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# NUTRITIONAL ASPECTS OF PROJECT FOOD AID

Edited by  
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United Nations



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## FOREWORD

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There are two major forms of food aid: bulk and project. Bulk food aid is normally provided to governments as concessional sales or donations to meet national food deficits. Food so transferred becomes the responsibility of the recipient government, which generally places the commodities into regular commercial channels using a variety of mechanisms. Project food aid provides food as a donation in support of specific projects, such as school feeding, maternal and child health, or food for work. The food provides specific rations for specific numbers of people involved in specific projects for a specified time period.

This book reports on a workshop on "Nutritional Aspects of Project Food Aid". Held in Annapolis, Maryland, USA, January 14-18, 1985, the workshop was sponsored by the United Nations Administrative Committee on Coordination/Sub-Committee on Nutrition (ACC/SCN). It brought together 42 experts from 15 countries, all knowledgeable in different aspects of project food aid. Participating were representatives of bilateral and multilateral aid agencies, developing country policy makers and program managers, staff of private voluntary organizations, and investigators from universities and research institutions.

Within project food aid, there are, as may be expected, a number of issues which are debated. Some people are concerned with the degree to which food aid affects production, local food prices, and local marketing of similar food crops. These are all valid subjects, and, indeed, they are regularly discussed in various forums. This workshop, however, dealt only with the nutritional aspects of project food aid.

After consultation with various organizations and governments involved in food aid, the planning committee selected six issues:

- Targeting Food Aid
- Food Aid as Income Transfer
- Catch-up Growth
- Phaseover of Food Aid Programs
- Evaluation of Food Aid Programs
- Nutrition Education

Overview papers were commissioned for each of the six issues; a second paper was prepared for two of the issues. These papers were read in plenary sessions and were followed by brief presentations made by two commentators familiar with the subject. A short general discussion was then held for the purpose of sharpening the issues. The group then divided into three small groups to intensively discuss and debate the issues.

Chapter 1 provides an introduction to the subject of improving the effectiveness of project food aid. Chapters 2-7 include both a summary of the presentations made and the conclusions and recommendations arrived at for each of the six issues. The Appendix contains

the complete text of the overview papers presented as well as a copy of the workshop agenda and a list of participants.

Although the list of recommendations is relatively short, implementing them will require significant effort and funding. The Working Group on Food Aid and Nutrition of the ACC/Sub-Committee on Nutrition will pursue some of these recommendations. Food donor agencies and the governments who support and manage food aid programs will need to sponsor others. Private voluntary organizations working on food aid will want to learn more about what is needed to improve program effectiveness.

Everyone who is interested in food aid should be concerned not just with finding answers to the questions raised but also with finding answers based on objective evidence rather than on emotion and generalities.

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April 1986

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## CHAPTER 1

### INTRODUCTION: IMPROVING THE EFFECTIVENESS OF PROJECT FOOD AID

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Martin J. Forman

Project food aid is expensive and extensive. Every year hundreds of millions of dollars worth of food are transferred to tens of millions of people around the world. Although projects are varied, from child feeding to food for work, and have a number of goals, such as community development and employment generation, increasingly a major rationale is the need to address nutrition problems in the developing world.

In the early years of project food aid, there was relatively little attention paid to the nature of the population groups who received the food or to how the food was used. The emphasis was on transferring food from countries that had it in abundance to countries that did not, trying to insure that within these countries the food went to people in need. Need, however, was very broadly defined, if at all.

Food donor agencies established simple procedures which gave maximum flexibility to their field representatives and to the authorities of local governments and local private voluntary organizations.

Local authorities had merely to present annually an estimate of requirements, backed up by an explanation of how the figures were arrived at. Decisions were made locally on the criteria for eligibility. Although the most common criteria used was economic status, this was interpreted in many different ways. Every local program manager could and did establish his or her own indicators of economic status, definition of poverty, and the cutoff points for program eligibility. The food needs of local project proposals were added together and submitted by the voluntary agency field representatives to their headquarters for submission to the donor agencies. Where programs were run by local governments, the authorities submitted their needs to the donor either directly or through a country-based representative if there was one.

Reviews took place along the way, but they were often superficial. The degree to which donor reviews were critical depended to a large extent upon the supply of food available. In times of great food surplus, reviews tended to be perfunctory at best. Donors were interested in moving the maximum amount of food out of donor warehouses. Local national governments, which had to clear and approve the requests received from the several ministries and non-government organizations, were quite lenient and non-critical in their reviews. They tended to look upon "free" food imports as an opportunity to foster various goals.

The import of food with no outlay of foreign exchange helped to remedy balance of payments problems. Whatever food was imported under a donation program could replace that which otherwise would have to be purchased. Programs that provided help tended to reduce people's frustrations; if the government itself sponsored the program,

it could gain some local political mileage by fostering the image of a caring government that did things for its people.

The relative ease with which governments and private voluntary agencies could obtain food donations often meant that these organizations exercised little or no discipline in assuring need on the part of the recipients or in evaluating the impact of the programs or both. Much was assumed; little was tested.

In time, donors, project managers, and government planners began to question both the costs and the benefits of food aid programs. Thoughtful people wanted to know more about these programs: how did they work? what did they cost? who actually benefited from them? Two things helped to speed up this questioning process. When a world-wide recession developed in the 1970s, hardly a country was immune to its effects. Rich and poor alike were concerned with bringing down government spending. Donors began to consider whether there were ways to cut costs, either by reducing the size of programs or by eliminating the more costly foods, such as food blends or fortified commodities. Recipient governments became more aware of the real costs involved in importing the donated foods. Costs for in-country storage, transportation, and distribution, including demands for personnel, rail and truck facilities, and gasoline and other fuel, needed to be considered.

These considerations were even more important to the countries that began to reach the levels of economic development at which food aid would be reduced or eliminated. With this prospect looming ahead, governments faced the difficult decision of whether or not they should continue to fund food aid programs by assuming the additional costs formerly met by donors.

As both donor agencies and recipient countries began to give greater thought to the real costs and the real benefits of food aid programs, they found that good information was hard to come by. There were only a few reports of program evaluations, and in those, no attempt had been made to evaluate the impact of programs. Rather, these reports were almost "audit-like" in nature, dealing only with process, reporting such things as the amount of food distributed, the number of recipients reached, the amount of ration received, the frequency of distribution, and the costs of delivering a unit of food or reaching a recipient.

Some attempts were made to assess "impact" but these often dealt with such things as whether food increased school enrollment or attendance or whether food distributed at an MCH center increased participation in the programs of that center. There was little attempt to measure nutritional impact, although this was often the justification given for the program's existence.

Researchers interested in impact found not only a paucity of data but also a scarcity of reports of methodologies that were likely to produce the desired results. When attempts were made to develop methodologies and to design evaluations, researchers found an absence of the data required to measure nutritional impact. Small wonder that so little is known about the nutritional impact of programs.

Logically, it could be assumed that impact would likely be greatest where nutritional levels were lowest since people with adequate diets would benefit little from a supplement. The trick was to

## CHAPTER 2

### TARGETING FOOD AID

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#### A. Robert J. Timmons

The simple and obvious answer to the questions, "Why target food aid?" is "Because, in the real world, food aid is scarce, and it is necessary to direct it towards those who need it most and can benefit most from it."

Targeting is basic to any nutrition intervention and must be at the forefront of the design of food aid programs. A program's specific objectives are of particular relevance in targeting. For example, the goal of curing severely malnourished children in a given community will lead to one target population while the goal of lowering the overall incidence of malnutrition among children in the same community will lead to a decidedly different and much larger population.

In addition, targeting strategies must reflect a broad range of "contextual" factors: the local customs, the existence or absence of roads and other infrastructure in the area, the local and national political situation, the financial constraints of most nutrition intervention work.

In nutrition programming, three fundamental targeting strategies are regularly employed, either singly or in combination: geographic, family, and individual.

Although non-nutritional concerns frequently single out large areas, such as regions and provinces, for service, nutritional concerns govern the selection of particular villages within these areas. Therefore all nutrition programs are geographically targeted.

Studies have demonstrated relationships between malnutrition and various family characteristics, such as family size, socioeconomic status (especially the education of the mother), spacing of children, or a history of poor nutrition in any of the family members. One targeting strategy is to select families for the program based on some subset of these characteristics. This strategy is applied in combination with geographic targeting: that is, only families within certain well-defined geographic boundaries are queried and they are admitted or rejected from the program on the basis of their socioeconomic status.

With the ever increasing use of weighing as a fundamental component of food aid program design, often for educational purposes as well as screening of individuals, targeting at the level of the individual on the basis of personal nutritional status has gained favor.

In any given context, the appropriate targeting scheme should be based on an assessment of the costs and benefits of all feasible alternatives. This can be a complicated process since the costs of targeting are especially difficult to assess. While there may be some direct costs of, say, failing to take advantage of alternative uses of health workers' time, the more important costs are not monetary, especially the loss of benefits associated with denying services to

find the nutritionally needy and deliver food to them. This was easier said than done. Objective criteria were needed to identify these populations. What was their food consumption? Per capita income? Nutritional status? What should be measured? And once indicators were selected, how, as a practical matter, could these individuals, families, or other groups be segregated from the less nutritionally needy in the community?

In addition to these issues of targeting and evaluation, interest emerged in a different type of question. How could project food aid be used more effectively? Could project food aid be used to foster changes in food habits? How could this be done? Could food aid be used to foster catch-up growth on the part of children who had suffered from acute diarrhea or other infection? Could food aid be used to help children who had endured long periods of chronic malnutrition catch-up to their age-sex cohorts?

In the past five years, the major food donor agencies and many governments sponsoring programs using food aid commodities began to look at these issues more closely. A number of project evaluations were carried out and studies were commissioned on various aspects of food aid. More information has been assembled in the past five or six years than in the previous twenty-five. Nevertheless, good answers continue to be elusive.

Part of the reason for that elusiveness is that provision for data collection has not generally been built into projects, and, therefore, insufficient appropriate data exists for analysis. A second problem is the cost involved. Food donor agencies and program sponsors have been reluctant to invest in studies. Funds for research are not built into programs, the rationale being that it is more important to feed people than it is to study programs. This attitude will need to be changed if we are ever going to gain objective information on food aid--its costs and benefits, the conditions under which it works best, its potential for achieving various goals, and how to overcome the constraints to its effective programming.

an individual who may need them. Targeting can also have political costs, such as loss of support from the community due to denial of services to some of its members. These kinds of costs are also virtually impossible to quantify. Finally, there are indirect costs of targeting, the costs due to losses of the economies of scale inherent in non-targeted programs.

Perhaps the most important concept in assessing targeting schemes is that any strategy will exclude some needy individuals while including others who could fare quite well without food aid. Depending on the local conditions and the targeting strategy employed, the "exclusion error" can be as high as 20.1 per cent while the "inclusion error" can be as high as 84.1 percent. Unfortunately, most targeting strategies with a small exclusion error have a large inclusion error and vice versa.

The Community Systems Foundation (CSF) has compared various programs in different countries or regions confronting different malnutrition rates, using longitudinal data, which permits tracking change in an individual's nutritional status, anthropometric data on preschool participants, household socioeconomic data, and environmental data. These comparisons enabled CSF to assess the costs and benefits of various targeting strategies.

When targeting only geographically, thereby assuming that the entire population of preschoolers is at risk, the inclusion error increases sharply as the rate of malnutrition decreases.

Targeting young preschoolers seems reasonable, since it is known that older preschoolers are often chronically malnourished (stunted) but not acutely malnourished (wasted) and, therefore, not at extreme risk. There is also evidence that as a child gets older, the risk of death diminishes for any given nutritional status. Again, however, inclusion errors are relatively high, particularly in areas with lower rates of malnutrition, since young preschoolers who are "normal" are not screened out of the program by anthropometry. On the other hand, such a strategy excludes preschoolers who deteriorate into malnourishment over time.

A program that screens individuals by anthropometry restricts its benefits to rehabilitating individuals as opposed to preventing the overall incidence of malnutrition. Since weight-for-age, a commonly used measure of malnutrition in preschool children, is an imperfect measure, and since mistakes are bound to be made in the field, the size of the excluded population could be expected to be relatively large at all prevalence rates. Again, preschoolers deteriorating over time might be left untreated. Targeting by age and anthropometry would produce similar results.

Programs targeted on the basis of socioeconomic indicators have absorbed almost the entire preschool populations of the areas served. It is apparent that either the areas covered by nutritional programs are relatively homogeneous or the appropriate socioeconomic indicators of nutritional status in these areas of the world have not yet been found.

One can argue that all preschoolers should be targeted in villages which have been identified as the most needy, since the synergistic relationship of malnutrition and infectious disease would put all villagers at risk. However, this strategy could have startling results. For such

a population in the southernmost district of India, targeted villages showed a dramatic increase in rate of malnutrition over a year, whereas the hypothetically excluded population in villages confronting less rampant malnutrition showed a dramatic decrease. This could be because the program was inadequate to prevent deterioration into malnourishment in villages where the problem was most critical.

This points to the need for food aid program designers to ask not only if it is more efficient to target selected regions, but also if it is more efficient to use different targeting strategies in different areas. Given the same program, if the differences in severity of malnutrition among areas prevail, decidedly different outcomes should be expected.

The rationale for targeting by weight trend criteria is relatively straightforward: a preschooler who fails to gain weight over a period of time is at extreme risk of malnourishment. In areas where malnutrition is prevalent, weight trend criteria screen out relatively effectively the normal preschoolers who would remain normal without aid, but they miss a relatively large proportion of preschoolers who would deteriorate over time.

Targeting according to 12 scenarios representing different combinations of the three most important contextual factors:

- prevalence of malnutrition
- existence of logistical infrastructure,
- existence of on-site infrastructure

were presented and discussed as follows.

Scenario 1 (high prevalence of malnutrition, minimal logistical infrastructure, minimal on-site infrastructure) represents the most difficult combination of factors for any food aid intervention. This scenario is typical in remote rural regions of many developing nations. The combination of high prevalence and minimal infrastructure suggests that rigorous targeting would not be appropriate. An alternative is minimizing costs and maximizing control through well planned expansions of the program. Later, more selective targeting strategies could be introduced in accordance with program objectives.

Scenario 2 (high prevalence of malnutrition, substantial logistical infrastructure, minimal on-site infrastructure) describes a situation that might arise in areas where roadways or railways have been built but where social service development and/or government organization has been slight. Here one might also anticipate lack of enough data for geographic targeting. But where the problem is widespread, one need not worry too much about finding the needy. The informed judgment of medical personnel might be the best available source of information. Costs of distributing and storing food would be low, so more resources could be available to bolster the local infrastructure as part of the program.

Scenario 3 (high prevalence of malnutrition, minimal logistical infrastructure, substantial on-site infrastructure) is rare, since the development of on-site infrastructure generally lags behind the development of roads, etc. The exception is when small projects run by non-governmental organizations exist in remote rural areas. Costs of distribution would be high relative to the costs of identifying the most needy, so rigorous targeting based on anthropometric and/or socioeconomic data would be called for.

Scenario 4 (high prevalence of malnutrition, substantial logistical and on-site infrastructures) is also quite rare. Exceptions include urban poverty zones such as the resettlement barrios on the outskirts of major Latin American cities. In the urban poverty zone, a highly targeted scheme based on anthropometrics would probably yield the best results.

Scenario 5 (high-low prevalence of malnutrition, minimal logistical infrastructure, minimal on-site infrastructure) is typical of places where nature is relatively benign, i.e., landholders are capable of subsistence existence, though the landless live more precariously. As in Scenario 1, the program should be designed to proceed slowly, developing adequate infrastructure as it expands geographically. Emphasis should be on the high prevalence zones, where targeting should be minimal.

Scenario 6 (high-low prevalence of malnutrition, substantial logistical infrastructure, minimal on-site infrastructure) is common in countries where transportation and communication links have been well established between major urban centers, while sub-areas still experience malnutrition. The high prevalence zones should be identified. If they are far from transportation and storage centers, targeting should proceed as in Scenario 2. If they are uniformly distributed throughout the region, the program can expand more rapidly.

Scenario 7 (high-low prevalence of malnutrition, minimal logistical infrastructure, high on-site infrastructure) is also rarely encountered. Preliminary targeting, probably an anthropometric survey done by the on-site staff, would identify those zones in which food aid was needed most.

Scenario 8 (high-low prevalence of malnutrition, substantial logistical and on-site infrastructures) is common in areas where the benefits of economic development are not uniformly distributed throughout the population. The presence of a strong, all-around infrastructure makes a highly targeted service delivery system feasible.

Scenario 9 (low prevalence of malnutrition, minimal logistical and on-site infrastructures) is another situation rarely encountered by nutrition intervenors. The situation would probably be one in which malnutrition is linked to poor nutritional practice by some members of the community. Targeting would best be based on anthropometrics, and the emphasis should be on cure. A nutrition education program might also be included.

Scenario 10 (low prevalence of malnutrition, substantial logistical infrastructure, minimal on-site infrastructure) is similar to Scenario 9. The emphasis of the program should be on the education of the poorly nourished.

Nutrition program planners encountering Scenario 11 (low prevalence of malnutrition, minimal logistical infrastructure, substantial on-site infrastructure) should assist the local people in their efforts to reduce malnutrition, if their role is a positive one. If not, this scenario is essentially the same as Scenario 9.

Scenario 12 (low prevalence of malnutrition, substantial logistical and on-site infrastructures) is a situation where intervention may not be appropriate, except perhaps for highly targeted services to those who simply cannot break out of the shell of poverty.

In summary, targeting is most effective in areas where the rate of malnutrition is low. Differences in conditions within a country can be, and often are, of such magnitude that various targeting strategies should be considered. The existence of infrastructure is also very important. Food aid programs should be linked to other programs when possible since the cost of implementing a "stand-alone" targeting strategy is so high. Finally, the correct targeting strategy depends to a great extent on the specific objectives of the program, particularly if the emphasis is on either prevention or cure.

#### B. Mary Ann Anderson

Targeting is one way to cut costs, possibly without reducing a program's effectiveness. It certainly is better than using smaller rations or cheaper commodities or shorter periods of time--all cost-saving measures being considered in India.

Targeting does become more complicated and controversial when applied in the field. Many opposed to nutritionally based targeting will ask "Are we more concerned with saving food and money or with saving children?".

It is most cost effective to concentrate supplementary feeding on children under three years of age. However, many of these needy children are not reached in communities with supplementary feeding programs. This group has the greatest mortality risk, and studies in Tamil Nadu, India, done by Anderson for CARE, showed that rations dramatically increased the total calorie intake of children under three. These children were also more likely than older preschoolers to consume the food as a true supplement, not just a substitute for the home diet. In some cases, older children have been found to deteriorate in nutritional status the longer they stay in a feeding program, since their food intake at home is cut back.

Exclusive targeting of under-threes will happen only on paper. In take-home feeding programs, the mother will share the supplement with her older preschoolers. In on-site programs, the younger children are frequently accompanied by older preschoolers; if the younger child's ration is not to be diluted, food must also be provided for the older child. Still, emphasis should be given to achieving high coverage of the younger group in programs with broader selection criteria.

Pregnant and nursing women form another group deserving much greater emphasis in feeding programs. Little is known about how to target supplementary feeding programs to women at greatest risk of delivering low birth weight infants or of having inadequate breast-milk production. A 1982 study by D. Rush concluded that maternal food supplementation programs have been a disappointment. However, programs in Colombia suggest it may be possible to achieve much larger increases in birth weight if women are chosen for supplementation on the basis of being under weight for their height and length of gestation rather than on the basis of poverty or inadequate diet. Researchers have suggested that fetal growth retardation can be identified in rural programs by measuring weight-for-height, fundal, or intrauterine height serially, abdominal circumference, arm circumference, or height and head circumference. There is an urgent need

for a growth chart for pregnant women in developing countries as well as for inexpensive, portable, and accurate equipment for maternal anthropometry. Village or intermediate health workers must make home visits and monitor women's menstrual cycles to identify problem pregnancies early. The debate over whether supplementary feeding for pregnant women should start in the second or third trimester should be resolved.

Unfortunately, even less is known about how to identify nursing mothers who are at risk and in need of supplementary feeding.

A general targeting strategy, one that can be applied to all supplementary feeding programs was discussed. Although no one universal strategy can be adopted and strategies must be tailored to each country's needs, there is a general targeting strategy which can be applied to all supplementary feeding programs.

The first stage of this strategy is targeting individual countries, based on national nutrition status data. Some cutoff point should be established, e.g., countries with less than 20 percent of children under six years of age with weight-for-age less than 75 percent of NCHS/WHO standards (in other words, moderate and severe malnutrition) should be graduated from food aid. The economies of scale in countries with low malnutrition rates are not high enough to justify the cost of feeding programs. Other types of programs, such as nutrition education and growth monitoring, may be more effective in these countries. Some Latin American countries have already been graduated from food aid, while other countries in Africa and Asia are in desperate need of supplementary feeding programs. It is possible to rank countries according to prevalence of malnutrition, since in many countries national nutrition surveys have recently been done and since techniques for doing such surveys rapidly have been worked out by AID and the Center for Disease Control.

The next step in targeting should be to select whole geographic areas within the selected countries--regions, states, districts, etc., again using nutritional status data. Within these needy areas, whole villages, schools, etc., could be made eligible for food aid if the rate of malnutrition were higher than 50 percent. If the rate were lower, it might be useful to apply nutritional selection criteria to target individual children within the needy areas. In 1973, while at CARE, Anderson helped the Government of Sri Lanka evaluate 8,082 schools for eligibility for food aid, using the criteria of arm circumference for height or the QUAC Stick method. The entire survey took only six months. Arm circumference measurement also can accurately screen children aged one to five years for severe malnutrition. But it should not be used as a substitute for weighing when the objective is growth monitoring and selection of individual children for supplementary feeding, since it cannot accurately detect moderate malnutrition.

The third stage should be targeting within communities. In maternal and child health feeding programs, growth monitoring by regular, i.e., at least quarterly, weighing of all children in the community is a must. This not only helps to identify the neediest children but also can lead to early detection of malnutrition in other children. It is an excellent tool for nutrition education

for parents and community leaders, can help workers get to know the villages, and can generate data for a built-in evaluation system.

In areas with moderate and severe malnutrition rates (less than 50 percent), growth monitoring data should be used to strictly target feeding programs to children failing to gain weight or in various degrees of malnutrition by weight-for-age. In communities in which malnutrition is more prevalent, targeting with the aid of weight data is also desirable but not absolutely necessary.

Whether stunted or chronically malnourished, children with height less than 90 percent of the standard for their age but with normal weight-for-height can benefit from supplementary feeding programs has been a matter of debate. When weight-for-age is used as the selection criterion, it is impossible to distinguish these children from the acutely malnourished who have low weight-for-height. Since it is difficult to accurately measure height in the field and until evidence is produced showing that supplementary feeding can or cannot benefit stunted children, it is recommended that they be allowed to participate in the programs.

Anthropometry is an accurate tool not only for programs that aim to cure malnutrition, but also for those that seek to prevent it. Programs with continuous growth monitoring can lead to early detection of mild to moderate malnutrition. If weighing is done frequently, high "exclusion errors" are not inevitable.

In areas where malnutrition rates are low, nutritional criteria should be used to graduate children from food aid, once they have reached an acceptable nutritional status and have maintained it for several months. This would help prevent dependence on outside food aid and free up resources for new beneficiaries. However, since the rate of growth and recovery is different for every child, no arbitrary time period should be set up.

The Integrated Child Development Services Scheme (ICDS) is a major national program for mothers and children under six years of age in about 20 percent of India's villages. The program has been gradually expanded from 33 blocks (population units of 100,000) in 1975 to more than 1,100 blocks in 1984. The blocks were chosen using socioeconomic indicators, such as income and literacy, not nutritional status data, though this data is available for most Indian states. Once a block is selected for ICDS, theoretically all villages in that block become eligible.

Beneficiaries of ICDS receive supplementary feeding, preschool education, some health services, and nutrition and health education. The nutrition program emphasizes both prevention and cure.

Within specific communities, children are eligible if they are between six months and six years of age, are less than 70 percent of the Harvard standard for weight-for-age, have arm circumference less than 13.5cm, or are from socioeconomically deprived families. Pregnant and nursing women must also be from socioeconomically disadvantaged families, and pregnant women must be in their third trimester. Like most on-site feeding programs, ICDS has had difficulty reaching under-threes and pregnant and nursing women.

All children are supposed to be weighed every three months; children with moderate and severe malnutrition are supposed to be weighed every month. In practice, however, this is not strictly

enforced. No poor children who come to the feeding centers are turned away. Graduation, based on achievement of normal nutrition status (greater than 80 percent of standard weight-for-age) is also not strictly enforced, though parents of children who have achieved normal nutritional status are urged to voluntarily withdraw them from supplementary feeding.

The Tamil Nadu Integrated Nutrition Project (TINP) illustrates the difficulty in mastering political will to employ nutritional targeting.

Unlike the ICDS program, TINP, operating in 9,600 villages, allows only malnourished children (from 6 to 36 months of age) and at-risk pregnant and nursing women to receive supplementary feeding. All children under three are weighed monthly, and nutrition and graduation criteria are strictly enforced.

When the state government agreed to start this project in 1980, it was considered a real breakthrough. India's first large-scale experiment with nutritional targeting. Hopes were dashed less than two years later when the Chief Minister of Tamil Nadu introduced a hot noon meal program for all poor children from two to ten years of age in the state--at great expense. These days, political will seems to be directed more towards massive child feeding programs, with little concern among politicians for cost-effectiveness. How to effectively lobby for nutritional criteria and cost-effectiveness in food aid programs at high political levels is an issue that must be addressed.

### C. Conclusions and Recommendations

- Targeting food aid is cost-effective. Since food aid is both scarce and temporary, it is necessary to direct it to those in need who can benefit most. Targeting can insure proportionately greater coverage for communities, families, and individuals in need and potentially expand coverage by reducing expenditures.

- There is no universal strategy for targeting food aid. The targeted population of each program should be identified in the context of the environment in which it operates. The magnitude of malnutrition, infectious diseases, and poverty, as well as the state of appropriate infrastructure development, are important factors to consider in determining eligibility for the program. It is also important to take into account the fact that food aid is frequently attached to welfare programs with different purposes, and each program often has a number of objectives.

- It follows that targeting food aid should reflect the program's objectives. The type of program, such as MCH school feeding or Food for Work, influences the selection of families or individuals to participate, as does the functional role of the program. Consideration should be given as to whether the food aid is directed to reducing mortality, increasing child growth, or transferring income to a family. Also, as to whether the goal is to be rehabilitation or prevention. Whereas an emphasis on cure requires identification of the malnourished, a prevention program would include beneficiaries from a broader at-risk population. Growth monitoring can identify not only the malnourished, but also those at extreme risk of becoming

malnourished. It can also help educate parents about their children's nutritional needs.

- If targeting is to be effective, data needs to be collected on a continuous basis. The target population should be considered a dynamic element, not a fixed factor in program design. As the composition of the targeted population changes, so might the eligibility criteria for directing the food aid or package of services.

- Any adjustments to the criteria for selecting beneficiaries, however, should be acceptable to the community. This is particularly critical where there are cultural or political constraints to excluding some community members from the program.

- Food aid may be most cost effective when combined with nutrition education and health care. Targeting must take into account the entire package of services.

- Finally, targeting communities on the basis of need is worthwhile. Frequently, socioeconomic factors are used to designate large service regions, whereas nutritional concerns govern the selection of communities within these regions. Whether socioeconomic or nutritional criteria should be employed to select participants in a program depends on the particular targeted population. Nutritional criteria may be appropriate for targeting pregnant and lactating women and for preschoolers, among whom malnutrition rates are high as is the risk of death. On the other hand, if families are selected for targeting, socioeconomic factors may prove more useful.

## CHAPTER 3

### FOOD AID AS INCOME TRANSFER

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#### A. Anne M. Thomson

During the past decade, one of the major debates in the area of food aid has been over the issue of assessing the impact of programs. Most of the attention has focused on ways of evaluating the impact on the nutrition of participants in the programs. A nutritional assessment of a project considers the benefit to be only the additional food eaten by the individual recipient, or, in some cases, by the recipient family. Taken a step further, the aid would have to show up as changes in body weight or height. However, most evaluations have failed to show significant impact on the nutritional status of food aid recipients. Though much of the blame lies with poorly designed and implemented projects, a great deal also lies with the evaluations themselves, which among other things have relied on inadequate base line data or used inappropriate indicators to measure a program's impact on nutrition. In the past few years, it has been suggested that it might be easier and more appropriate to look at food aid as income transfer and measure its impact accordingly.

This interest in food aid as income transfer is based on the fact that in transferring food to a family or an individual, a project transfers a resource that has a value. This is true whether the food is eaten in place of food the family would otherwise have eaten, eaten in addition to the food the family is already eating, sold in the market, or some combination of the three. That value, the reasoning goes, should be measured and taken as the benefit of the project.

The concept of income transfer was initially raised in the context of selecting the most appropriate commodities for specific food aid projects. In the past, it was assumed that the commodity would be consumed by the intended beneficiaries and should therefore be chosen according to their nutritional needs. For example, in supplementary feeding projects in which the target population was calorie-deficient preschool children, commodities that were calorie cost-effective would be selected.

But studies showed that not all food was being consumed by the intended beneficiaries. One response to this has been to try to design projects that reduce the so-called leakage problem, sometimes by trying to tailor commodities more specifically to the particular family members most in need. Another has been to question the way in which food aid projects traditionally have been viewed, to think of food aid as income-in-kind, as a transfer of income from the donor to the recipient. It follows then that income transfer, not impact on nutrition, would be the measure of the benefits of a project.

Income transfer has a great deal of intuitive appeal, especially to those who consider poverty to be the basic cause of malnutrition and that malnutrition, therefore, can only be satisfactorily attacked by reducing poverty. Another attraction of this approach is that it might avoid much of the current sterile debate over the leakage problem.

The choice of whether to use impact on nutrition or income transfer as the criterion for selecting particular food aid commodities would depend on the extent to which the two criteria produced the same ranking of commodities. If these were in effect the same, the issue would come down to ease of measurement. If not, the reasons for any differences would have to be examined carefully before one criteria could be preferred to another. In any case, a careful analysis of how income transfer should be measured is required.

It has sometimes been asserted that it is much easier to measure income transfer than to measure impact on nutrition. The term "alpha factor" was first used by Reutlinger and Katona-Apte in 1982 in the context of choosing commodities for Food for Peace programs. It was argued that the best commodity would be the one with the highest alpha factor; that is, the one with the highest monetary value to the recipient and the lowest relative cost to the donor, expressed by the formula  $a = V_i / K_i$ ,  $V_i$  being the value of the commodity to the recipient and  $K_i$  the cost to the donor.

At first glance, the above formula seems simple and relatively uncontentious. The problem comes in trying to attach numbers to it. For example, a commodity will have a different value depending on whether it is eaten as a substitute, eaten in addition to the family's regular diet, sold on the open market, or some combination of the three. Although it appears possible to determine whether food aid is resold to any significant extent and at what approximate price, it is much more difficult to determine whether the food consumed at home is in addition to normal food consumption or a substitute for it. The matter becomes even more complex when other factors are considered: Where fortified foods are substituted for nonfortified foods, for instance, can markets distinguish between the value of the two? Do markets even exist? What are the costs, in time and/or transportation of such transactions to food aid recipients?

Another potential problem is that in rural areas where a significant section of the population is receiving food aid, the price of a commodity, especially an unusual one or one normally consumed in small quantities, could drop dramatically if the recipients were to sell it on the market. In addition, food aid projects require consistency and stability in type and amount of food supplied. Both the value of the commodity to recipients and the cost to the donor may vary from year to year. Calculations of the alpha factor would have to reflect some form of expected average for the life of the project. And the value of commodities in recipient countries depends to a great extent on government policies in the particular country. Taxes, subsidies, and import controls all affect prices. These policies would have to be taken into account by donors. Thus, both the numerator and denominator of the alpha equation are volatile and reflect political factors as much as, if not more than, any concept of resource cost.

The greatest danger would be to use urban prices to calculate the value of a commodity being distributed in a rural area. In the example of income transfer most often cited, in Reutlinger's and Katona-Apte's 1983 World Bank study, this has indeed been done.

Analyzing food aid projects in terms of income transfer is an improvement in many ways over the narrow nutrition-oriented approach. It is doubtful whether, at the present time, the capacity to adequately consider all the necessary factors exists. Only two instances could be pointed to in which initial attempts have been made to estimate the alpha factor in the field, in Bangladesh and in China. Work in this area must be done if income transfer is to be put into practice. However, care must be taken not to end up with another form of project evaluation and commodity selection that is overly complex and debatable.

It should also be pointed out that if any one criterion of efficiency were to be used solely and systematically to shape food aid programs, they would look very different from the way they look today. They might well be more effective economically in the recipient countries; they would almost certainly be less effective politically in the donor countries. Donors should also be aware that implicit in the use of the alpha factor as a major criterion of food aid project design and evaluation is the acceptance that food aid is conceptually no different from financial aid, that there is no specific advantage to the resource transfer's being made in the form of food. Clearly, it would be ridiculous to take income transfer as the sole criterion. Nutritional suitability of the commodities included in food aid programs must also be taken into account.

Ultimately, the choice between using income transfer and impact on nutrition criteria, where they give different results, depends on the objectives of the particular project. To take an extreme example, is a commodity which is consumed almost entirely in the household, possibly because of an inability to resell it easily, and therefore a commodity which increases calorie consumption considerably, to be preferred to one which is easily sold, but where little of the resulting income is spent on food? The answer may well be different for a Food for Work project than for a supplementary feeding project, and may also differ according to the characteristics of target families.

#### B. Judit Katona-Apte

In order to calculate nutritional cost-effectiveness, it is necessary to establish whether the value of the distributed commodity to the recipient should be considered according to nutritional content or monetary value. This depends on a number of factors, such as the designated purpose of the program and how much of the food is consumed in addition to the recipients' usual diet. When food aid is consumed in addition to the usual diet, it should be selected for nutritional content; that is, the quantity of energy or of nutrients should be divided by the cost of the commodity to arrive at the nutritional value at the least cost. When food aid commodities replace other foods in the diet, it is best to provide commodities that re-

place other foods in the diet, it is best to provide commodities that replace foods of highest cost to the recipients, but in amounts equal to or below those usually purchased. In this case, the monetary value of the commodity to the recipient should be divided by the cost to the donor in order to arrive at the ratio indicating the transfer of the highest income value at the least cost to the donor.

The Bangladesh Vulnerable Group Feeding Project was designed solely as a nutritional supplementation program. The one commodity distributed, wheat, was consumed entirely in addition to the recipients' normal diet. Therefore, the nutritional content of the commodity selected for the program was of utmost importance. The evaluation indicated that wheat was, indeed, the most cost-effective commodity for food energy in this case.

In a related World Food Program project in Bangladesh, an on-site feeding project whose object was both nutritional supplementation and budgetary support for the Bangladesh government, wheat, oil, and pulses were being distributed. In this project, improvement in recipients' nutritional status would come mainly from the nutritional content of the distributed food. Very little would result from income transfer. Wheat oil and dried skim milk were found to be the most cost-effective commodities.

The World Food Program in China, on the other hand, was a wage and incentives-based project. Hence, monetary value of the commodities selected was the primary gauge of cost-effectiveness, though some of the food was, indeed, consumed in addition to the recipients' usual diet. The objective was to encourage participants in the program to increase production and consumption of animal foods, replacing coarse grains from their diet. Wheat, rice, and oil were being distributed; wheat was found to more cost-effective than oil.

The Indonesian Transmigration Project was an incentive program designed to improve the food supply through agricultural improvements. Monetary value was therefore the biggest factor in assessing the appropriateness of the rice, fish, dried skim milk, and pulses being distributed. The evaluation suggested that rice was more cost-effective than fish, that pulses should be eliminated, and that oil and sugar should be added to the program.

The Mother's Club program in Bolivia, also an incentive program, aimed at increasing the proportion of recipients' income spent on cooking fuel and nutrient-dense foods. Again, monetary value was the criterion most important in assessing the cost-effectiveness of the commodities involved. Wheat flour, fish, oil, dried skim milk, meat, and rolled oats were being distributed; wheat flour, fish, oil, and dried skim milk were the most cost effective.

### C. Conclusions and Recommendations

- In reality, most food aid programs function by increasing the income available to the household through the delivery of food and commodities.
- Currently, there are virtually no consistent criteria for selecting types and quantities of commodities for food aid projects. A new approach is recommended: one that selects commodities for food

aid according to their monetary value, or income transfer, to the recipient relative to the cost to the donor.

• The income transfer value of commodities should be maximized except when it can be shown that:

--A commodity with less income transfer value would increase the intake of specific foods and this tradeoff can be documented to be nutritionally beneficial;

--When all of the donated food is consumed in addition to the usual diet. (This is most likely to occur where there is a large energy gap.);

--When specific classes of individuals within the household are the only targeted beneficiaries, and there are means to insure that the donated food is consumed by those individuals; and

--When specific foods are needed for nutrition education purposes.

• The income transfer approach should be tested. Small, inexpensive, rapid reconnaissance type studies should be used and the following should be given priority:

--Use of the income transfer approach in project design, that is, selection of commodities for projects in the planning stage;

--Comparison of consumption impact of two commodity packages with the same nutritional content but different income transfer values within the same project;

--Comparison of consumption impact of two commodity packages within the same project in which the same income transfer value is derived from different commodity packages; and

--Further studies on measuring income transfer in situations where, a priori, one might expect difficulties in measurement, for example, in remote areas and in cases in which sales of the food aid are extensive.

## CHAPTER 4

### CATCH-UP GROWTH

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#### A. Hernán Delgado and Víctor Valverde

Infectious diseases, especially diarrheal diseases, have a great impact on the metabolism and utilization of nutrients. Not as much food is consumed. There is interference with the absorption of nutrients. Virtually all normal metabolic and endocrine functions are disturbed. And there is direct loss of protein in the gastrointestinal tract.

After an infection, nutrient-dense foods are needed for catch-up growth in children. Achieving good growth recovery is most critical in infants and preschool children, since so high a proportion of their energy intake is allocated to growth and physical activity. Due to inadequate nutrition, the children in developing countries cannot recover from infections, and the probability of new infectious episodes is high. The result is child growth failure.

