 51 per cent, and in the study area more than 60 per cent, neither have nor own land to grow their major staple) and therefore suffer from an inadequate food supply in terms of both quantity and quality. Although in recent years there has been an increase in cereal production (table 1), this increase has not necessarily been translated into feeding those who suffer from chronic food deficiency. This situation is not unique to Bangladesh. Fleuret and Fleuret (1), Linowitz et al. (2), and Teller and co-workers (3) report that much of the world population's food and nutritional status remains far from satisfactory. According to the Nutritional Survey of 1975–1976, 60 per cent of rural households were deficient in calories and 30 per cent were deficient in protein. Tables 2 and 3 compare per capita food and nutrient intakes for 1962–1964 and 1975–1976 in Bangladesh. The Nutrition Survey of 1981–1982 (yet to be published) estimates a 10 per cent decrease in per capita food intake since 1976.

INTRA-HOUSEHOLD FOOD DISTRIBUTION

Little is known about the distribution of food within the family. The presence of inequitable food distribution in developing countries has been pointed out by a few authors (4,5). In a review article published in the *FAO Newsletter* of 1972, den Hartog gave an overview of inequality in food distribution. In discussing this topic, some authors have cited sex bias as an important factor in the aetiology of malnutrition among women and children. While anthropologists have mainly been concerned with studying food preferences and restrictions, nutritionists and occasionally anthropologists have reported preferential treatment of adult males in intra-household food distribution.

The Food Security Plan of Bangladesh has not taken into account the inequality present in the community and at the household level between different age and sex groups. The presence of a vulnerable group is recognized, but such a definition does not include women and children as especially disadvantaged groups who suffer from serious calorie and other nutrient deficiencies. Before discussing the impact of food policy on intra-household food distribution, it would be useful to examine the factors affecting food intake at the intra household level.

FACTORS AFFECTING INTRA-HOUSEHOLD FOOD DISTRIBUTION

The type and quantity of food available to a household with no major food base depends on income and budget allocation. An in-depth, careful examination of the income and food purchase pattern in a group of 25 rural households has revealed that a low-income rural household in Bangladesh spends over 90 per cent of its income on food only, and when the price of fuel is included, the household runs on a deficit budget (6). So, the accusation often made that poor households do not know how to allocate income seems unfounded. The purchase of rice and other alternative cereals constitutes the major expenditure in poor households. The lack of employment opportunities, the low rate of wages in bonded labour, and the limited supply of food grain received in food for work programmes reduce total food availability and naturally affect food distribution and consumption patterns of household members.

Contrary to present belief that the size of the household affects the food intake of the individual, we found that size per se does not seem to affect food allocation. A small household is not necessarily supplied with adequate food, nor does a large household necessarily have an inadequate supply. Household size becomes important when it is viewed in relation to income.

DIFFERENT STATUS OF MALES AND FEMALES

Intra-household food distribution cannot be understood without referring to the different status of males and females in the context of cultural norms in Bangladesh. The distinction between male and female is articulated through a set of behaviours that include preferential treatment of the husband and other adult males and sacrifice by the wife/mother in the distribution of food to members of the household. For young children zero to five years of age, being male or female does not seem to affect food allocation. Because of the belief that early introduction of solid food (rice and other adult foods) might cause gastrointestinal problems and a "pot belly," children below the age of two years do not consume any appreciable amount of family food. Mothers do not make any distinction between male and female children during breast-feeding or serving of family food. However, once a young girl is expected to learn the social norms dictating her inferior position, the mother tries to instill in her the value of the sacrifice necessary for her to become an ideal wife and mother.

From the time of puberty, a girl is expected to be a near-perfect approximation of an idealized wife and mother. It is from this time that a female child becomes least demanding and consequently receives a smaller allocation of food. It needs to be emphasized here that, while this custom of considering women as the epitome of sacrifice is emphasized in all socio-economic groups, adherence is strongest in the low-income group where a limited supply of food leads to greater inequality.

The intra-household food distribution pattern cannot be understood in terms of economic or cultural factors alone. The income or the purchasing power that determines total food availability and variety or lack of it cannot be ignored in any discussion of food allocation at the household level. Similarly, a knowledge of cultural factors relating to food beliefs, food preferences, and cultural norms and values is also necessary.