The INCAP study tracked physical growth and mental development and their various biological and socioeconomic determinations in four small agricultural villages in Eastern Guatemala. The basic hypothesis of the study was that mild to moderate protein-calorie malnutrition adversely affects the mental development of infants and preschool-aged children.

To test the hypothesis, a high protein-calorie supplementation drink called "atole" was made available to two of the villages. The remaining two villages were provided with "fresco", a fruit-flavored drink containing no protein. Both supplements contained vitamins and minerals and were given twice daily, seven days a week. Participation in the study was voluntary and free.

As the project progressed and a need for medical care became apparent, a health care program was implemented, which, in addition to managing common diseases, was responsible for maternal and child care activities, including vaccination programs. The health care was integrated with the food supplementation activities of the project.

Data collection began in 1969. Examinations included anthropometry and were done every three months during pregnancy and lactation and in children less than 24 months of age and every six months thereafter. Morbidity surveys were done fortnightly.

The integrated food supplementation and health care programs had important effects on infant and child mortality rates and on physical growth. The food supplementation project led to an increase in birth weight and in weight and length in older children. This was more obvious in the beginning of the project. In addition, food supplementation had its greatest impact on children with low weight and length as well as on those who had suffered from diarrheal disease.

Health care and food supplementation can be integrated in a variety of ways. Food aid resources should be used to strengthen government efforts to bring primary health care services to the most deprived and isolated communities. This strategy was used successfully in Costa Rica in the last decade in the Rural Health and Community Health programs, and the health and nutritional consequences of linking food aid to an integrated health care program geared to those most in need have been well documented. Moreover, food aid can be used as a tool to promote the extension and use of medical care services in rural areas, particularly those whose inhabitants have not been exposed to modern medicine and are reluctant to take advantage of the services.

Food aid can be linked to integrated medical care services primarily through two types of programs: supplementary feeding schemes through the maternal and child care programs and Food for Work activities. However, in Latin America at least, Food for Work programs have seldom been linked to integrated efforts to deliver health services to deprived and undernourished populations. Most of the programs have involved road maintenance and construction and some agriculture-related activities. Food for Work efforts need to be directed towards strengthening the health infrastructure in dispersed rural communities. Potential activities include not only the construction of health posts but also, more importantly, the design of projects (including introduction of potable water, improvements in garbage and sewage disposal systems, and so on) to prevent the diseases which plague children in rural communities.

Better targeting of programs can also enhance catch-up growth. The means for this exist, particularly in Central America and other Latin American countries, where permanent information systems provide mapping and monitoring of the prevalence of malnutrition in even the smallest political-administrative units. Thus, better targeting of food aid and other nutrition and health programs by regions, sub-regions, communities, and within communities by families and individuals is feasible.

In addition, certain seasonal factors need to be taken into account in program design. In many developing nations, the peak of diarrhea and other diseases usually coincides with the months when less food is available. Both the coverage and amount of foods per participant in a program should be modified with this in mind. At the individual level, this would accommodate the additional demands of energy and nutrients of children suffering from diarrhea and other diseases during these lean periods.

There is a need to revise existing norms and procedures of food aid programs, including the criteria for selecting eligible children; instruments and interpretation of growth-monitoring curves; type, quantity, and quality of foods; length of participation in a program; criteria for graduation from a program; and follow-up of graduated children. The resulting increase in program efficiency would be reflected in catch-up growth in some chronically malnourished children, as well as in those who had recently suffered from acute infection.

## B. Conclusions and Recommendations

- Catch-up growth is defined as the process of recovery following an acute episode of infection or malnutrition and the longer-term process during which a poor previous history of growth is compensated for, resulting ultimately in a "normal" or near-normal body size. These processes can be followed in terms of weight, height, or body proportions (weight for height).

- Achieving good recovery growth is particularly important for the very youngest children, aged two years or less. The objective should be to insure that children regain at least their previous growth status after each infectious episode.

- Achieving compensatory growth would also be particularly beneficial to adolescent girls. During this period, accelerated growth is possible, given adequate food, and could lead to fewer complications during pregnancy, increased birth weight in their offspring, and more successful lactation.

- Working adults, both men and women, can also benefit by regained capacity for physical labor or by regaining weight lost, specifically muscle mass, after episodes of illness, food shortage, or seasonal imbalance between food supply and energy expenditure.

- Adequate food supply is not the only thing necessary for achieving catch-up growth. Food distribution schemes must be designed to complement other programs--health care, education, income generation, etc. Food aid can be seen as a catalytic and supportive element in a variety of schemes designed to improve family health and nutrition.

- A recognition that food aid is part of the development of the larger health system in the recipient country should be implicit in the donor-recipient agreement. A mutual recognition that potential food programs need to be ranked according to need with the highest priority being the provision of basic services for the very poorest is also necessary. Food donations can also act as an incentive to increase attendance at education programs for women and can be a means of increasing women's control over resources in the household.

- Special formulations of foods should be avoided. Although such factors as bulkiness and nutrient balance are important advantages of special formulas, they do not outweigh the disadvantages, including cost, level of technology, and the good chance that they will be usurped by wealthier sections of the population. Instead of special formulations, households should be provided with enough food so that the needs of under two year old children are met.

- The speed of catch-up growth depends upon the level of feeding, so it is necessary to know what level and duration of extra feedings will be most cost-effective. This will vary with the frequency and type of infectious episodes. It is not yet possible to define such dose-benefit relationships or to say how much more food needs to be made available to the household to insure a minimum acceptable level of benefit. Such levels need to be established in order that food aid not be spread too widely with small rations, resulting in a diminished nutritional impact.

- After illness, children need to be offered food more frequently and sometimes in a greater variety of forms and flavors than normally. This means that consideration must be given to the economic costs to the family of an increased level of child care during illnesses. Such costs would include loss of working time of women and a temporarily higher expenditure of income on a wider variety of foods as well as on fuels for cooking. All these suggest that some degree of income transfer is likely to have a positive effect on the nutrition of children.

- Program operators need to be more imaginative in using food aid in conjunction with other programs in order to bring about catch-up growth. Catch-up growth should neither be assumed nor left to happen by chance.

## CHAPTER 5

### PHASEOVER OF FOOD AID PROGRAMS

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#### A. M. C. Swaminathan

Many factors may be involved in the decision on whether to phaseover a food aid program. The nutritional status of the vulnerable segments of the population is one factor. The amount of surplus food available may not be keeping pace with the needs of developing countries; on the other hand, support for nutrition and other development programs in recipient countries may be increasing. The fact that the major cost of a nutrition program is for the food must also be considered, as should indications that to be most effective, nutrition programs should be integrated with health, education, income generation, and other efforts. Food production may be increasing in some recipient countries. There is also the fear that food aid to countries whose economies are based largely on agriculture may influence agricultural productivity and divert funds from food and nutrition programs to other sectors of the economy, making the population even less self-reliant.

Any decision on phasing over food aid should be made only after much deliberation and consultation between the donor and the recipient country.

A number of Indian groups involved in improving nutrition believe that supplementary feeding should be a short-term measure and that community self-help and self-reliance are the best long-term solutions to the malnutrition problem. However, since the cost of food is so high, if it were to cover the costs of supplementary feeding programs on its own, the government would have to curtail other development programs, and it is reluctant to do so.

Several studies in India have clearly demonstrated the value of bridging the food gap in preschool children with locally available foods early in life. The effectiveness of homemade recipes, particularly ready-to-mix ones, has also been demonstrated. Such studies showed that nutritious snacks, bakery products, etc., prepared locally and sold in rural shops could effectively supplement the diet of preschool children, while village cooperatives and industries involved in such efforts could create jobs. Studies did indicate, however, that poverty and lack of purchasing power were problems in such programs. According to one investigation, such economic factors were a big reason why mothers did not use weaning foods made from locally available foods and made available in the villages at cost price. For this reason, communities covered by supplementary feeding programs favor continuing the aid, even extending coverage. Such social and economic factors need to be kept in mind when policies designed to promote self-reliance are considered.

There are a number of factors likely to influence any decision on the phaseover of food aid programs in India. First of all, evaluations have shown that supplementary feeding programs often help reduce the prevalence of severe cases of malnutrition, and the political will for such programs exists. However, the emphasis is shifting from feeding programs alone to integrated programs including education, health care, and income generation. A system of community-based health and development workers makes possible the delivery of nutrition services under the auspices of primary health care. The goal is self-reliance through programs with staunch community support. This means that the community should have a say in the selection of who will receive food aid. There is also a recognition that different segments of the population, including industry, have an obligation towards the welfare of India's citizens. Also important is the fact that vast improvements in technology, management, and communication have led to increased food production in India in recent years. However, food aid is scattered and inadequate, malnutrition among the vulnerable sectors of the population is still widespread, and natural calamities like drought, famine, cyclones, and floods occur frequently, increasing the need for food.

There are basic principles to be followed when phasing over food aid. Discussion and decisions should be mutual and the emphasis should be on the interests of recipient countries. Together, donor and recipient countries should carefully consider the various factors influencing a decision to withdraw food aid and plan a program of phased withdrawal, allowing enough time for recipient countries to develop alternate resources. The focus of these programs should be the nutritional needs of only the most underprivileged groups. Local resources should be used whenever possible, with a view towards full self-reliance. Incentives for community participation should be built into the programs. In addition, a quick and efficient system for renewal of aid in emergency situations should be provided for.

A general plan of action for phasing out food aid programs in India could proceed in a series of steps, with each step reducing external program assistance by 20 percent. Government, the community, and industry would contribute to a development fund that would help cover the costs of the programs. The development fund would also be used to integrate the nutrition programs with education, income generation, food production, health care, and other efforts. A minimum of three to five years and a maximum of six years would be needed for such a phasing over process. The external aid agency would continue to monitor the programs so that in an emergency, aid could be continued on short notice and the programs would not be disrupted.

The government role in all this would be to link nutrition with human resources development and an overall development strategy. The government would have to commit itself to allocating resources to nutrition programs and to integrating them with education, health care, and related efforts, pooling resources where possible. The government would also stress community participation in these efforts as well as the social obligations of the private sector.

The community itself would be actively involved in monitoring and supervising the programs and in identifying beneficiaries. The

community would cover at least 15 to 25 percent of the cost of the programs.

The private sector would take advantage of government subsidies and incentives to meet the needs of the planned programs, including research, production, marketing, and distribution of cheap processed foods and the establishment of small-scale local industries to employ women and the needy. Industry would also contribute to the development fund.

The external aid agency would follow and encourage the government policy of self-reliance and provide technical help wherever necessary.

In phase one of the plan, all feeding centers would be screened according to socioeconomic and anthropometric criteria and a decision made on whether the prevalence of severe malnutrition were high enough to warrant a continuation of the program. It is estimated that this process, not now being used, could result in a reduction of nearly 50 percent in the number of beneficiaries.

In the second phase, efforts to integrate educational measures, monitoring, community participation, management services, etc., would be undertaken.

In the third phase, efforts would be concentrated on mobilizing resources for the development fund and planning ways to utilize it.

In the fourth and final stage, after a satisfactory level of self-reliance was attained, a phased program of withdrawal would begin.

#### B. Paul R. Crowley

"Phaseover" is the replacement of donated food commodities with locally procured commodities or the replacement of the program with one with an equivalent purpose, whether commodities are used or not. Moreover, phaseover does not necessarily mean that either the food or the program must remain the same, though retaining the same types of commodities in basically an unchanged program might in some instances be the preferred form of phaseover. Terminating food aid without replacing it with an equivalent program is not phaseover, but rather phaseout. The phaseover process, of course, could be initiated by either the donor agency or the recipient government.

Under what circumstances might a program be phased over? Food aid commodities are usually made available, along with other forms of aid, to help low income countries accelerate social and economic development. In principle, aid of all types should stop when some higher level of development is achieved. Project food aid, therefore, should not be considered perpetual and will eventually end in all countries, just as U.S. food aid has already ended in Brazil, Colombia, and elsewhere.

Currently there are no formal criteria to determine when food aid will be terminated. Achievement of a reasonably high level of development is one important factor. Termination of food aid might also be triggered by other factors, such as a lack of specific commodities, changes in program priority requiring diversion of commodities to other programs, or a determination by the recipient govern-

ment that it wishes to provide food commodities on its own. There has also been no systematic study of the process or the issues involved in the process of phasing over. In a hypothetical phaseover of a typical maternal and child feeding program, based largely on phaseover experiences in a number of low income countries, several issues should be dealt with.

The first issue that must be confronted is what changes in the program should be made when food aid is terminated. One option is to retain the same program and coverage and simply substitute foods procured with local resources. The advantages of this approach are that it continues actions that have evolved over the previous years and for which commitment has already been established. Disruption is minimized, as are efforts to develop a new type of program. The major disadvantages are that substantial additional funding from local sources is required, and a source of food commodities must be developed.

Another option is for the recipient government or agency to continue to fund the program at the same level it has been funding it before external aid was withdrawn. In this case, rations or the number of beneficiaries would have to be reduced. The program would continue without a major new financial burden on the recipient government. However, a major effort would have to be undertaken to identify acceptable changes in the program. The program would be substantially disrupted, and results achieved through past program development efforts would be dissipated.

The third option is to discontinue food inputs but establish a stronger health and nutrition education program to help alleviate malnutrition among the target group. The operation could continue without an increase or perhaps even with a reduction in funds. However, when food commodities are withdrawn, low income and malnourished children could be adversely affected, and a major program development effort would be required.

Each of the above options has been given serious consideration and/or has been adopted in some form by at least one country. But little is known about the reasons for the selection of a particular approach by the phaseover country. The commitment of the various countries to nutrition improvement and nutrition intervention has seemed to be an important factor. The relative effectiveness of the alternative programs has not been a factor, since information on comparative effectiveness was not--and is not--available.

The second major issue that must be considered when phasing over, assuming it has been decided to continue the same type of program and maintain the same coverage, and simply substitute foods procured with local resources, is how the additional funds will be raised to pay for the increased costs of the program. Additional funds could come from government revenues allocated to the program. Government financing is a simple, relatively reliable source of funds that does not impose a financial burden on recipients or discourage either participation in the program or use of the food. However, the funding authority must be highly committed to the program. In addition to government subsidies, funds could also come from recipients. Since this option would place less of a financial burden on government, government approval would be more easily obtained. Unfortu-

nately, this option would tend to discourage the most needy from participating in the program.

Adding the cost of food more than triples the cost of a food program to the government of a developing country. This is probably within the funding capability of any country, particularly one that has moved up the development ladder. However, accepting this extra burden in light of the many other needs of the country is not an easy decision, even if failure to do so jeopardizes the program. Consequently, several countries have sought to obtain at least partial payment from some of the recipients by selling the product, sometimes at a subsidized price. Little is known about how much of the cost can be passed on to participants without severely damaging the program.

A third issue, assuming the government decides to pay for the food directly, is how much and what kind of food commodities should be provided. One option is to provide the same kinds of food in the amounts that were being provided. This would cause minimal program disruption; food aid commodities are simply processed foods that can be produced easily in any country. On the down side, importation of vitamins, minerals, and, possibly, certain ingredients, such as the protein supplement, might be required. And this option would not take advantage of the potential benefits of using other food commodities preferred by the local population, nor of using less expensive or more nutritious foods. That, however, would require a substantial effort to determine the optimal amount and kinds of food to be used.

Typically, the amount and kind of food selected for phaseover programs has been similar to that provided through food aid. Some countries have developed special foods designed to cater to local tastes and to utilize local ingredients. But the relative nutritional impact of these foods, compared to food aid commodities, is not known.

A fourth issue in phaseover programs is who should produce the food commodities. A special organization could be established by the government to operate a facility constructed and owned by the government. In this case, food production could be closely controlled by the government. On the other hand, governments are not believed to be as efficient as commercial organizations in manufacturing operations. Another option would be to have commercial food processors working under contract to the government. This might help minimize the cost of food products, but the commercial organization would be dependent on government demand and government contracts.

Almost all countries interested in local production of commodities for feeding programs have sought the participation of either public or private sector food processors in the building and/or operation of the factories. Potential problems have been avoided by having the government own the production facilities while the commercial sector organization operates them under contract to the government.

A fifth issue is what responsibilities the recipient government, as well as the food aid donor, have in connection with phaseover. Both parties have certain responsibilities. For example, the donor agency should be responsible for notifying the government far enough in advance of reduction or discontinuation of food aid that

reasonable, non-disruptive steps can be taken to implement the phase-over. The recipient government is unquestionably responsible for its own programs, knows that food aid will eventually be discontinued, and therefore should probably not undertake programs it is not prepared to terminate or phaseover.

The phaseover of food aid programs can be an extremely complex process involving many difficult political, budgetary, and technical decisions. Programs vary, and information on alternative programs is likely to be minimal, so a "phaseover cookbook" is improbable. However, a number of actions might be taken to expedite a more rational and orderly phaseover. Guidelines to identify when termination of food aid is likely to occur need to be developed as well as a formal understanding of the responsibilities of the donor agency and recipient country when food aid is terminated. While a phaseover "cookbook" seems unlikely, an options document or checklist would make phaseover countries aware of the program, commodity, funding, administrative, and other options open to them and the likely consequences of exercising those options. Ways to insure an eventual smooth phaseover need to be incorporated in the design of food aid programs.

### C. Conclusions and Recommendations

- Phaseover is inevitable as the priorities of projects and countries shift and the needs of regions and communities served by food aid programs change.
- From the very beginning, project designers should identify the ways phaseover should be brought about. This should also be taken into account in the monitoring and evaluation of the project. Phaseover provisions should be applied, too, to ongoing projects which originally did not have them.
- Enough time should be allowed for phaseover; the precise amount of time will differ according to the countries, projects, and specific situations involved. Projects in the least developed countries will require the longest phaseovers.
- To facilitate phaseover, the project should be made an integral part of programs of the country aimed at increasing productivity, income generation, and overall development.
- Governments, the community, and donors need to work closely together to plan and implement the phaseover process.
- The selection of food commodities should take into account the food habits and cultural practices of the participants in the program as well as the ability of the country to produce more foods.
- The community should be involved in all phases of projects: initial planning stage, implementation, evaluation, etc. This will generate community support and insure that the phaseover of projects is effective.
- Institutional arrangements should be strengthened for effective community participation. It is especially important to recognize the special role of women.
- Community participation could also be strengthened if beneficiary families were to contribute both money and services to the

project and if income generation activities were encouraged at the community level, particularly among women.

- Phaseover would also be facilitated if industrially processed weaning foods were replaced by homemade preparations based on locally available foods.

- Money saved through effective targeting of supplementary feeding programs could be used to help ease the phaseover process.

- Governments of recipient countries need to be politically committed to nutrition programs if adequate financial resources are to be made available for the phaseover of the projects. Ways to encourage political commitment should be part of the phaseover strategy.

- An inventory of options for the design of phaseover of food aid projects should be drawn up under the auspices of ACC/SCN.

## CHAPTER 6

### EVALUATING FOOD AID PROGRAMS

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#### A. John Haaga and John Mason

Whereas "process" evaluations answer questions like "Is enough of the right food getting to the right people at the right time?" and "adequacy" evaluations go beyond these to look at gross program outcomes and to address such questions as "How are the children in the program doing?", impact evaluations attempt to ascertain the next outcomes of programs, or how much improvement or deterioration in participants' nutritional status can be attributed to program activities.

Participants in the Cornell Nutritional Surveillance Program (CNSP) workshop did not feel there was much point in doing impact evaluations for large numbers of projects since they are so complex and the commitment of staff time and other resources required to produce plausible estimates of impact is formidable. Impact evaluations, as opposed to more routine types of evaluation, also generally require resources from outside the program. The results are often more useful for setting policy for future programs than for making the program under examination more effective. Nevertheless, workshop participants agreed that impact evaluations can produce reliable information and that a select few of them need to be done if public and private aid agencies are to achieve their goals.

Impact evaluation can be seen as a continuum, ranging from "gross outcome" evaluation, which can lead only to very tenuous guesses about the impact attributable to a program, to the classic double-blind trial with random assignment of subjects to treatment or control groups, which would lead to very solid inferences about impact. As one proceeds toward the latter, the plausibility of inference, the difficulty and complexity of the study in the field, as well as its costs, all increase. Evaluation planners need to reach a compromise between level of plausibility and difficulty and cost.

The level of plausibility needed depends on what the evaluation will be used for. A high degree might be necessary for a government with severe budget constraints that wanted to be sure a program had large enough benefits to justify taking over its financial burden from an international agency. Funders from international agencies themselves might need almost this same level of plausibility to decide whether or not to continue a program or whether to expand it. On the other hand, a less complex adequacy evaluation would suffice for interim funding or routine management decisions.

Although a number of designs have been used in impact evaluations of supplementary feeding and other types of health care and nutrition programs, there are basically two types of design. The first involves the type of comparison being made: program participants vs nonparticipants, longtime participants vs those who have participated

for a shorter time or less intensively, participants before and after the program, longtime participants vs new entrants or a combined strategy of before-and-after comparisons for those with and without programs. The second type of design involves the units being compared: individual participants (vs other individuals) or communities in which programs operate (vs other communities).

The first type of individual-level comparison, between participants and nonparticipants, measured either at one point in time by a survey or over time by means of growth records, is usually vitiated by the "self-selection" phenomenon. For example, children brought first, or most often, to the program, may be those with the most concerned parents or guardians, or those whose parents have enough time to attend to their needs, or those whose parents are the most adept at using public services. These children would tend to be better off than nonparticipants, even without the program. On the other hand, if a program is locally considered one to cure ill children, or if there is a social stigma attached to participating in the program, those who receive supplementary feeding may tend to be children with acute or chronic illness or members of social outcast families or broken homes. Comparing their health and growth with those of the more fortunate nonparticipants would tend to obscure a beneficial effect, if there were one. These social and economic variables, known as "confounding" variables, are not easily measured, but they must be taken into account.

Comparisons between program and non-program communities are subject to similar effects, though perhaps to a more manageable degree. Communities may "select themselves" for a program by having more active and efficacious leaders or just by being more accessible geographically; in either case, they are more apt to have better access to health care, sanitation systems, potable water, income-enhancing public services, etc., than those in non-program communities. Also, it is sometimes hard to distinguish program from non-program communities: individuals may travel from one place to another to participate (or if supplementary feeding is really valuable, as it is in a food crisis, even relocate).

Similar disadvantages are involved in comparisons of individuals and communities that have long or intensely participated in a program with those that have participated for a shorter time, to a lesser degree, less frequently, or with long interruptions. Again, the problem is that length, frequency, and continuity of participating in the feeding program are likely to be related to other, unrelated individual and community characteristics affecting health and nutritional status. However, this multifaceted design may be stronger than the simple with-vs-without design. As in the two previous designs, a very careful attempt to measure and estimate the effects of confounding social and economic variables would have to be made.

"Aging" or maturation factors are a problem for any designs that call for comparing children of different ages. For example, the children who have been in the program longest may simply be older than those who have been in a short time. The problem is that low scores on various anthropometric tests are more common at some ages than others; children's scores may improve or deteriorate simply because they have passed from one age group to an older one, not because of a positive or negative impact of the feeding program. Care must be ta-

ken to compare children of similar ages or to compare children's weights or heights to what would be expected locally, given their age at time of measurement.

Before-and-after comparisons are also difficult when there is screening into a program (for example, when children are eligible only if they exhibit low weight-for-age) or graduation from a program (when children are no longer eligible, for example, if they have gained weight satisfactorily for several months). In such cases, participants in the program are by definition a select group, not representative of the entire community and not comparable to nonparticipants for the purposes of estimating impact.

Both individual- and community-level before-and-after comparisons are subject to the problem of secular trend, or changes affecting health and nutrition that are not related to the program. There might be steady improvement or deterioration in standards of living, hygiene, and health care, or even rapid changes due to new employment opportunities, natural disasters, or wars. All of the above would make the before-and-after comparison an unfair test of program impact, unless the effects were measurable. The longer the period between first and last measurements, the more secular trends are likely to account for observed changes. Incorporating comparison communities into the study design helps estimate the secular trend, as well as comparing mortality rates, growth data, immunization coverage, etc., in study areas with any available provincial or national data covering the same periods.

A combination of before-and-after and with-and-without-program designs avoids many of these problems. Two groups of individuals or communities are measured in a base line survey--those that will and those that will not participate in the feeding program. These groups must be as similar as possible in all other respects. Unless these other factors change unexpectedly in one but not the other group, differences in nutritional status that emerge during the life of the program can reliably be attributed to program activities.

A major difficulty with this type of design is that it is often infeasible, administratively as well as politically, to keep a group of individuals or communities unserved by the program for the length of time needed to observe differences in children's nutritional status. If the non-program communities are too close to program communities, a valid comparison may be impossible, since people in non-program communities may not only benefit directly from the program but also indirectly through, for example, the spread of health and nutrition knowledge. When a program increases the food supply of a participating community, it will also have an impact on surrounding communities as supplies increase and prices fall. If these problems are avoided by choosing comparison groups far apart geographically, then the groups may differ in too many other respects.

Such considerations often lead to a sort of compromise course--staggered implementation of a program. Rather than keep some communities unserved for years, socioeconomic conditions and child health and nutritional status are measured in each community as the program expands to it, then remeasured in later years. This allows a kind of with-vs-without comparison (the communities just entering the program being the "withouts") and also a comparison of communities served

longer with those in the first or second year of a program. Secular trends can be estimated by observing the changes in new entrants over time. The major problem with this approach is if the communities first enlisted differ systematically from those later enlisted in ways likely to affect nutritional status. Again, it is important to account for all such confounding variables.

The "unit of analysis", either the community or the individual participant, is important. Self-selection is the chief difficulty with the individual-based studies. Also, it may be difficult to assign individuals correctly to the groups being compared; children not counted as participants may actually be benefiting from a supplementary feeding program if their family members or friends are participants. Screening into a program or graduation from it are additional problems of individual-based studies.

Sample size is the problem with community-based studies. This is because communities differ in many ways affecting child health and nutritional status that are unrelated to program participation. The program and non-program groups must either be comparable in terms of existing health services, diets, housing quality, family income, etc., or else there should be enough variation in these within each group to enable researchers to sort out the effects of the program from those of the other factors.

If the relevant characteristics of communities were all measurable and known before a program was implemented, the number of communities required to assure comparability in the analysis would be relatively small. However, field trials with small numbers of replicates suggest that matching in advance is so imprecise that larger numbers of communities (say, tens in each group) are required. Analysis of data from program and non-program communities is likely to include such individual characteristics as the age and sex of the children, plus birth weight or weight upon entry in a program; family characteristics such as income, housing quality, the quality of the household water supply, etc.; and community characteristics, notably the availability of the program. The "effective sample size" for such analyses is somewhere between the number of individuals and the number of communities--exactly where depends on the relative degree of variation in nutritional status within the community and variation among communities. The most effective way to increase the validity of the sample is to increase the number of communities, not the number of children in each community. In the national nutrition surveys sponsored by the USAID Office of Nutrition, generally less than thirty children per community were studied.

Evaluation studies can also be classified according to whether they employ prospective, retrospective, or a mixed strategy for data collection. Prospective studies are those in which data collection begins before the program itself. Retrospective designs call for retrieval of data some time after the event or measurement; for example, by collecting information from growth cards. Mixed strategies might use prospective methods for some variables or sub-samples and retrospective methods for others. A retrospective data collection strategy is sometimes appropriate, but it should not be confused with belated planning of an evaluation study. Evaluation design, to be effective, must be a part of initial planning of the program.

Another type of evaluation, the "case control" study, was also discussed at the CNSP workshop, but opinions differed on its usefulness. In this design, subjects with a certain condition are sought, either by screening or by a search of records, then matched with otherwise similar subjects without the condition. The two groups are then compared for the presence of one or more "risk factors". Theoretically, this could answer a question such as "How much does past or current participation in a feeding program affect the odds that a child is malnourished?". It could not estimate the prevalence of the condition in the community, nor remove other problems associated with individual-based comparisons. Subsequent discussions at Cornell suggested that this design might be appropriate when the condition being studied is relatively rare in a community (for example, xerophthalmia or child mortality) since the economic advantages of case-finding as opposed to household surveys would then be greatest. However, the approach is not generally appropriate for evaluations of feeding programs assessed by measuring child growth.

Given the importance of obtaining accurate estimates of the impact of selected programs, as well as the difficulties involved in obtaining them, workshop participants recommended that detailed feasibility studies be done before resources are committed to major evaluations. A feasibility study should first propose specific audiences for the evaluation, determine questions to be answered, then make recommendations on the need for a particular study and the level of effort required. A feasibility study should also include a preliminary process evaluation, since if such an evaluation indicated problems, it would be unlikely to be worth trying to evaluate impact. Concentrating on management and logistical issues would make more sense. A feasibility study should also consider possible evaluation designs, in addition to the data needed to figure in confounding variables. If there is not enough data on the confounding variables in a particular program, it is a poor candidate for intensive impact evaluation.

The control of confounding variables is a crucial task in both the design and analysis of impact evaluations. A confounding variable can either exaggerate or understate the true impact of a program.

To address problems of noncomparability between program and comparison groups and other common areas of confounding, data on specific variables are needed. Common potentially confounding variables relate to the community (for example, the availability of potable water), the family (socioeconomic status, for example, or the education of the mother), the child (sex, age, birth order, immunization status, etc.) and such "temporal" factors as the season of the year in which data are collected. Many of these variables are always important and can be specified for collection in advance. Others are unique to the country or situation.

The self-selection bias is an important cause of noncomparability of groups, and designing a program to minimize the effects of self-selection does not guarantee that it will not occur. In the evaluation, therefore, bias introduced by self-selection should be assumed present and data produced to demonstrate otherwise.

Reasons for withdrawal from a program--dropping out of a program, graduation from a program, and mortality--must also be taken

into account when comparing groups. To assess the comparability of withdrawals and remaining participants in the analyses, the last available anthropometric measurement for withdrawals should be compared to those of children remaining in the program. Differences indicate the likely direction of bias.

When groups of children of different ages are compared, little can be done to assess the potential bias introduced by the "aging" factor. When a cohort of children is followed through time and the effect of a program is measured as the difference in nutritional status at entry compared to a later date, such bias can be analyzed and accounted for.

To insure that either an improving or declining secular trend is not confounding evaluation results, data from national surveys or other independent sources (on nutritional status, infant or child mortality rates, etc.) should be presented. Where they exist, seasonal effects are often strong and can seriously bias evaluations. Simple before-and-after comparisons are particularly susceptible to bias if measurements are made at different times of the year. Height-for-age measurements are less sensitive to seasonal effects than weight-for-age. Young children are also more likely to be affected than older children.

So-called information bias is often a problem in evaluation studies when data are being collected for purposes other than evaluation and therefore cannot be "blinded". The most common problems are misclassification bias and bias in reporting of age.

Misclassification bias is a potentially serious problem when criteria are used to determine eligibility for a program, as is often the case. When misclassification is inadvertent, or random, and cutoff points for nutritional status are used, using means instead of prevalences will reduce the magnitudes of error in the analysis. When children not meeting entry requirements are allowed into a program and deliberate misclassification occurs, the problem is more serious and may result in an overestimation of program effects. If the original data on weights, heights, and ages are available, they can be examined to see if "clumping", that is, large numbers of children falling just below the cutoff, is occurring.

Measures can be taken to check potential bias in age reporting. As a general technique, the date of birth should be asked as well as the child's age, and these should be checked against each other. The age distribution of the sample can be compared to the known age pattern of the area or country. Where misreporting is high, weight-for-height or measures of growth velocity could be used. Data on a second indicator of nutritional status should be collected and used as a confirming indicator.

"Regression to the mean" is always a problem when individuals are screened for participation in a program. It refers to the tendency of individuals allowed into a program on the basis of a low initial anthropometric score to have higher scores the next time they are checked. The first score may have been unusual due to random errors in measurement or random fluctuations in weight or height themselves. One way to deal with this is to have a control group with comparable initial anthropometric scores; another is to remeasure the entire population originally screened and compare the two population means. Additional research in this area is needed.

What kind of measurements, or "indicators" should be used to determine the impact a program is having? The choice of indicator depends on the purpose of the evaluation and the goals of the program. The ideal indicator would also be accurate, easily and cheaply collected, useful for program management, and responsive to changes in nutrition status.

Anthropometric measurements were emphasized at the workshop. The decision on which anthropometric indicator to use depends on a number of factors, including the nutritional status of the population before intervention and ease of measurement. For example, height is sensitive to long-term impact and less sensitive to seasonal factors than weight, but it is more difficult to measure accurately. For this reason, it should probably not be used in routine data collection in a clinic setting, but might be part of special surveys done periodically to assess impact. Values of weight-for-age, height-for-age or weight-for-height can be expressed either as percentages of a standard value (the median of a reference population) or as centiles or Z-scores, showing where the measured child would "fit in" to the distribution of the reference population. Each has advantages and disadvantages. Another method of analysis, using standardized residual scores, has been used at Cornell and found to be a more sensitive indicator of mortality risk and of inter-group differences than the more familiar percents of median or Z-scores.

Estimates of mortality were considered useful indicators in some studies. On the other hand, morbidity was considered generally a poor measure of the effects of programs since evidence suggests that food supplements do not affect the frequency of disease, only the severity. When nutrition education is an important part of the program, measuring changes in behavior can be useful. However, biochemical and clinical indicators are too expensive and complicated to collect and measure. Economic indicators, such as family food expenditure, could be useful but should not substitute for more concrete measures of nutritional impact. Quantifying the nutrient intake of an individual is very difficult and expensive and should be done only in very specific situations, such as when a particular nutrient problem is of interest, for example, Vitamin A deficiency.

Adequacy evaluations of feeding programs should be concerned not only with gross outcomes of programs but also with coverage (the percentage of the malnourished in program communities participating in the program) and with reasons why intended beneficiaries are not participating or are dropping out. Workshop participants also suggested that adequacy evaluations should be part of nearly all programs and need to be included in program design from the start. They, too, should be preceded by feasibility studies. Growth card data can be used to assess the health and nutritional status of children in the program.

While the emphasis in the discussions of impact evaluation was on anthropometric indicators of outcome, for adequacy evaluation, other, intermediate indicators were also considered important, for example, the value of a food supplement as an income transfer and the effect of program activities on women's time.

When adequacy evaluations indicate problems, some of the questions that must be asked are: What are the program's unintended con-

sequences? Is the program appropriate for this population? Were the indicators used to measure or approximate outcomes appropriate ones? Is the program targeted to those who would actually benefit most?

## B. Conclusions and Recommendations

### Objectives and Outcomes:

- Project objectives are too often vague or unstated, or, if stated, unrealistic and infeasible to achieve or measure. Early on, there must be agreement on outcome indicators, or measures of the effects of the program. Better project design would follow. This is true not only for impact evaluations but also process evaluations and effect monitoring.

- It is important to choose outcome indicators that can accurately measure change in the health of children--the objective of feeding programs. Moreover, agencies should develop practical methods of monitoring mortality trends in areas where such information is currently incomplete or nonexistent. New ways to monitor morbidity trends in project areas, especially for diarrheal diseases, should also be developed and tested.

### Built-In Monitoring:

- Some monitoring and evaluation should be part of every food aid project and should be designed to answer, on a fairly continuous basis, basic questions about the planned flow of inputs and outputs and the achievement of a project's intended effects: Did inputs get delivered and planned activities take place? Did the project reach the right people? In child feeding projects, are the children doing as well as expected?

### Impact Evaluations:

- Impact evaluations, or in-depth investigations of how and to what extent project inputs, outputs, and activities have caused observed changes in the outcome indicators, are necessary. However, cost and technical requirements necessitate that they be undertaken only on a select basis and be well planned and designed. These are not routine evaluations. Impact questions should not overshadow other evaluation questions tied more specifically to project design and management.

- Impact evaluations should not be undertaken unless some minimal criteria have been met. For example, the project should have succeeded in doing what was planned in terms of input and output delivery. Adequate base line data must exist. And both donor and recipient should agree that such an evaluation is necessary.

### Special Studies:

- Both donor agencies and the governments of participating countries require more information in some areas. For example, more information is needed about the use of food aid as income transfer, about the effects of projects on infant feeding, etc. Agencies should encourage both the synthesis of existing information and, where warranted and feasible, research on such key issues. Interagency cooperation appears to be particularly important for this.

Other:

- From a substantive standpoint, the information that donor agencies and participating governments need for evaluations does not differ much.

- Evaluation must be integrated in the appraisal and design stages of food aid projects more often than has been the case. A project that is not designed to be evaluated cannot be evaluated.

- Agencies should involve governments and local institutions as much as possible in the evaluation process. Evaluation should not be seen as an imposed "donor activity".

- The most underutilized source of information for evaluations is the project beneficiary himself or herself. Managers should try to tap this source of information more extensively and effectively through person-to-person contact and survey research.

- A two-way flow of information on a continuous basis is needed if information from monitoring and evaluation is to lead to smoother-running and more effective programs.

## CHAPTER 7

### NUTRITION EDUCATION

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#### A. Marcia Griffiths

Nutrition educators promise the sky--increases in knowledge about nutrition, changes in attitudes and daily practices, and, ultimately, the nutritional well-being of those who have learned and applied the knowledge. However, just as it has been difficult to document that food aid has made a difference, it has been difficult to prove that nutrition education has been effective. This has been especially true of nutrition education in maternal and child feeding programs.

Some programs have made a difference. The evaluation of Morocco's nutrition program showed that the nutritional status of children in the program was better when the program combined education and food than when the program consisted solely of food distribution. Anecdotal evidence from breastfeeding promotion programs with strong communications components, mostly in Latin America, indicates that the trend away from breastfeeding can be halted. In Brazil, it has even been reversed. An Indonesian pilot project based solely on nutrition education demonstrated improved nutritional status in children under five.

The success of these projects is proof that new approaches to nutrition education must be sought, and there must be a greater openness to experimentation if the assistance is to be more effective.

One important aspect of any new approach is to combine education and feeding. Planners have traditionally divorced the two, seeing the options as either a preventive/educational program or a curative/feeding one. Moreover, if nutrition educators were a part of early planning, their research could help to structure feeding programs and address common problems like low participation and food targeting.

Over the years, nutrition educators have seen that food patterns can change in response to fluctuations in the economy and to the enticements of commercial marketing. The late 1970s saw a desperate attempt in the nutrition community to compete with commercial forces by mimicking commercial slogans and catchy jingles. While these efforts often caught peoples' attention, they did not lead to meaningful changes in behavior and improved nutritional status. The reason was that the newfangled messages were still conveying the same old theories about the nutritional value of "The Four Food Groups", etc. The result was mothers who could repeat the theories but who did not have an inkling about how to feed children when they reached the weaning age, failed to gain weight, or succumbed to diarrhea.

The beauty of the social marketing approach is that the nutrition-educator-turned-social-marketer can create a program based on consumer needs and desires rather than applying the same technology or solution

everywhere. During project planning, the nutrition educator of old specified the number and type of materials needed--often without ever setting foot in a village. And, when faced with a problem such as poor nutritional status among weaning-age infants, he or she used standard nutrition messages calling for more eggs, milk, and liver. Today's "social marketer" does not automatically recommend a specific weaning food, nor a radio program, nor flipcharts before exploring with project participants the feasibility of different solutions and their willingness to change harmful practices or adopt new ones.

During the past several years, the social marketing approach has been tried in a number of nutrition programs--the most notable of which are Brazil's breastfeeding promotion program and Indonesia's nutrition education program.

The principal features of the Indonesian government's Family Nutrition Improvement Program, begun in 1974 and intended primarily for children under five and pregnant and nursing women, are a monthly weighing program and a trained corps of volunteer nutrition workers to provide nutrition education, ORS, and referrals to the health centers. In 1977, the Ministry of Health set aside part of the World Bank's nutrition loan to establish the Nutrition Communication and Behavior Change Pilot Project in five subdistricts of three provinces (Central Java, South Sumatra, and the Special Territory of Yogyakarta). The objective was to test various communications techniques that might accomplish the national nutrition program's goal of achieving household-level changes in feeding practices to improve nutritional status.

The evaluation of the pilot project four years later compared households in the pilot areas with those participating in the normal nutrition programs in neighboring areas. It found that project children consumed more of the recommended foods than comparison children, that children and nursing mothers in the project had a significantly higher protein and calorie intake, and that children in the project sample grew significantly better than comparison children after five months of age.

In addition, not only did project mothers score higher on knowledge of nutrition, but the scores of those with less formal schooling, who normally have less well nourished children, were equal to those of the better educated mothers, indicating that the project met its special objective of reaching the population most at risk. Moreover, kaders were able to reach more mothers and children. The social marketing approach to the tasks of concept development, message design, and media planning made the difference.

The hallmark of the social marketing approach is flexibility and responsiveness to attitudes of the target population toward a set of problems, including the more subtle "resistance points" that often thwart educational efforts. In the Indonesian project, mothers were repeatedly consulted during concept testing, materials pre-testing, and tracking studies. Regular consultations with field staff and kaders were equally important in insuring the project's effectiveness by keeping it continually responsive to new developments.

In the first, or concept testing, phase of the project, the major nutrition problems were identified by project managers through

nutrition and health surveys. Project workers adapted commercial marketing's concept testing approach--the trial of ideas and products with the intended audience--to determine what changes mothers might make in feeding practices to improve infant health and any problems they might have with making such changes.

In each subdistrict, two villages were selected, a total of ten villages out of 60 in the project, to participate in this initial concept testing phase. The community conducted a "self-survey". All children were weighed and their weights were charted on a single community graph. A community meeting was then held to discuss some solutions to problems identified in the survey and to announce that more intensive household surveys would be done. Central level staff met and developed a question guide based on the solutions that mothers and others had proposed. The question guide was not a questionnaire with precoded responses but rather was structured to stimulate discussion and to explore the experiences of mothers in greater depth. Each guide contained four parts:

- a set of demographic questions,
- a "topics" sections addressing a specific problem,
- a "food recall" section, and
- a "behavior trial" section oriented toward improving specific practices.

In each province, a small team of investigators, all of them women, was hired and trained. The investigators lived in the villages where they worked. In each of the villages, the families for the investigation were selected because they included a pregnant woman, a nursing mother, a malnourished child, or a child with diarrhea, preferably under the age of two. A total of 330 households participated. No more than two relevant topics were addressed in a household.

In the household, the investigators weighed infants to confirm that their classification in monthly weighing records was correct, then used the question guide to probe one or two topics in an informal, leisurely, conversational manner. A 24-hour dietary recall was done next.

At this point, the interview departed significantly from the conventional household survey. Based on the age of the child and the outcome of the dietary recall, the investigator worked with the mother on particular dietary changes that would improve her own or her child's nutrient intake, taking into account the ingredients the mother had in the house, her ways of preparing foods, and her own recipes. Before leaving, the investigator promised to return in three to four days and asked the mother to continue to try whatever activity they had agreed upon. When the investigator returned, invariably the mother had modified the recipe to suit her needs and had some comments or questions. This opportunity for "product development"--for trial, adaptation, and retrieval--in the mothers' homes was one of the most important elements of the process. It was social marketing's adaptation of commercial product testing.

At the end of this initial phase, project workers had a comprehensive picture of current attitudes and practices and of the rural mother's openness to altering them. They knew which feeding practices were most susceptible to change and how to translate this knowledge into messages and materials.

Concept testing had also brought into sharper focus what marketing experts call "audience segmentation". The mothers were "segmented" by their concerns, which changed along with the age-related dietary needs of their children. Weighing sessions provided the opportunity to make audience segmentation come into play. The weighing session is ideal for the precise delivery of the precise message to the precise mother at the precise time of her precise need for the instruction. This is social marketing's primary tactic: the focus on priority need when, where, and for whom it is essential. All extraneous factors are minimized.

Concept testing also provided the opportunity to find out the mother's primary sources of information, including the impact of the mass media. For example, it was learned that mothers in Java did not listen to the radio as much as had been thought. Having designed a significant role for radio, planners found it necessary instead to rely to a greater extent on the kaders and to design special "action posters" for them to use.

The seven individual messages for each audience segment were translated into traditional short radio minidramas. The action posters, on the other hand, were a radical departure from the traditional poster. They were designed to encourage audience involvement several times a day in much the same way that radio intrudes into audience awareness simply by repeating the message. For instance, the action poster used by kaders to instruct mothers of infants five to eight months of age to breastfeed from both breasts and to feed a specially developed weaning food four times a day consisted of illustrations and a "scorecard" for the mother to mark or pierce each time she completed a prescribed feeding. The 30 vertical boxes under each illustrated action allowed space for a month's "scoring".

The action posters and radio spots were tested with both the kaders and the mothers after they were developed. This testing showed that only minor modifications were necessary. Most importantly, the testing pointed up special training needs of the kaders. They were trained to use the posters in conjunction with the weighings and the maintenance of growth charts and to give mothers only the posters relevant to their own or their children's needs. Kaders were also instructed on the proper weighing procedure, on how to use the growth chart, and how to conduct home visits. This practical focus in the training of kaders is credited with their superior performance compared to that of their counterparts in non-program areas.

Monthly reports from the villages and monthly meetings of kaders with field staff kept project headquarters informed of developments. And management's decision to allow local adaptations in the project prevented the rigidity that often discourages field personnel. The suggestions of kaders and field staff were considered and implemented, contributing not only to better morale but to a more responsive program.

The cost-per-beneficiary in the project was US \$3.94, the lowest of six nutrition projects assisted by the World Bank. If the project were to be expanded to more areas of the country, the annual cost would be even lower, about US \$2.05 per beneficiary (compared with US \$20.00 to \$50.00 per beneficiary in feeding programs). Based on the Bank's cost estimates and the finding that 40 percent of the chil-

dren in the project were growing better by 24 months of age than children in the comparison sample, the cost per child with nutritional status improvement was US \$9.85 per year for the pilot project and would be approximately US \$5.13 per year for an expanded program, figures that indicate nutrition education programs can be among the most cost-effective.

However, many food program planners are resistant to the social marketing approach. Many maintain it is too time-consuming, others that it is too costly. Still others balk at the need for specialized expertise, and some are uncomfortable with such a behavior-change orientation. To help overcome these attitudes, Manoff International persuaded planners in the Dominican Republic and Ecuador to test the approach used in Indonesia, making some adaptations to allow programs to proceed on a limited budget. In both programs, the principal focuses are infant feeding and dietary management during episodes of diarrhea; hygiene, maternal nutrition, and specific nutrient deficiencies will be addressed in later phases. Both have reduced the length and thus the expense of the concept testing phase by combining focus group interviews with the in-depth individual interviews used in Indonesia. Time-consuming individual interviews are used only to verify what is learned in the focus groups. In addition, in both the Dominican Republic and Ecuador, the media plan is being implemented in stages. The development of individual counseling materials has been the first step; materials for group discussions and for radio spots will come later.

There are a number of steps agencies can take to foster the social marketing approach to nutrition education in connection with food aid projects.

1. Agencies should encourage program planners to recognize that a strong educational component can help to overcome the common problems of food aid programs and can also help to avoid unwanted outcomes, such as the decline of breastfeeding.
2. Agencies should work towards instituting a policy that every program will have an educational component that is undertaken seriously and systematically, not fulfilled simply by printing pamphlets and posters designed in the program's headquarters.
3. Key program managers should be brief about the process of developing a communications component so that they are aware of the key decisions that must be made and can monitor the work.
4. Agencies should make special funds available for development of a communications component that can be obtained without a proposal that specifies the number and kinds of materials to be produced. Such specifications only lock field personnel into a plan that may not be the most appropriate.
5. Agencies should aim for continuity in technical assistance, since most programs will need periodic guidance at a number of different stages.

## B. Conclusions and Recommendations

● A new approach to nutrition education in general and to feeding programs in particular is needed:

- improve practices that affect nutritional status at the household level,
- make programs more attractive to families, creating a demand for services and thereby increasing participation,
- increase the prestige and credibility of program field personnel,
- assist in overcoming problems of food targeting by altering a food's image.
  - Nutrition education should always be an integral part of feeding programs.
  - The education aspect should be designed and budgeted at the planning stage of feeding projects.
  - "Nutrition education" may be a limiting concept. Project planners should think instead in terms of the entire role of communications. For example, messages need to be developed not only for the poor, but for other women (perhaps slightly better off) who serve as role models. Messages also need to take into account differing cultures, literacy levels, and languages, and need to encourage mothers to continue to participate in programs.
  - Nutrition education should also address such problems as the need for assistance once food aid is withdrawn or what to do about the presence of imported foods when attempts are being made to increase the use of local foods.
  - The use of professional communicators in assisting the planning and implementation of the educational efforts should be seriously considered.
  - In food deficit areas, there is still a need for nutrition education, even though it may be less effective.
  - Flexibility, feasibility, continuity, and support are useful characteristics of the social marketing approach.
  - The social marketing approach should be tested in selected food aid programs, including feeding programs for vulnerable groups and food-for-work projects. The tests should aim at determining the effectiveness, feasibility, and cost of the approach as a whole and as modified to include only selected steps. The following aspects of the approach are worthy of priority considerations:
    - qualitative research on behavior, which would improve the way in which messages are developed;
    - community participation in defining needs and problems;
    - clarification of education objectives;
    - the use of a multimedia approach in delivering the messages;
    - the use of growth monitoring as an educational tool;
    - evaluation and monitoring; and
    - flexibility in implementation.
  - Current, more traditional educational activities linked with feeding programs should be studied and evaluated.
  - The label "social marketing" should be re-considered.

A P P E N D I X

## SELECTING PARTICIPANTS FOR COMMUNITY NUTRITION INTERVENTIONS IN DEVELOPING COUNTRIES

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*Robert J. Timmons, Roy I. Miller, and William D. Drake*

### INTRODUCTION

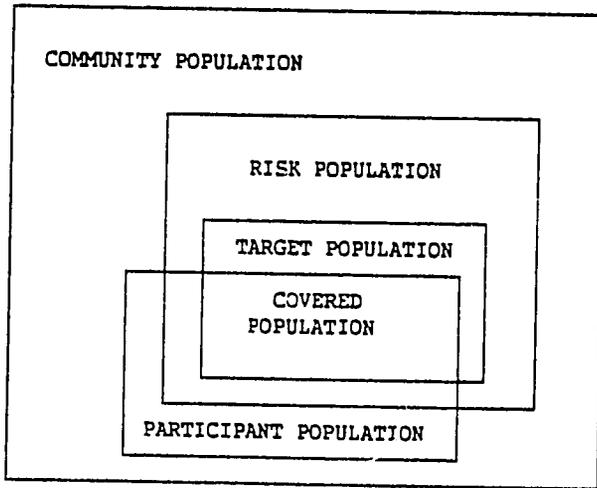
There is a simple and obvious answer to the question, "Why target nutrition interventions?" In the real world of scarce resources, it is necessary to direct those resources to those who most need them and to those who can most benefit from them, being mindful that those most in need of help are not always those who can most benefit from a given set of services. This is especially true of supplementary feeding. Food supplements, in the absence of infectious disease control, may be of greatest benefit as a preventive measure for the moderately malnourished. However, in situations where disease is rampant or seasonally rampant, the supplements may be ineffective when administered to the most seriously ill due to the absence of an effective program to arrest and prevent infectious disease (diarrhea in particular). It is almost trivial to point out that any major effort to alleviate problems of malnutrition is destined to fail if those susceptible to malnutrition are not the target of that major effort. The only conceivable argument to contradict such a statement is that malnutrition can be eliminated only through general economic development in an atmosphere conducive to equitable distribution of wealth. While waiting for this development to materialize, we must push on to find the best means of identifying individuals most in need who will benefit most from the intervention.<sup>1</sup>

Identifying this population to receive the intervention does not, of course, ensure that it will be the treated population. Quite simply, the targeted population and treated population overlap but are not the same. In fact, it should be clear that, in reality, there are often members of the participant population who are in neither the target or risk populations, because of errors in the selection process. Except in the rarest of cases, the participant population is smaller than the target population due to the scarcity of resources and the difficulties inherent in trying to reach everyone in a designated group. (See Figure A.)

Since targeting is one of a series of interrelated design elements comprising a nutrition intervention, modification of targeting is tantamount to a complete program redesign. Placing targeting at the forefront of the design of a new program virtually assures fair consideration of nutritional objectives. The design process is driven by the broad goals and more specific operational objectives of the intervention. (See Figure B.) It is necessary to consider the operational objectives explicitly in the design process because most nutrition interventions share the same broad goals:

- 1) to reduce infant mortality,
- 2) to improve the nutritional well-being of preschool children, and
- 3) to enhance the nutritional status of pregnant and lactating mothers.

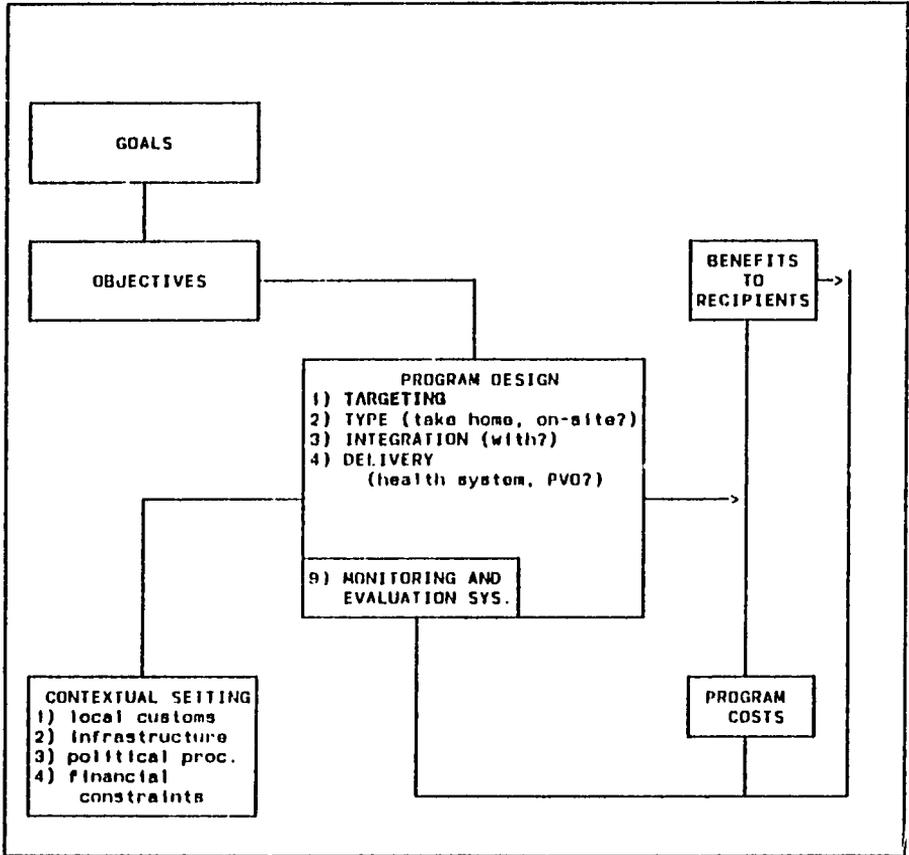
Figure A. Conceptual Representation of Populations



The number of ways of achieving these goals is substantial, and it is only through the expression of more limited, specific objectives that program designers can select their program elements. The objectives relative to cure and prevention of malnutrition are of particular relevance in the selection of a targeting strategy. For example, the goals of rehabilitating severely malnourished children in a community and lowering the incidence of malnutrition of children in the same community should lead to programs with decidedly different target populations; participants in the former would be limited to malnourished children, whereas in the latter, a broader definition of "at-risk" would lead to the inclusion of a much larger group. Howard Barnum *et al* point out that unless the program is strictly curative in nature, the appropriate target population is not obvious.<sup>2</sup> By introducing a program objective which lays claim to prevention or by introducing both program objectives, the target population is expanded because of the complexities of cause/effect formulation (e.g., low birth weight, preschoolers' age, and a variety of household socioeconomic indicators are often suggested as predictors of malnutrition in young children).

In addition to goals and objectives, program design, and especially, targeting strategies, should reflect a broad range of additional contextual factors. These include, first and foremost, local customs. Such cultural traits as propensity to share or sequence of intra-family feeding should influence the selection of a targeting strategy. Similarly, the targeting scheme must be consistent with the level of infrastructure in an area. Schemes requiring frequent visits from health system personnel in areas with few roads, fewer vehicles, and an inability to garner the resources to alleviate those shortages should be rejected. Also, the targeting strategy must be conceived within the political context (local and national) and within the financial constraints of most inter-

Figure B. Targeting in the Design Process



vention work. For example, if the local political organization is opposed to directing resources to only a subset of its constituency, targeting to individuals and/or families may be infeasible. The targeting strategy is intricately related to the type of program. A program calling for on-site feeding could take advantage of the gathering of the beneficiaries to mount a continuous screening program, for example, anthropometric screening calling for monthly weighings. By contrast, a take-home feeding program which requires a special effort to bring a scale to each participant should probably rely on a less frequent weighing scheme or, perhaps, dispense with anthropometry altogether. Similar arguments could be presented which relate the targeting strategy to other design elements. For example, if the health system is involved, health status could be used as a criterion for participation; otherwise, such a criterion might be infeasible.

In summary, due to the central role played by targeting in the overall design of an intervention, concentration on the targeting strategy by program designers proves to be an effective link to program design, to operational objectives, and to broader goals.

#### TARGETING ISSUES

Three fundamental targeting strategies are regularly employed, singly or in combination, in nutrition programming: geographic targeting, targeting to families, and targeting to individuals. In fact, all nutrition programs are geographically targeted, although the selection of service area boundaries is not always based on nutritional criteria. Frequently, non-nutritional concerns dominate in the designation of broad service areas (regions, provinces, states, etc.) and nutritional concerns govern the selection of specific villages within these broadly defined service areas.

The selection of service areas can take two forms, depending on the availability of data and/or the willingness of program designers to commit resources to the generation of data. The first form is the use of nutritional survey data to identify those villages with the highest prevalence of malnutrition. In the absence of specific nutrition data, indicators of economic well-being can be substituted. This assumes a high correlation between economic well-being and nutritional status--an assumption that is generally reasonable but rarely completely valid.

Empirical studies have demonstrated a relationship between malnutrition and various family characteristics. These include: family size, socioeconomic status (especially the education of the mother), child spacing within the family, and a history of poor nutrition in any of the family members. One targeting strategy is to select families for inclusion into the program based on some subset of these family characteristics. This strategy is applied in combination with a geographic targeting scheme; that is, families are queried only within well-defined geographic boundaries and are admitted or rejected from the program on the basis of their socioeconomic status.

With the ever increasing use of weighing as a fundamental component in intervention design, often for educational purposes as well as individual diagnosis, targeting at the level of the individual on the basis of personal nutritional status has gained favor. In pro-

grams of a curative nature, current nutritional status is the obvious factor on which to target. In preventive programs, the role of direct measures of nutritional status is less obvious; however, changes in status over time (or even failure to gain weight) have been used to identify individuals who need help to prevent further deterioration.

These last two strategies, targeting to individuals or to families, require periodic measurement of the factors used in the targeting scheme, even in groups initially rejected from the program. Otherwise, individuals or families excluded from the program at any time may well experience changes which would enable them to qualify for services at some later date. Similarly, qualifying families or individuals may cease to meet the requirements over time, especially if the program is having the desired effect. This is particularly relevant in the use of anthropometric measurements of nutritional status such as weight-for-age. It is now well known that preschoolers tend to move into and out of states of malnutrition, often in a predictable manner related to age. Steady nutritional deterioration from birth until the age of twenty-four months is a common phenomenon among children in harsh environments. After attaining the age of two, some children develop coping mechanisms which enable them not only to survive but to regain a measure of their nutritional well-being. A consequence of this phenomenon is that, within a village, a targeting rule based on anthropometrics will exclude some individuals who would come to qualify for the program after relatively little time had elapsed.

A relevant argument for not targeting to individuals or families within a village emerges from this recognition that both individuals and families are constantly changing. The argument runs as follows:

The prevalence rate of malnutrition in a village at any time is indicative of the potential of every individual in that village becoming malnourished within some reasonably short period of time. A high enough prevalence rate would indicate the need to serve every individual in the village because, at some time, just about everyone would experience sustained periods of nutritional deficiency.

This "tip of the iceberg" argument interprets the prevalence rate as a measure of the size of the underlying problem in the entire community. For a prevalence rate far less than 100%, the underlying problem may become large enough to merit treating everyone.

#### CONSTRAINTS ON TARGETING

In practice, there are often very real and very important constraints which restrict the flexibility of the program designer in conceptualizing a targeting scheme, namely political and cultural constraints, logistical constraints, technical constraints, and budget sequence constraints. One should not conceptualize a targeting scheme solely on the basis of the theoretical ideal. That scheme which best supports the specific objectives of a given program may, in practice, be unworkable. Any targeting scheme should be evaluated in the reality of the environment in which it will operate. We must ask, "Is the scheme introduced at the optimal level of the

societal structure? Is it politically feasible with the host government? Is it culturally acceptable to the local citizenry? Can the logistical constraints be overcome? Are the data to be used easily generated in an accurate fashion?"

#### FRAMEWORK OF ASSESSMENT

The selection of an appropriate targeting scheme in a given context can best be resolved through an assessment of the costs and benefits of the feasible alternatives (those that meet the political, cultural, logistical, and technical constraints).

The analysis of the costs and benefits of targeting is especially complex. Techniques which might work well in assessing other program components are inappropriate for targeting. For most components of a nutrition intervention, there is a "dose-response" relationship which can be used to estimate the benefit accruing to the individual if given some amount of treatment. (For example, weight gain as a function of caloric intake might be used to estimate the benefit derived by an individual through a supplementary feeding program.) However, targeting, per se, does not alter the response of a given individual to the package of services. An individual, once in the program, receives the same package of services no matter what the screening mechanism that admitted him into the program. Targeting is incidental to the individual recipient; however, because the composition of the entire participant group does change in response to targeting, it is far from incidental to the program designer. If that change in composition leads to the inclusion of a higher percentage of individuals likely to respond to the given package of services, the aggregate response of the participant population may improve. If, in response to the introduction of a more restrictive targeting policy, no new participants are found to replace those newly excluded, there can be no benefit due to targeting save the reduction of costs. If new participants are sought to replace those eliminated, the aggregate benefit might be estimated using the hypothesized dose-response relationships for those individuals but costs must also be re-estimated to include the expense of finding and serving those new participants.

Similarly, the costs of targeting are inordinately difficult to assess. While there may be some direct costs or failure to take advantage of alternative uses of the health workers' time associated with a given targeting strategy (costs for scales, growth charts, survey forms, computer analysis, etc.), the more important costs are non-monetary, especially, the loss of benefits associated with denying services to an individual who may need them. Placing a value on such exclusionary practice is virtually impossible. Already alluded to are the potential political costs of targeting, especially the loss of support from the community due to the denial of services to some of its members. These too are virtually impossible to quantify. Finally, there are indirect costs of targeting--the costs due to losses of the economies of scale associated with non-targeted programs. One such cost, for example, is the added cost required to move commodities or supplies over a larger physical area to reach a predetermined number of beneficiaries, or the cost of needing more workers in more villages to reach the same number of people.<sup>3</sup>

## INCLUSION AND EXCLUSION ERRORS DEFINED

Perhaps the most important concept in the assessment of targeting strategies is that any strategy excludes some needy potential participants and includes some individuals who would fare quite well in the absence of intervention. If the former is an error, than it is the rate at which needy individuals are barred from a program due to a flaw in the targeting scheme. And if the latter is an error, it is the rate at which individuals without need are included in a program due to a flaw in the targeting scheme. Therefore, the best targeting scheme is the one that, given the explicit objectives of the program, excludes the fewest needy individuals while including the fewest number of non-needy individuals. Unfortunately, most targeting strategies with a small exclusion error have a large inclusion error and vice versa. In a sense, these errors behave much like Type I and Type II errors in statistics--if one is kept to a minimum, it is at the expense of the other.

## TARGETING STRATEGIES

The benefits of longitudinal data, which allow us to "track" change in an individual's observed nutritional status, are straightforward analysis and intuitive interpretations of the results. Anthropometric data on preschool-age participants, household socioeconomic data, and environmental data from different developing countries or regions within countries permit test comparisons among programs confronting different prevalence of malnutrition rates.<sup>4</sup>

Each test of a targeting strategy can be expressed as a 2x2 contingency table when every individual in the data set is classified as either malnourished or normal at any given time.<sup>5</sup> Hence, the four cells of the contingency table reveal the number of individuals in the program who remained malnourished over time, those who improved their nutritional status, those who deteriorated nutritionally, and those who were relatively well nourished and remained so.

Table A illustrates how any of the strategies may be interpreted. First we see that at time  $t$  there are a number of malnourished preschools ( $C_{11} + C_{12} = P$ ) and a number of normal preschoolers ( $C_{21} + C_{22} = 1-P$ ). At time  $t+1$ , however, the malnourished group is expressed in terms of  $C_{11} + C_{21}$  and the normal group in terms of  $C_{12} + C_{22}$ .

We can reconstruct this 2x2 contingency table in a manner reflecting the passage of time. From the graphic representation in Table A, part B, we can see what has happened nutritionally to the proportion of malnourished and proportion of normal preschoolers from time  $t$  to time  $t+1$ . For the proportion who were malnourished at time  $t$ , some may remain malnourished and some may become normal at time  $t+1$ . And for the normal group at time  $t$ , some may deteriorate into malnourishment, whereas some may remain normal at time  $t+1$ . Such a figure can be constructed for each population selected and excluded by each targeting strategy.

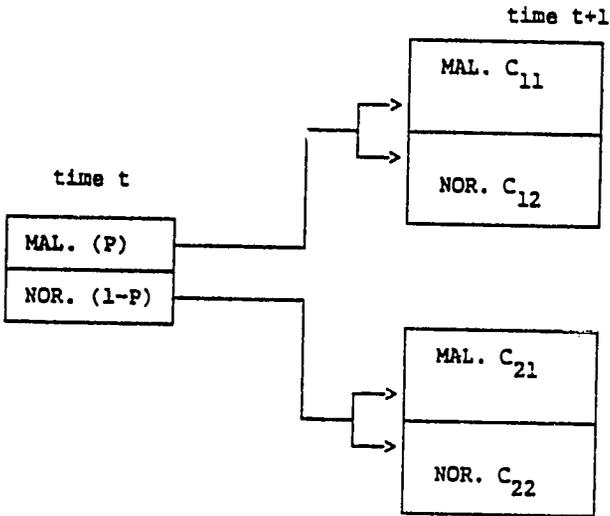
From the three fundamental targeting strategies introduced, namely, targeting geographically, targeting to families, and targeting to individuals, we can make operational a variety of strategies, plausible in the field, which permit us to identify, in particular, participating individuals who may not be in need and excluded indi-

viduals who may be in need and to probe the broader issue of program cost effectiveness.

Table A. Illustration of a Targeting Strategy as a 2x2 Contingency Table

		time t+1		
		MAL.	NOR.	
time t	MAL.	$C_{11}$	$C_{12}$	P
	NOR.	$C_{21}$	$C_{22}$	1-P

B.



To do so we select strategies that restrict targeting only to all at-risk individuals in a program's service area or to all at-risk individuals in selected villages within the service area. To target more "narrowly", individuals of a certain age cohort believed to be at extreme risk are chosen. Typically, preschoolers older than six months and younger than 24 months or 36 months are selected for testing. On the other hand, a larger at-risk population, all preschool-age children, for example, can be screened strictly for those in need, i.e., those diagnosed as malnourished by a composite anthropometric measure such as weight-for-age. We very often see older preschoolers who are chronically malnourished but not acutely malnourished. For this r.a-

son, using weight-for-age measurements, preschoolers under 24 months or 36 months who are malnourished also form realistic target populations.

The concept of selecting individuals as social program beneficiaries by their family's socioeconomic status has a long tradition in Western countries. For nutritional programs in developing countries, this concept has been transplanted and, although not implemented to any considerable extent, has appeared in the literature.<sup>6</sup> Socioeconomic indicators most often discussed in the literature as useful in identifying malnourished or high-risk individuals, such as individuals in families in which an infant has died, in families of low economic status, in families in which the mother is very young or relatively old, or in families with many children, form appropriate strategies for testing.

Last, targeting strategies employing weight trend criteria for program entry, specifically, failure of a child to gain weight from one month to the next or for two consecutive months, should identify preschoolers at extreme risk or in need. Proponents of screening preschoolers by a weight gain/weight loss criterion not only claim a strong preventive orientation but also attest to the procedure's capacity to identify malnourished preschoolers who are in need of rehabilitation.

In analyzing each strategy by its inclusion and exclusion errors, its selected population size, and the proportion of excluded malnourished children, we are, in turn, evaluating some of the most fundamental concepts related to targeting: the level of targeting, reliance on anthropometry to identify malnourishment in children, program objectives, either preventive, curative, or both, and the relationship between a preschooler's age and risk of malnourishment. For different developing countries representing different rates of prevalence of malnutrition, the cost (excluding individuals actually in need or at extreme risk and/or including individuals not in need) and benefit (including individuals in need and/or at extreme risk) of each strategy can be assessed.

In any at-risk population selected for treatment, there are individuals who do not actually need to be treated. These are individuals who will not deteriorate to a malnourished state if left untreated. We can assess this proportion of the targeted population only if it is assumed that the prevalence rate has not changed due to program impact. When this assumption is unrealistic, the proportion of individuals who have remained normal from one year to the next will also reflect the program's benefits and inflate the proportion unless other forces counteract the program's benefits. Therefore, the calculated inclusion error is accurate only when we can control for program impact; otherwise the error is distorted. On the other hand, distortion of the exclusion error is likely to deflate the error rate. Because all the children are actually participants, they deteriorated into malnourishment despite the intervention.

Because we cannot distinguish between what change in recipients' nutritional status is attributable to the interventions and what change is attributable to other forces in the community, the possible distortion in these errors can be corrected by adjusting

for the observed change in prevalence of malnutrition over time. For each targeting strategy in which an inclusion error exists, the percentage of change in prevalence is calculated and multiplied by the percentage of targeted individuals who remained normal over time. This figure is then added to or subtracted from the error rate to account for the change in prevalence.

#### TARGETING GEOGRAPHICALLY

What then should the results be from such an analysis? When targeting only geographically, thereby assuming the population of preschoolers to be the at-risk population (i.e., no one excluded), the proportion of individuals who were included in the program yet who would have been remained normal without the intervention increases sharply as the prevalence rate decreases.

#### TARGETING BY AGE COHORT

We know that older preschoolers, although malnourished by the composite weight-for-age measure, are often chronically malnourished (stunted) but not acutely malnourished (wasted), and, therefore, not at extreme risk. There is also evidence that as a child gets older, the risk of death diminishes for a given nutritional status. Kielman and McCord found in their study of "the effects of the interaction of nutrition and infection in fourteen villages of Punjab, North India . . . that malnutrition contributes to the deaths of most infants below 80% of the Harvard weight-for-age median and to most deaths of those aged 12-36 months and below 70% of that standard".<sup>7</sup> Again, inclusion errors are relatively high because young preschoolers who are "normal" are not screened out of participation by anthropometry. Nonetheless, these strategies exclude preschoolers who deteriorate into malnourishment over time. A partially preventive orientation and disuse of anthropometry for screening lead to considerable errors of inclusion, especially in areas of lower prevalence. We also see from such an analysis that targeting by age does not catch all preschoolers at extreme risk and misses many malnourished children, especially in areas of higher prevalence as measured by weight-for-age.

#### TARGETING BY ANTHROPOMETRY

Weight-for-age is a commonly used composite measure of malnutrition in preschool-age children. A program that screens individuals by anthropometry restricts its benefits to rehabilitating individuals, as opposed to intervening to prevent malnutrition, thereby lowering the incidence rate. As we have defined an inclusion error here, targeting preschoolers by weight-for-age will not permit entry of preschoolers categorized as normally nourished. This eventuality could only occur in theory, since weight-for-age is an imperfect measure of nutritional status and mistakes are made in field protocol (i.e., in practice some preschoolers would be misclassified as malnourished when they were actually normal or normal when actually malnourished). The size of the excluded population is expected to be considerably larger than in the previous strategies where anthropometric screening was not used, unless the prevalence rate is extremely high. The price to be paid for an inclusion error of zero and "catching" all the malnourished is a rise in the exclusion error in absolute terms at all prevalence

rates and a rise proportionally in areas of higher prevalence as well. We should expect to find excluded from a program that screens individuals by anthropometry in an effort to rehabilitate those already suffering from malnutrition, a considerable proportion of preschoolers at extreme risk who actually deteriorate into malnourishment when left untreated.

#### TARGETING BY AGE AND ANTHROPOMETRY

By combining the rationales for targeting by age and anthropometry, a supplementary feeding program would still benefit from not feeding any normally nourished preschoolers who would remain so without receiving the supplement. In areas of higher prevalence, targeting more "narrowly" leads to a larger proportion of excluded preschoolers who will deteriorate into malnourishment, and a substantial number of excluded preschoolers who were malnourished at the time the strategies are applied. In the areas of lower prevalence, the target populations are less than ten percent of the preschooler population (slightly less than their rates of prevalence). The very modest increase in target population size in lower prevalence areas experienced when targeting to preschoolers by anthropometry seems justifiable in the face of the malnourished preschoolers missed when restricting eligibility to certain age cohorts who are malnourished.

#### TARGETING BY SOCIOECONOMIC INDICATORS

It is apparent from socioeconomic strategies that either the areas in which the nutritional programs lie are relatively homogeneous, or the appropriate socioeconomic indicators of nutritional status in these areas of the world have not been found. Populations targeted by socioeconomic indicators absorbed almost the entire preschool-age populations. A third possibility as to the failure of these tests to discriminate among malnourished preschoolers, those at extreme risk, and normal preschoolers lies in the strategies themselves. In what combination the socioeconomic criteria should be used to identify needy individuals is not known. For conclusions drawn here, an individual needs to be included in only one socioeconomic category to be targeted. Conceivably, a program could require qualification on a number of criteria for program entry.<sup>8</sup>

#### TARGETING BY VILLAGE

To target to all preschoolers but only to those in villages identified as having the greatest need, one might first argue that the synergistic relationship malnutrition has with infectious disease makes feeding all at-risk individuals in a village, rather than a select few, more beneficial; and second, that it could prove a more feasible strategy for reaching the "most needy" (third-degree malnourished) who are often the most difficult to reach (i.e., such a strategy might improve program accessibility in hard-to-reach rural areas). Applying this strategy to actual larger participant populations not so selectively targeted may produce startling results. For such a population in the southernmost district of India, the targeted villages uniquely showed a dramatic increase in their prevalence rate over a year, whereas the hypothetically excluded population in villages confronting less rampant malnutrition showed a

dramatic decrease in prevalence over the same year.<sup>9</sup> A possible interpretation of this phenomenon is that the program intervention was inadequate to effect an improvement in nutritional status or prevent deterioration into malnourishment in these villages where the problem was most critical.

Of greater importance to policymakers is program design at a national level or near country-wide level. We, in effect, want to ask not only if it is more efficient to target to selected regions, but if it is more efficient to use different targeting strategies in different areas. If differences in severity of malnutrition among areas prevail, we should expect decidedly different outcomes. It is quite clear from just such a study of P.L. 480 Title II programs in Senegal that the same strategy produces targeting errors of sizable differences in areas confronting malnutrition of different magnitudes. Delimiting the preschooler population by targeting not only by weighing but by age as well appears more considerate of the participant population at centers facing lower prevalence rates. Targeting all preschoolers who are diagnosed as malnourished seems to be fundamentally more effective than selecting malnourished preschoolers of age 7 to 24 months in areas where prevalence of malnutrition is higher than the national average. And in areas where prevalence of malnutrition is considerably lower, it is more efficient to select preschoolers of age 7 to 24 months who are malnourished.<sup>10</sup>

#### TARGETING BY WEIGHT TREND CRITERIA

The rationale for targeting by weight trend criteria is relatively straightforward: a preschooler who fails to gain weight over a specific period of time is at extreme risk of malnourishment. It could also be argued that such a screening procedure will identify preschoolers already malnourished, assuming that malnourished preschoolers do not gain weight over a month or two, or that if they do, they are stunted but not wasted.