EVALUATION OF FOOD POLICY IN MEETING FOOD AND NUTRITION NEEDS OF VULNERABLE GROUPS

The Food Security Plan was designed to meet the food needs of people at a minimum desirable level of consumption. Since per capita figures have been used in estimating food requirements, the inequality present in the distribution of food at the inter- and intra-household level has received very little attention. The economists who planned the Food Security Plan are aware of the inequality in distribution of land and income, but in formulating food

policy this was not given due consideration. Rather, they operated under the assumption that increasing cereal production and encouraging the open market sale of cereal grain, coupled with a public food distribution system aimed at meeting the needs of the poorer classes, would be able to alleviate the problems of the poor and ensure a minimum level of consumption.

The impact of food policy on meeting the food needs of poor people has been minimal. Increased food production has not resulted in closing the food gap between rich and poor. On the other hand, increased production has enabled well-to-do landowners to hold off sale at the post-harvest season and release the grain later for sale at a higher price. Government procurement and resale have not been too successful either, as it has been difficult for the Government to procure enough rice and sell it at a price affordable by the poor.

Recent study has shown that the modified ration system has been operating at a level that has no substantial impact on household food supplies. The supply was inadequate; finding a private ration dealer, which demands a huge investment, was difficult, delaying distribution; the information system announcing that the food supply was ready for distribution was poor; and the time and money spent on transportation and the wages lost through travelling to the pick-up point did not make it a profitable venture. Moreover, the grain was often supplied at inadequate intervals. Theoretically, a modified ration should be distributed monthly to the eligible households, but in practice distribution has been highly irregular. The majority of households reported getting the ration once in three months, or even less frequently. Distribution of relief foods was also far from adequate. The food for work programme demands heavy manual labour and pays only 15 seers' worth of wheat for a week's labour, which is even less than the daily wage rate prevailing in the area. Moreover, such work is purely temporary; it may last only one or two months.

As is evident, the various strategies used in meeting the needs of the poor have been far from satisfactory. As pointed out earlier, intra-household food distribution is affected by income and food availability as well as cultural factors. It is, therefore, axiomatic that food policy having limited effect in ensuring minimum food supply will have no positive effect on household food distribution.

On the other hand, limited food availability has further reduced the share of food for women, including pregnant and lactating mothers. Determination of food needs has not taken the increased requirements of this vulnerable group into account, nor has any attention been paid to the food requirements of children. Food needs have been calculated only for calories; therefore, the requirements for protein and other nutrients were not considered. In view of this, the name "Food Security Plan" may be more justified than national food and nutrition policy. In a recent communication with a senior economist, I learned that planners are aware of the lack of attention to the caloric and nutrient needs of women and children, and they intend to use nutrition survey data in revising their food policy.

Increased cereal production has led to an increase in supplies on the market, but has had a negative effect on the household food supply of underemployed landless day labourers. Moreover, with the recent expansion of rice mills in rural areas of Bangladesh, unhusked paddy is no longer sold in village markets at a low price because the paddy is bought by the mill owners as soon as the crop becomes available for sale. This means that low-income landless households can no longer take advantage of the harvesting season and buy paddy at a lower price and process it at home. The displacement of women from home-processing of rice has also reduced family income, which, in turn, has a negative effect on household purchasing power.

The lack of pulse production and the transfer of pulse acreage into HYV rice has resulted in a continuous decrease in the supply of pulses and a rise in prices. The market price of a seer of pulse varies between 9 and 14 takas, which has greatly reduced the quantity consumed. It no longer forms a regular accompaniment to the rice-based diet of Bangalees. In poor homes, when the fish supply was insufficient, women used to sacrifice their share of fish and eat rice with pulses and other inexpensive greens, so that protein deprivation for women and girls was not as great as it is today.

The trade policies, particularly the export of frozen shrimp and transport of fish from the rural areas to the city markets, has reduced the supply of fish in village markets and in turn raised the price to a level unaffordable to the poor.

The unrestricted importation of baby formula and milk powder has led to the desire to use such foods. This practice is responsible for undermining the confidence of mothers in the food value of breast milk. Nutrition intervention programmes that involved distribution of donated milk powder and other baby foods (puréed vegetables, fruits, and gelatinous, starchy desserts) did little to improve the nutritional status of children, but did lead the mother to believe that such foods were of superior quality. Poor mothers in urban slums over-diluted the milk powder, to the detriment of their infants.