In an area of high prevalence, weight trend criteria screen out relatively well the normal preschoolers who would remain normal without the intervention. For screening procedures that are so positively preventive, they miss a relatively large proportion of preschoolers who will deteriorate over time. By weight-for-age measures, weight trend strategies exclude large proportions of malnourished preschoolers in an area of relatively high prevalence. (Whether or not these proportions of malnourished in the excluded populations are chronically malnourished, acutely malnourished, or both, remains at issue, as it does for any of the targeting strategies.)

#### TARGETING SCENARIOS

In selecting a targeting scheme, interveners committed to the reduction of malnutrition must consider the relationship of several design parameters and a variety of contextual factors. Foremost among the design parameters are the stated purposes of the intervention, especially its position with regard to prevention versus cure, and the type of staff designated to deliver services. (Medical professionals, for example, are capable of using an array of health diagnostics generally unavailable to laymen.) Foremost among the contextual factors are the underlying prevalence of malnutrition,

the quality of the physical infrastructure for moving and storing food commodities and other supplies, and the on-site "human" infrastructure to direct the dissemination of commodities and services.

Let us consider the logic of targeting given a series of scenarios involving these three contextual factors. If we segment prevalence into three categories representing its magnitude and uniformity, and we also segment logistical and on-site infrastructures each into two categories, minimal and substantial, twelve plausible scenarios can be addressed by the permutations of these factors.

### Prevalence

The underlying prevalence of malnutrition is indicative of the degree to which discriminating targeting is needed. In high prevalence areas, one can afford to be less exacting in targeting. Where there is widespread malnutrition, so many individuals need assistance or, in preventive programs, are likely to need assistance at some future time, that rigorous targeting is unnecessary if not inadvisable. In contrast, in low prevalence areas, one cannot afford to distribute services without discriminating among potential recipients because so many unneedy people will be covered.

Thus, in situations marked by a high prevalence of malnutrition, a limited amount of resources should be directed toward the implementation of rigorous targeting. However, in situations where malnutrition is less rampant, it may pay to invest resources in locating those truly in need. In situations where there are communities within program areas afflicted with serious malnutrition, one should identify those sub-areas but not invest too heavily in distinguishing among residents of those sub-areas with regard to need.

### Logistical Infrastructure

The logistical infrastructure is indicative of the cost of widespread geographical penetration. In regions lacking infrastructure, the costs of shipping, storage, and management are sometimes extremely high. This suggests strongly that it may be cost-effective to saturate small, accessible areas, even if some individuals at low risk are included in the participating population. Where infrastructure exists, one can afford to discriminate within small sub-areas because the cost of moving into adjacent areas is within reason.

### On-Site Infrastructure

The existence of a good local organization, be it governmental, quasi-governmental or naturally inherent in the community, makes discriminating targeting possible. If such organization is lacking, the interveners must perform many functions themselves, generally at great cost, or forego them altogether.

More than the first two, this contextual factor is subject to change as part of the intervention. That is, the on-site infrastructure is as much a design element as a contextual factor. If the infrastructure exists, as it does when a supplementary feeding program is appended to an existing and functioning health system, the interveners need not invest in creating that infrastructure. Where it does not exist, the intervener is faced with a critical choice regarding

the allocation of resources--a choice between expanding the service area or enhancing the on-site capabilities in a limited area.

Results of a cost analysis of up to twelve programs show that there is an extremely wide range of variation in relative cost within each cost category (commodities, in-country processing, local field level costs, and overall administrative costs). For instance, commodity costs represent anywhere from 42 to 83 percent of the total program cost. Similarly, transportation, storage, and handling costs can vary from four to fifty percent of the total. Variation in cost is due in part to supplement distribution distance and size and method of feeding but perhaps more importantly to the amount of infrastructure available for distribution and local program operation. For instance, in some cases in Africa, transportation cost per ton-kilometer varies fivefold--between \$.10 and \$.49.<sup>11</sup>

We consider targeting in the circumstances defined by each of twelve scenarios formed by the permutations of the three identified contextual factors: prevalence of malnutrition, logistical infrastructure, and on-site infrastructure. Prevalence is classified as uniformly high, uniformly low, or varied. Both infrastructures are classified as either minimal or substantial.

**SCENARIO 1 - High (uniform) prevalence, minimal logistical infrastructure and minimal on-site infrastructure.**

Scenario 1 represents the most difficult combination of factors for intervention--a large, widespread problem in the absence of support systems to facilitate intervention. Typically, this scenario persists in the remote rural regions of many developing nations.

The combination of high prevalence and minimal infrastructure reinforces the notion that rigorous targeting is inappropriate. As an alternative, we suggest that costs be minimized and control (supervision) be maximized through the slow, well-planned expansion of the program. At first, due to the lack of local infrastructure to support either anthropometric or socioeconomic targeting, it might be best to serve all preschoolers and pregnant and/or lactating mothers in those villages designated as participating. In areas with minimal infrastructure, one should anticipate the lack of quantitative data to guide the village selection process. Due to the high prevalence, the expert opinion of knowledgeable officials might suffice to guide village selection--one need not allocate valuable resources on the collection of data because the benefits of having data are, at best, marginal.

After a program has been operating in a village for a period of time, one could introduce more selective targeting strategies in accordance with program objectives. If one objective of the program, either directly stated or implied, is the development of a local infrastructure, selective targeting might be introduced village by village as each proves its capability for implementing the chosen strategy. For example, the introduction of a weighing program might be delayed until the new local organization proves its competence in handling the distribution to all preschoolers.

Under this scenario, geographic expansion should always be deliberate so that the logistics of transporting, storing, and distributing food commodities and other services can be "solved" in all pro-

gram villages. Program designers should accept the fact that instant solutions to logistics problems and/or the overriding problem of malnutrition are most difficult to conceive and implement in areas with minimal infrastructure.

SCENARIO 2 - High (uniform) prevalence, substantial logistical infrastructure and minimal on-site infrastructure.

Scenario 2 describes a situation which might arise in locations where roadways or railways have been built but where social service development and/or government organization has been slight. This is especially common in places where small settlements grow rapidly into villages because of their very proximity to a road or railway. Often, in this case, governmental and quasi-governmental service agencies cannot mobilize resources quickly enough to keep pace with rapid urbanization. Scenario 2 might also occur in places where the population retains its predominantly rural configuration even in the face of rail and/or roadway development.

Here, as with Scenario 1, one might anticipate a general lack of quantitative data for the specification of geographical targeting rules. (Generally, the availability of such data is positively correlated with the degree of on-site infrastructure.) Again, the cost of creating the infrastructure to generate data is not worth incurring due to the high (uniform) prevalence of nutritional deficiency--where the problem is widespread, one need not worry too much about finding the needy. In this case, the informed judgment of medical personnel may be the best available data source.

However, because of the existence of good logistical infrastructure, the costs of distributing and storing food commodities and other materials will be less and more resources should be available to bolster the local infrastructure as part of the intervention. A trade-off exists between expansion of on-site infrastructure in relatively few locations and geographic expansion. If the former option is pursued, anthropometric targeting (strategies 8 through 10) becomes feasible and should be considered for implementation in selected villages which have proven their ability to carry out such strategies.

SCENARIO 3 - High (uniform) prevalence, minimal logistical infrastructure and substantial on-site infrastructure.

We believe Scenario 3 to be a rare occurrence--the development of on-site infrastructure generally lags behind the development of logistical infrastructure. The exception is in small projects, often run by benevolent non-government organizations, where representatives of the organization take up residence in a small but remote area. Such programs are most frequently operated independent of government; however, clever entrepreneurs often facilitate the extension of government programs in their regions.

Under this scenario, the costs of bringing food commodities and other supplies to the remote locations served are large relative to the costs of identifying the most needy. Therefore, in contrast to high prevalence Scenarios 1 and 2, discriminating or rigorous targeting based on anthropometrics and/or socioeconomics is called for. If the on-site team has medical competence, we urge that anthropo-

metrics and medical diagnoses be used in targeting. Otherwise, due to the unique relationship between service provider and participant which so often develops in this case, the knowledge of the service provider regarding socioeconomics and/or behavioral practices of the individual participants can be used.

**SCENARIO 4 - High (uniform) prevalence, substantial on-site and logistical infrastructure.**

Scenario 4 is also quite rare. Presumably, if infrastructure is well developed, the area is well developed and malnutrition should be rare. Exceptions include urban poverty zones (for example, the re-settlement barrios on the outskirts of major Latin American cities) or segments of countries whose governments have supported the development of social services more than economic development (for example, in Sri Lanka). In the urban poverty zone, there is likely to be a high turnover of participants and also high migration within the program area itself. People enter the zone already malnourished and remain that state until they assimilate into the urban way of life.

Due to the highly developed infrastructure, the costs of moving and storing commodities as well as the cost of implementing selective targeting schemes should be relatively low. In the urban poverty zone, a highly targeted scheme based on anthropometrics is likely to yield the greatest benefit--the benefit of helping displaced families through their rural or urban transition.

**SCENARIO 5 - High-low prevalence, minimal logistical infrastructure and minimal on-site infrastructure.**

Scenario 5 is typical of places where nature is relatively benign, so that landholders are capable of subsistence existence but the landless live with a more precarious life style. The minimal infrastructure is indicative of limited government activity and/or general progress toward economic development throughout the area.

Unlike Scenario 1, this scenario is conducive to preliminary efforts to gather data (or use existing data) to inform the targeting scheme. For example, an anthropometric survey might be launched to identify the high prevalence sub-areas (villages) in the overall program region. However, like Scenario 1, the program should be designed to proceed slowly, developing adequate infrastructure as it expands geographically. Emphasis should be placed on serving high prevalence villages or sub-villages in their entirety with relatively little emphasis on targeting within the high prevalence zones.

**SCENARIO 6 - High-low prevalence, substantial logistical infrastructure and minimal on-site infrastructure.**

Scenario 6 is commonly found in countries where transportation and communication links have been well established between major urban centers. Some sub-areas retain conditions leading to undernutrition while others, in more favorable environmental or economic circumstances, overcome those adverse conditions. Also, the development associated with the logistical infrastructure benefits segments of the society while other segments remain unaffected. This creates pockets of economic and nutritional well-being in otherwise harsh environments.

As with all the high-low prevalence scenarios, an effort to identify the high prevalence zones, at the outset, is likely to prove beneficial. If these zones tend to be more distant from transportation and storage centers, targeting should proceed as in Scenario 2-- but only in the high prevalence zones. If the zones are uniformly distributed throughout the region, the possibility for more rapid geographic expansion of program services in a highly targeted environment should be exploited.

**SCENARIO 7 - High-low prevalence, minimal logistical infrastructure and high on-site infrastructure.**

Scenario 7 is rarely encountered. The circumstances which give rise to high on-site infrastructure and minimal logistical infrastructure (see Scenario 3) are such that high prevalence scenarios are more likely than high-low areas under this scenario. If this scenario is encountered, preliminary targeting, probably in the form of an anthropometric survey done by the on-site staff, would identify those zones where resources are most needed.

**SCENARIO 8 - High-low prevalence, substantial on-site and logistical infrastructure.**

Scenario 8 is common to situations where the benefits of economic development are not uniformly realized by a population. Those segments of the population in a position to capitalize on development usually make up the low prevalence areas.

From a design perspective, this scenario offers an unusual set of choices. On the one hand, one could pursue the dissemination of the benefits of development to the high prevalence zones; on the other, one could proceed toward the prevention and cure of malnutrition through health/nutrition interventions other than supplementary feeding. The former, if it works, might eliminate the need for the latter.

The presence of a strong all-around infrastructure makes it feasible to consider a highly targeted service delivery system. Targeting of this type is probably best achieved using anthropometrics tempered by other data available through the on-site infrastructure.

**SCENARIO 9 - Low prevalence, minimal logistical and on-site infrastructure**

Scenario 9 is rarely encountered by nutrition interveners. Where the environment is inordinately favorable, families flourish despite the general lack of infrastructure. Such environments do not require outside intervention.

If this scenario is encountered, the situation is probably one where malnutrition is linked to poor "nutritional practice" by some members of the community. This suggests targeting resources based on anthropometrics and using any commodity resources for curative purposes. The intervention should include a nutrition education component designed to enable the relatively few families suffering from poor nutrition to learn how to utilize their resources fully to promote better nutrition.

SCENARIO 10 - Low prevalence, substantial logistical infrastructure and minimal local infrastructure.

This scenario does not differ greatly from Scenario 9. The existence of a good logistical infrastructure makes it somewhat less expensive to move commodities and materials to the sites; however, the emphasis of the program should be the education of the poorly nourished in utilizing their resources.

SCENARIO 11 - Low prevalence, minimal logistical infrastructure and substantial local infrastructure

Upon encountering this scenario, intervention planners should attempt to ascertain the role played by the on-site infrastructure in reducing the prevalence of malnutrition. If the role is positive, the planner should assist the people making up that infrastructure in continuing what they are already doing. Highly targeted services can quite easily be distributed through an effective local organization. If the on-site infrastructure is playing a more neutral role, this scenario is essentially the same as Scenario 9.

SCENARIO 12 - Low prevalence, substantial logistical and on-site infrastructure.

Low prevalence and strong infrastructure are indicative of a situation where intervention may be inappropriate. Except for highly targeted services to those who cannot break out of their shell of poverty in the face of a full support system, individuals in this setting do not need external assistance. If there is any place where socioeconomic targeting (however informal) is helpful, it is in this scenario.

#### SUMMARY

Regardless of which targeting strategy is selected and no matter how well the scheme is implemented, there is a surprisingly large percentage of children who are not included in the program but who should have been based upon their ensuing nutritional status. Depending on the local conditions and the targeting strategy employed, this exclusion error can be as high as 20.1%.

Similarly, regardless of the targeting strategy, there is a significant number of children included in the program who, in retrospect, probably did not need the services provided by the program. Depending on the local conditions and targeting strategy employed, this inclusion error was as high as 84.1%.

The most effective targeting strategy depends heavily on the prevalence of malnutrition in the population. When the prevalence is high, strategies which try to discriminate among families or among children within a particular community are less effective. On the other hand, when prevalence is low, the reverse is true.

Differences in conditions within a country can be, and often are, of such a magnitude that it is perhaps more effective to consider variations of targeting strategies within the country. The Senegal analysis shows that there are gains to be made by targeting geographically, and by targeting anthropometrically when fulfilling nutritional need is the sole or predominant objective and when it is acceptable to the community.

Another critical determinant of the best targeting strategy is the amount of existing infrastructure in the region. If there is an ongoing program which is to receive supplementary feeding, targeting to individual children is more likely to be reasonable. The reason for this tendency is the relatively high cost of implementing a "stand-alone" targeting strategy.

Finally, the nature of the stated objectives of the local program, especially the relative emphasis on either prevention or cure, influences the selection of the most appropriate targeting strategy. Use of anthropometrics is most appropriate for preventive programs. In neither instance is socioeconomic targeting within communities, using those variables most often available to program designers and/or implementers, very helpful.

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<sup>1</sup>This paper is a revision of *Targeting: A Means to Better Intervention*, by Robert J. Timmons, Roy I. Miller, and William D. Drake, submitted to the U.S. Agency for International Development, November, 1983.

<sup>2</sup>Howard Barnum *et al.*, *A Resource Allocation Model for Child Survival* (Cambridge, Massachusetts: Oelgeschlager, Gunn and Hain, 1980).

<sup>3</sup>Once again, as noted in the preceding paragraph, such costs are a function of the response of program designers to the discretionary resources which become available because of more restrictive targeting.

<sup>4</sup>We have conducted such a study using data from six countries. The prevalence rate among preschoolers for the Kottar Community Health Development Project in India was 52.5 percent in 1976; for the Promotora project in Candelaria, Colombia, 11.7 percent in 1968; for the rice fortification experiment in Thailand, 36.8 percent in 1973; for Esperança in Brazil, 16.1 percent in 1977; for the Thriposha project in Sri Lanka, 42.0 percent in 1980 (65.1 percent in our data because of program targeting to malnourished preschoolers) and for the PPNS feeding program in Senegal, 13.3 percent in 1982.

<sup>5</sup>A child's weight as a percentage of weight-for-age referenced by the NCHS/CDC standard is used as a measure of nutritional status throughout this analysis. A child is classified as malnourished if he is less than 75 percent of the standard, and normal if he is 75 percent of the standard or greater.

<sup>6</sup>See for example, James E. Austin and Marian F. Zeitlin, eds., *Nutrition Intervention in Developing Countries: An Overview* (Cambridge, Massachusetts: Oelgeschlager, Gunn and Hain, 1981), pp 28-29, for a list of at-risk factors for supplementary feeding programs; and "Guidelines on the At-Risk Concept and the Health of Young Children," International Union of Nutritional Sciences Report, *American Journal of Clinical Nutrition*, Vol. 30, No. 2 (1977).

<sup>7</sup>Arnfried A. Kielman and Colin McCord, "Weight-for-Age as an Index of Risk of Death in Children," *The Lancet*, June 10, 1978, pp 1247-50.

<sup>8</sup>CSF, in an unpublished study, has tested a socioeconomic model for predicting nutritional status in the Kottar CHDP data set and found

such a model to be a poor predictor. Discriminant analysis was used to simulate targeting from cross-sectional data.

- 9 Timmons, Miller, and Drake, *Targeting: A Means to Better Intervention*, p 45.
- 10 Robert J. Timmons and William D. Drake, *Food Aid in Senegal: Can Targeting Provide Increased Benefits to Children in Need?* (Ann Arbor: Community Systems Foundation, 1984), p 16.
- 11 Timmons, Miller, and Drake, *Targeting: A Means to Better Intervention*, p 71.

## TARGETING OF FOOD AID FROM A FIELD PERSPECTIVE

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*Mary Ann Anderson*

I am working as Nutrition Advisor in USAID, India. The Title II food aid program in India is the largest in AID's world with more than 11.5 million recipients and food valued at \$105 million. India also has some of the highest malnutrition rates in the world and probably more malnourished children than any other country. I've been asked to speak about targeting of food aid from a field perspective. The paper prepared by Community Systems Foundation (CSF) was comprehensive and provided a useful framework for discussing this topic (Timmons, 1983). I appreciated it very much and agree with their analysis overall. There are a few concepts with which I do not agree which I will discuss as I go along and several other points I would like to amplify from a field view.

The merits of various targeting strategies should be judged on the basis of cost effectiveness. If food costs can be saved by more strict and narrow nutritional targeting in a program that is more effective at reducing malnutrition than a less strictly targeted program, then nutritional targeting is definitely worthwhile. Current budget exercises in the Title II program in India to find ways to cut rising food costs and meet Africa's growing food needs definitely demonstrate that the high cost of food aid and finding ways to use this scarce resource to greater advantage, are becoming of increasing concern to donors and that targeting is one way to cut costs possibly without reducing effectiveness. Various other less desirable cost-saving options in terms of nutritional effectiveness which are being considered in India are smaller rations, shorter feeding duration, and cheaper commodities.

The concept of using nutritional selection criteria to target supplementary feeding programs which have nutritional improvement goals is theoretically sound but targeting does become complicated and controversial when applied in the field. Nutritionally based targeting is in general not popular and many opposed to it will ask: "Are we more concerned with saving food and money or with saving children?" It is well known that malnourished children, particularly those under three years of age, are more in need of supplementary feeding due to increased risk of death (Kielmann, 1978) and their greater response to supplementary feeding as evidenced by higher weight gain (Hanumantha Rao, 1977) than well nourished children. Still many of these needy children remain unreached in communities with supplementary feeding programs. One of the biggest problems we face in maternal and child health (MCH) feeding programs is reaching children under three years of age, particularly in on-site feeding programs. Any targeting strategy for MCH feeding programs should emphasize maximum coverage of children under three years of age and include special program features to assure high coverage of this group. It is more

cost effective to concentrate supplementary feeding on children under three years due to certain characteristics of this age group as follows:

- a) higher malnutrition rates
- b) larger calorie gaps
- c) greater mortality risk, and
- d) greater probability of consuming food as a true supplement and not just as a substitute for the home diet.

Examples from CARL studies in Tamil Nadu, India, of the much greater problem of substitution of an on-site ration for food normally consumed at home by children three to five years of age are shown in Tables 1 and 2 (Anderson, 1981). It can be seen that in children under three years of age, the ration consumed increased their total daily calorie intake by 79% of the intended amount in contrast to only 16% for older children. The younger children consumed their ration almost totally as a supplement and the older children consumed their ration almost totally as a substitute. One can readily deduce in this situation that coverage of under-threes would be more cost-effective in terms of improving calorie intake and thereby nutrition status. In some cases older preschoolers have been found to deteriorate in nutritional status the longer they stay in a feeding program, due to greater dependence on the feeding center and a significant reduction from pre-program levels in their total food intake due to cutbacks at home. The data from India reflect the problem of very late weaning and introduction of solid foods, which supplementary feeding programs seem uniquely able to overcome.

I am not suggesting here that MCH supplementary feeding programs be targeted strictly and exclusively to children under three years of age, but that emphasis be given to achieving high coverage of this younger group in programs with broader selection criteria. In take home feeding programs, exclusive targeting to under-threes will happen only on paper, because at home the mother will share the supplement with her older preschoolers as well. By not providing enough food for the older preschoolers, the younger child's ration will be greatly reduced due to this sharing. Likewise in on-site feeding programs, targeting to under-threes only is difficult, because these younger children cannot come to the feeding center alone and are frequently accompanied by older preschoolers for whom food must also be provided, if the younger child's ration is not to be diluted.

Another group deserving much greater emphasis in MCH feeding programs are pregnant and nursing women, who frequently do not attend or consume the ration in adequate quantity. Special efforts should be made to increase the coverage of these women. We know much less about how to target supplementary feeding programs to pregnant and nursing women at greatest risk of delivering low birth weight infants or having inadequate breastmilk production, than we do about how to identify malnourished children in need of supplementary feeding. A recent review of results of maternal food supplementation studies concluded that their impact has been disappointing with only an average increase in birth weight of 50g (Rush, 1982). However, there is a suggestion from work done in Colombia, that it may be possible to achieve much larger birth weight increases if women are chosen for supplementation on the basis of being under weight for their height

and length of gestation rather than by the usual criteria of poverty or inadequate diet (Herrera, 1979). These researchers found that birth weights increased by 181g in supplemented women with weight for height less than 360g per cm at the sixth month of pregnancy. Other researchers have suggested that fetal growth retardation in pregnant women could be identified in rural program settings by measuring: fundal or intrauterine height serially (Belizan, 1978), abdominal circumference (National Institute of Nutrition, 1982), arm circumference (Tibrewala, 1978), and height and head circumference (Lechtig, 1976 and Shah, 1980). All of these measures are urgently in need of further testing and validation in large field trials as soon as possible, and I would urge that one of the recommendations of this workshop be that efforts be made to get such studies done in the near future. What we need in essence is a growth chart for pregnant women in developing countries. Also lacking are inexpensive, portable, and accurate equipment and reference standards for maternal anthropometry.

Still less is known about how to identify at-risk nursing mothers for supplementary feeding. Should we assume that all women found to be at-risk in pregnancy continue to be at-risk in lactation? Are there any specific measurements or indicators of nutritional need that can be applied to nursing mothers? I am not aware of any.

Efforts should be made to identify pregnancies early, which can only be done by continuous monitoring of women's menstrual cycles through home visits by village or intermediate health workers. The debate also continues whether supplementary feeding for pregnant women should start in the second or the third trimester. I think it would be useful for participants at this workshop to discuss the most effective timing for supplementation during pregnancy and make a recommendation on whether the second or the third trimester is the more appropriate time to start.

I will now describe a general targeting strategy which is recommended for application at various levels in supplementary feeding programs. I agree with CSF that no one universal strategy can be adopted but that strategies must be tailored to each country's needs.

#### TARGETING BETWEEN COUNTRIES

The first stage of targeting that I would recommend is by country based on national nutrition status data. Given diminishing food aid resources and increasing need in various parts of the world, countries with low rates of protein-energy malnutrition, say less than 20% of children under six years of age with weight for age less than 75% of NCHS/WHO standards (moderate and severe malnutrition), should be graduated from food aid. This is obviously an arbitrary cut-off point which could be debated and decided. Table 3 demonstrates the wide range in rates of malnutrition by this indicator with countries like Egypt at 8%, Costa Rica at 9%, and India at 52-74%. Rather than strictly target food to malnourished children in countries with very low rates of malnutrition, it would be more efficient not to have programs in these countries. Food aid has been phased out of a number of countries in Latin America in this low malnutrition category in recent years probably due in part to this reason. Other types of interventions such as nutrition education and growth monitoring may

be more cost effective for tackling the remaining malnutrition problem in these countries.

There are many other countries in Africa and Asia with higher malnutrition rates which desperately need food aid. If such selection between countries is to be done, it should be stressed that it should be based on accurate, representative anthropometric data. Many countries have had national nutrition status surveys done in recent years from which such data are available, and rapid techniques for doing such surveys have also been worked out by AID and the Center for Disease Control. Superficial impressions of need should not be used as selection criteria. Examples of this are data in Table 4 on acute undernutrition or wasting in various countries based on weight less than 80% of NCHS standards for height. Superficially, many would have thought that malnutrition data collected by the Center for Disease Control (CDC, 1975) in five Sahel countries in the peak of the 1974 drought in Africa would have shown these countries to be much worse affected by malnutrition than India around the same time. The table shows that of the five Sahel countries, only Chad with 22.5% wasted children, had more acutely undernourished children than Tamil Nadu, India, in 1976 with 15.5%. Studies in 1980 in Somali refugee camps showed need to be very great there with 26.2% of the children acutely undernourished. Meanwhile, countries like Egypt and Colombia had only 0.5 and 0.6 acutely undernourished children respectively.

In countries with very low malnutrition rates, the economics of scale are not enough to justify the cost of feeding programs. Table 5 illustrates a five country CARE study (Anderson, 1981) of how the cost efficiency of feeding programs is greatly affected by the number of children in the program who are normally nourished and who probably would continue to be so without the program ("inclusion errors" as defined by CSF). In countries with high malnutrition rates, such as India, even in programs which do not apply strict nutritional targeting criteria, the cost per malnourished child fed is low (\$23.94/year) due to the high prevalence of malnutrition (60%) in the communities served. The cost per malnourished child fed rises to \$260.53/year in Colombia where the malnutrition prevalence rate (10%) is low. There is a strong cost effectiveness argument for targeting between countries.

#### TARGETING WITHIN COUNTRIES

The next stage of targeting should be to select whole geographic areas such as regions, states, divisions, districts, blocks, etc., within countries for supplementary feeding programs, using nutritional status data. Weight for age, weight for height, or even arm circumference measurements taken once every several years in a sample survey could be used to select geographic areas with higher malnutrition rates. Within these selected needy areas, whole villages, schools, etc., could be eligible for supplementary feeding with no further nutritional targeting criteria applied to individual beneficiaries, if the prevalence rate of moderate and severe malnutrition was high, say 50%. If the malnutrition prevalence rate was lower than 50%, then it might be useful to apply nutritional selection criteria to individual children within the needy areas. A quick review of recent national nutrition survey results from India, Sri Lanka, and Sierra Leone re-

veal that rates of severe malnutrition can vary by about two to three times from lowest prevalence areas to highest prevalence areas. Figure 1 shows the rates of severe malnutrition in ten states in India varying from 4.8% in Kerala to 11.5% in Madhya Pradesh.

In 1973, while I was working with CARE, we helped the Government of Sri Lanka to quickly and effectively use this sort of targeting approach to select schools for the school lunch program. Using the criteria of arm circumference for height or the QUAC Stick method, 8,082 schools were given nutritional status scores and retained or eliminated from the feeding program on the basis of nutritional need (Anderson, 1975). The whole survey took only six months. This technique, requiring only measuring tapes, was found to be rapid, economical, and highly practical for field situations as a device for nutritional selectivity. For younger children in the one to five years age group, arm circumference measurement alone can be used for accurately screening and obtaining the prevalence rate of severe malnutrition (Anderson, 1979). I would like to stress here that arm circumference measurement is useful for community screening purposes, but should not be used as a substitute for weighing when the objective is growth monitoring and selection of individual children for supplementary feeding. The reason is that arm circumference measurement in preschool children effectively identifies the severely malnourished, but is not sensitive enough to accurately detect moderate malnutrition. Thus, it is not effective as a preventive tool, which is the purpose of growth monitoring in contrast to infrequent community nutritional screening for targeting purposes.

#### TARGETING WITHIN COMMUNITIES

The next stage of targeting to be considered is within communities. In MCH feeding programs, growth monitoring by regular weighing of all children in the community, at least quarterly, is a must for many reasons, not just for targeting programs to the neediest children. Growth monitoring is essential for early detection of children failing to gain weight and for prevention of more severe forms of malnutrition. Regular weighing is an excellent tool for nutrition education of parents and community leaders. The community weighing survey is also an effective way of getting the worker to know the village and focus extra attention on those children at greater risk of malnutrition and on those already malnourished. Growth monitoring, if done well, can also generate nutrition status data for a built-in program monitoring and evaluation system. As stated previously, arm circumference measurement is not an appropriate substitute for weighing if the purpose is growth monitoring and early detection of malnutrition or growth faltering.

In areas with moderate and severe malnutrition rates (less than 75% of standard weight for age) less than 50%, growth monitoring data should be used to strictly target feeding programs to children failing to gain weight or in various degrees of malnutrition by weight for age. In communities with higher malnutrition prevalence rates (more than 50% of the children malnourished), it is also desirable but not absolutely necessary to use weight data to nutritionally target feeding programs, since in such communities all children are at high risk of malnutrition. If weight data are used to target feeding pro-

grams, it will be possible to identify more malnourished children under three years of age and encourage their attendance for feeding.

There has been some debate about whether stunted or chronically malnourished children with height less than 90% of the standard for their age but with normal weight for height can benefit nutritionally from supplementary feeding. When weight for age is used as the selection criterion, it is impossible to distinguish these chronically malnourished children from the currently malnourished who have low weight for height. Some chronically malnourished children are in this condition due to having been born at low weights (less than 2500g). If weight gain or weight for height methods (less than 90% of standard) are used for targeting, it possible to screen out these chronically malnourished children who may not benefit from supplementary feeding. I am not aware of any studies which have conclusively shown that supplementary feeding can or cannot increase the height of stunted children or that stunted children are at greater risk of not achieving normal weight gains. Until such evidence is in, it is probably easier to continue to use weight for age selection criteria and allow the chronically malnourished to participate in the program. This is because there is some chance that they may benefit and it is difficult to accurately measure height in the field. The "weight-for-height" or "thinness" wall chart developed by the Save the Children Fund and the London School of Hygiene and Tropical Medicine is a simplified screening tool which takes height into account.

I would like to disagree here with CSF's conclusion that programs which use anthropometry to select malnourished beneficiaries are strictly curative in nature. On the contrary, programs with continuous growth monitoring are preventive as well as curative of malnutrition, because of their power to detect mild to moderate malnutrition or failure to gain weight early and to intervene to prevent deterioration to more severe forms of malnutrition. An evaluation of the nutrition rehabilitation centers in Haiti showed that such growth monitoring, when used to educate parents, was also a powerful tool for prevention of malnutrition in younger siblings in the same families (King, 1978).

It should also be noted that the high "exclusion errors" found in the CSF analysis, when various anthropometric targeting strategies were applied, are due only to the fact that CSF assumed that anthropometric measurements would be taken only once or very infrequently. Obviously, anyone left out as a result of those measurements who later become malnourished would have to wait a long time or forever for measurements to be taken again to detect their malnourished state. On the contrary, anthropometric selection criteria should never be applied infrequently at the community level, weights should preferably be taken monthly or, at a minimum, quarterly. This frequent weighing and detection of new malnutrition cases would eliminate any "exclusion errors" other than a few unavoidable ones due to misclassification of nutrition status or faulty measurements.

If nutritional status criteria are used strictly to determine eligibility to enter supplementary feeding programs in areas of low to moderate malnutrition prevalence, then nutrition status based graduation or exit criteria should also be applied. The only rational way to determine the appropriate duration of participation is to monitor

the growth of the beneficiaries. When a child reaches an acceptable nutritional status and has maintained this level for several months, he or she can be "graduated" from the program. Since the rate of growth and recovery of each child is different, this is probably the most efficient way of ascertaining when a child has participated in a program for an adequate length of time. This method would be far more accurate than setting an arbitrary time period for all children. As children reach a normal nutritional level and are removed from the program, new beneficiaries can be enrolled, resulting in a more efficient use of resources than with the indefinite enrollment of those who have reached a normal nutritional status. However, major improvements must be made in the environment in which the child remains once graduated from the program. Without these overall changes in the community, it is likely that children will fail to thrive and that they will have to be readmitted to the program at a later date for nutritional recuperation. Limiting the duration of participation in feeding programs to the minimum required to achieve nutritional goals may also be desirable for encouraging self-sufficiency among the beneficiaries and preventing dependence of the family on outside assistance in the form of food donations.

#### INDIA'S INTEGRATED CHILD DEVELOPMENT SERVICES SCHEME (ICDS)

I will now describe the targeting strategy in use in India in the Integrated Child Development Services Scheme (ICDS) which is a major national program underway for mothers and children under six years of age in about 20% of India's villages. Food aid through the World Food Program and Title II/CARE supplies more than half the total requirement of the ICDS Program. As you will recall from statistics presented earlier, India definitely qualifies on nutritional grounds for food aid due to its high prevalence of malnutrition. The ICDS program has been gradually expanded from 33 blocks (population units of 100,000) in 1975 to more than 1,100 blocks in 1984 out of the total 5,600 blocks in India. Each block has from 50 to 100 villages. The blocks chosen for ICDS were selected for their socioeconomic backwardness using income and literacy as some of the indicators (Tandon, 1981). Nutritional status data have not been used to select geographic areas for the program on a national basis though such data have been collected by the National Nutrition Monitoring Bureau and the Food and Nutrition Board for most of the major states. Once a block is selected for ICDS, theoretically all villages within that block become eligible for services at a ratio of one child care center per 1,000 people in rural areas and one per 700 in tribal areas. Due to lack of resources for complete block coverage, some less accessible or smaller, isolated villages within selected blocks still may not be receiving ICDS services.

Beneficiaries of ICDS receive supplementary feeding, preschool education, selected health services, and nutrition and health education. The overall objective of ICDS is to lay the foundation for the child to achieve its full physical, psychological, and social development potential. With reference to malnutrition, the program has both preventive and curative goals.

Within specific communities the ICDS eligibility criteria for children to participate in supplementary feeding are that they be less than 70% of Harvard standard weight for age or have arm circumference less than 13.5cm or be from socioeconomically deprived families and that they be six months to six years of age. To be eligible for supplementary feeding in ICDS, pregnant and lactating women must also be from socioeconomically backward families and further eligibility criteria are that pregnant women be in the last trimester and that lactating women be nursing a baby whose age does not exceed six months.

All children in the communities served are to be weighed every three months, and children with moderate and severe malnutrition are to be weighed monthly. In practice, these nutritional selection criteria are not strictly applied and no poor children who come to the feeding center are turned away. Targeting based on nutritional status criteria is culturally and politically very unpopular in India due to a long history of distributing food based on poverty grounds alone. With the high prevalence of moderate and severe malnutrition in the ICDS communities (most of the children are affected) and the harsh environment and extreme poverty, it is not necessary to limit the program only to the currently malnourished, since nearly all children are at high risk of some degree of malnutrition. Furthermore, since one of the ICDS goals is provision of preschool education to as many children three to six years of age as possible, exclusion on the basis of normal nutrition status is not seen as appropriate for this activity at which children also receive supplementary foods.

Regular weighing of children in ICDS, although not used for targeting, helps the worker to locate the malnourished children, especially those under three years of age, and pay special attention to assuring their regular attendance and to teaching their parents. Weight data are also used to determine the ration size to be fed to each child, since severely malnourished children receive double the quantity of food as other children. Graduation based on achievement of normal nutrition status (greater than 80% of standard weight for age) is not strictly enforced, but parents of children who have achieved normal nutrition status are educated and urged to voluntarily withdraw their children from supplementary feeding. Again, the goal of maximum coverage of children three to six years of age with preschool education including supplementary feeding makes mandatory graduation on nutritional grounds not desirable in this age group.

Like most other on-site feeding programs, it has been found particularly difficult in ICDS to regularly reach under threes and pregnant and lactating women. USAID is providing dollar assistance to ICDS to test some innovative ways to increase coverage of these groups by better training and supervision of workers, more outreach and nutrition and health education, and a management information system using nutritional status data. The emphasis is on prevention and wellness through enrolling pregnant women as early in pregnancy as possible and children as soon after birth as possible and keeping them gaining weight and growing properly, rather than on treatment of malnutrition. There is an excellent infrastructure of ICDS and health workers and equipment available at village and intermediate levels to do the job, but the workers must be trained and supervised well if the program is to succeed. The target in the communities assisted by USAID is to regu-

larly reached 85% of the at-risk pregnant and nursing women and mal-nourished children under three years of age with supplementary feeding.

#### POLITICAL WILL TO NUTRITIONALLY TARGET FEEDING PROGRAMS

I would like to describe one more MCH feeding program in India which illustrates the difficulty of mustering the political will to nutritionally target such programs. In contrast to the less strictly, nutritionally targeted ICDS program, the Tamil Nadu Integrated Nutrition Project (TINP) which the World Bank is assisting in 9,600 villages in 170 blocks in six districts allows only malnourished children from 6-36 months of age and at-risk pregnant and lactating women to participate in supplementary feeding. Nutrition selection and graduation criteria are strictly enforced through monthly community weighing of children under three years. The specific selection criteria for children are weight gain over several months and not degree of malnutrition, with the exception of severely malnourished children who are immediately enrolled, irrespective of their weight gain. It was a real breakthrough to get the state government to agree to start this project in October 1980, because it represented the first large scale experiment with nutritional targeting of MCH feeding in India. However, many high hopes of the lessons that could be learned in these villages, following this strict age and weight gain selection approach, were dashed in July 1982, less than two years into the project, when the Chief Minister of Tamil Nadu introduced a hot, noon meal program of local foods to be provided to all poor children two to ten years of age in the state, including those in the World Bank-assisted villages, at a cost of over \$300 million annually. Political will seems to be directed more these days toward massive child feeding programs, and programs such as the local noon meal in Tamil Nadu have spread to other states like Andhra Pradesh and Gujarat as well, at huge expense to the state governments. There seems to be no concern among the politicians for cost or effectiveness.