TABLE 4. Food Intake of Mothers in a Village (per Day), Assessed by 24-Hour Dietary Recall Method, Compared with Requirements

	Intake	Requirement*
Energy (kcal)	1,062.6	1,900
Protein (g)	23.8	42.6

N = 10

* Requirements do not include extra calories and protein needed during pregnancy and lactation.

Although inequitable allocation of food resources at the household level cannot be attributed to insufficient food supply alone, there is no doubt that food scarcity leads to increased sex discrimination in who eats more, as reported in a number of studies (7–10). The food policy in Bangladesh focused on increasing food production, which gives token attention to inequality in the distribution of resources and operates with little or no in-depth knowledge of household food behaviour, and thus has had little success in alleviating the serious food and nutritional deprivation of the poor, particularly women. A quantitative assessment of the food intake of mothers in landless homes revealed that both calorie and protein intake were grossly inadequate (table 4).

NEED FOR COLLABORATIVE RESEARCH FOR EFFECTIVE FOOD POLICY FORMULATION

To formulate an effective food policy, the collaborative input of economists, anthropologists, and nutritionists is needed. The different perspectives of these disciplines can help to diagnose the extent and severity of the problem at national, community, and household levels, and thus help formulate an effective food and nutrition policy.

However, it must be recognized by economists and policy makers that an economic data base derived mainly from macro studies needs to be supplemented with in-depth anthropological studies of household food behaviour. The complex set of factors affecting household food behaviour can be unraveled only through in-depth observation and intimate contact with household members, particularly mothers. The rationale used by women in giving up their share of quality food and limiting their intake of staples in times of scarcity will otherwise be ignored. Nor will economists/policy-makers know the agony suffered by women when there is no staple (rice/wheat flour) to feed their families. Although men are the major providers of food, it is the women who have to worry about what to cook for the next meal and how to serve their husbands and children. The responsibility for borrowing food from neighbors and kinfolk rests on them, and it is they who suffer from the embarrassment of such tasks. While doing my field work in Bangladesh, on many occasions I heard women saying, "It is getting dark, time for my husband to get back from work, and the children are asking for food, but I don't have any rice for the next meal. I've already borrowed yesterday from X. I don't know whom to approach next. I'm really embarrassed to do it."

I hope this paper has shown why collaborative efforts are essential in formulating an effective nutrition policy. In a country like Bangladesh, and many other Third World countries, where economists enjoy a privileged position in the formulation of food and other policies, it may not be easy for anthropologists to convince authorities/planners about the necessity of integrating economists', anthropologists', and nutritionists' approaches and perspectives in policy formulation. The attitude prevailing in many countries, that only economists have the expertise for policy formulation, need not discourage anthropologists from underscoring the contribution they can make in various types of planning and policy formulation. It is time for anthropologists to move away from the stance of neutrality and make an effort to become involved in alleviating the suffering of people.

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THE SIGNIFICANCE OF INTRA-HOUSEHOLD FOOD DISTRIBUTION PATTERNS IN FOOD PROGRAMMES

Judit Katona-Apte

INTRODUCTION

Nutrition surveys reveal that within the same income level and household structure some households contain malnourished members while others do not. Many causes have been attributed to this phenomenon, such as differences in the following: kin and social network, purchasing power, food preferences, demand for women's time, and so forth. All of these factors influence the household concerning its ability to acquire food, but they do not provide explanations for what happens to the food once it reaches the household. However, knowledge about the differential allocation of food within the household could provide insights as to which individuals benefit and to what degree. Just as little is known about the flow of food once it reaches the household, there is also no information available on how food programmes might affect it. Yet, food programmes that focus on the household are designed with specific goals in mind. Awareness of the differences in intra-household food distribution practices could provide insights into why the desired impact may not be achieved. Knowledge of what the intra-household food distribution practices are could provide assistance in the planning and effective implementation of more programmes.

This paper presents and discusses a model of food flow within the household, explains the pathway of nutritional effect and the conveyance of nutritional benefits from food programmes, and concludes with an explanation of the interactions among them.

PROPOSED MODEL OF FOOD FLOW

Figure 1 is a model of food flow to and within the household. Household here is defined as a group of individuals who share a domestic unit that pools its resources, especially for the purpose of sharing food. The model starts with the collective ability of the household to acquire food and lists some of the factors affecting it as well as those affecting the choice of foods acquired. These factors, however, will not be discussed. Instead, I will concentrate on factors involved in the pathway between acquired food and individual allotment, labelled as intra-household food distribution factors in figure 1. While the initial point in the model is the household, the final outcome is individual health and well-being, which is the ultimate aim of all programmes. Here, too, some of the factors that may interfere with the most positive outcome are noted but not discussed.

Knowledge of the factors that influence intra-household food distribution would aid in explaining the nutritional status quo and would provide useful information for the design and implementation of food programmes. Figure 1 shows the major factors believed to influence the amount of food each household member receives: the nature of the distribution system, variations in patterns of distribution, role and function of the person responsible for distribution, and other factors such as food preferences of household members, seasonal variations, and the influence of special events. While the factors themselves are not part of the model because of the importance only of their effects, it might still be worthwhile to discuss them briefly.

Nature of the Distribution System

There are several possible systems for dispensing food; for example, it could be distributed according to sex, age, and status, a common practice in many societies. In this system males usually get served first (1, 2) followed either by women or more likely children, as in India (2) or Peru (3). Non-family members of the household, such as hired labourers and servants are usually served last.

Another system is one in which wage-earners get a disproportionately larger share of the household's food supply than other members. Or, the decision-maker could distribute it according to how he/she perceives each member's need, which may or may not have any relationship to actual need. On the other hand, food may be dispensed in similar proportion to everyone's actual need. This is possible because activity levels adjust to energy intake; therefore, those with reduced energy intake are likely to expend less energy in activity and thus will have a decreased food need.

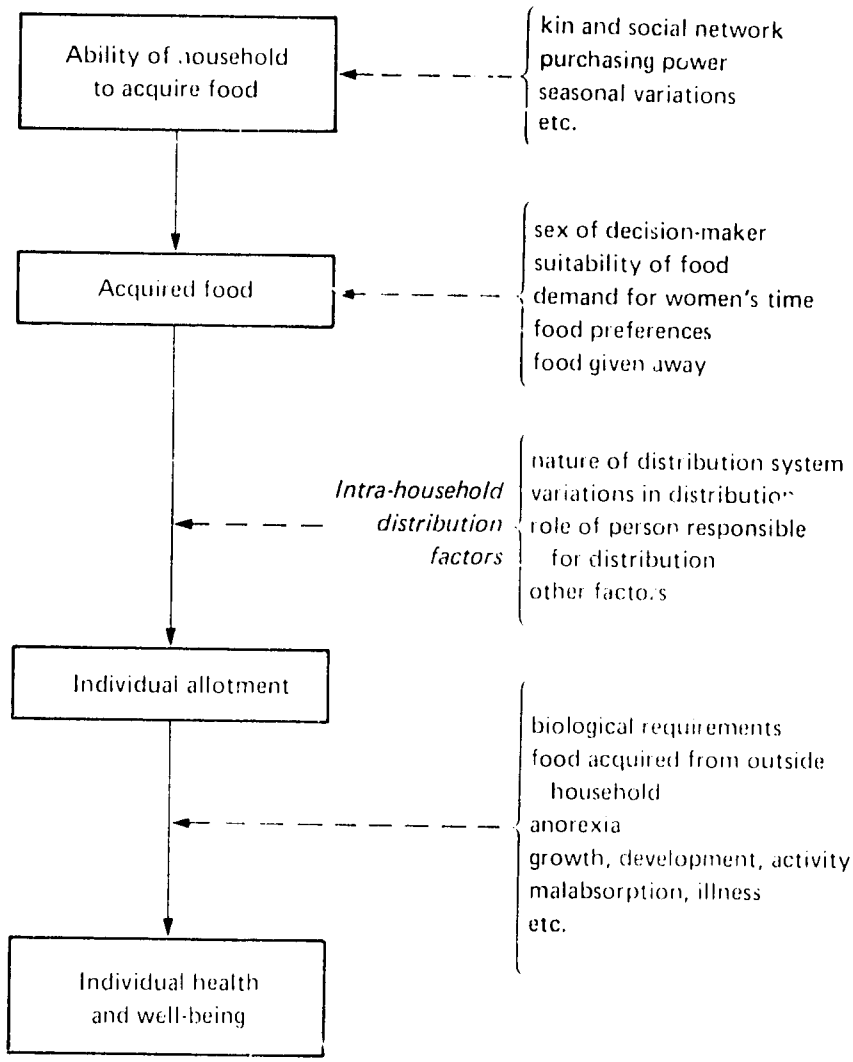

FIG. 1. Proposed Model of Food Flow in the Household

Households with marginal food availability in which wage earners are given preference use a system that is responsive to the best interest of the group, even at the expense of the vulnerable members, i.e. infants and pregnant/lactating women. If infants and women are not as healthy as wage earners, the effects on the household are not as devastating as when the wage earner's working ability is impaired (4).