The issue that should be discussed at this workshop is what sort of advocacy of nutritional concerns and cost effectiveness can we make at high political levels to stop the spread of such ill conceived and unaffordable, massive, dole feeding programs, because resources spent on them are lost to much more cost effective, child survival interventions, such as growth monitoring, immunization, nutritionally targeted supplementary feeding, oral rehydration therapy, etc. It is possible, however, that this issue is unique to India and not of general relevance to other countries represented here.

Table 1

MEAN DAILY CALORIE AND PROTEIN INTAKE + STANDARD DEVIATION OF PRESCHOOLERS GROUPED BY AGE IN AN ON-SITE CARE FEEDING PROGRAM IN TAMIL NADU, INDIA

AGE IN YEARS	TOTAL INTAKE WITHOUT RATION			GAP WITHOUT RATION			TOTAL INTAKE WITH RATION			GAP WITH RATION*	
	CALORIES	PROTEIN g	N	CALORIES	PROTEIN g	N	CALORIES	PROTEIN g	N	CALORIES	PROTEIN g
1-3	667 <sub>+365</sub>	20.7 <sub>+13.7</sub>	26	693	16.3		937 <sub>+236</sub>	30.9 <sub>+6.7</sub>	79	423	6.1
3-5	935 <sub>+483</sub>	27.7 <sub>+16.4</sub>	33	425	9.3		990 <sub>+237</sub>	34.2 <sub>+8.2</sub>	110	370	2.8

\*Gap based on FAO requirement of 1,360 calories and 37 grams protein for 12- to 47-month old children.  
Source: Anderson, 1981.

Table 2

SUPPLEMENTATION AND SUBSTITUTION EFFECTS OF RATION ON THE HOME DIET OF PRESCHOOLERS GROUPED BY AGE IN AN ON-SITE CARE FEEDING PROGRAM IN TAMIL NADU, INDIA

AGE (yrs)	MEAN RATION CONSUMED S.D.		SAMPLE SIZE	EFFECT ON DIET		
	CALORIES	PROTEIN (gms)		INCREASED CALORIES MEAN	% OF INTENDED*	SUBSTITUTED CALORIES
1-3	340	16	79	270	79.4	70
3-5	340	16	110	55	16.2	285

\*Calculated on basis of total ration distributed for daily consumption.

Source: Anderson, 1981.

Table 3

PERCENT OF CHILDREN 0-6 YEARS OF AGE WITH WEIGHT FOR AGE LESS THAN 75-80% OF THE MEDIAN HARVARD OR NCHS STANDARDS IN VARIOUS COUNTRIES

COUNTRY	PERCENT MALNOURISHED	SOURCE
EGYPT	8.0	MIN. OF HEALTH
COSTA RICA	9.3*	ANDERSON, 1981
DOMINICAN REPUBLIC	10.5	ANDERSON, 1981
COLOMBIA	11.7*	CSF, 1983
COLOMBIA	12.0*	ANDERSON, 1981
BRAZIL	15.1*	CSF, 1983
BOTSWANA	25.6 (<80% of Wt/Age)	KREYSLER, 1978
SIERRA LEONE	30.5	UCLA, 1978
KENYA	32.7 (<80% of Wt/Age)	CENTRAL BUREAU OF STATISTICS
PAKISTAN	34.0*	ANDERSON, 1981
THAILAND	36.8*	CSF, 1983
SRI LANKA	42.0	CDC, 1976
NEPAL	49.9	CDC, 1975
INDIA-TAMIL NADU	51.9*	ANDERSON, 1981
INDIA-TAMIL NADU	52.5*	CSF, 1983
INDIA-7 STATES	74.4	NNMB, 1976

\*Includes some beneficiaries of supplementary feeding.

Table 4

PERCENT OF WASTED CHILDREN 0-6 YEARS OF AGE WITH WEIGHT FOR HEIGHT  
LESS THAN 80% OF THE MEDIAN NCHS STANDARDS IN VARIOUS COUNTRIES

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COUNTRY	PERCENT ACUTELY MALNOURISHED	SOURCE
SOMALIA	26.2	CDC, 1980
CHAD	22.5	CDC, 1975
INDIA-TAMIL NADU	15.1*	ANDERSON, 1981
NIGER	11.4	CDC, 1975
MALI	10.7	CDC, 1975
MAURITANIA	9.9	CDC, 1975
UPPER VOLTA	9.1	CDC, 1975
PAKISTAN	8.2*	ANDERSON, 1981
SRI LANKA	6.6	CDC, 1976
COSTA RICA	3.6*	ANDERSON, 1981
SIERRA LEONE	3.0	UCLA, 1978
DOMINICAN REPUBLIC	1.6*	ANDERSON, 1981
EGYPT	0.6	MIN. OF HEALTH, 19
COLOMBIA	0.5*	ANDERSON, 1981

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\*Includes some beneficiaries of supplementary feeding programs.

Table 5

ANNUAL FEEDING PROGRAM COSTS IN CARE PROGRAMS IN FIVE COUNTRIES IN U.S. DOLLARS (1976)

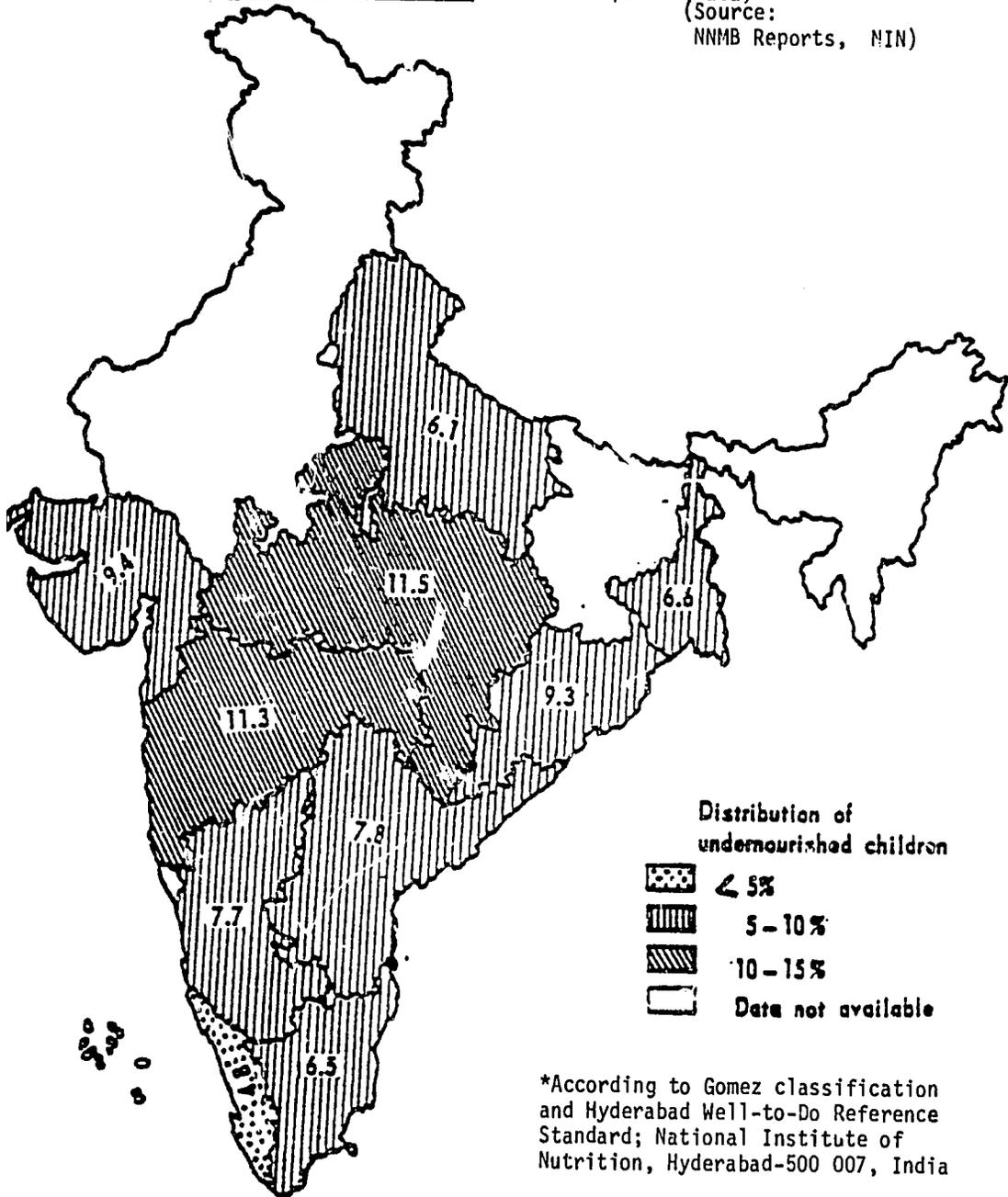
COUNTRY	ANNUAL COST PER CHILD	PER CHILD WITH CALORIE DEFICIT	PER CHILD WITH ANTHROPOMETRIC DEFICIENCY <u>a/</u>
INDIA-TAMIL NADU (ON-SITE)	14.46	16.43	23.94 (60)
PAKISTAN (TAKE-HOME)	23.51	28.67	45.39 (52)
DOMINICAN REPUBLIC (TAKE-HOME)	13.55	14.89	66.10 (21)
COSTA RICA (ON-SITE)	94.54	112.21	290.00 (33)
COLOMBIA (TAKE-HOME)	24.75	29.11	260.53 (10)

Source: Anderson et al. 1981

a/ Costs divided by number of children who were less than 90% NCHS reference weight for height are enrollment. Numbers in parentheses are percent malnourished.

**Figure 1: PERCENTAGE DISTRIBUTION OF SEVERELY UNDERNOURISHED\* PRE-SCHOOL CHILDREN - INDIA (1975-1979 pooled data)**

(Source: NNMB Reports, MIN)



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## FOOD AID AS INCOME TRANSFER

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*Anne M. Thomson*

One of the major ongoing debates in the area of food aid over the last decade has been over the issue of assessing the impact of project food aid. Because of the nature of many food aid projects (supplementary feeding programs attached to Mother Child Health Centers or schools), attention has been focused until recently on ways of assessing the impact on nutrition of participation in these programs. In the last few years, however, it has been proposed that instead of concentrating on nutrition as the outcome variable of these programs, it would be both more appropriate and easier to look at project food aid as an income transfer and measure its impact accordingly. This paper gives an overview of the issues surrounding both the concept and practice of measuring income transfer and the implications of using it as a measure of project food aid impact.

### ASSESSING THE IMPACT OF PROJECT FOOD AID

Since the mid-1970s, there has been concern over the results of nutritional assessment of food aid projects, principally because of the failure of most evaluations to show significant impact on nutritional status. This is true both of supplementary feeding projects (Maxwell, 1978; Beaton and Ghassemi, 1979) and of food aid projects as a whole (Stevens, 1979; Sahn, 1984).

The reasons given for this vary. Much of the fault must lie with bad project design or implementation, but it has also been pointed out that there have been substantial problems with bad design of project evaluation, such as inadequate base line data, sloppy data collection, and inappropriate use of indicators to measure nutritional impact.

One topic that crops up regularly in the literature is the problem of leakage. Projects give unsatisfactory results because not all of the food distributed is consumed by the intended beneficiaries. Beaton and Ghassemi (1979) estimate that in the supplementary feeding programs which they examined, the overall net increase in intake of the target populations ranged from 45% to 70% of the food distributed. One response to this problem has been to try to design projects which reduce leakage, sometimes by trying to tailor commodities more specifically to individual family members, such as weaning foods. Another has been to question the way in which food aid projects have been viewed. Stevens (1979) comes to the conclusion that

.... food aid which is distributed to individuals through food for nutrition or food for wages projects is best thought of as income-in-kind. Like any other form of income, it may improve the nutrition of its recipients provided that they were in-

adequately nourished in the first place, and that their nutritional problems stem from poverty and not, for example, from ignorance. Since food aid is income in the form of food, it may have a better chance of improving nutrition than other forms of income, but this advantage should not be exaggerated.

This trend in current thinking creates problems for donor agencies. Although historically one of the principal factors influencing food aid programs has been the existence of surplus food production in donor countries, this is now less so for many of the smaller food aid donors and, in any case, this does not mean that food aid is costless. There are transport costs involved in delivering the aid; there are costs to the donor government of buying up the donated food domestically; and there are conceptual opportunity costs in using food aid in one program as opposed to another. For all these reasons, food aid donors are interested in getting as much for their food aid dollar as they can.

The problem really lies in defining what are precisely the objectives of the various programs funded to some extent by food aid. In very specific terms, some programs (food for work, for example) may have employment creation as an objective, others (school feeding programs), the encouragement of school attendance, and yet others (MCH supplementary feeding programs), the reduction of child malnutrition. In more general terms, the broad aims of project food aid could be seen as the reduction of poverty and malnutrition.

In other types of development aid projects, the problem of weighing up the importance of multidimensional outcomes exists, and has generally, though not entirely satisfactorily, been dealt with by using some variant of cost-benefit analysis. In many ways, the debate over the use of income transfer, as opposed to nutrition impact, as a measure of the benefits of a project raises many of the same issues.

It should be noted that the income transfer concept was initially raised in the context of appropriate selection of commodities in specific food aid projects. In the past, commodity selection was largely undertaken on the assumption that the commodity would be consumed in the specific project and that it should be chosen according to the nutritional requirements of the project participants. For a supplementary feeding project where the target population was the calorie deficient preschool child, commodities which were calorie cost-effective would be selected. It is now suggested that a commodity which is efficient in income transfer terms might be more appropriate.

However, to use this concept in one aspect of project design implies that it is a valid measure of the outcome of a project. The two cannot easily be separated. If income transfer is inappropriate as a measure of project outcome, then it is equally inappropriate as a measure of commodity selection.

What precisely is meant by income transfer? The argument is that in transferring food to a family or an individual, a project transfers a resource that has a value, whether the food is eaten instead of food the family would otherwise have eaten, eaten in addition to the food the family is already eating, sold in the market,

or some combination of the three. That value should be measured and taken as the benefit of the project.

In contrast, a nutritional assessment of the project would only regard additional food eaten by the individual, or, in some cases, the family, as benefit. (For some, the process would have to be taken a stage further and show up as changes in body weight or height.) The rest would be seen as leakage, except insofar as any additional income freed by the project was in turn spent on food. Where projects are aimed at specific members of a family, for example, the preschool child, only food which was consumed by that member, either directly or indirectly as a result of the project, would be regarded as a successful outcome of the project.

Income transfer as a way of assessing the outcome of a project has a great deal of intuitive appeal, especially to those who consider that poverty is the basic cause of malnutrition and that therefore malnutrition can only be satisfactorily attacked by reducing poverty (i.e., increasing the family's control over resources). The approach also avoids much of the rather sterile debate in the area of leakage (though not, of course, leakage in the sense of food going to households who can in no way be seen as part of the target population, broadly defined).

In a practical sense, and in particular, in terms of commodity selection, the choice as to the use of income transfer or nutrition impact as a criterion depends on the extent to which they show the same ranking, either of commodities in a project or of successful outcomes of projects. If the ranking is the same, then the issue comes down to ease of measurements; if not, the reasons for any differences have to be examined carefully before one can be preferred to the other. To do this requires a careful analysis of how the income transfer effect should be measured.

#### THE ALPHA FACTOR

The term, the alpha factor (here denoted by  $\alpha$ ) was first used by Reutlinger and Katona-Apte in a report of the US National Research Council (1982), and it occurred in the context of the discussion of commodity choice in Food For Peace programs. It was argued that commodity choice would be optimized if the alpha factor,  $\alpha = V_i/K_i$  was maximized, where  $V_i$  is the value of commodity  $i$  to the recipient and  $K_i$  is the cost of commodity  $i$  to the donor.

The formula is simple and in itself relatively uncontentious. The problem comes in trying to attach numbers to it. As was stated above, there are three major ways in which food aid can be utilized by recipient families: it can be eaten in addition to existing family food consumption; it can be substituted for food already being consumed by the family; or it can be sold on the open market, or bartered. Combinations of the three are also possible. In each of these situations, the food would normally have a different value, measured as income transfer.

In the first, where it is an addition to family food consumption, it should be valued at the price the family would have to pay for it were it to buy it. This could either be an open market price or a subsidized ration price depending on the institutions existing in the region and for the specific family concerned. Where the food

substitutes for commodities already being consumed by the family, the value to the family is the cost of the commodities it no longer buys (i.e., income freed). Thus, if a household receives wheat flour in a supplementary feeding program and as a result reduces its consumption of corn by an equivalent amount, the value of the wheat flour to the recipient is the price the family would have to pay for the corn. Finally, if a household sells all its food aid, the value of it is the amount the household receives for its sale.

These values are likely to differ, one from another, in some cases quite substantially. There are also factors which are left out which it might be desirable to include. Where fortified foods are substituted for non-fortified foods, no allowance is made for what might appear to be a better diet. Equally, where one staple is substituted for a preferred local staple, no allowance is made for the family eating a less palatable diet.

In theory, these factors should be taken into account in the household's decisions whether to eat the food aid or to sell it, but this assumes that the markets which the households are facing are sufficiently sensitive to distinguish between fortified and unfortified commodities, or that there *exist* markets in which food aid recipients could sell that food aid should they wish. Where this is not the case, the value of the food aid may be over- or, in some circumstances, under-estimated.

Equally, where food aid is sold, it is important that any transaction costs to the recipients in selling the commodities are fully accounted for. These could be substantial both in terms of time and transport.

#### THE ALPHA FACTOR IN PRACTICE

The above shows how complicated it could be to estimate the value of a in practice, though it is a conceptually simple notion. As yet, there are relatively few examples which can be examined to see whether the considerations raised above are simply pessimistic nit-picking, or do have a basis in reality. The author is aware of only two cases where initial attempts have been made to estimate a for commodities in the field, in Bangladesh and in China.

It appears possible to determine whether food aid is resold to any significant extent, and also the approximate price at which it is resold. It is much more difficult to determine whether food aid consumed at home is additional to normal food consumption or a substitute for some part. This is particularly true for very poor families, where "normal" consumption may fluctuate considerably from week to week.

Where a commodity is not one commonly eaten by recipient families, e.g., wheat flour in some regions, or where it is a less preferred commodity, such as corn in a predominantly rice-eating area, the question as to whether the food consumed at home is additional or a substitute can make a substantial difference to the calculated value of the a factor. Where it is additional, its value is taken to be the cost to the family of buying the food. Where it is a substitute, the value is taken as the income freed by no longer buying the previous food. (Technically, in economic terms, these are both

approximations.) The difference between these two measures could easily be of the order of 30-40%.

Where markets are not perfect, it is very difficult to deduce the value of food aid to the recipient with complete accuracy. Unfortunately, this is more likely to be the case than not in most types of food aid project. In addition, where a project covers a significant section of a small rural population, the amounts of food distributed may very well not be marginal. This means that if the recipients were to sell the food aid on the market, it could bring the price of the commodity down substantially. This is probably more true for unusual commodities, or commodities normally consumed in relatively small quantities, such as oil, butter oil, or skim milk powder.

It is quite clear from this discussion that it would be very difficult to use the a factor as an ex-ante method of ranking different commodities for use in food aid projects. At worst, urban market prices might be used to calculate the value of the commodity to the recipient, which could give a totally misleading value for, say, a project proposing to distribute tinned fish in a rural area. At best, even if local prices were used, and appropriate discounts taken for resale prices, predictions would have to be made as to how recipients would use the commodities distributed and how long it would take for markets in the commodities to develop or adjust, if indeed they did.

At the present time, it is doubtful whether the capacity exists to make these kinds of predictions adequately. This is not to say that it is impossible to develop this ability. However, until now, little work has been done systematically on the dynamics of local markets in this type of situation. Because of the importance of price in the calculation of the a factor, work in this area would be advisable if this type of criterion is to be used.

What would be dangerous would be the use of urban retail prices for commodities in calculating a values. It is perhaps unfortunate that the numerical example given in most of the presentations of the income transfer criterion (See, for example, Reutlinger and Katona-Apte, 1983, Table 6) appears to do this, and the results given show very high values for milk. This may well be true in urban areas, but rural markets for milk may well show very different characteristics, especially where there are no facilities for reconstituting skim milk powder on a commercial basis.

What these figures may indicate is the potential for commodity exchange agreements with recipient governments which could be beneficial to both donor and recipient. National governments could agree to provide a certain amount of a local cereal for use in projects in exchange for skim milk powder, at a rate lower than on the world market, while the donor might get more cereal for use in the project than the equivalent of the skim milk powder value in his domestic prices.

#### INCOME TRANSFER OR NUTRITION IMPACT

It was pointed out above that if the income transfer criterion is accepted in the context of commodity selection, then it must also be acceptable as a criterion for measuring project benefits. It in-

cludes as a benefit rather more than a nutrition impact measure would include. Does the alpha factor give the same ranking as a measure of nutritional impact would?

In the absence of any empirical testing of this question, the answer must be somewhat speculative. However, there are some pointers as to what might be expected. If the alpha factor is measured completely accurately, making allowances for imperfect (or possibly non-existent) markets and for transactions costs, then, the ranking should be the same as long as the additional consumption of calories (assuming that that is the measure being used for improved nutrition) arising from increased income is the same regardless of the form the increased income takes. There are tentative indications that income increases arising from food transfers as opposed to cash transfers may lead to a greater increase in calorie consumption. This would probably lead to a higher relative ranking being given to a food aid commodity which was mainly consumed in the household when a measure of calorie increase was used, rather than an income transfer measure.

Our understanding of family preferences and expenditure patterns, particularly in very poor families, is changing somewhat as more evidence becomes available. As Lustig (1984) points out, there may well be families at very low levels of income, with food intake levels which appear to be inadequate, where extra income is spent on satisfying non-food basic needs, which they themselves feel are more constraining, e.g., fuel for cooking or clothing. For these types of families, income transfer is a better indication of the benefit they receive than measures of nutrition impact, and attempts to increase their calorie intake without increasing other basic needs are doomed to, if not failure, at least very incomplete success.

Even where equivalence between income transfer and nutrition ranking of commodities should occur technically, whether it does or not depends on how well the various parameters are measured. The difficulties with income transfer measures have been mentioned. There are equal difficulties with measuring increases in calorie intake, without a base line survey. Much the same procedure has to be undertaken: information is needed on the amount of distributed food consumed within the household, the amount of extra income gained through household sales of food aid, and the amount of extra calories bought with that extra income.

It has sometimes been asserted that it is much easier to measure income transfer as opposed to nutrition impact. In fact, the information required to measure both is remarkably similar. There are two major differences: as stated above, what is actually counted as benefit; and the unit of account, whether calorie or price. Without a base line survey, the degree of guessimation is about the same for each measure and with one, the measure of calorie increase may be slightly easier, as the unit of account is the calorie, rather than a subjective measure of value. To try to measure impact in terms of specific nutrients, rather than calories, is extremely difficult.

If anthropometric measures are used to measure ultimate outcome, then a base line study is necessary. However, because of the complex relationship between intake, environment, and growth, to understand the results of an anthropometric assessment of a food aid

project may well require the kind of consumption survey discussed above.

Ultimately, the choice between income transfer and nutritional impact as a measure for assessing the effectiveness of a commodity in a project, where they give different results, depends on the objectives of the project planners and funders. To take an extreme example, is a commodity which is consumed almost entirely in the household, possibly because of an inability to resell it easily, and therefore increases calorie consumption considerably, to be preferred to one which is easily sold, but where little of a substantial resulting increase in income is spent on food? The answer may well be different for a food for work project, as opposed to a supplementary feeding project, and may also differ according to the characteristics of target families.

#### IMPLICATIONS OF USING INCOME TRANSFER AS A CRITERION

If income transfer were to be used as a criterion in project design, would this lead to major changes in donor policy, and what would be the implications of this?

Before tackling this question, the point ought to be made that if any one criterion of efficiency were to be used solely and systematically to shape donor food aid programs, they would look very different from the way they do at the moment. They might well be more effective economically in the recipient countries; they would almost certainly be less effective politically to the donor countries. Food aid programs are designed and operate in a highly constrained context and it would be unrealistic to expect donor policies to be transformed by the introduction of the use of the alpha factor. However, it is worthwhile pointing out pitfalls that could exist in the indiscriminate use of this criterion for guiding policy.

Food aid projects require consistency and stability in the type and amount of food supplied. Both the value of the commodity in the recipient community and the cost of the commodity to the donor may vary from year to year. To facilitate effective performance in the project, calculations of the alpha factor would have to reflect some form of expected average for the life of the project.

The value of commodities in recipient countries depends very much on government policy in that country. Taxes, subsidies, and import controls all affect prices. Donors will have to consider carefully their willingness to accept the implications of these policies in designing their own programs.

This is equally true as regards the cost of the commodity to the donor country. Thus both the numerator and denominator of the expression may be volatile, and reflect political factors as much as, if not more than, any concept of resource cost.

Possible adverse effects of encouraging the consumption of non-traditional commodities in recipient countries have to be considered. If this is not done, then skimmed milk powder, for example, could be distributed where conditions were not adequate to ensure its safe use. Alternatively, demand could be fostered for a commodity which could not be produced in the country and which might in the longer term, lead to pressure on the government to import it commercially.

If crude ex-ante calculations of the alpha factor are used, without due consideration for the nature or even existence of markets for the commodities being considered, there is likely to be a systematic bias towards overvaluation of high value commodities, such as tinned fish or butter oil, which may have resale value in urban areas, but where markets in rural areas may be so thin as to make the commodity effectively nonfungible.

Donors should be aware that use of the alpha factor as a major criterion in determining food aid projects has implicit in it acceptance of the nature of food aid as conceptually similar to financial aid. There is no specific advantage to the resource transfer being made in the form of food. That is simply the form in which the resources exist in the donor country. Making a factor calculations essentially allows the donor to exploit fully differences in pricing regimes between donor and recipient countries, to the benefit of the recipients of food aid.

To analyse food aid projects in terms of their income transfer effects is an improvement in many respects on a more narrowly nutrition-oriented approach. However, care must be taken not to end up with a form of project evaluation or commodity selection which is sufficiently complex, or gives such debatable results, that income transfer evaluation ends up in the same kind of impasse that nutrition evaluation appears to have entered. It may well be that use of alpha values may avoid this if practical work is undertaken to provide guidelines for their application. Without these, there will remain a risk that the concept, applied blindly, could hinder rather than help.

#### QUESTIONS FOR CONSIDERATION

It would clearly be ridiculous to take income transfer as a sole criterion for project design and/or evaluation. Suitability of the commodities being considered for inclusion in food aid programs also has to be taken into account. That being said, should income transfer measures, which take into account non-nutritional benefits of projects, replace conventional nutritional measures in project design and evaluation?

Is their role a more limited one, of supplementing nutritional measures, or is the information to be gained from estimating them insufficient to warrant any additional effort in calculating them?

Do the answers to the above questions depend on the type of project being considered?

Do we know enough to answer the above questions, and if not, is there a case for undertaking more field research on measuring income transfer?

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## A COMMODITY-APPROPRIATENESS EVALUATION OF FOUR WFP PROJECTS: A BRIEF EXPOSITION

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*Judit Katona-Apte*

### INTRODUCTION

This brief discussion will attempt to summarize the results of studies carried out to assess the appropriateness of food aid commodities used in World Food Program (WFP) projects in Bangladesh, Bolivia, China, and Indonesia.\* The type and quantities of commodities selected for a food aid project may have a differential effect on nutrition (National Academy of Sciences, 1982; Reutlinger and Katona-Apte, 1983), therefore it is important to provide the most appropriate commodity package for each specific project.

The commodities distributed in food aid projects can be used in the following ways: (1) Consumed by recipients; (2) Sold, bartered, or shared with other households; or (3) Used for animal feeding or discarded. The discussion below will concentrate on the usual situation: when food aid commodities are consumed.

One of the major programming considerations in food aid projects should be the selection of appropriate types and quantities of commodities. This involves a two-step process:

- (1) Selecting from the list of potential commodities those that aid in fulfilling the purpose of the project, are acceptable to the target population, are physiologically suitable, and involve no major logistical problems in their distribution.
- (2) Ranking the commodities that meet the criteria listed in (1) above according to their nutritional cost effectiveness.

### MODEL OF NUTRITIONAL COST EFFECTIVENESS

In order to calculate nutritional cost effectiveness, it is necessary first to know the value of the food aid package to the recipient. *Value can be calculated either in terms of nutritional content or in monetary terms.*

Second, it is necessary to calculate costs. These can be costs to the donor agency, to the recipient government, to the voluntary agency distributing the food, and so forth. For some types of nutritional cost effectiveness calculations, it is also necessary either to know the marginal propensity of the recipient population to spend additional income on food in general or on more nutrient-dense food, or to assume that the marginal propensity is not differentially affected by the commodities received in the project.

The most difficult task in calculating nutritional cost effectiveness may be to estimate the value of the commodity package to the recipient. (See Annexes A and B.) Nutritional value is simply the quantity of energy or specific nutrient (e.g., protein) in the foods distributed. Examples of such calculations can be found in Table 1. Monetary value is the amount of cash the household may

save as a result of receiving the food aid commodity package. Examples of such values are in Tables 2 and 3. For this calculation, it is necessary to know which foods and in what quantities need not be purchased as a result of receiving the distributed commodities.

When the food aid replaces a commodity usually purchased, it may be either an identical commodity, or a different commodity of equal, higher, or lower market price. For example, wheat could replace wheat, which is identical to the commodity distributed, or wheat flour, which may have an identical market price, or rice, which may have a higher market price than wheat, or cassava, a commodity that usually has a lower market price than wheat. Commodities in food aid packages, however, may replace not one food item but some of each of two or more different ones. For examples from the projects being discussed, see Table 4.

In situations where both nutritional and monetary values need to be considered at the same time, commodities should be ranked according to their cost effectiveness for both values. For example, Table 5 presents four alternative food aid packages for institutional feeding in Bangladesh. This is an on-site feeding project where the wheat received displaces either rice or wheat. Package (a) is the commodity basket program by WFP; pulses and oil are purchased by the institutions when necessary, however, no dairy products or corn are. The following rankings for cost effectiveness emerge for packages (a), (b), (c), and (d) as depicted below.

Packages	Value			
	monetary	protein	energy	fat
a	2	1	1	3
b	1	1	3	4
c	3	3	4	2
d	4	4	2	1

#### COMMODITY SELECTION

The ultimate goal of nutritional cost effectiveness is to improve the diet of members of the household. In order to achieve this, commodities in food aid projects should be selected according to the following guidelines:

- (1) When the food aid commodity is consumed in addition to the usual diet and in on-site feeding projects, it should be selected for its nutritional content, i.e., the quantity of energy or of protein should be divided by the cost of the commodity to arrive at the nutritional value obtained at the least cost. For example, in Bangladesh, wheat was more cost effective for energy content than either rice or corn, but corn was more cost effective for fat content than either wheat or rice. (See Table 6.)
- (2) When the food aid commodities replace other foods from the usual diet, as in most take-home distributions, it is best to provide commodities that replace foods of high monetary value to the recipient, but in amounts equal to or less than those usually purchased. In this case, monetary value of the food aid commodity to the recipient should be divided by the cost to the

donor to arrive at the ratio indicating the transfer of the highest income at the least cost to the donor. For example, rice was found to be more cost effective than fish in Indonesia (See Table 3) and wheat was more cost effective than oil in China (See Table 8). In situations where commodities are distributed in quantities exceeding those usually purchased, the excess quantity when consumed by the recipient has little monetary value, regardless of its market price.

#### APPLICATION OF ABOVE MODEL

The model described above was tested in four projects. Table 9 is a summary of the findings. The projects will be briefly explained here.

#### Bangladesh 2226 - Vulnerable Group Feeding (VGF) and Institutional Feeding (IF)

The objective of the VGS project is to help alleviate any deterioration in the nutritional situation of destitute women with dependent children. Wheat is distributed to them at the rate of 31.25 kilograms per month. The wheat is consumed totally in addition to usual foods, therefore cost effectiveness was calculated on the basis of nutritional content per unit of cost to WFP. Wheat does appear to be the most cost effective commodity in terms of both energy and protein content (See Table 6).

The IF project serves students living in educational institutions. The WFP food was added to either cash or other foods and/or goods provided for the institutions by the government or by private donations. Therefore, there is a potential to improve the diet through both the nutritional and monetary value of the food aid package. The marginal propensity to spend the additional income on food, however, appears to be extremely low. It would be possible to improve the cost effectiveness of the presently-used commodity basket (Examples are provided in Table 5), but due to logistical constraints no changes were recommended.

#### Bolivia 2121 - Assistance to Mothers' Clubs\*\*

This project focuses on encouraging low-income women to undertake economically productive group activities. The WFP commodities are sold to women who are participating members of the mothers' clubs at 25 to 30 percent of their market value. The funds generated from the sales are used for capital investments to benefit members of the clubs.

The following commodities were used in this project: wheat flour, rolled oats, dried skimmed milk, vegetable oil, canned fish, and canned meat (See Table 7). Wheat flour was found to be substituting for wheat flour or bread and as one or other of these products is usually purchased by the recipients, it had a high monetary value to them. Rolled oats substituted for the same products as wheat but at a higher price, therefore was found to be less cost effective. Oil and dried skimmed milk also substituted for expensive food items and therefore were found to be highly cost effective. Canned fish frequently substituted for dried fish. In most regions canned meat substituted for lower-cost staples resulting in a loss of income because the fraction of the market price paid for them was higher than

the value of the commodity it substituted for. Therefore, both rolled oats and canned meat were replaced with additional wheat flour and canned fish respectively in the commodity basket (See Table 9).

### China - Country-wide Assessment

Commodities currently used in China are wheat (sometimes exchanged for rice with the Chinese government), oil, canned meat, canned fish, and dried fruits (dates and raisins). The values to the recipient, and therefore cost effectiveness to WFP, varied depending on the price recipients pay for the same or substitute commodities. Due to the food rationing system, prices are different for agriculturists and non-agriculturists. Table 2 depicts monetary values by occupation, and Table 3 depicts cost effectiveness calculations differentiated for these two groups.

Wheat appears to be the most cost effective commodity for both, canned meats and fish and dried fruits have little monetary value to the recipient since they are not commodities ever purchased by this group, nor do they replace commodities of high value. Oil, on the other hand, is subsidized by the government and is therefore inexpensive; moreover, the population serviced by the food aid program does not purchase much of it. Being a scarce and expensive commodity for the donor, oil in these situations becomes highly cost ineffective. It was recommended, therefore, that oil be replaced with additional wheat.

The wheat in China has a substitution effect; WFP recipients consume more wheat (or rice) and less coarse grains than previous to the program. This results in more coarse grains being fed to domestic animals which can be either consumed by household members or sold for cash.

### Indonesia 2597 - Transmigration

Commodities currently used in Indonesia are rice, canned fish, pulses, and dried skim milk. The food aid package is meant to provide an incentive for transmigrants to develop their own land as a means towards self-sufficiency. There are several deterrents to this, however, such as migrants hire out for daily wage, crop yields are small due to inability to purchase fertilizer, or crops are lost to rodents and wild boars. It was recommended, therefore, that the value of the food aid package be increased to provide an amount at least equivalent to what could be earned through daily wage, and that food aid be given on a continuous basis so that recipients could plan ahead the purchase of fertilizers, pesticides, and fencing materials.

As dried skim milk and pulses were found not to have much monetary value to the recipients (neither item is usually purchased), it was recommended that they be removed from the food aid package. Oil, however, had a high monetary value to the recipient and therefore should be added. Table 3 depicts the values and costs of the present and recommended food packages. The proposed food aid package increased the value to the recipient by 18 percent, decreased the f.o.b. (acquisition) cost to WFP by ten percent, and improved the overall cost effectiveness by 28 percent. In addition, the number of items in the food aid package were reduced from four to three,

providing additional savings in terms of ocean freight and internal transport, storage, and handling costs.

#### SOME ADVANTAGES OF USING THE NUTRITIONAL COST EFFECTIVENESS MODEL FOR SELECTING COMMODITIES IN FOOD AID PROJECTS

- It provides guidelines as to the types and quantities of commodities needed.
- It could save on costs and thus increase the number of potential recipients.
- It is possible to use only the numerator of the cost effectiveness equation and to rank commodities in terms of value, either nutritional or monetary, to the recipient.
- It improves the probability of increasing nutritional benefits for the recipient households.
- It is useful to monitor the overall appropriateness of existing commodity packages and thus for recommending changes.
- It can provide input into project design.
- It can enable policy makers to consider food aid from a variety of perspectives, thus broadening the overall approach.
- As more is known through the use of this model about how food aid operates at the household level, additional guidelines may be established for commodity selection, such as how to target food aid more successfully, or how to increase a household's marginal propensity to spend additional income on food.

#### COMMON MISUNDERSTANDINGS ABOUT THE MODEL OF NUTRITIONAL COST EFFECTIVENESS

There exist many misconceptions regarding the model of nutritional cost effectiveness and its potential achievements. Those frequently mentioned will be discussed here.

"Cost effective foods have high nutritional and/or monetary value to the recipient." This misconception is due to an inability to distinguish between the *ratio* of cost effectiveness and the *numerator* of the ratio which is the value of the commodity to the recipient.

"Value to the recipient is identical to the market price of the commodity." The value of a food aid commodity to the recipient may have no relationship to its market price as it may replace a different food from the diet.

"Nutritional cost effectiveness is the *primary* criterion for commodity selection." There are several criteria for commodity selection, the primary one being acceptability. In fact, there are many situations where commodity cost effectiveness should be sacrificed for other specific gains.