Neither in all societies nor at all times are individual households able to have their food together. Work schedules, school attendance, and so forth may make it necessary that some household members eat at different times from others. In such situations the food available for each member may not be the same. For example, those who are present when the food is first available may have an advantage over those who eat later. Some foods, especially animal products, are known to spoil more easily than grain products. Therefore, those who leave early or get home late, such as children who attend school, may not get any of those foods that are prepared while they are away.

It is also possible that the food is not dispensed according to any system. In some households food is served and consumed from a common utensil as in parts of the Middle East, in which case cultural rules of manner operate; it might be perfectly acceptable for fast eaters to have an advantage over slow ones. It is also not uncommon for food to be put on the table and for all to partake of it at the same time. In this situation, not only speed but the size of the eating utensils has advantages; this lack of system could be detrimental to the food intake of young children. In some households food may be prepared and put aside during the day for all to eat from as they get hungry. This is common practice in the southern United States, where a container of cooked food is left on the

stove all day for household members to consume as they wish (author's own research in rural Mississippi and rural North Carolina). In this case young children are usually fed by an older female household member.

Variations in Patterns of Distribution

Not all the foods consumed in the household may be dispensed according to the same system. Staple foods may be plentiful and therefore distributed freely, while other more nutrient-dense foods may be dispensed with greater care. In some societies a disproportionate share of meat may go to the wage earner, but dairy products or fruits may be fed mainly to children. Another common variation in the distributional pattern is one where the household consumes one formal meal a day together, with cooked food dispensed in a particular way, but the rest of the time household members consume whatever is available without being specifically allocated any particular amounts of food. In this situation children "snack" frequently and it may be a child's level of aggressiveness and the size of his her palm that has the greatest impact on how much of certain foods he she receives.

Role and Function of the Person Responsible for Distribution

The person who decides how the available food is to be distributed may be the dispenser, though the decision-maker and the dispenser are not necessarily the same person. Usually the individual who dispenses the food is the female head of household, but the decision on who gets how much of each food may be made by another person such as the male head of household. Whether the decision-maker is a female or a male appears to make a difference in the amount of food allocated to children; women tend to be more aware of children's food needs than men are.

Dispensing is an important function because the person who dispenses the food has some control over its distribution. All foods may not be dispensed by the same person, or the same individual may not do it at all times. Note, for example, that on Sundays and other festive occasions in the United States it is customary for the male head of household to carve and distribute the meat while females dispense other foods at the same table.

Other Factors

There are many other factors that individually or collectively have an effect on how the food is distributed within a specific household. For example, the food preferences of household members could be taken into account. Some foods are liked more by certain family members than others, and the person responsible for deciding what foods will be served can control the amounts consumed by keeping individual food preferences in mind.

Seasonal variations could also play a role. Both the type and the amount of food available may be affected by the change in seasons and may have an effect on the way food is distributed in the household. In addition, activity levels and work schedules may also change with seasons, thereby affecting the food dispensing pattern.

Festive occasions could change everyday food distribution patterns. As nutrient-dense foods tend to be more abundant at such events, all household members may receive adequate amounts of them. Since many nutrients can be stored, some of the results of everyday inequalities of food distribution are alleviated in societies with frequent special occasions.

PATHWAY OF NUTRITIONAL EFFECT

Food and programme planners have presumed that the food provided in the context of programmes was consumed totally in addition to the recipients' usual diet. More recent data, however, indicate that food programmes usually reach households that, due to inadequate resources, have an insufficient food supply. This means that the food provided is not necessarily consumed totally in addition to foods usually available, but replaces some of the foods normally purchased (5-7).

Figure 2 is a simplified illustration of the pathway of nutritional effect from food programmes. There are two possible options for the food to exert an effect (8). The direct pathway implies that the food is consumed in addition to the usual diet or to what would be available without any food aid. The nutritional effect results from the actual consumption of the food, either by the household (arrow to acquired food) or by the individual (arrow to individual allotment).

The other option is for the recipients to substitute the food provided by the programme for the same or similar foods they usually purchase. The nutritional impact then is an income-mediated one and depends on how the recipients choose to spend the additional income, i.e., what proportion will be spent on food and what foods will be purchased. There is reason to believe that the foods purchased as a result of increased income are more nutrient-dense than the ones being replaced (9, 10).

The nutritional effect of most food programmes is achieved through both pathways at the same time: The food provided is consumed – direct pathway – making it unnecessary to purchase as much as before, thus freeing up

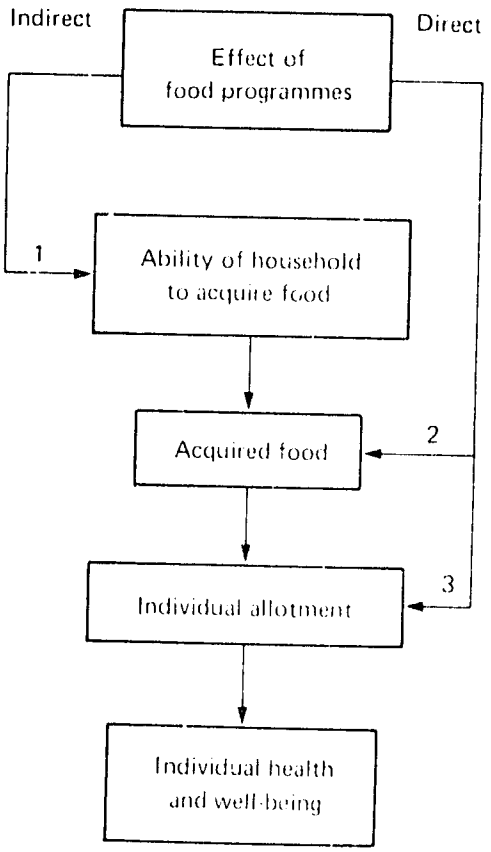

FIG. 2. Pathways of Nutritional Effect from Food Programmes. (1) Effect from income transfer potential of programme. (2) Effect from substitution of food with higher nutritional value than that in present diet. (3) Effect by same means as in pathway 2 but with programme food targeted to specific individuals in the household.

some income for more and better foods -- indirect pathway. However, if all the food received is sold, or is identical to what is usually purchased, then only the indirect pathway is operating, and if all of it is consumed in addition to the usual diet, then only the direct pathway is in effect. The latter is most likely to be the case in emergency or disaster relief type programmes.

CONVEYANCE OF NUTRITIONAL BENEFITS

The means through which nutritional benefits are conveyed can be classified into two types of programmes: targeted and untargeted. Targeting is an attempt to increase the energy and/or nutrient intake of specific members of the household who are perceived to be at greater risk of nutritional deficiency than other individuals, i.e., infants, young children, pregnant women, and lactating mothers. In fact, programme planners invest both labour and expense in attempts to reach these individuals, though it is "not clear why so much effort is spent on actually trying to reach the individuals within these households unless there is some concern that *household decision making* does not reflect the same desire to reach these individuals as that which motivates government . . . " (4, p. 18, italics mine). Untargeted programmes are those from which *specific nutritional* impacts are not expected to result.

Many different permutations and definitions of the variety of food programmes, both targeted and untargeted, are possible. However, for the purposes intended here, the following classification will be appropriate to illustrate the relevant points to be discussed later.

Untargeted Programmes

Take-home food packages. These are provided to recipients for consumption by the household at a future time. Examples of this type of programme are food-for-work projects in developing countries or the United States commodity programme for Indian reservations.

Entitlement programmes. These programmes specify criteria for participation and either distribute coupons that can be exchanged for food items, such as in food stamp programmes, or provide specific amounts of specific foods or categories of foods, as in "ration" or "fair price" shops.

The pathway of nutritional effect in untargeted programmes is mainly indirect, since the nutritional benefit depends on how many extra or new foods are brought into the household. There may also be a direct nutritional benefit if the distributed food is nutritionally superior to the food it replaces. The magnitude of effect depends on how the food is distributed in the household. If all of it goes to individuals whose nutritional needs are already met, then the effect is nullified.

Targeted Programmes

On-site feeding of designated beneficiary. In this type of programme the food is prepared and consumed on the premises of a child-care facility, health clinic, civic centre, and so forth under the auspices of an agency. Examples of such programmes are school feeding, soup kitchens, and institutional feeding.