"No information is needed on the household level in order to calculate the value of the commodity to the recipient." Actually, a great deal of information is needed on the household level. First, it is necessary to ascertain which of the usually purchased commodities will be displaced by the food aid commodity. Next, it is also necessary to know the quantities of the commodities usually purchased.

"The income transfer criterion can only be applied to take-home projects." Income transfer accrues from any program in which savings occur as a result of receiving the food aid package. When a child

receives a meal and therefore does not eat the same meal at home, that i savings to the household or income transfer.

"The value of a food aid commodity to the recipient is the same as what it would cost the household to purchase food for additional consumption." If the food aid commodity is not additional consumption, its value to the recipient is the same as the commodities *not* purchased as a result of receiving the food aid. When the food aid commodity is additional consumption, its value is related to the quantity of food energy it provides.

"For the cost effectiveness criterion to operate, it is necessary for the recipients to sell their commodities."; or "The nutritional cost effectiveness approach encourages the sale of food aid commodities." The proposed approach in fact discourages the sale of food aid commodities because in a properly planned project, the food-aid substitutes for usually purchased food, therefore there is no advantage in selling it.

"Income transfer and nutritional improvement are competing criteria for commodity selection." In fact, just the opposite is true if one accepts that the marginal propensity to spend on food in low-income (food aid recipient) populations is high. Then, increased income transfer will lead to improved consumption.

"The income transfer approach is an alternative to measuring nutritional impact or outcome." The recommendation that in certain situations commodities should be selected on the basis of their monetary value to the recipient has nothing to do with measuring impact.

"Application of the income transfer approach leads to the use of non-traditional commodities." As it is unlikely that non-traditional types of food aid commodities convey more income transfer than traditional ones, the income transfer approach could not be a justification for the use of non-traditional foods.

\*The following reports were used for the preparation of this publication. Data for all tables, unless otherwise noted, are from these reports.

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\_\_\_\_\_ *A Brief Description of the Function of WFP Food Aid in China* (Rome, Italy: World Food Program, 1984).

\_\_\_\_\_ *Commodity Appropriateness Analysis for Indonesia 2597* (Rome, Italy: World Food Program, 1984).

\*\*This section on Bolivia was prepared by Martha Steinbock.

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<sup>1</sup> Food and Nutrition Board. *Nutritional Analysis of P.L. 480, Title II Commodities* (Washington, DC: National Academy of Sciences, ).  
<sup>2</sup> Shlomo Reutlinger and Judit Katona-Apte *The Nutritional Impact of Food Aid: Criteria for the Selection of Cost Effective Foods* (Washington, DC: World Bank, 1983). Report No ARU 12.

Table 1

NUTRITIONAL VALUE OF PRESENT AND POTENTIAL ALTERNATE COMMODITIES  
IN BANGLADESH

<u>Commodity</u>	<u>Nutritional Content/100 g*</u>		
	energy	protein	fat
wheat	330	12	1.9
pulse	360	22	1.5
oil	890	0	100.0
rice	360	7	1.0
soyfortified sorghum grits	360	16	1.0
dried skimmed milk	363	36	0.8
corn	348	9	3.9

\*Numbers have been rounded

Sources: United States Department of Agriculture Handbook  
Number 8; and Agency for International Development's  
Food for Peace Commodities' Reference Guide

Table 2

WFP COSTS AND MONETARY VALUES TO RECIPIENTS FOR PROJECTS IN CHINA  
(\$ per ton)

<u>Commodity</u>	<u>Costs to WFP</u>			<u>Values to Recipients*</u>	
	<u>f.o.b.</u>	<u>Freight</u>	<u>Total</u>	<u>A</u>	<u>non-A</u>
wheat	170	25	195	270	133.5
oil	800	280	1080	370	180
canned pork	1500	160	1660	171.8	84.9
canned fish	2300	300	2600	249.5	123.3
pasta	700	130	830	280	180
dates	1100	120	1220	200.4	99.1
raisins**	1500	250	1750		
dried pears**	1500	300	1800		
edible fat	800	290	1090	370	180
DSM	800	100	900	294.5	145.6

\*A=Agriculturist, non-A=non-Agriculturist. For wheat, oil, and pasta average prices used, for all other commodities values are calculated as if commodity replaced wheat in terms of kcal of energy, i.e.

$$\frac{\text{kcal energy/100g commodity}}{\text{kcal energy/100g wheat}} \times \text{monetary value/100 g wheat to recipient}$$

\*\*Nutritive values not noted in "Average Nutritive Value of Commodities available to WFP", used for other commodities in this table.

Table 3

COST EFFECTIVENESS OF WFP FOOD AID COMMODITY PACKAGES IN INDONESIA

Present Package

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
rice	22.5	7.88	9.0	0.87
fish	1.88	2.34	4.31	0.54
DSM*	2.5	0.04	2.0	0.02
pulse*	1.88	0.03	0.75	0.04
Totals		10.29	16.06	0.64

Proposed Package

rice	25.0	8.75	10.0	0.87
fish	1.7	2.12	3.9	0.54
oil	1.0	1.25	0.8	1.56
Totals		12.12	14.7	0.82

Columns

- 1 commodity
- 2 amount distributed (kg)
- 3 value to recipient
- 4 cost to WFP (f.o.b.)
- 5 cost effectiveness ratio

\*DSM and pulse are valued at the cost of cassava, the commodity they are most likely to replace; as both quantities and values are small, calculations are by weight and not energy replacement.

Table 4

COMMODITIES DISTRIBUTED AND THE COMMODITIES THEY REPLACE IN THE FOUR  
WFP PROJECTS EVALUATED

<u>Project</u>	<u>Distributed Commodity</u>	<u>Commodity Replaced</u>
Bangladesh	wheat	wheat/rice
	oil	oil
	pulse	pulse
Bolivia	wheat flour and rolled oats	wheat flour/quinua/ potatoes/rice/ maize/cassava
	canned meat and canned fish	dried fish and staples noted above
	oil	oil
	DSM	fresh milk
China	wheat (rice)	wheat/rice + millet + sweet potatoes
	dried fruit	staples noted above
	canned fish and canned meat	dried fish/staples noted above
	oil	oil
Indonesia	rice	rice/cassava
	canned fish	dried/fresh fish
	DSM and pulse	cassava

Table 5

POTENTIAL COMMODITY PACKAGES FOR THE IF PROJECT IN BANGLADESH

	(a)	(b)
Package Content:	300 grams wheat 40 grams pulse 20 grams oil	300 grams wheat 40 grams dried skim milk 20 grams oil
K (cost) :	12.42¢	13.76¢
V (value) :	1302 kcal energy 45 grams protein 25 grams fat  10.97¢ income transfer	1338 kcal energy 50 grams protein 25 grams fat  12.78¢ income transfer
Alpha :	0.86	0.92
Beta :	104 for energy 3.6 for protein 2.0 for fat	97 for energy 3.6 for protein 1.8 for fat
	(c)	(d)
Package Content:	300 grams corn 40 grams pulse 20 grams oil	300 grams corn 40 grams dried skim milk 20 grams oil
K (cost) :	13.83¢	15.17¢
V (value) :	1356 kcal energy 35.5 grams protein 32 grams fat  10.97¢ income transfer	1367 kcal energy 41 grams protein 32 grams fat  12.78¢ income transfer
Alpha :	0.79	0.84
Beta :	98 for energy 2.5 for protein 2.3 for fat	90 for energy 2.7 for protein 2.1 for fat

Alpha = Value/Cost

Beta = cost effectiveness by nutritional content

Table 6

COMMODITY COST EFFECTIVENESS BY NUTRITIONAL CONTENT FOR PROJECTS IN BANGLADESH

Commodity	Cost/100 g ¢	Value/100 g			Cost Effectiveness		
		energy	protein	fat	energy	protein*	fat
wheat	2.65	330	12	1.9	124	4.52	0.56
pulse	6.62	360	22	1.5	54	3.6	0.24
oil	10.10	890	0	100.0	88	infinite	9.90
rice	4.92	360	7	1.0	73	1.42	0.20
soy-fortified sorghum grits	4.22	360	16	1.0	85	3.79	0.23
dried skimmed milk	9.47	363	36	0.8	38	3.79	0.08
corn	3.12	348	9	3.9	111	2.85	1.25

\*These figures may be misleading because values are not adjusted for quality; e.g., when adjusted, DMS, for example, is more cost effective than wheat (3.79 vs 2.39).

Table 7

COST EFFECTIVENESS OF WFP COMMODITIES IN BOLIVIA

<u>Commodity</u>	<u>Value to Recipient*</u>	<u>Cost to WFP**</u>	<u>Cost Effectiveness</u>
wheat flour	1.43	0.40	3.5
rolled oats	0.81	0.55	1.5
canned fish	2.10	2.28	0.9
canned meat	-0.32	2.08	
oil	1.88	0.95	1.9
DSM	2.37	0.85	2.8

\*For illustrative purposes only one site, Rural Altiplano, was used. Value takes into consideration price recipient pays to receive commodity as well as foods displaced from usual diet.

\*\*Costs include f.o.b., ocean freight, and internal transport.

Source: Data collected and analysed for review of Bolivia 2131 by Martha Steinbock.

Table 8

COST EFFECTIVENESS FACTORS FOR WFF COMMODITIES IN CHINA

<u>Commodity</u>	<u>Cost Effectiveness*</u>			
	<u>To Agriculturists</u>		<u>To Non-Agriculturists</u>	
	A1	A2	A1	A2
wheat	1.38	10.80	0.68	5.34
oil	0.34	1.32	0.16	0.64
canned pork	0.10	1.07	0.05	0.53
canned fish	0.09	0.83	0.04	0.41
pasta	0.33	2.15	0.21	1.38
dates	0.16	1.67	0.08	0.82
edible fat	0.33	1.27	0.16	0.62
DSM	0.32	2.94	0.16	1.45

\*A1 = f.o.b. plus ocean freight costs

A2 = ocean freight costs only

Table 9

SUMMARY OF FINDINGS IN FOUR WFP PROJECTS WHERE COMMODITY APPROPRIATENESS WAS EVALUATED

<u>WFP Project</u>	<u>Pathway of Effect</u>	<u>Commodity Usage</u>	<u>Pathway to Additional Nutritional Improvement</u>	<u>Commodities Currently Programmed</u>	<u>Recommendations</u>
Bangladesh					
VGF	direct	all consumed in addition	nutritional content of the food	wheat	no change
IF	mainly direct, some direct	mainly consumed in addition	mainly from nutritional content of food, very little income transfer	wheat oil pulse	no change
Bolivia	mainly indirect	mainly displacement	increased income spent on cooking fuel and more nutrient-dense foods	wheat flour fish oil DSM meat rolled oats	wheat flour fish oil DSM
China	mainly indirect	mainly displacement	displacement of coarse grains from human diet to increase animal food production and animal consumption	wheat/rice oil (meat) (fish) (dates/raisins)	wheat/rice  (meat) (fish) (dates/raisins)
Indonesia	mainly indirect	mainly displacement	increased income spent on agricultural improvement to improve food supply	rice fish DSM pulse	rice fish oil/sugar

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## Annex A

To calculate the approximate nutritional content of the food aid package to the recipient household,

- let  $i$  = commodity distributed by food aid project;  
 $N_i$  = energy or nutrient content of food aid commodity  $i$  per unit of weight;  
 $Q_i$  = quantity of food aid commodity  $i$  distributed;  
 $V_i$  = nutritional (energy or nutrient) value of distributed food aid commodity  $i$  per unit of weight;
- then  $V_i = Q_i N_i$
- if  $V_t$  = nutritional value of total food aid package to the household, then

$$V_t = \sum_i V_i = V_1 + V_2 + V_3 + \dots + V_n$$

$$i = 1, 2, 3, \dots n$$

(e.g. 1 = wheat  
2 = DSM  
3 = canned fish)

Note:

$N$  = energy or any nutrient (e.g., protein, fat, vitamin A, iron, etc.). Calculations have to be made individually for each  $N$ , as  $N(\text{energy})$ ,  $N(\text{protein})$ , and so forth.

## Annex B

To calculate the approximate monetary value of the food aid package to the recipient household,

let  $i$  = commodity distributed by food aid project;

$P$  = price of commodity per unit of weight that commodity  $i$  substitutes;

$Q_i$  = quantity of food aid commodity  $i$  distributed per same unit of weight as  $P$ ;

$e$  = expenses incurred by the recipient in receiving food aid commodity  $i$ ;

$V_i$  = monetary value of food aid commodity  $i$  to recipient household;

then  $V_i = PQ_i - e$

let  $V_t$  = monetary value of the total food aid package to recipient household, then

$$V_t = \sum_i V_i = V_1 + V_2 + V_3 + \dots + V_n$$

$i = 1, 2, 3, \dots, n$

(e.g. 1 = wheat  
2 = oil  
3 = dates)

## INTEGRATING FOOD SUPPLEMENTATION AND HEALTH CARE PROGRAMS TO STIMULATE CATCH-UP GROWTH IN DEVELOPING COUNTRIES

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### INTRODUCTION

Studies carried out in hospitals and metabolic wards have shown that when food is given ad libitum to acute malnourished children, catch-up in weight is possible at a very rapid rate. Weight increments from 15 to 20 g/kg/d make it possible for acute malnourished children to recuperate to normal weight-for-age in a three to six month period<sup>1-3</sup>. Catch-up in length or height, on the other hand, follows catch-up in weight, and the normal length or height-for-age is reached after approximately ten months of nutritional rehabilitation<sup>4</sup>.

At the community level, pilot nutritional rehabilitation projects, in which the normal diet of acute malnourished children was supplemented, have also been successful in normalizing weight-for-age after a three to six month period<sup>5,6</sup>.

Although these results are useful for understanding catch-up growth, they are based on small samples of children living in conditions different to those prevailing in free-living populations in which infection and mild-to-moderate malnutrition are characteristic.

The present paper reviews information related to growth and catch-up growth in mild-to-moderate undernourished populations, analyzes data from a longitudinal study carried out in rural Guatemala and discusses some of the alternatives to link food aid with integrated health care services to bring about catch-up growth, both in chronically and malnourished children as well as in those who have suffered recently from infections.

### NUTRITION, INFECTION, GROWTH, AND CATCH-UP GROWTH

Studies pointing to the importance of energy for growth have long been reported in scientific literature<sup>7,8</sup>. As indicated by Sinclair<sup>9</sup>, energy intake, expenditure, and losses remain in equilibrium with the mass and composition of the individual, so that increments in total mass or changes in composition imply changes in energy intake. The relevance of energy as a limiting factor for growth, moreover, is underscored by its relationship with nitrogen metabolism and the efficient use of protein intake<sup>10</sup>. Although other nutrients also play a role and should be available in sufficient quantities for tissue synthesis to occur, positive energy and nitrogen balance are essential for tissue accretion.

Data from developing countries suggest that the effect of these nutritional factors on growth is more critical during early infancy. In these populations, a rapid decline in growth status, relative to the World Health Organization reference population, occurs during the first two years after birth. Weight retardation usually shows a peak prevalence in the second year of life, while the prevalence of height

retardation increases with age<sup>11</sup>. The factors responsible for poor infant growth in developing countries also affect preschool children. Surviving older children, nonetheless, achieve adequate growth rates, although not sufficient to significantly reduce the consequences of earlier growth retardation.

The factors responsible for infant and preschool growth retardation are those related to the utilization of available energy and protein resources and the impact of infections and calorie-protein insufficiency relative to requirements. The maintenance energy requirements and the amount of energy required for growth, physical activity, and infections have considerable variability between and within individuals.

The energy requirements of a child are largely a function of body mass and body composition<sup>12</sup>. All tissues have a requirement for energy, but the various components of the total cell mass have different metabolic rates. Furthermore, these cell mass components possess specific growth rates and hence form varying proportions of total body composition as growth proceeds. For instance, muscle mass represents about 20-25 percent of body weight during the first 18 months, and about 35-40 percent at five years of age<sup>13</sup>.

The very high metabolic requirements of the major organs, such as the brain, and the rapid growth of the brain during infancy and preschool age explain why brain metabolic rate forms the larger part of the basal requirements during most of the first five years of life<sup>12,13</sup>.

The proportion of energy intake required for growth in healthy children at different ages is dependent upon variations in the quantity and quality of weight gain. The proportion of energy intake allocated to growth declines from 44 percent at three weeks of age to 17 percent at four months and to three percent at 12 months of age<sup>14</sup>. When energy requirements are not met by intake, body energy stores will be utilized, specially body fat, with body protein stores affected only minimally and after continued hypocaloric states<sup>15</sup>.

The main cause of energy expenditure above maintenance energy requirements in healthy children is physical activity. Physical activity constitutes an increasingly important and variable component of energy requirements with age. Payne and Waterlow<sup>16</sup> have estimated that physical activity requires 10.4, 14.9, 25.0, and 28.2 percent of energy intake in children 0-3 months, 0.75-1 year, 2-3 years, and 4-5 years respectively. These authors also underscore the wide individual variability existing in energy requirements and the important role that physical activity plays in determining such variability.

Studies on the interaction of growth and physical activity<sup>16, 17,19</sup> suggest that reduced physical activity may represent a significant energy conservation measure in the child faced with inadequate caloric intake relative to current metabolic needs.

The consequences of infectious illnesses, especially diarrheal diseases, for the metabolism and utilization of nutrients are numerous<sup>20-22</sup>. The nutritional impact of diarrhea is postulated to operate through at least four basic mechanisms: reduction in food consumption<sup>23-26</sup>, interference with the absorption of macro and micro nutrients<sup>22,27-29</sup>, disturbance of virtually all normal metabolic

and endocrine functions, and increments of direct loss of protein and other nutrients in the gastrointestinal tract.

The magnitude of physical growth retardation associated with diarrheal diseases in developing countries is significant<sup>30-34</sup>. In addition, it has become increasingly clear that insufficient catch-up growth during recovery from infection is primarily responsible for the poor growth status of children in developing countries. Children generally cannot recover from infectious episodes because of inadequate nutrition and repeated infections<sup>35-36</sup>.

In the joint FAO/WHO/UNU Expert Consultation on Energy and Protein Requirements, Waterlow presented estimations of requirements for catch-up from wasting, from stunting, and after infections<sup>37</sup>. He estimated that the extra protein and energy requirements for catch-up growth of a one year old child at the rate of 3 g/kg/d should be 0.8g of protein and 15 calories per kilogram body weight per day. The nutrient requirements for catch-up after infections corresponds to an extra daily requirement of 3.75 kcal/kg/d and 0.2g protein/kg/d. In the case of stunted populations, Waterlow recommends that the requirements for children one to five years of age be increased by 20 percent for protein and ten percent for energy.

In summary, the information reviewed in terms of the patterns of energy used indicate the special sensitivity of children during infancy and the preschool age. Given the high metabolic requirement, and a high proportion of energy intake dedicated to growth and physical activity, it is clear that chronic energy deficits will be reflected on growth retardation. When infection elevates requirements and reduces intake and absorption, the result is child growth failure. The children in developing countries are unable to replete catabolized tissue after an infection because they lack high-nutrient density foods and the probability of new infectious episodes is high.

#### INSTITUTE OF NUTRITION OF CENTRAL AMERICA AND PANAMA LONGITUDINAL STUDY IN EASTERN GUATEMALA

The Institute's longitudinal study has been well described elsewhere; however, a brief description follows<sup>38</sup>.

##### Population, Design, and Methods

In 1969, a longitudinal study of the biologic and socioeconomic determinations of physical growth and mental development in rural Guatemala was begun. The project involved four small villages of eastern Guatemala. The ethnic background of the population is *Ladino*, or mixed Indian and Spanish. These are agricultural villages and the main crops are corn and beans, most of which are consumed in the same village. The total population of the four communities was 3359 inhabitants in 1975, half of them being below 15 years of age.

The basic hypothesis of the study was that mild-to-moderate protein-calorie malnutrition adversely affects the mental development of infants and preschool-aged children. To test the hypothesis, a quasi-experiment design was employed. Experimental treatment consisted of food supplementation in four closely matched villages. In two of the villages, a high protein-calorie supplementation drink called "atole" containing 11.5g of protein and 163 kcal

per 180 ml was made available. The other two villages were provided with a fruit-flavored drink called "fresco", which contained no protein and supplied only 59 kcal per 180 ml. The supplements also contained vitamins and minerals. Attendance at the food supplementation centers and consumption of the supplements were free and voluntary, and as a result, a wide range of supplement intake in mothers and in children was observed. The supplement was given twice daily, seven days a week. Subjects were provided with a cup containing 180 ml, and more was given if requested. Leftovers were measured and actual intake on an individual basis was recorded to the nearest 10 ml. Because dietary intake was more limiting in energy than in protein, supplement intake was expressed in terms of calories.

No medical care services were included in the original experimental design, but a real and felt need for these was detected as the project progressed. Thus, a health care program was implemented in each community with services provided by physicians. After this study was through, this system was simplified in such a way that the physician's role became that of supervisor for Auxiliary Nurses, who took charge of the primary health services. In addition to the management of common diseases, the Auxiliary Nurses were responsible for the implementation of maternal and child care activities and vaccination programs for mothers and children. The primary health care was integrated to the food supplementation activities of the program.

The longitudinal data collection on nutritional, socioeconomic, health, and demographic aspects of the population began in early 1969. The principal examinations made in pregnant and lactating mothers and children seven years old and under and analyzed in this report include anthropometry (every three months during pregnancy, lactation, and in children less than 24 months of age; every six months thereafter), morbidity (obtained through fortnightly surveys). The survey was symptom-oriented and utilized retrospective home interviews, and supplement intake.

## Results

A marked reduction in neonatal and postneonatal mortality rates occurred during the first six years of the project. According to the data obtained from pregnancy histories for the 1960-1968 cohort, before the study began, neonatal mortality rate was 104.8 and postnatal mortality was 47.0 per thousand live births. The stillbirth death ratio was 24.8 per thousand live births during the same period. The stillbirth death ratio and the neonatal and postneonatal mortality rates for the 1969-1975 cohorts, during the study period, were 21.7, 24.1, and 32.2 per thousand live births, respectively. Information recently collected in the four communities, after the health and nutritional interventions took place, revealed that infant mortality continued to be low, 27 per thousand live births, for the 1977-1980 period. The reduction in mortality rates in the longitudinal study could be attributed to the food supplementation and health care programs, given that no other intervention was concurrently instituted in these communities.<sup>39</sup>

Regarding the impact of the food supplementation program on physical growth, we have published results showing that caloric supplementation given to the pregnant mothers is causally related to

birth weight and to the length of pregnancy. The magnitude of the association is such that the proportion of low birth weight ( $\leq 2.5$  kg) and short gestational age ( $<37$  weeks) babies in the group of low supplemented mothers was 19 percent and 18 percent as opposed to nine and four percent in high supplemented mothers, respectively<sup>40,41</sup>.

An association between the caloric supplementation consumed by the mother during pregnancy and lactation and by the infant during lactation on infant's growth in weight and length has also been reported<sup>42</sup>. Moreover, the impact of additional calories and proteins on children's growth has been communicated by Martorell *et al.*<sup>43</sup>

In the following section we will examine information on the effect of food supplementation and morbidity on physical growth. For those analyses, cohorts of all children who reached 18, 30, and 36 months of age during the study period, 1969-1977, and who were followed during one year, were selected. In total, 793 children at 18 months, 763 at 30, and 746 children at 36 months were identified and studied.

The information included in these analyses are anthropometry (weight and length), morbidity (percent time ill with diarrhea per semester) and food supplementation (mean daily calorie intake from supplementation during each semester). The absolute anthropometric measurements were converted to Z-score, in relation to the WHO reference population, and the semestral weight and length changes expressed as semestral Z-score changes. In theory, healthy children growing normally maintain their Z-score in consecutive weight and length measurement and their semestral Z-score change should approach zero.

Table 1 indicates that in this population, the growth deficits, relative to the WHO reference population tends to decrease at older ages. In both, weight and length, as well as in weight-for-length, there is a statistically significant reduction in growth retardation from younger to older ages.

The six-month increments in weight, length, and weight-for-length in children living in "atole" and "fresco" villages are presented in Table 2. In all cases, semestral Z-score changes are positive, and at 18 to 24 months, they are significantly higher in "atole" than in "fresco" villages. In addition, at 18 to 24 months, the changes in length are greater than in weight, in both "atole" and "fresco" villages.

Tables 3 to 5 present the semestral changes in weight, length, and weight-for-length Z-scores, according to the initial length and weight Z-scores. In general, at all ages, the semestral Z-scores changes in weight and in weight-for-length are greater in children with low weight at the beginning of the interval, and especially in those children with low weight and high length. The semestral Z-score changes in length are greater in children with low length and high weight at the beginning of the semester, especially at younger ages. These results support the existence of an effect of prior patterns of growth on subsequent growth, and are consistent with Ferrusson *et al.*<sup>44</sup>, who reported that growth in the postnatal period acts in a redistributive fashion which tends to stabilize the relationship between the child's length and weight<sup>42</sup>.

Tables 6 to 8 present attained and incremented weight and length information, by year of the study, in the three cohorts. Attained weight and length Z-scores at 18 months of age and the 18 to 24 month

Z-score length tend to decrease from the beginning to the end of the program. The six-month changes in weight and length are also significantly smaller at later years of the project, without significant changes in the attained weight and length measurement.

The association between diarrheal diseases and physical growth is explored in Tables 9 and 10, for weight and length respectively. The study sample was categorized in two groups: children with low and children with high diarrhea in two consecutive semestral periods (low diarrhea: zero percent time ill with diarrhea during each semester; high: five percent or more time ill with diarrhea), in each of the three cohorts and in the "atole" and "fresco" villages. According to morbidity experience in the first and second semester, children were grouped as follows: children without diarrhea in the two consecutive semesters, children with high diarrhea during the first semester and without diarrhea during the second, and children without diarrhea during the first and with diarrhea during the second semester. As shown in Tables 9 and 10, in all cases, children with diarrhea in the first semester and without diarrhea in the second have greater six-month changes during the second semester in weight and length than those without diarrhea in both semesters. In most cases, the six-month Z-score changes in weight and length during the second semester are negative in those children who had diarrhea during the second semester but not in the first. These data suggest that growth velocity in weight and length is greater after a period with diarrhea than what could be identified as normal growth in those cases without diarrheal disease. It is also evident from these results that weight changes are greater than length changes at all ages and that length changes are greater at younger ages.

Finally, Table 11 presents information on the six-month changes in length, according to the pattern of morbidity and the level of energy supplementation in the "atole" villages. As in Table 10, children were grouped according to their morbidity experience, and were divided in two categories, based on the daily mean amount of supplemented calories consumed during the second semester. As clearly shown in this table, the length increments in well-supplemented children is significantly greater than the low supplemented group in the 24 to 30 month age interval. In addition, the length increment in children with high supplementation and diarrhea during the first semester and no diarrhea during the second is significantly greater than the group of children without high supplementation and no diarrhea in the two consecutive semesters. At older ages, 36 to 42 and 42 to 48, the effect of supplementation is not significant.

In summary, the integrated food supplementation and health care programs had important effects on the infant and child mortality rates and on physical growth. The food supplementation project was responsible for an increment in birth weight and in weight and length of children at older ages. This was more obvious at the beginning than at the end of the project. It was also found that the effect of the food supplementation was greater in children with low weight and length than in heavier and taller children, as well as in those who had suffered from diarrheal disease in the past. The conclusion from the data is that the food supplementation project carried out in these villages was successful in stimulating catch-up growth in preschool children.

Based on the experience previously presented, and others in which we have been participating, a generalized model for food supplementation programs that utilizes a system of health as a vector for operationalizing integrated development programs was planned. In the next section, some of these ideas are discussed.

## DISCUSSION

Food aid resources available in a developing nation should be used to strengthen government efforts to expand primary health care services to the most deprived and isolated communities within a country. This strategy was used successfully in Costa Rica in the last decade with the initiation of the Rural Health Program (RHP) and the Community Health Program (CHP). The health and nutritional consequences of linking food aid to an integrated health care program gear to those segments of the populations in most need of these services have been well documented in the literature<sup>45,46</sup>. The latter example should not be overlooked, particularly in the Central American countries. A series of anthropological reports on health seeking behavior in Central America and Panama, carried out by INCAP and scientists of its member countries<sup>47</sup>, have singled out the low utilization by rural populations of government health services. While it is recognized that existing sociocultural practices in rural communities may preclude a better use of these services, it is also true that in the initial stages of provision of health services to isolated rural communities, certain material stimulus besides health (i.e., food aid) need to be present while the confidence between health providers and recipients is established. Our own data<sup>34</sup> have singled out the positive impact on subsequent growth of those children who consulted the health service due to diarrhea as opposed to those who did not make use of the program. Therefore, food aid can serve as a tool to promote the extension and use of medical care services in rural areas, particularly when the recipient populations have not been exposed to modern medicine.

The link of food aid to integrated medical care services, oriented to provide health to deprived communities of developing nations, can be established mainly through two types of food aid programs: supplementary feeding schemes through the maternal and child care programs and food for work activities. The former will fulfill objectives such as avoiding deteriorations or improving the health and nutritional conditions of vulnerable demographic and physiological groups (mothers and children) and/or of vulnerable groups within high risk poor families. They will also propose other broader objectives such as being an income transfer or becoming a tool to improve the utilization of health services as it has already been described.

However, at least in the Latin American context, food aid in the form of food for work has seldom been linked to integrated efforts of delivering health services to deprived and undernourished populations. Construction or maintenance of roads and certain agricultural-related activities have accounted for most food aid provided in Central America as food for work. If food aid is to be integrated to efforts to provide comprehensive health services in developing countries, certain resources to be allocated to food for

work activities need to be invested to support the strengthening of the health infrastructure in dispersed rural communities. These potential food for work projects include not only the construction of health posts but, more importantly, projects geared to prevent the occurrence of the most important plague diseases affecting children in rural communities: improvements to existing houses with adequate sanitary conditions, introduction of potable water, improvements to garbage and excreta disposal systems, adequate sewage systems. Thus, the expansion of present food for work activities to improve the infrastructure for health and sanitary services in isolated rural communities of developing nations may be an important contribution of food aid to the health and nutritional status of mothers and their children in the developing world.

By no means a larger allocation of resources of food for work programs to strengthen the health and sanitary infrastructure is in conflict with the broad objective of food for work project, which is to make use of surplus labor in certain periods of the year to promote development projects while providing to unemployed or underemployed families some economic means to fulfill basic needs. However, trade-offs should be carefully analyzed if resources are to be diverted from other existing developmental projects as well as the government capacity to handle efficiently more food aid if the new projects are going to be financed with additional resources.

How, in practice, can food aid be efficiently linked to promote, within integrated health services, catch-up growth? The answer to this question, besides taking into consideration the general nutritional policy issues on food aid and health care services already discussed, rests on effective program selection, design, and control of program performance (process). Other papers in this workshop will be dealing at length with targeting and evaluation of food aid programs and therefore we will only discuss the pertinent aspects of targeting and evaluation of process and impacts related achievement of catch-up growth.

The probability to observe catch-up growth may be enhanced if food aid programs operating in the health or any other government sectors are better targeted. The means for that exist, particularly in the Central American isthmus and other Latin American countries, where permanent food and nutrition information systems of mapping and monitoring the prevalences of malnutrition for the smallest political-administrative units are operating<sup>48</sup>. In Panama, which is divided in 505 *corregimientos*, for political and administrative purposes, a total of 34 *corregimientos* exhibited a proportion of less than 3% of children below -2 Standard Deviation of the NCHS reference pattern. Conversely, 59 *corregimientos* (11.7%) showed a prevalence of height retardation above 50%, while 6 *corregimientos* had more than 75% of their children with height retardation<sup>49</sup>. For ethical and cost-effectiveness reasons, one may select the worst-off *corregimientos* as target communities for food aid programs. If that is so, either as a true catch-up growth and/or as part of a regression to the mean effect, one would expect a greater impact of the program in those communities exhibiting the worst conditions.

The same argument holds true for targeting the food aid program to those families and individuals in the most precarious condi-

tions within selected communities. To maximize the efficiency of selecting the worst-off within the communities, nutritional status criteria can be complemented with information about the functional occupation of heads of households as has been proposed in the Central American isthmus<sup>48,49</sup>. Thus, better targeting of food aid and other food, nutrition, and health programs by regions, subregions, areas, and communities, and within communities by families and individuals are feasible nowadays to be carried out in some developing countries and are not an impossible task in many others. The selection of the most deprived and undernourished (thinnest, sickest, and smallest) through food aid and health care services will enhance any possibility to produce catch-up growth.

Seasonal factors are commonly overlooked in food aid program design. If food aid is properly designed within health care systems, it may have important implications in buffering periodic scarcity of foods coupled with higher occurrence of diseases which are commonly found in rural areas of developing nations. Thus, in many developing nations, the peak of diarrhea and other diseases usually coincides with the months where less food is available at home. Therefore, with knowledge of these patterns for different agricultural communities in a country, both the coverage and the amount of foods per participant can be modified. The latter will accommodate, at the individual level, for the additional demands of energy and nutrients imposed by the higher proportion of children in the selected communities who during these periods exhibit diarrhea and other diseases.

Besides policy definitions with regards to the utilization of food aid and better targeting of existing resources to the most deprived and undernourished families, the possibility to link food aid with health care programs to produce catch-up growth will have to face a critical revision of existing norms and procedures of these programs. This revision will have to include the criteria for selecting a child to enter the program, instruments and interpretation of growth monitoring curves, type, quantity, and quality of foods to stimulate catch-up growth, length of child participation in a program, follow-up of discharged children. The above issues should be addressed in the circumstances in which food aid programs operate in developing nations and will be the subject of a research project to be conducted in 1985 as part of INCAP's efforts in the next five years to support the efficient operation of food aid programs in Central America and Panama<sup>51</sup>. The following are examples of the type of revisions to be made on the criteria for selecting participant children, if we expect to maximize the potential to see catch-up growth. No food aid out of 26 programs operating in the Ministries of Health in Central America and Panama have, within the criteria for incorporating a child to the program or for determining his length of participation, the presence or antecedents of diarrheal diseases. Furthermore, the amounts of food given to a family do not take into consideration the initial nutritional status of the child and/or his recent morbidity events.

To recapitulate, the field evidence reviewed in this paper and our experiences supporting national food aid programs in the health sector, particularly in Central America and Panama, lead us to suggest that the measures to improve food aid program efficiency in the

health sector, in general, are the very same measures which will maximize the effects of food aid on catch-up growth. They entail the use of food aid, both as a basic element of a strategy to expand the coverage and effective use of health care services and to strengthen the health and environmental sanitation infrastructure to prevent or reduce the occurrence of diseases. With regards to program design, better targeting (political-administrative, within selected communities, seasonal criteria) and a revision of existing norms and procedures should be carried out to maximize the achievement of clear-cut program objectives, one of which may be to stimulate catch-up growth. Existing permanent data collection mechanisms for food and nutrition planning and operational research in national food aid programs are essential tools for improving design and program performance and, therefore, for increasing program efficiency which will, in turn, be reflected in catch-up growth in some participant children chronically malnourished as well as in others who had suffered recently from acute morbidity events.

Finally, as will be discussed in another session by Dr. John Mason, it is feasible but difficult and costly to ascribe nutritional impacts to a national food aid program. Thus, the evaluation of impact of food aid programs on catch-up growth can be addressed as part of field studies on nutritional effects of national food aid programs.

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Table 1

ANTHROPOMETRIC INDICATORS IN THE STUDY SAMPLE

Age months	N	Z-score weight		Z-score length		Z-score weight-for-length	
		$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
18	731	-2.11	.90	-2.78	1.06	-.71	.84
24	793	-2.03	.96	-2.46	1.10	-.61	.68
30	704	-1.83	.89	-2.41	1.10	-.45	.71
36	762	-1.66	.85	-2.34	1.03	-.33	.73
42	746	-1.56	.82	-2.32	.99	-.23	.76
48	664	-1.53	.77	-2.26	.98	-.23	.73

Table 2

SIX-MONTH CHANGES IN WEIGHT, LENGTH, AND WEIGHT-FOR-LENGTH IN "ATOLE" AND "FRESCO" VILLAGES

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Age (months)	Type supplement	N	Six months changes in		
			Z-score weight	Z-score length	Z-score weight-for-length
18-24	Fresco	346	.01 *	.26 *	.06
	Atole	373	.15	.37	.12
30-36	Fresco	341	.17	.06	.11
	Atole	342	.14	.05	.12
36-42	Fresco	329	.11	.01	.10
	Atole	338	.05	.02	.05

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Comparison between "Fresco" and "Atole" villages

\* t-test > 1.96; p < .05

\* t-test > 2.58; p < .01

Table 3

CHANGES IN WEIGHT, LENGTH, AND WEIGHT-FOR-LENGTH FROM 18 to 24 MONTHS ACCORDING TO INITIAL LENGTH AND WEIGHT MEASUREMENTS\*

Categories of length	Categories of weight	N	Six-month changes in Z-score		
			weight	length	weight-for-length
Low	Low	40	.19	.45	.12
	Mid	31	.22	.63	-.09
	High	6	-.04	.77	-.74
Mid	Low	17	.41	.07	.86
	Mid	49	.10	.41	.10
	High	27	.09	.36	-.18
High	Low	4	.60	-.20	1.43
	Mid	43	.28	.33	.54
	High	156	.08	.32	.02

\*In Atole Villages

Table 4

CHANGES IN WEIGHT, LENGTH, AND WEIGHT-FOR-LENGTH FROM 30 TO 36 MONTHS, ACCORDING TO INITIAL LENGTH AND WEIGHT MEASUREMENTS\*

Categories of length	Categories of weight	N	Six-month weight	changes in length	Z-score weight-for-length
Low	Low	25	.30	13	18
	Mid	23	.11	35	-14
	High	5	-.01	29	-16
Mid	Low	22	.31	5	28
	Mid	55	.24	4	24
	High	37	.11	16	4
High	Low	3	.48	-.02	.59
	Mid	37	.21	-.02	.24
	High	135	.02	-.04	.07

\*In Atole Villages

**Table 5**

**CHANGES IN WEIGHT, LENGTH, AND WEIGHT-FOR-LENGTH FROM 36 TO 42 MONTHS, ACCORDING TO INITIAL LENGTH AND WEIGHT MEASUREMENTS\***

Categories of length	Categories of weight	N	Six-month changes in Z-score		
			weight	length	weight-for-length
Low	Low	23	.22	.14	.18
	Mid	22	.04	.10	-.03
	High	10	.14	.38	-.03
Mid	Low	7	.18	-.07	.06
	Mid	42	.12	.00	.25
	High	48	.07	.06	.13
High	Low	3	.15	.03	.10
	Mid	26	.08	-.02	.13
	High	157	-.01	-.03	.08

\* In Atole Villages

Table 6

ATTAINED WEIGHT AND LENGTH AT 18 MONTHS OF AGE AND CHANGES FROM 18 TO 24 MONTHS, BY YEAR OF THE STUDY

	Years of the Study							
	1969-70	1971	1972	1973	1974	1975	1976	
Z-score weight	2.23	2.12	2.17	2.27	2.02	1.93	2.00	F 2.60; p: 0167
Change in Z-score weight	.00	.13	.05	.03	.04	.06	.14	F 1.08; p>.05
Z-score length	2.94	2.63	2.98	2.96	2.73	2.60	2.59	F 3.86; p: 0011
Change in Z-score	.56	.28	.44	.52	.24	.09	.17	F 11.69; p: .0000

Table 7

ATTAINED WEIGHT AND LENGTH AT 30 MONTHS OF AGE AND CHANGES FROM 30 to 36 MONTHS, BY YEAR OF THE STUDY

	Years of the Study							
	1969-70	1971	1972	1973	1974	1975	1976	
Z-score weight	-1.87	-2.04	-1.76	-1.89	-1.89	-1.69	-1.72	F 0.82; p > .05
Change in Z-score weight	.14	.18	.04	.20	.18	.20	.12	F 2.73; p: .0127
Z-score length	-2.36	-2.60	-2.38	-2.40	-2.51	-2.33	-2.35	F .21; p > .05.
Change in Z-score length	.56	.28	.44	.52	.24	.09	.17	F 11.69; p: .0000

Table 8

ATTAINED WEIGHT AND LENGTH AT 36 MONTHS OF AGE AND CHANGES FROM 36 to 42 MONTHS, BY YEAR OF THE STUDY

	Years of the Study							
	1969-70	1971	1972	1973	1974	1975	1976	
Z-score weight	-1.69	-1.59	-1.73	-1.72	-1.69	-1.58	-1.57	F: .88; p > .05
Change in Z-score weight	.17	.08	.04	.10	.06	.07	.04	F: 2.06; p: 0549
Z-score length	-2.35	-2.16	-2.47	-2.37	-2.42	-2.20	-2.37	F: 1.80; p > .05
Change in Z-score length	.11	-.08	.06	.06	.00	.01	-.02	F: 3.39; p: 0030

Table 9

SIX-MONTH CHANGES IN WEIGHT ACCORDING TO THE PATTERN OF MORBIDITY

Pattern of morbidity	Calorie Supplementation Months			Protein-calorie Supplementation Months		
	24-30	36-42	42-48	24-30	36-42	42-48
Low diarrhea* - 1st semester	.26	.17	.01	.31	.04	.01
Low diarrhea - 2nd semester	(44)	(87)	(122)	(51)	(126)	(143)
High diarrhea** - 1st semester	.27	.21	.18	.32	.16	.11
Low diarrhea - 2nd semester	(36)	(26)	(23)	(46)	(28)	(25)
Low diarrhea - 1st semester	-.16	-.10	-.21	.04	-.13	-.08
High diarrhea - 2nd semester	(9)	(12)	(5)	(12)	(6)	(12)

\*Low diarrhea: 0 percent time ill with diarrhea during each semester.

\*\*High diarrhea: 5 percent or more time ill with diarrhea.

Table 10

SIX-MONTH CHANGES IN LENGTH ACCORDING TO THE PATTERN OF MORBIDITY

Pattern of morbidity	Calorie Supplementation Months			Protein-calorie Supplementation Months		
	24-30	36-42	42-48	24-30	36-42	42-48
Low diarrhea* - 1st semester	.17	.04	.08	.07	.02	.03
Low diarrhea - 2nd semester	(44)	(87)	(122)	(51)	(126)	(143)
High diarrhea** - 1st semester	.25	.07	.11	.26	.08	.07
Low diarrhea - 2nd semester	(36)	(26)	(23)	(46)	(28)	(26)
Low diarrhea - 1st semester	-.14	.01	-.56	0.04	-.17	.03
High diarrhea - 2nd semester	(9)	(12)	(5)	(12)	(16)	(12)

\*Low diarrhea: 0 percent time ill with diarrhea during each semester.  
 \*\*High diarrhea: 5 percent or more time ill with diarrhea.

Table 11

SIX-MONTH CHANGES IN LENGTH, ACCORDING TO THE PATTERN OF MORBIDITY AND LEVEL OF ENERGY SUPPLEMENTATION IN "ATOLE" VILLAGES

Pattern of morbidity	Supplementation during 2nd semester	Six-month changes in Z-score length		
		Months		
		24-30	36-42	42-48
Low diarrhea 1st semester	Low (0-99 kcal/day)	-.01 (21)	.02 (51)	.04 (66)
Low diarrhea 2nd semester	High (>99 kcal/day)	.13 (30)	.01 (75)	.02 (77)
High diarrhea 1st semester	Low	.14 (15)	.12 (11)	.07 (11)
Low diarrhea	High	.31 (31)	.05 (17)	.06 (15)

In parenthesis, number of cases

## PHASEOVER OF PROGRAMS

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### INTRODUCTION

In most countries of the developing regions of the world, the widespread prevalence of undernutrition and malnutrition is being tackled mainly through the implementation of Supplementary Feeding Programs (SFP). These programs are almost always based on food aid received from external resources, from countries who have surplus of foodstuffs. The type and extent of such aid varies considerably and depends on many factors related to local conditions. In the initial stages, this aid was mainly given for emergency situations (natural calamities, war, etc) as a welfare measure. In the course of time, this aid was extended even under normal conditions not only for human resources development but also to encourage national efforts for socioeconomic development.

At the present moment, these programs are supported directly through bilateral agreements or they are channeled through international agencies as a coordinated program. In this effort, even voluntary agencies, both outside and within the country, are involved. The global situation with regard to food aid for nutrition and related health and development projects is not known. However, for India, it has been estimated to be about 90 to 100 million dollars worth of food per year and for such a large country, it amounts to about less than half to one paisa per person per day and less than 1% of its current total annual production of food grains. It is not expected that for a single nation there would be this amount of food aid in any other part of the world. It is also of interest to note that almost all of them are derived from the USA either directly or indirectly through international and voluntary agencies. Thus food aid has been one of the most important forms of mutual assistance between developed food surplus countries and the countries of the developing regions.

### SHOULD THERE BE A PHASEOVER OF FOOD AID?

#### FACTORS INFLUENCING PHASEOVER OF FOOD AID

One can think of many considerations for taking a decision on phaseover of food aid programs. Some of these are listed below:

1. General level of nutritional status of the vulnerable segments of the population.
2. Availability of surplus food not keeping in pace with the demands and needs of developing countries.
3. Increasing 'political will' and support for nutrition programs as a minimum need of the population and for increasing the pace of productivity, social, and developmental activities.
4. Major cost of nutrition program is for food.

5. The fear that external aid, particularly in terms of food for countries based on agricultural economies, may influence agricultural productivity and diversion of allocation of funds from food and nutrition programs to other sectors, thus affecting the stable self-reliant economy of the population subsisting on agriculture.
6. Experiences with SFP<sup>31</sup> indicates the need for other basic inputs like health, educational effort, income generation, social and women's upliftment for maximum benefit of the programs.
7. National policies of health, of children, etc., stressing the concept of self-reliance to achieve long term benefits.
8. Limitation of waste by utilizing scientific approaches to the problem of nutrition deficiency amongst the vulnerable segments.
9. In certain countries, increased food production and its consequences.

It is obvious that one or more of these and many more factors may operate in any of the developing countries now receiving food aid. Therefore, any decision on phaseover should be taken after great deliberation and consultation between the donor and the recipient country or agency.

#### FOOD AID FOR NUTRITION IN INDIA

As far as India is concerned, the undermentioned observations are made on the current status of food aid from external sources and the attitudes of different groups towards SFP and food aid.

Food aid for SFP in India is provided mainly by the international agency, the World Food Program (WFP), and by voluntary agencies like CARE and Catholic Relief Services with support from the USA. (Table 1). Though precise information is not available, it is estimated that for SFP for preschool children (PSC) the contribution of food by WFP and CARE is around 24% and 30% and the rest is by the government. However, there are a number of other agencies assisting SFP in a limited manner. Five ministries of the Government of India are currently involved in utilizing the aid for various types of programs. These could be broadly classified into three types though in practice overlaps do occur:

- a. nutrition as food aid
- b. nutrition in relation to health in general
- c. nutrition in relation to development

Based on past experience, the agencies are now shifting their strategy from mere food aid to an integrated approach in keeping with the Government of India policy and thus providing support to other inputs like health delivery and income generation, including women's participation. Emphasis is being placed on educational efforts to improve nutritional status and overall socioeconomic improvements of the underprivileged. In recent years, participation of voluntary agencies at the local level has also been encouraged, laying the foundation for self help and self reliance.

In this connection, the observations of certain groups interested in nutrition and health are relevant and require our attention.

The National Health Policy of India<sup>1</sup> (1982) lists nutrition as a problem requiring urgent attention. It states that national and

regional strategies should be evolved and implemented on a time bound basis to ensure adequate nutrition for all segments of the population, through a well developed distribution system, especially in the rural areas and urban slums. Food of acceptable quality should be available to every person according to physiological needs. Low cost, processed, and ready-to-eat foods should be produced and made readily available. It calls for an integrated socioeconomic development and measures for improving better food habits, including promoting breastfeeding and scientific utilization of available nutritious foods. It recommends special schemes for chronic nutritional disorders, including supplementary foods for vulnerable segments and integrated health care activities with educational aspects. It stresses links between maternal and child health (MCH), school health, and occupational health services.

These programs require supplementation by health, nutrition, and population education programs in all educational institutions at all levels; they should also be linked with universal education of the adult and family.

Above all, delivery of all services should be at the doorstep.

The report of a study group of the Indian Council of Social Science Research and the Indian Council of Medical Research (ICMR) (1981)<sup>2</sup> on "Health for All, an Alternate Strategy", discussing the various nutrition programs, states:

Taken all in all, the record of these programmes are far from satisfactory. They rely too much on foreign aid. At best they are palliative or charity operations that cannot cure a multitude of economic and social sins. What is worse they are exercises in tokenism, consume disproportionately large resources and ultimately tend to cloud the issues and distract us from the reality. This does not mean that there is no scope for supplementary feeding (SF). It is needed in calamities. There is also a justification for selective and limited SF directed at carefully selected/identified target group at risk. But such programmes have to be carefully planned and built into an integrated programme of community health care.

In the report of the Sixth Regional Consultation (FAOROAP)<sup>3</sup> on improving nutrition of the rural poor, held in Hyderabad in 1982, one of the recommendations was "projects should not be based only on external assistance; efforts should be made to include them as part of the national programme so that they can be sustained even after the withdrawal of external assistance". The meeting also recommended the creation of a definite policy and financial commitment for inclusion of the nutrition component in development programs, especially in rural and agricultural ones.

In a recent proceedings of the Nutrition Society of India<sup>4</sup>, Number 29, 1983, an expert group discussed the SFP, including Mid-Day Meal Programme (MDMP). Giving an overview, Swaminathan states that goals and objectives of the SFP had not been clearly stated with the result that their effectiveness as assessed through nutrition parameters have been equivocal and not consistent. Depending on the program, the stated objectives are:

- a) to improve enrollment of children in primary school;

- b) to provide family welfare measures, including encouragement for adoption of family planning<sup>28</sup>;
- c) to raise the level of nutrition and health.

Supplementary Feeding Programs, though considered as short-term measures, have been extended over prolonged periods, duration and coverage depending on available resources. Thus, the assessment of these programs should be in relation to the objectives and, more importantly, on the relative emphasis laid on concepts of welfare, health, and nutrition. From the point of view of nutritional status, it is claimed that only severe forms of malnutrition, particularly in children, have been reduced with consequent reduction in mortality amongst this group (Tables 2 to 6). The suggestion is that, for achieving long-term goals of raised levels of nutrition, there is need for an integrated approach with mobilization of community resources and stress on dissemination of knowledge about the value and utilization of locally available food and other developmental resources and services, especially by the underprivileged sections of the population. Such an approach is also likely to be cost effective (Chart).

Some of the recommendations of the group relevant to our discussion of approaches to phaseover are: increased coverage of beneficiaries along with careful selection process, better distribution of foods through fair price shops, etc., for the benefit of the poorer sections, type of food best decided on local conditions and resources, strategies to improve participation of children below 24 months and pregnant and lactating mothers, and utilization of the program facilities for educational efforts including limitation of family size.

As regards the Mid-Day Meal Program, the group felt that it is more to appease hunger and improve enrollment in school. It is the only SFP which is consistently claimed to be achieving satisfactorily its objectives. Incidentally, in India, this program is now engaging the attention of politically motivated persons and large amounts of local food resources are being utilized for the purpose. However, the group felt that dovetailing of school health<sup>23</sup> and educational effort with MDMP would give it a nutritional relevance.

Thus it is seen that all those who are interested in improving the level of nutrition in India are in favor of utilizing SFP only as a short-term measure and now even agencies giving food aid are also tending towards this concept, i.e., long-term benefits can be achieved only on the basis of self help and self reliance with community support. However, because of the high cost of food, the government does not like to allocate its meager resources of budget for SFP in preference to other development programs. At the present moment, in the integrated program of ICDS, even for the selective feeding program, the government has requested full assistance of food from external agencies<sup>5</sup>. As stated earlier, for the MDMP, relatively a large scale program, both local as well as external resources are utilized. What will be the future policy of India and what should be the right approach is a matter which requires attention at all levels, particularly in view of the attitudes expressed by different concerned groups in India and outside.

## NUTRITION AND SELF-RELIANCE IN INDIA

Some of the observations made by studies undertaken in India relevant to the subject of phaseover of food aid and self-reliance are briefly discussed below.

The earliest MDMP scheme was started in Madras City in 1920 by the Municipal Corporation in their primary schools where it is still in operation. Later it was extended to other major cities on the recommendation of the school health committee of the Government of India. In many situations, local community contribution, especially in the rural areas after harvest, was available. With CARE coming in with food aid in the Sixties, it was considerably expanded, but has now been reduced to a lower level of about six to seven million beneficiaries. This was due to the shift in priorities from school children to preschool children. As mentioned earlier, there is renewed interest in MDM and large local food resources are being utilized for the purpose, mainly for reasons other than nutrition.

The participation of CARE in MDM with food aid was felt by many nutrition workers as interfering with the concept of self-reliance, even though local food resources were not adequate at that time in India.

As regards preschool children, the shift from skim milk distribution to SFP under the ANP was based on the concept of local production and consumption leading to better food habits and encouragement of self-reliance. This program failed in its objectives since the emphasis was on production and consumption of nutritious foods, particularly protein rich foods, at the local level as a demonstration program. Education effort was sadly lacking<sup>6</sup>. Now we know that food gap or caloric deficiency was the most important factor in nutritional deficiencies.

Several studies<sup>7-16</sup> reported from all over the country clearly demonstrated the value of bridging the food gap in preschool children with the locally available foods early in life. It was also shown that educational effort in this direction was capable of reducing the prevalence of malnutrition in the community. The feasibility of domiciliary approaches in early detection and management of severe forms of malnutrition with homemade recipes, particularly ready to mix ones, was also demonstrated by studies in the hospital and in the community. Community participation, particularly of mothers, in rotation, could be utilized for dissemination of knowledge and in organization of nutrition programs, including SFP. Popularization of nutritious snacks, bakery products, etc., prepared locally and marketed through rural shops could serve the supplementary needs of preschool children. Village cooperatives and village industries also provide scope for employment.

However, it must be admitted that research studies conducted over short periods and even ongoing SFP under voluntary agencies in a limited area, though they improved the knowledge about good food habits of children, were not always practiced at home. It was determined that the reason was not lack of knowledge or lack of time at their disposal, but mainly lack of purchasing power or poverty. Therefore the attitude of the communities covered by SFP is always in favor of continuing the service and even extension of the benefits to the whole family<sup>18</sup>.

The results of an investigation<sup>17</sup> into the reasons for mothers not utilizing homemade weaning foods made available at the village at cost price concluded that economic factor is the most important constraint for utilization of weaning foods based on locally available foodstuffs even at home, though commonly lack of awareness and lack of sufficient time are mentioned as causes (Table 7).

Similar conclusions were made in the evaluation of nutrition education activities under the India Population Project (IPP) supported by the World Bank in Karnataka<sup>29</sup>.

Thus it would seem that the concept of self-help and self-reliance as applied to nutritional rehabilitation in the utilization of available resources at home and in the community should be considered in terms of the total social, economic, and physical environment of the community. Nutritional needs cannot be isolated from total needs of the families. In other words, SFP for certain members of the family alone in the long run cannot be the solution for nutritional deficiencies observed in vulnerable segments. In the discussion of phaseover of food aid, this holistic view should be taken and appropriate measures should be taken for the benefit of the needy groups.

It may also be pertinent to state that the conditions prevailing now in India are not the same as before and rapid changes are taking place. A wide variety of resources like food, manpower, technology, education, communication, and welfare services are now available to the community and preference is given to the underprivileged. Attitudes towards every aspect of life is changing at all levels.

#### FACTORS LIKELY TO INFLUENCE THE DECISION ON PHASEOVER OF FOOD AID IN INDIA

- A) Evaluation studies<sup>8,18</sup> of SFP in most instances indicate that it leads to reduction in prevalence of serious cases like kwashiorkor and marasmus and grade III malnutrition and reduces mortality among preschool children and this reduction of serious cases does not go down beyond a certain level, as it is probably influenced by factors other than SF.
- B) SFP supported on a continuing basis by external aid does not serve the long-term interests of the nation and the community. Emphasis is being shifted from mere feeding programs to integrated inputs like education, health care, and income generation to maintain self-generation of activities with community support. Implementation of integrated child health services is a step in this direction.
- C) The desire of the nation to be self-reliant through community support is an ideal and long-term approach for social and political upliftment.
- D) Political will to include nutrition, a minimum need, as one of the inputs for progress, productivity, social and economic upliftment, and therefore included in the 20-point program in India.
- E) Social obligation of different segments of the population including industries for the welfare of the citizens, present and future.

- F) Scientific approach to human resources development and human welfare of the underprivileged and application of these concepts to the major public health problem of malnutrition.
- G) Vast improvements<sup>30</sup> taking place in technology and industry, including the fields of management, communication, availability of food resources<sup>19</sup> - increase in food production in recent years.
- H) Frequent occurrence of natural calamities - drought, famine, cyclones, floods.
- I) Coverage according to resource and needs. The present coverage is too little and scattered to meet the needs of the entire nation. Malnutrition amongst the vulnerable sections is still widespread<sup>20,25</sup>.
- J) The availability of a system of community workers for health and developmental activities close to the community favorable for delivery of health and nutrition services under the concept of primary health care<sup>21,22</sup>.
- K) In public health programs, we are interested in individuals as part of an overall community. Individual serious cases are better tackled by the health agencies as a curative effort. So community approach in selection of areas or groups of population or beneficiaries for SFP would be simpler and manageable and decision making is also likely to be easier.

#### DO WE HAVE THE RIGHT CONDITIONS FOR PHASEOVER OF FOOD AID?

##### GENERAL PRINCIPLES OF PHASEOVER

There could be three ways of withdrawing food aid:

1. Complete and abrupt withdrawal, giving due notice
2. Phaseover without any non-food inputs
3. Phaseover with non-food inputs covering the period of withdrawal or even beyond, depending on needs.

Since food aid forms an integral part of mutual assistance programs under normal conditions, the choice is between the second and third approaches and this would depend on the policy of the recipient country and the nature and extent of available resources with the donor country.

The basic principles to be followed in phaseover of food aid, particularly from the nutritional point of view, would be:

- A) Strengthening rather than weakening of the concept of mutual assistance with emphasis on the protection or safeguarding of interests of recipient nations rather than that of donor countries.
- B) A careful consideration of the various factors influencing a decision on withdrawal of food aid through mutual discussion between donor and recipient country/ies.
- C) A time bound program of phased withdrawal allowing sufficient interval for takeover of the responsibility.
- D) Planning and encouragement for development of alternate resources like development fund (DF) or other types to substitute the equivalent value of food aid withdrawn.

- E) Optimum utilization of available local resources through careful selection of beneficiaries and area of operation to meet the nutritional needs of only the most underprivileged groups.
- F) The effective use of the DF and alternate local resources for non-food inputs, with a view to achieve the goal of self-reliance.
- G) Encouragement and incentives for active and wholehearted participation of local community.
- H) Development of an efficient system of education, information, and communication.
- I) A quick and efficient system of renewal of assistance on an emergency basis in case of failure of phaseover and breakdown of the program detrimental to the community.

At this, it may be relevant to point out that the scope for phaseover of MDM, SFP for primary school children, is on an entirely different footing. The objective is more welfare oriented and connected with increases in enrollment in schools and other social considerations rather than nutrition. Selective approach to meet the nutritional needs of the undernourished may not have relevance and not possible also, unless it is linked to school health<sup>23</sup>. Perhaps instead of phasing, it may have to be increased at least for some time to come, to meet the targets of literacy in the community and then a decision taken on withdrawal or phaseover.

#### PLAN OF ACTION

1. To begin with area wide reduction of, say, 20% of program assistance at intervals in terms of cost only.
2. The supply of food is continued but the cost is recovered as contribution by government, community, and industry, etc., to a development fund (DF), collected through various ways and means.
3. DF is utilized for required additional inputs mainly with a view to achieving the goal of self-reliance, i.e., education, income generation, food production, industrial food processing, health care, etc.
4. A minimum period of three to five years is allowed for this exercise but extended (but not beyond six years) if there is a need.
5. On the basis of satisfactory performance, complete withdrawal from that area.
6. Similarly, extend to other areas in a phased manner or simultaneously. However, sufficient interval should be allowed to test the validity of the Procedure. Allow for variation in the above procedures and sequences depending upon experiences and local conditions.
7. At the time of withdrawal, a token contribution and adequate monitoring by the external agency should be retained for any emergency situation so that in case of mishaps in the program, they could be brought back at short notice to maintain continuity.
8. The role of each participating agency should be clearly delineated with proper time sequence so that the change over is smooth without any interruption.

9. In case of complete failure, the food aid should be abandoned for that area as it is not capable of sustaining on its own resources. Further decision should be the responsibility of the government and the community.

#### ACTION BY GOVERNMENT

1. Linking nutrition with human resources development and developmental strategy.
2. A policy of commitment for allocation of resources to nutrition and SFP for the benefit of the most needy groups. DF should be considered as additional resources.
3. Integrated approach - allocation for nutrition in all related sectors. If possible, pooling of resources.
4. Special allocation for education, food products development, health care of beneficiaries, income generation in relation to SF.
5. Encouragement for community effort, removal of social disability, industrial participation, public sector as well as private sector with proper incentives and insistence on social obligation of industry, policies on pricing and profitability.

#### ACTION BY COMMUNITY<sup>26</sup>

1. Wholehearted cooperation and coordination of effort with government in mobilization of resources for nutrition, including for SFP, through local effort.
2. Avoidance of social and political influences to interfere in this effort.
3. Full participation of women, youth, and possibly children, in dissemination of knowledge to avail of community services like health, education, welfare, development according to needs.
4. Follow guidelines<sup>26</sup> for community participation in efforts for human resources development.
5. Contributions depending on capacity to include men, material, and money and participation in planning for their needs, including nutrition.
6. Assessment of resources and mobilization to the extent of at least 15-25% of total requirements.
7. Full utilization of government subsidies and other incentives.
8. Monitoring and supervision of programs - quality control and food management.
9. Clear definition of community participation, identification of groups at the local level to undertake the task, identification of beneficiaries who are in need of services/avoid waste of resources.

#### ACTION BY INDUSTRY - PUBLIC SECTOR/PRIVATE SECTOR

1. Acceptance of concept of social obligation to the needy.
2. Clear definition of responsibilities and allocation of resources and profits for the purpose.
3. Proper utilization of government incentives/subsidies, tax relief pricing, etc., for meeting the needs of the planned program.
4. Production of cheap processed foods for the program, research in processing, and development of food products for such use,

5. Publicity/education of community.
6. Encouragement to small scale, local ancillary industries, employment generation for women and the downtrodden.
7. Extent of contribution, dependent on needs of program, sale proceeds of their products could be pooled as resources for DF. Contributions from welfare fund/productivity bonus, etc., could also be utilized.

#### ACTION BY EXTERNAL AGENCY

1. Follow and encourage government policy of self-reliance.
2. Assist commitment of government in social and political policies in relation to SF and other developmental programs.
3. Provide technical help if needed.
4. Assistance and inputs for multisectoral development and for nutrition components of other developmental sectors.
5. Assistance for training of personnel and setting up of monitoring and evaluation cells.
6. Assistance can be channeled through international agencies.
7. Encouragement to voluntary agencies and participation of relevant institutions<sup>16,27</sup>.

#### STAGES OF THE PLAN

In the first stage, economy in terms of number of beneficiaries and area of operation should be attempted since many considerations are involved, including political ones. This is rather difficult. However, the area could be limited and concentrated to avoid logistic problems. A phased withdrawal with screening of beneficiaries for health parameters should be completed.

All children below three years belonging to the poorer sections and those with body weight under 60% or arm circumference in the red area (less than 12.5 mm) in the age group three to five or six years should be eligible.

Decision on selection of area or community to be included in the program can preferably be based on group averages. The program is essential in communities where the average prevalence of grade III malnutrition is greater than 5% or very low arm circumference (red) values greater than 20% among the preschool children<sup>24</sup>.

This procedure is suggested on the basis of the recent observation<sup>18,25</sup> in India that the average percentage of grade III in the unsupplemented preschool children belonging to the poor rural communities is between five to ten. In the supplemented group, the values are around three or below. This suggests that with SFP these values could be brought down to a level of three or below, depending on the inputs and success of these programs. This applies also to the values of arm circumference (Tables 8 and 9). These values of grade III in the community could also be utilized for determining withdrawal of program from an area as they are much simpler from the point of view of public health as compared to weight gain or any other method currently being used in some of the programs.

It must be stated, however, that this method has so far not been tested in the field in India.

By these economy measures which are simple enough, there could be a reduction of nearly 50% of the number of beneficiaries. Resis-

tance from the public for withdrawal should be overcome through proper publicity and education. This method is more likely to demonstrate the value of early and adequate supplementation in preventing malnutrition to the mothers as compared to the existing programs, since quite a number of apparently normal children are enrolled for purposes other than nutrition.

The availability of Community Health Guide (CHG) in the community should be of great help in this screening procedure<sup>21</sup>.

In the second stage, simultaneous arrangements should be made for health inputs, educational measures, monitoring, community participation, infrastructural facilities, and management services. Additional requirements may have to be planned for and secured depending on needs.

In the third stage, efforts should be concentrated on (a) mobilization of resources for DF and (b) planning for its utilization, depending on requirements mentioned above.

In the fourth and last stage, after satisfactory levels of self-reliance have been achieved, a phased program of withdrawal should be undertaken.

The participation of industry could be encouraged at any stage depending on needs and circumstances. The principal activity will be development and marketing of quality, food products at the local level, income generation activities, especially for the needy and women in particular, use of local food resources encouraged in the process and included in postharvest technology.

In urban areas, small scale industries can be associated with projects like food for office goers, mini-restaurants, catering for functions, cheap food packets for low income groups, workers, canteen services, etc. Nationalized banks can subsidize these projects through low interest loans. Transport of foods should utilize appropriate technology like porters, cycles, rickshaws, carts. Co-operative organizations both in rural and urban areas could be formed with participation from workers and low income groups and encouraged to provide services to the various nutrition and health related activities.

From the point of view of meeting the nutritional needs of the most vulnerable segment, these various activities with community support could be expected to lead to self-reliance first at the level of the community and ultimately at the family level itself.

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## PLAN OF WORK - A SUMMARY

- I. Screening of all feeding centers
- Prevalence of severe grades of malnutrition
- Program area
- a) decision to continue program
- If more than satisfactory level
  - under 3 years and those below 60% of expected body weight (grade III)
  - mothers at risk
  - add other inputs if not available
  - review once in 6 months
- b) to phase over program
- If the level is satisfactory or lower
  - add other inputs if not available
  - continue SFP for (as above) selected beneficiaries for limited period of one year
  - debit cost of food to DF ?
  - utilize DF for education efforts, etc.
  - enlist community support through incentives
  - after 1 year leave
  - later community or government to decide
  - external resources can continue to support educational activities and measures to support community participation, self-reliance, income generation, etc.
  - review every 6 months
- c) select new areas/
- Using same criteria as above
- II. Surveillance - Monitoring : Come back if level is unsatisfactory
- III. Management
- Technical support wherever needed
  - funds for surveillance screening and training from DF
  - trained manpower from the community

- IV. Long term measures
- Continue health, educational efforts, income generation, food production and food products development, etc.
  - Support from government, DF, and community
  - Agency also could continue to contribute whenever and wherever needed
- V. Readiness for emergency
- Coordination between government agency, community system to be maintained on a long term basis for any eventuality and available at short notice
- VI. Support from Industries
- Continuous as social obligation
- Should we use nutritional criteria for phaseover?

Table 1

MAJOR SOURCES OF FOOD AID FOR SFP IN INDIA

Agency	Beneficiaries in million:			Food quantity in million tons	Cost \$ in million
	Mid-Day Meal	Preschool Children SFP	Others		
World Food Programme (U.N.)	-	2.1	NA	0.15 <sup>1</sup>	€5.0 <sup>1</sup>
CARE	6.5	5.5	NA	0.2 <sup>2</sup>	67.0 <sup>2</sup>
Catholic Relief Services	0.3	0.6	0.7	0.1 <sup>3</sup>	46.7 <sup>3</sup>

<sup>1</sup> For three years

<sup>2</sup> Per year: only for MDM and PSC

<sup>3</sup> Per year: for all types

Source: WFP India, CARE India, CRS India

Table 2

EVALUATION OF NUTRITION PROGRAMMES

Programme	Primary objective(s)	No. of children examined	Impact on Nutritional Status	
			Growth	Clinical
1. Special Nutrition Programme (SNP) Andhra Pradesh (Tribals)	Nutritional Status	2,000	+	+
2. Special Nutrition Programme Karnataka (Rural & Urban Slums)	Nutritional Status	22,000	+	±
3. India Population Project Karnatak (Rural)	Acceptance of Family Welfare	1,200	-	±
4. Applied Nutrition Programme Six States (Rural)	Nutrition Education through demonstration feeding	15,000	±	±
5. WFP-SNP Nine States (Rural & Urban Slums)	Nutritional Status	55,000	+	±
6. Vitamin A Prophylaxis Programme (Rural)	Nutritional Status (specific signs of vitamin A deficiency)	28,500	-	+
7. Mid-Day Meal Programme in Madhya Pradesh	Nutritional Status	3,823	+	+
8. ICDS	Nutritional Status		+	+

Table 3

NUTRITIONAL DEFICIENCY DISORDERS IN PRESCHOOL CHILDREN

	Percentage Prevalence					
	Survey in South India 1955-58	Preschool studies ICMR 1966 +	NNMB 1975-79	ICDS 1975 Rural	Tribal	WFP-SNP 1982
Kwashiorkor	1.0	1.0	0.2	1.7	4.4	0.3
Marasmus	1.7	2.0	1.6	4.0	5.8	0.5
Bitot spots	NA	4.2	0.7	4.0	4.0	3.9
Angular stomatitis	2.4	5.2	3.2	7.2	1.9	7.0
Anemia	NA	53.0	NA	NA	NA	NA

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Table 4

MEAN BODY WEIGHT OR PRESCHOOL CHILDREN (1-5 YEARS) (BOTH SEXES)

Survey	Rural/Urban	Year	Body Weight kg
South India NIN	Rural/Urban	1955+	10.3
Preschool Studies -ICMR	Rural/Urban	1966+	9.7
Studies on Growth -ICMR	Rural/Urban	1956+	10.8
NNMB (ICMR)	Rural	1974+	10.3
WFP-SNP (NIN) Evaluation	Rural and Urban	1982	10.3

Table 5

BODY WEIGHT GRADES (GOMEZ CLASSIFICATION) % OF CHILDREN

Grades	Normal	I	II	III	Rural/Urban
Preschool studies (1969)	3.0	14.0	65.0	18.0	Rural
ICMR Special Report Series No. 26 (1977)					
NNMB (Reports 1981) 75-79 pooled data	13.0	41.9	37.0	8.1	Rural
ICDS (1975) B.N. Tandon <i>et al</i> IJMR 73 (1981)	23.0	26.2	27.0	17.4	Rural
WFP-SNP (1982) Evaluation					
NB	25.1	44.7	26.1	4.1	Rural & Urban
B	27.9	45.8	23.4	2.9	
M.C. Swaminathan <i>et al</i> (NIN) 1983					

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Table 6

## ICDS - NUTRITIONAL STATUS OF CHILDREN (15,571)

Type of project area	Baseline survey (1976)				Second round survey (1977)				Third round survey (1978)			
	Normal & Gr.I	Gr.II	GR.III & IV	Not recorded	Normal & Gr.I	GR.II	GR.III & IV	Not recorded	Normal % Gr.I	GR.II	GR.III & IV	Not recorded
Rural	46.06	27.85	21.63	4.44	52.06	27.26	15.22	5.45	59.00	27.75	11.13	2.12
Tribal	45.89	23.30	21.90	8.91	53.66	21.08	11.16	14.10	59.02	17.65	5.70	17.63
Urban	43.29	33.97	21.72	1.06	54.14	32.98	12.31	0.56	72.56	19.81	6.07	1.55
All	45.42	27.73	21.73	5.10	53.11	26.39	13.11	7.39	62.55	22.71	8.21	6.53

Number in bracket: Number of preschool children surveyed

Table 7

	I	II
SF perceived as beneficial by mothers	85.0%	58.0%
Enrollment of children less than 10 months for feeding	71.4%	7.1%
Willingness of mothers to buy or make at home	80.0%	46.5%
Percentage of children who bought	32.9%	25.6%
Purchased for less than 25% of the days it was available and in amounts costing 5 to 10 paise	77.0%	86.0%

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Village I: A package of SF, health activities, and nutrition education

Village II: Only SF

Table 8

PERCENTAGE DISTRIBUTION OF CHILDREN AS PER BODY WEIGHT DEFICIT (GOMEZ CLASSIFICATION)

State	Number covered	Experimental				Number covered	Control			
		N ( <u>/</u> 90)	I (75+)	II (60+)	III ( <u>/</u> 60)		N ( <u>/</u> 90)	I (75+)	II (60+)	III ( <u>/</u> 60)
Kerala *	5158	37.28	47.50	14.33	0.89	853	28.25	49.00	20.75	2.00
Madhya Pradesh	4385	17.58	47.69	29.74	4.99	1641	17.61	46.98	31.08	4.33
Maharashtra	10527	23.91	44.94	27.59	3.56	1158	22.63	42.83	30.57	3.97
Orissa*	4577	28.49	48.04	21.72	1.75	1318	28.15	44.39	24.20	3.26
Rajasthan*	4571	38.72	43.75	15.00	2.53	676	37.97	31.42	20.46	10.15
Uttar Pradesh*	4366	36.72	41.89	18.30	3.09	1144	29.63	44.32	21.33	4.72
West Bengal(R)	3163	11.76	48.01	36.79	3.44	714	17.93	50.28	30.11	1.68
Pooled*		27.92	45.77	23.38	2.93		25.03	44.74	26.13	4.10

\*Significant

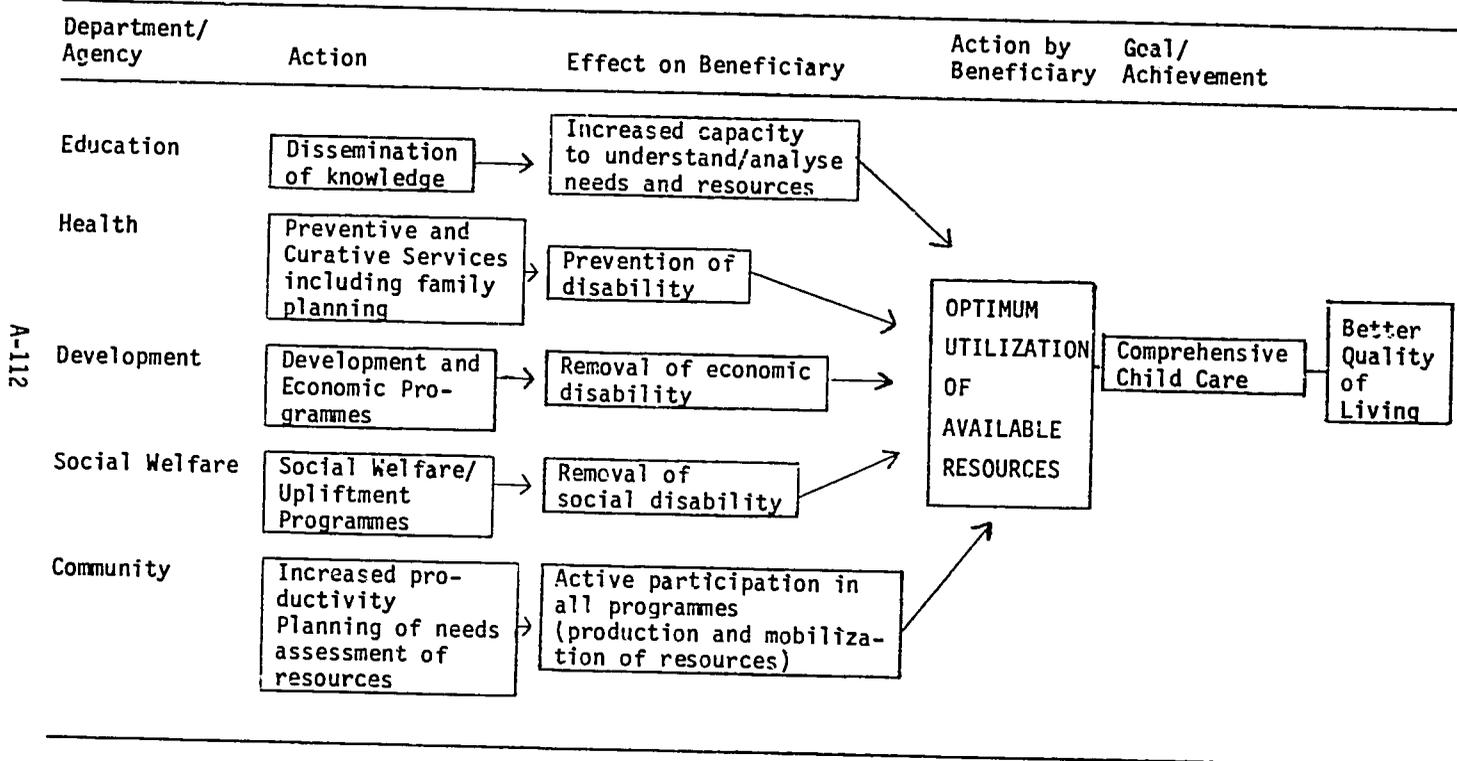
Table 9

GRADES OF MALNUTRITION - ARM CIRCUMFERENCE (ACS)

State	Number covered	Beneficiaries			Number covered	Non-Beneficiaries Control		
		Normal	Marginal	Poor		Normal	Marginal	Poor
Kerala	5235	48.27	28.60	23.13*	865	33.87	33.64	32.49
Madhya Pradesh	4425	52.43	27.07	20.50	1646	53.22	28.25	18.53
Maharashtra	10565	48.64	28.96	22.39	1159	52.12	27.18	20.71
Orissa	5057	65.15	24.78	10.07	1389	64.30	25.13	10.58
Rajasthan	4954	44.21	24.78	31.01	701	39.23	26.82	33.95
Uttar Pradesh	4584	65.78	19.26	14.97*	1175	54.29	21.96	23.74
West Bengal (Rural)	3181	41.53	33.61	24.87*	715	33.84	39.30	26.85
Pooled	38001	52.12	26.81	21.07*	7650	49.95	28.07	21.99

\*Significantly different (P<0.05)

CHART: INTEGRATED ACTION FOR CHILD WELFARE



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## PHASEOVER OF FOOD AID PROGRAMS

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*Paul R. Crowley*

In the preceeding paper, Dr. Swaminathan provided a broad overview of the issues involved in phaseover of food aid programs and focused more closely on phaseover of Indian programs. In this paper, I will examine phaseover by addressing in somewhat more depth certain of the major issues which arise in phaseover of food aid programs. In doing so, I will draw on USDA experience with actual phaseover activities in a number of countries. I'll limit my discussion to maternal child feeding (MCF) which is one of the most important categories of food aid used principally for nutrition improvement.