Take-home food packages. Food packages can be targeted either to specific classes of individuals such as infants or to whole households. The food, if properly used, is supposed to achieve a stated nutritional impact such as increased growth, eradication of anaemia, decreased incidence of infections, and so forth.

Entitlement programmes. These are similar to the above, but instead of a food package the recipient is provided with vouchers or coupons to be exchanged for specific types of foods to be given to designated members of the household. The supplementary feeding programme for women, infants, and children (WIC) in the United States and many milk programmes in other countries are examples.

In targeted programmes the pathway of nutritional effect is meant to be direct, and the targeted individual's nutritional status is expected to improve as a result of the food provided. However, the extent of the effect depends on a number of factors related to the distribution of food within the household, as will be seen in the next section. Targeted programmes also have indirect effects because the targeted individual rarely consumes the intended food totally in addition to what the household provides for him/her. Therefore there is some displacement of foods that would go to the target in the absence of a programme, and these displaced foods do not have to be provided for in the household budget.

It is important to note that the classificatory categories listed above are not mutually exclusive. It is possible, for example, (a) to have a *targeted entitlement programme* in which the food is provided *on site*, as in the United States school lunch programme, (b) to combine *on site* feeding five days a week in a maternal and child health centre with a *targeted take-home food package* for weekends, or (c) to design a *take-home food package* with both *targeted* and *untargeted* components.

But who in the household benefits and to what degree as a result of food programmes? This question cannot be answered until more is known about the intra-household distribution of the food supply. The rest of this paper will concentrate on illustrating the importance of acquiring knowledge about intra-household distribution of food in the context of programmes.

Problems of Conveying Nutritional Benefits from Food Programmes within the Household

This section will elaborate on some of the problems that could interfere with the magnitude of effect from food programmes. Both the pathway of nutritional effect and the conveyance of nutritional benefits have been discussed. The problems that may result from not being aware of household level activities regarding food allocation for different types of programmes will be discussed below.

Take-home food package

These programmes are most popular in situations where food is provided either as an incentive for some other purpose – such as for people to bring their children to a health centre for routine care, or to attend nutrition education classes, or to reforest their land – or as part wages for work performed. There are usually no choices in either type or amount of food received, though the content of the food package may change periodically. At times unfamiliar foods are used such as soy-fortified analogues, staples, dried milk powder, lyophilized products, and so forth. The effect of such programmes is usually indirect, but in certain situations it could also be direct, as when soy-fortified flours or other high-protein foods replace foods of lesser nutritional quality, for example, when soy-fortified corn meal replaces regular corn meal or non-fat dried milk replaces tea in a household's diet.

The indirect effect of this programme is increased purchasing power. However, several questions arise regarding the outcome of such an innovation. How does it affect each household member's nutritional intake? How is the new food supply allocated among household members? If, for example, more of the expensive but less nutritious staple is purchased as a result of the programme, such as more rice but less corn, who gets how much of each with what final effect? If the extra income is spent on more nutritious foods, such as animal products or fruits, how is that divided within the household? Some household members may not have improved diets in spite of the programme, while others could suddenly meet and exceed their needs.

Entitlement programmes

Entitlement programmes have become more popular in recent years. They operate on the principle that persons or households who meet certain criteria are entitled to a minimum amount of food or the ability to acquire such food. These programmes have an indirect effect, as in food stamps, since the aid is provided as cash, coupons, ration cards, and so forth, to be exchanged for food. Often there is an additional direct effect if such a programme is an on-site feeding one.

Without knowledge of intra-household food distribution patterns it is impossible to predict what changes in household allocation of resources such programmes might initiate in terms of food, and therefore impossible to arrive at conclusions about the possible nutritional consequences to household members.

On-site feeding of designated beneficiaries

There are many variations of this type of programme. The purpose is usually to increase the amount of food or specific nutrient(s) the proposed beneficiary should consume. The effect of such programmes is both direct and indirect.

Unfortunately, there is little information on how the household reacts to the fact that one or more of its members is consuming a free meal or free food away from home. How is this taken into account? For example, does a child who receives milk in school then receive no milk at home? Or only less milk? Or the same as before? Or, if there was no milk given at home to begin with, does the child receive less of other nutrient-dense foods?

If a pregnant woman receives a meal at a health facility, does that replace the meal she would have consumed at home, or does it also displace other meals and/or foods? It is possible that instead of a person's total intake increasing as a result of the feeding programme, it could decrease because of the adjustment made in the household.

Targeted take-home food package

These programmes provide a food package with the stipulation that a specific part, or possibly the whole package, should be fed to the targeted individuals only. Many maternal and child health programmes are this type. It has both direct and indirect effects: consuming the targeted food should increase the energy and/or nutrient intake of the proposed beneficiaries and should release income that had been spent on feeding these individuals. In the case of an infant food supplement or milk this could be quite a large amount of money that is now released for spending on other foods and goods.

However, the results could be quite different from those intended, depending on what is happening in the household (11, 12). For example, the goal of the programme could be to increase protein intake for the preschool-age child using an expensive blended food such as corn-soy-milk (CSM). However, if the distributed food is shared by all members of the household, only a small portion may reach the targeted child. In that case the programme becomes an expensive and inefficient attempt at increasing a targeted individual's protein intake.

If the programme is targeted at the household and its purpose is to increase protein consumption for the total household, then the use of high-protein foods in the package is an appropriate method for achieving this. Depending on the intra-household allocation of food resources, however, the results might be different from those intended. If non-fat dried milk, for example, is distributed to increase a household's protein intake, the milk may be considered acceptable only to children (13) and fed to them alone. Not only does the programme not achieve its purpose because all members of the household do not partake of the food, but it could even be dangerous if young children consume large quantities of food with such a high protein-to-energy ratio.

Targeted entitlement programmes

These programmes specify the household member and the food that he/she is entitled to. The WIC programmes mentioned earlier are an example of targeted entitlement. This programme provides vouchers to be exchanged for specific nutrient-dense foods with some choice of brand names, flavours, types, and so forth within a category; for example, dairy products could be chosen as either milk or cheese, fruit juice could be cranberry, orange, grape, and so forth. The effect of this programme is meant to be direct since the special nutrient-dense foods are aimed at the preschool-age group and at pregnant women. However, lack of knowledge of what happens in the household of recipients makes it difficult to establish how the targeted food is consumed. For instance, older children tend to be more vocal about their food preferences than younger ones, and therefore more of the nutrient-dense foods may be brought into the house for their benefit.

CONCLUSION

The focus of this paper has been on the phenomenon of intra-household food distribution and its numerous aspects because it was felt that such an input has been consistently absent from the design, implementation, and evaluation of food programmes. The questions that need to be answered regarding intra-household food distribution were discussed along with some hypothetical answers to illustrate how such information would affect the outcome of food programmes. Combined with an awareness of the differences in the pathway of nutritional effect and of the different modes of conveying nutritional benefits, information regarding intra-household food distribution could have significant implications for the planning of food programmes. Table 1 summarizes the interaction among all the relevant components of the theoretical framework proposed in the paper. Many other aspects, such as how the resources are allocated for food versus other items, or how much of the income transfer resulting from food programmes is spent on food, though important, were considered to be outside the scope of this paper.

Acquiring the information is not as expensive or time-consuming as it may appear. Some data are already available by way of ethnographic information gathered by anthropologists in specific cultures on such aspects as order of dispensing foods (2, 14, 15), foods appropriate to specific sex, physiological state, or status (16, 17); foods prepared for special events (18, 19); and so forth. In addition to any available information, a social scientist could collect the specific data needed in a short time at little cost. The cost-effectiveness of such an undertaking is self-evident.

TABLE 1. Interaction between the Conveyance of Nutritional Benefits, Pathway of Nutritional Effect, and Intra-household Behaviour

Conveyance of Nutritional Benefits	Pathway of Nutritional Effect	Summary of Questions on Changes in Household with Programme Goal in Mind
Untargeted programmes		
All programmes	Indirect	How are extra and/or new foods distributed?
Take-home packages	Direct	Which members receive how much of what foods from those distributed?
Targeted programmes		
On-site feeding	Direct	What proportions of targeted individuals' nutritional needs are met?
Take-home packages		
individual is beneficiary	Direct	How much of intended food does targeted individual receive?
household is beneficiary	Direct	Do all members partake in proportion to their needs?
Entitlement programmes	Direct	Which foods does target receive from those intended and in what amounts?
All programmes	Indirect	Which foods are displaced from those usually allocated to the beneficiary and in what amounts?

The policy implications of the above are clear. When information is available on what actually happens with regard to food distribution at the household level, more efficient programmes in terms of conveying the desired nutritional benefits at the least possible cost can be planned, implemented, and evaluated.

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