### PHASEOVER

For purposes of this paper, phaseover will be treated as replacement of donated food commodities used in MCF programs with locally procured commodities, or as another option, the replacement of the program with one with equivalent purpose, whether commodities are used or not.

In my view, phaseover does not necessarily mean that either the food or the program must remain the same. However, retaining the same types of commodities in basically an unchanged program might in some instances be the preferred form of phaseover. Termination of food aid without replacement with a program intended to achieve similar purposes is not, in my mind, phaseover. That action might more appropriately be called phase-out, or more directly, program termination.

The process of phaseover might be initiated by either the donor agency or the recipient government.

### TRIGGERING FOOD AID PHASEOVER

The food aid commodities used in MCF programs are for the most part made available, along with other forms of aid, to help low income countries accelerate social and economic development. In principle, aid of all types should be expected to stop when the country achieves some higher level of development. Project food aid, therefore, is not expected to be eternal and will eventually end in all countries, as US food aid already has ended in Brazil, Colombia, and elsewhere.

Unfortunately, as far as I know, there are no formal criteria which enable either donors or recipients to know when or under what precise circumstances food aid will be terminated although achievement of a reasonably high level of development by the recipient country is probably an important determining factor. In addition, termination of food aid for a country and/or a specific program might sometimes be triggered by other factors such as (1) lack of availability of specific commodities, (2) changes in program priority requiring diversion of commodities to other programs, or (3) determination by the recipient government that it wishes to provide food commodities to its programs internally rather than through food aid.

This workshop might consider steps which could lead to the development of guidelines for food aid discontinuation.

#### MATERNAL CHILD FEEDING PROGRAMS

Donation food aid provided by the World Food Program and through various bilateral programs can be categorized as either emergency relief (to help cope with disasters and provide assistance to refugees) or food development (to help supply food commodities to ongoing feeding programs and food for work activities). The amount of resources devoted to these programs has been enormous. Over the years, United States inputs alone have exceeded 50 million tons of commodities valued at over \$10 billion. In any given year, the program reaches many millions of recipients in each of the major program categories. In 1982, for example, US Title II donated foods were delivered to 64,000,000 recipients of which nearly 50,000,000 were in the food for development category. Of the recipients in this category, roughly one-third were supplied through maternal child feeding programs, one-third through school feeding, and one-third through food for work. Thus, US supplied foods alone reached over 15 million recipients in nutrition-oriented maternal and child feeding programs.

While MCF programs vary substantially in their format, and perhaps there is no such thing as a typical MCF program, for purposes of discussion we might characterize a representative MCF program as having the following features:

- The program is intended primarily to help alleviate malnutrition among preschool children and pregnant and lactating women and is implemented through a network of maternal child health centers (MCH). The food aid is only one of many inputs to a multi-component health/nutrition intervention program administered by the country's Ministry of Health (MOH).

- Food aid is targeted to families selected on the basis of the presence or risk of malnutrition among preschool children in the family. Food is provided to eligible mothers and preschoolers in a take-home mode including about 50 grams per day of blended food such as CSM for the child and 50 grams per day of a mix of a cereal or milk and vegetable oil for the mother. The cost of the food aid component is roughly \$10.00 per year per recipient of which about \$7.50 is for the food supplied by food aid donors and \$2.50 is for local transportation, storage, management, and other distribution costs which are paid by the recipient country.

- The MCH network in the "typical" food aid recipient country has expanded over the years and now extends throughout much of the country. Roughly half the population of the country has convenient access to the centers and one-third of this group actively uses the centers for health care and counseling. Among this group, one-third have been selected to receive food aid, i.e., about 5% of the mothers and preschool population receive food aid through MCH centers. This group also receives, in addition to health care, counseling about preferred food practices.

- The MOH does not believe the program is being fully satisfactorily implemented and, although the program has been modified regularly to overcome obvious problems and to introduce improved concepts and technologies, such as weight charts and ORT, it requires

further change in order to meet the MOH's goals. Nonetheless, the MOH supports the program and hopes to expand it and make it more effective.

The "representative" MCH program outlined above is intended to convey the idea that existing programs have evolved over time and are still in the process of change. It is intended to indicate a substantial effort to strengthen the programs by food aid recipient countries and by donor agencies as well over a long period of time. And it is also intended to indicate a continuing commitment to the programs by recipient countries, including a substantial financial commitment. While not every MCF program has these features, most of the ones I have studied over the past several years fit this description.

#### MAJOR PHASEOVER ISSUES

Obviously, phaseover of food aid is a complex process that can not be adequately treated during a few minutes of discussion. And, although my colleagues and I have worked in a number of situations where phaseover was the goal, I am not aware of any systematic study of the process or the issues involved in the process.

However, some of the major issues arising during food aid phaseover can be identified by considering a hypothetical recipient country faced with phaseover. In the following sections, a hypothetical phaseover activity will be examined using the "typical" MCF program outlined in the previous section as the setting. While the issues and options outlined in the sections do not include all possibilities, they are drawn largely from experiences in actual phaseover activities in a number of low income countries.

For purposes of analysis, it will be assumed that the decision to phaseover has been made and no decision taken beyond that.

#### Issue No. 1 - What changes in the program should be made when food aid is terminated?

##### Options

- (1) Retain the same type program and coverage and simply substitute similar foods procured with local resources.  
Major Pros - Leads to perpetuation of actions which have evolved over the previous years for which commitment already been established. Minimum disruption and minimum development effort required during phaseover.  
Major Cons - Substantial additional funding from local sources required (\$7.50 per recipient) and a source of food commodities must be developed.
- (2) Utilize same local fund availability as budgeted during aided program (\$2.50 per recipient) but reduce ration, beneficiaries, or coverage, to permit continuation of program within reduced overall budget.  
Major Pros - Permits operation without requiring a major increase in budget.  
Major Cons - Requires major program development effort to identify acceptable changes in program. Involves substantial disruptions in program. Leads to dissipation of results achieved through past program development efforts.

- (3) Discontinue food inputs but institute stronger health/nutrition education program to help alleviate malnutrition among the target group.

Major Pros - Permits operation without increase or perhaps even with reduction in funds.

Major Cons- Potentially reduces impact on target groups when food commodities are withdrawn from low income and malnourished children. Requires major program development effort. Involves substantial disruption in program. Leads to dissipation of infrastructure achieved through past program development efforts.

Each of the above options has been given serious consideration and/or adopted in some form by at least one country. The reasons for the selection of one approach in preference to another by the phase-over country are not fully understood. However, the respective commitments of the various countries to nutrition improvement and the attitudes of the decision makers and their advisors to one form or another of nutrition intervention have seemed to be important factors. Unfortunately, the relative effectiveness of the alternative programs to alleviate malnutrition has not been a factor since comparative effectiveness information was not (and is not) available.

Issue No. 2 - Assuming it was decided to continue the same type program and maintain the same coverage, and to substitute food commodity procured with local resources, how will the additional funds be raised to pay for the increased costs of the program?

Options

- (1) From government revenues allocated to the program.  
Major Pros - Government financing is a simple, relatively reliable source of funds that does not impose a financial burden on recipients or discourage either participation in the program or use of the food.  
Major Cons - Requires higher priority commitment to MCF program by the funding authority.
- (2) From recipients in combination with government subsidies.  
Major Pros - Places lower financial burden on government and therefore is easier to obtain government approval.  
Major Cons - Tends to discourage participation and commodity use by the lowest income, most needy program beneficiaries.

The cost to a developing country government to administer its MCF program (\$2-3 per recipient per year) represents a significant financial burden. Adding the cost of food to this burden, which more than triples the burden, is probably within the funding capability of any country, particularly one which has moved up the development ladder. However, accepting this burden in light of the many other needs of the country, is not an easy decision, even if failure to do so jeopardizes the program. Consequently, while several countries have decided to pay in full for a limited distribution in MCF programs, they have sought to obtain at least partial payment from some of the recipients by selling the product, sometimes at a subsidized price. Little is known quantitatively about the relationship between cost of the food to recipients and extent of use. Therefore the basis for

decisions as to how much of the cost burden can be passed to the recipients without severely damaging the program is lacking.

Issue No. 3 - Assuming the government decides to pay for the food directly, how much and what kind of food commodities should be provided to recipients?

Options

- (1) The same amount and kind as provided by food aid in the existing program.

Major Pros - Using the same commodities causes minimum disruption to the program; food aid commodities are simply processed foods which can be easily produced in any country.

Major Cons - Importation of vitamins, minerals, and possibly certain ingredients such as the protein supplement might be required. Introducing different amounts and/or kinds of commodities could lead to greater acceptability among recipients or more nutritional impact or reduced cost; these effects would not be realized if the same commodities are used which had been supplied by donors.

- (2) Introduce different commodities which are selected to optimally satisfy the special needs of the country's MCF program.

Major Pros - The program's needs for food will be optimally satisfied. For example, locally available ingredients might be used, local preferences for taste and form might be satisfied, and local prevalent nutritional diseases might be more effectively addressed.

Major Cons - A substantial developmental effort will be required to optimize the amount and kind of food used in the program.

Typically, the amount and kind of food selected for phaseover programs has been similar to that provided through food aid. Some countries have developed special foods designed to cater to local tastes and utilize locally produced ingredients. While these foods achieve some of their intended goals (preferred acceptability and better utilization of indigenous resources), their relative nutritional impact in the MCF program compared to food aid commodities is not known. The amount and kind of food required for the most cost effective program has not been adequately addressed in any program and therefore is beyond present know-how.

Issue No. 4 - Who should produce the food commodities?

Options

- (1) A special organization established by the government to operate a production unit constructed and owned by the government.

Major Pros - Production will be more closely controlled by the organization which schedules the requirements (the government).

Major Cons - Governments are not believed to be as efficient as commercial organizations in manufacturing operations.

- (2) The commercial food processing sector under contract to the government.

Major Pros - Production will be performed by the sector with the greatest capability and therefore should be of least cost.

Major Cons - If the production facility is of unique design (unsuitable for other commercial applications), the commercial organization is dependent on government demand for the product and the profitability of government contracts. Therefore, the commercial organization capital and profitability is at risk and it might be difficult to find a competent commercial organization with which to contract.

Essentially all countries interested in local production of commodities for feeding programs have sought the participation of either public or private sector food processing organizations to build and operate or simply operate the factories. However, in several instances, when commercial organizations invested capital, they incurred losses when governments either caused the companies to enter into unreasonable contracts or withheld contracts. A solution to this problem now used in several countries is government ownership of the production facilities and operation of the facilities by a commercial sector organization under a contract to the government.

Issue No. 5 - What responsibility do the recipient government and the food aid donor have in connection with phaseover?

This issue is not amenable to a discussion of options. However, both parties (the government of the country in which the food aid program is undertaken and the donor agency which furnishes the food aid) should each be expected to have certain responsibilities connected with phaseover. For example, the donor agency should be responsible for notifying the government far enough in advance of reduction or discontinuation of food aid so that reasonable, non-disruptive steps can be taken to implement phaseover. On the other side, the recipient government is unquestionably responsible for its own programs, knows that food aid will eventually be discontinued, and therefore should probably not undertake programs which it is not prepared to terminate or phaseover. Discussion of phaseover between the government and the donor could probably be facilitated if each party knew more specifically his own responsibilities and those of the other party.

#### CONCLUSIONS AND RECOMMENDATIONS

It can be concluded from the foregoing that the phaseover of food aid programs can be an extremely complex process involving many difficult political, budgetary, and technical decisions. While food aid programs have many similarities, each program in each country, and perhaps even at each point in time, has unique characteristics that make it difficult to generalize about phaseover. It might also be concluded that much of the information needed for rational phaseover decisions is likely to be extremely weak (e.g., the costs and effectiveness of alternative program options will probably not be known with any certainty and decision makers will be unable to reach firm conclusions as to which option is technically "best"). As a consequence, it seems unlikely that a phaseover "cook-book" procedure can be formula-

ted. However, a number of actions might be taken to expedite a more rational and orderly phaseover. These include:

1. Develop guidelines to identify when termination of food aid is likely to occur.

Donor organizations reach decisions to shift or terminate food aid based on some mix of factors which might be expected to include economic, political, and technical considerations. While it seems unrealistic to believe that donors will relinquish control of the food aid supply, it might be possible to develop an index which triggers potential changes in the supply. For example, if the index for a program in a particular country falls below a certain level into a "yellow zone", the donor and recipient would know that food aid might be discontinued within a certain period. If the index falls below another level into the "red zone", food aid will be discontinued within a certain period. Triggers other than the index might also apply, but an indexed trigger could represent a rational basis for program termination acceptable to both donor and recipient.

2. Develop a formal understanding of the responsibilities of the donor agency and recipient country when food aid is terminated.

As noted above, substantial time and effort will probably be required to phaseover a food aid program. Therefore, a long lead time is needed to permit orderly, non-disruptive replacement of food aid. Food aid donors need to take this lead time into account in establishing phaseover time tables. Likewise, recipient countries should be aware that food aid will be terminated eventually and should plan their programs to permit a rational phaseover when food aid terminates. Mutual understanding regarding technical assistance for phaseover and other matters might also be included in food aid agreements.

3. Prepare an options document to serve as a check list for possible phaseover activities.

While a phaseover "cook book" seems unlikely, it would be helpful for phaseover countries to be aware of the program, commodity, funding, administrative, and other options open to them, and to have guidance as to the likely consequences of exercising those options.

4. Upgrade the state-of-the-art for the design of nutrition interventions to utilize food aid or to replace food aid programs.

In order to make rational decisions concerning the selection and design of nutrition programs using food aid (or to replace food aid), recipient countries need better information concerning:

- (1) the effectiveness of various programs
- (2) the requirements for food used in the programs, including both the kind and the amount needed for optimum effect, and
- (3) the mix of health, education, and other inputs needed as components of a food aid program.

Current know-how permits little more than qualitative considerations of program design, even after commodities valued at billions of dollars have been distributed to hundreds of millions of recipients over a period of more than 30 years.

Food resources should be augmented with a significant level of funds to be used to improve the design of food aid programs and thereby improve the utilization of food aid and also permit more rational decisions for phaseover. If as little as one-half to one percent of the costs of food aid commodities were made available on a continuing basis to improve program effectiveness, the resulting several million dollars program could make an important contribution to the improvement of food aid effectiveness as well as the phaseover of food aid programs.

## EVALUATION OF NUTRITIONAL EFFECTS OF PROJECT FOOD AID

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John Haaga and John Mason

Three questions were posed for this session in the workshop agenda: What is the experience with evaluating programs for nutritional impact? How can evaluation be built into the design of projects? How can good evaluation be carried out at reasonable cost? We would like to start with the third question, by examining why it still is necessary to ask it. Many evaluations have been done over the years. Methods and theory have been discussed and written about--extensively--and we are ourselves responsible for contributing to the mass of evaluation literature. We would suggest that one important reason, and one very relevant to this meeting, is organizational. Adequate methods and experience exist, but often these are not brought to bear.

### NEED FOR EVALUATION POLICY WITHIN AGENCIES

The organizational constraints may be along these lines. Policy-making levels of agencies require evaluation results, for various reasons. Technical units charged with the job of meeting this need are then pressured to produce answers quickly and cheaply, in a way that is often simply impossible. There is an organizational reluctance to state this boldly, to affirm that one gets what one pays for. This leads to a search for magic bullets -- "Surely there is someone (or institution) who can evaluate simply, quickly, and cheaply?" Lists of questions are posed, objectives get blurred, and the outcome seems to be (witness the question we are considering) a degree of dissatisfaction. There does not yet seem to be a consensus within agencies about, essentially, how to set realistic objectives for evaluations, with realistic funding and time to allow these objectives to be met. This is in contrast, perhaps, to the consensus emerging from a series (admittedly selected) of deliberation--for example: *Evaluating the Impact of Nutritional and Health Programs* 1977 (Klein et al, 1979); *Methods for the Evaluation of the Impact of Food and Nutritional Programmes* 1981 (Sahn et al, 1984); *Evaluating Effects of Child Feeding Programs* 1984 (Haaga et al, 1984). In the 1977 meeting it was said "...my experience with evaluation is that there are few bargains, and usually you get no more than you pay for," and "When an evaluation is cheap and quick, it is often also not very good". The meeting held this summer at Cornell strongly reaffirmed that possible objectives for evaluation must be distinguished, and that impact is much more expensive to determine than, for example, program delivery.

In the evaluation literature, and as elements of such disciplines as demography, economics, epidemiology, and policy analysis, well established methods are available. For nutrition interventions, some evaluation exercises have reasonably met their objectives--good evaluation has been carried out (See, for example, some of the case studies reviewed in Kurz et al.) which was so determined to mea-

sure impact which the design could hardly allow, that important information on program coverage and delivery were almost ignored.

We suggest that one answer to the question "How can good evaluation be carried out at reasonable cost?" is to establish a policy within agencies that makes the application of existing methods and experience feasible. And this involves communicating effectively with those setting the policy, on what can reasonably be expected. They must then decide if the cost is reasonable. For example, assessing the impact or net effect attributable to a project with a high degree of plausibility may be essential for setting policies on future projects, but often may not influence the project being evaluated, since the effect can often be estimated only after several years. Added to this, the cost of such an impact evaluation is usually more than can reasonably be borne by the project itself. This argues for a very limited number of impact evaluations, funded from non-project-specific sources. Establishing this aspect of policy would go a long way to ensuring that good impact evaluations would be carried out. Second, no amount of analysis of outcome data will produce plausible inferences on effect if evaluation design and control of confounding factors are not taken into account. But often the major investment is in data, with limited attention to who really needs what information, and again, what is a reasonable price to pay for it. A policy that recognized that there are different types of information, needed by different people for different decisions, and required that adequate consideration be given to designing the production of the information before requiring the data be collected, would probably save money, generate immense goodwill among the thousands of program people who know they collect unused data, and concentrate effort on getting answers to at least some important questions.

In the planning of projects, established procedures exist which are widely used: for example, the project cycle consists of (pre-) identification/preparation/appraisal/implementation. The policy is that adequate resources and time are put into such procedures. There is no equivalent cycle for evaluation. Certainly procedures exist (e.g., the "interim" evaluation procedure used by WFP), but if they were widely perceived to be adequate, again we would not be addressing the current question. An "evaluation cycle", which includes deciding what sort of information is needed, by whom, why, etc., perhaps should begin to be tried and refined (specifically for impact evaluation, the sequence of feasibility study, summary report and scientific report was put forward at the meeting at Cornell). A policy decision to approach decisions on evaluation systematically could help.

#### DESIGN AND ANALYSIS ISSUES IN NUTRITIONAL IMPACT EVALUATION

In this overview, we will highlight some of the most important issues of evaluation design and data analysis that emerged from a review of recent evaluations of the nutritional impact of child feeding programs. Besides the background paper and workshop report for the meeting at Cornell referred to above, there are several useful references on each of the technical issues discussed, and evaluation reports that have dealt with them (See A-132-33 for selected references).

Virtually all the designs that have been found practical for evaluation of operational-scale feeding programs are "quasi-experiments"; that is, they do not call for random assignments of individuals to "treatment" and "control" groups. Quasi-experimental designs are variations on a basic theme, which is the comparison of two groups of individuals or communities which are as alike as possible in all factors affecting child nutritional status other than (and independently of) participation in a feeding program. Differences in nutritional status between groups being compared can be ascribed, more or less reliably, to the program. The main threat to the validity of this inference arises from the difficulty of ensuring that the groups are comparable, or even of assessing how they differ.

### Confounding Factors and Validity of Inferences About Impact

Bias due to self-selection of program participants is a major cause of non-comparability in feeding program evaluations. Children who receive rations are likely to differ from those who do not in many respects: family income, wealth, and social status; illness or disability; caretaker competence and motivation; and child's and mother's time use. These affect child growth (the major, though not the only, outcome measure) independently, at the same time as they affect program participation. These other factors are often very hard to measure, and their precise effects hard to estimate. The true effect of the program on nutritional status can be either exaggerated or masked by such confounding factors.

Self-selection has frequently been found to operate at the level of communities, as well as individual children. Communities with functioning programs tend to differ from those without them in all sorts of ways affecting the health and nutritional status of children: accessibility, ability to attract public resources, presence (and quality) of health care facilities, environmental sanitation, etc. When evaluations use program-generated data, a further confounding factor is introduced, since the clinics that can produce useable records are likely to be non-representative because they are unusually well managed.

The intended beneficiaries of feeding programs are not passive; they, or more appropriately, their families, treat a program ration as one additional resource that may be used in achieving what they desire, subject to the constraints and uncertainties faced by poor people in poor societies. The fact that beneficiaries use the ration in ways not fully intended or understood by planners and managers adds to the complication of evaluation. People in non-program communities may take their children to program communities. Resale of ration foods, or even just their replacement of formerly purchased foods, will affect food supplies and prices for ostensibly non-participant families and communities. More directly, sharing of the ration and substitution for the ration in the child's diet affects the diets of other household members. These are discussed in other sessions of this workshop; for present purposes, their relevance is that it is often difficult to say unambiguously who "benefited" from a feeding program and who did not.

The major task in evaluation design is to overcome selection bias and produce data on comparable groups; a major task in data ana-

lysis is to examine as carefully as possible how much the groups differ nonetheless on relevant factors and how the differences affect comparisons. Besides the social and economic factors at the individual and community level, the following sources of confounding have often been important for feeding program evaluation.

Aging. Differences in the age incidence of malnutrition and the usual local pattern of growth complicate comparisons of groups with different age composition (for example, before-and-after comparisons on the same children). This source of confounding is relatively tractable, if evaluators are aware of it. Nutritional impact, as measured by anthropometry, is most likely to be found for children in certain critical ages, when nutrient intake is not likely to be a constraint, e.g., the weaning period: this is important both for evaluators and for program planning.

Seasonal effects. Again, these can be dealt with in analysis if anticipated in evaluation design. Measurements can either be taken at the same time in the local agricultural calendar, or, for some comparisons, indicators less sensitive to seasonal changes in food intake and disease incidence (height-for-age) can be used instead of those more sensitive (weight-for-age, weight-for-height, arm circumference).

Regression to mean and loss to follow-up. Whenever there is a screening criterion for program eligibility, simple before-and-after comparisons reflect some element of spurious improvement, due to random measurement errors, fluctuations in weight causing a temporarily low score on an anthropometric indicator, initial misclassification, etc. Also, programs often have criteria for "graduation", and these, like screening criteria, may be applied differently at different times by different program staff. If an evaluation uses data only on current program participants, many of the children who have fared particularly well will be lost to follow-up. When whole communities are compared, however, this problem and regression to the mean are less important.

Differential mortality raises a different kind of "graduation" problem: feeding programs, especially coupled with health care, may promote survival without raising the average growth of survivors. The degree to which this causes misleading differences (or lack of differences) in anthropometric indicators between program participants and non-participants in practice is unknown. Mortality differences, where they exist, are most important for their own sake (See below).

This list of confounding factors is selective and not exhaustive. The point is not that impact evaluation is impossible, or too expensive (provided it is not required routinely of all projects). The point is rather to stress the need for careful evaluation design when an impact evaluation is actually called for. The problems we have described, culled from a review of recent evaluations, are unlikely to be solved simply as a by-product of things the project was going to do anyway in the interests of good management.

### Design Issues

Table 1 shows a typology of research designs that have been used in impact evaluations of supplementary feeding and other types of health care and nutrition interventions. The reliability of in-

ferences about program impact produced by these different types of studies depends on how well they reduce, or at least make it possible to measure, the effects of confounding variables on the differences between program participants and the children to whom they are compared. The designs are classified in two ways. The first is by the type of comparison being made: program participants vs. non-participants, long-time participants vs. those with shorter or less intensive participation, participants before and after the program, long-time participants vs. new entrants; and a combined strategy of before and after comparisons for those with and without programs. The second classification is by units being compared: individual program participants (vs. other individuals) or communities in which programs operate (vs. other communities).

The first type of individual-level comparison (1A in Table 1), between participants and non-participants, measured either at one point in time by a survey, or over time by means of growth records, is usually vitiated by self-selection of participants. Self-selection is hard to avoid, or even identify. If the relevant social and economic variables were easy to measure accurately, and their independent effects on nutritional status could be estimated and entirely controlled for in analysis, then self-selection would not be a threat to valid inference about program impact, but neither condition typically holds. Evaluators should try to measure some social and economic background variables in any case, partly because of their potential for confounding and partly because they are intrinsically interesting, showing how well a program is reaching its intended beneficiaries. Simple comparisons of participants vs. non-participants, however, are very likely to be misleading.

Comparisons between program and non-program communities (1B in Table 1) are also subject to self-selection through perhaps to a more manageable degree. This depends, of course, on how communities were selected for the program, which is a major concern for evaluators.

"Consumers" of evaluation results should not be satisfied with simple assertions that the groups being compared are really comparable. If the assertion is not well documented, the results should not be treated as even approximate measures of impact. This seems to us one of the major failings of several recent evaluation reports. It is all right, especially in documents intended for policy audiences, for the authors to say "Trust us" on some technical issues, but comparability of groups is not a minor technical issue. It is the essence of the enterprise, and should be discussed thoroughly in any report.

The second type of design (2A and 2B in Table 1) compares the longer or more intensely participating individuals and communities with those which have participated for shorter times, or to a lesser degree, or less frequently, or with long interruptions. Again, the problem is that length, frequency, and continuity of participation are likely to be related to other individual and community characteristics affecting health and nutritional status independently of the feeding program. However, this design may be stronger than the simple with vs. without program design, because a finding of a "dose-response" relationship between program participation (as a multi-level or continuous variable) and nutritional status would

Table 1

TYPOLOGY OF COMMON IMPACT EVALUATION DESIGNS

<u>COMPARISONS</u>	<u>UNIT OF ANALYSIS</u>	<u>SUITABILITY FOR FEEDING PROGRAM IMPACT EVALUATIONS</u>	<u>COMMENTS</u>
1. With program vs Without	A. Individual	X	Requires very careful treatment of confounding. Self-selection a big problem.
	B. Community	X	Self-selection. Individuals in a non-program area may travel to participate
2. Length of time in program or degree of participation	A. Individual	+	Self-selection largest problem. Aging effects.
	B. Community	+	Problems similar to 1.B.
3. Before and after program	A. Individual	+	Aging effects. Secular trend. Regression to mean (if screening) Need to follow up withdrawals.
	B. Community	+	Secular trend most important
4. Compare new entrants to those already in program	A. Individual	+	Same as 2.A.
	B. Community (Staggered implementation)	++	Potential confounding if reason for delayed implementation independently affecting nutritional status.
5. Combination of with vs without program and before-and-after	A. Individual	++	Strong design, deals with aging, secular trend, etc. Still control needed for self-selection.
	B. Community	+++	Strong design. Political/ethical difficulties in keeping some communities without program.

Legend: X Not a strong design - potential for confounding is too high  
 + Somewhat recommended  
 ++ Recommended  
 +++ Highly recommended - confounding not severe, and can often be estimated during analysis.

Source: Haaga *et al.* 1984.

often be more convincing, at least as presumptive evidence of impact, than the simple two-way comparison. As with designs 1A and 1B, inferences about program impact would still be weak, and would require a very careful attempt to measure and estimate the effects of confounding social and economic variables.

Both individual- and community-level before-and-after comparisons are subject to the problem of secular trend, i.e., non-program related changes affecting health and nutrition. There might be steady improvement (or deterioration) in standards of living, hygiene, and health care, or even rapid changes due to new employment opportunities in the community, or natural disasters, or wars. The longer the period between first and last measurements, the more secular trends are likely to account for observed changes. This effect can be estimated partially by comparing mortality rates, growth data, immunization coverage, etc., in study areas with available provincial or national level data covering the same periods. Incorporating comparison communities into the study design (as in types 4B and 5B) helps estimate the secular trend, especially if conditions in non-program communities (5B) or new program communities (4B) are continuously monitored.

A combination of the before-and-after and the with- and without program designs (types 5A and 5B in Table 1) guards against many of the threats to invalid inference discussed above. Two groups of individuals or communities are measured in a base line survey, those that will and those that will not have a chance to participate in the program. These groups are chosen to be as similar as possible in all respects other than program participation. Unless these other factors change unexpectedly in one but not the other group, differences in nutritional status that emerge during the life of the program can reliably be attributed to program activities.

A major difficulty with designs of type 5 is that it is often infeasible, administratively and politically, to keep a group of individuals or communities unserved by the program for the length of time needed to observe differences in children's nutritional status due to the program. Ideally, in this design, one would be able to match communities on known characteristics and thus achieve the purposes of the evaluation with a small number of communities, carefully monitored, in each cell. In practice, prior uncertainty about community characteristics and difficulties in implementing evaluations as planned have meant that a dozen or more communities in each cell would be needed.

Practical considerations often force a sort of compromise, in the form of staggered implementation of a program (type 4 in Table 1). Rather than attempt to keep some communities unserved for years, socioeconomic conditions, child health and nutritional status are measured in each community as the program expands to it, then re-measured in later years. This allows a type of with- vs without-program comparison (the communities just entering the program are the "withouts") and also a dose-response comparison like that of design type 2, comparing communities served longer with those in the first or second year of a program. Secular trends can be estimated by the observed changes over time in the measurement in new entrants. The major problem is posed if the communities first enlisted differ

systematically from those later enlisted in ways likely to affect nutritional status, e.g., accessibility. Several recent evaluations have used variants of this staggered implementation design; it seems to us one of the more promising achievable types of study. In all of the designs discussed here, it is important to measure potential confounding variables to include them in analysis, not just assume that the study design somehow takes care of them.

### Outcome Indicators

Anthropometry. The basic task in impact evaluation using anthropometry is to compare groups of children to see which is taller or heavier, and how much of the difference is due to the feeding program. The second part of the question is the more difficult one; there are methodological uncertainties and acrimonious debates about the use of anthropometric indicators, but they are often tangential to the main purpose of evaluation studies.

Debates over the use of international reference standards for expressing heights and weights of children of different ages and sex in common terms are a case in point. They are very relevant for assessing nutritional status of the individual and for studying the functional consequences of different degrees of growth deficit at different ages. But group comparisons were made, and made well, for over a hundred years before any international standards were ever published. The international standards have the advantage of familiarity and software availability, but if their use gets in the way of the main purpose of the evaluation, they can be dispensed with. All that is required is that analysts compare groups of program participants and non-participants across age/sex categories (or, more efficiently, use residuals from a regression of heights or weights on age and sex). If before-and-after comparisons are being made, then it becomes necessary to allow for aging effects (but this is also true even when heights and weights have first been standardized with reference to international standards - see above).

Similarly, there are unlikely to be important results of evaluation studies that turn critically on the choice of standards (Harvard, NCHS, or local ones) or the choice between percentages of medians, centiles, or Z-scores of the reference population. These could matter for clinical practice or for comparison with other studies or other countries, but for the immediate task of measuring height and weight differences, their resolution is not a prerequisite for valid comparisons of children's heights and weights.

Some technical choices do have the potential for affecting the outcome of an evaluation. One is the choice of body measurement. Ratios that are age-independent or nearly so (like weight-for-height and arm circumference) are attractive because they obviate the difficult task of age estimation. However, they reflect acute, not chronic, protein-energy malnutrition. The prevalence of low values of WH (wasting) may be quite low to begin with even in deprived populations. Height-for-age reflects long-term nutritional status, and it has been shown to respond to supplementary feeding. At least in non-famine situations, HA (or weight-for-age, which is an amalgam of HA and WH, often easier for less trained surveyors to measure) is prob-

ably the most meaningful indicator for evaluations of supplementary feeding of preschool-aged children.

When successive measurements on the same child can be matched, it is possible to use growth velocity (or categories of "gainers" and "losers") instead of attained growth as an outcome indicator. Velocity might be more sensitive to improvements or deterioration in nutritional status, but it is uncertain whether increased measurement error makes velocity in practice less reliable and responsive than attained growth.

For many purposes, policy makers want to know the percentages of children who have low scores on the anthropometric indicators. But statistically more powerful comparisons (which are also less sensitive to random measurement error) can be made between the mean values for groups. This sort of concern might call for analysis of evaluation data using several methods; unless conflicting results are obtained, the less familiar or less illuminating ways of presenting the data can be relegated to technical appendices of reports.

The purpose of listing these issues in the collection, use, and interpretation of anthropometric data is to suggest that there are real concerns and areas of uncertainty that require attention, but no really crucial or insoluble problems from the standpoint of impact evaluations.

Activity. Beaton and Ghassemi, in a review of about 200 evaluations of preschool supplementary feeding programs, suggested that voluntary activity "could be a very important effect of food distribution programs, an effect that might have greater long-term significance than the immediate weight response of the participating children" (1982, p. 908). It is at least possible that improvements in nutritional status, as measured by anthropometry, have in general been less dramatic than expected because growth deficits are only one of the results of low food intake. In contrast to anthropometry, however, the problems with any proposed quantitative outcome measure of other parts of the "energy balance" (activity, metabolic rate) do appear to us to be technical. In the present state of knowledge, it is hard to see what to do about this possibility, other than to acknowledge it. At any rate, it seems reasonable that in populations showing high degrees of growth deficit (compared to international standards, and according to numerous studies, to the growth potential of well nourished children in developing countries themselves), improvements in growth are likely to be satisfactory indicators of child nutritional status and health.

Mortality. Accurate knowledge of mortality trends and differentials is important for many policy purposes. If a feeding program, especially combined with other maternal and child health services, leads to improved child growth, increased utilization of preventive and curative health care, and perhaps better hygiene and other health-related conditions and behavior, these changes should have an impact on mortality rates. Few evaluations of feeding programs (other than therapeutic feeding in refugee camps) have tried to estimate mortality impacts, and these attempts have been unconvincing. Partly the problem has been a failure to take account of the basic sources of confounding that vitiate simple comparisons of participants and non-participants (discussed above). Partly the lack is due to technical

difficulties. Mortality rates pertain to time periods and cannot be estimated accurately in cross-sectional surveys (as children's heights and weights can) without either very large samples or very long recall periods.

Registration systems for vital events are incomplete in most poor countries. Special systems for demographic surveillance can be set up in project areas for research purposes, as in Matlab thana, Bangladesh, but these require very large inputs of demographic and data management expertise, infeasible for most feeding programs. There are methods for indirect estimation of mortality levels from census or survey data (indirect in the sense that they do not rely on vital events registration or precise recall of the timing of births and deaths). These can be used to estimate mortality differences among sub-groups of the population, but they require an assumption of a constant fertility schedule and age pattern of mortality in the last five years or so before the survey. This makes them unusable for monitoring short-term trends for most before-and-after comparisons, or for comparisons of mortality rates between areas when a feeding program has only operated a few years.

Methods for estimating short-term infant and child mortality trends in areas with deficient vital events registration should be high on the list of research priorities. In the meantime, consumers of evaluation reports need to examine skeptically any claims about changes in mortality rates due to child feeding in non-emergency situations.

Health care utilization measures (e.g., children's immunization status) are relevant outcome indicators when an intermediate goal of a feeding program is to increase clinic attendance (that is, when the food ratio is bait). Several program evaluations have based claims for success on increased numbers of immunizations or therapies. Here the comparisons should almost certainly be between program and non-program communities or areas, not individuals, and areas should be carefully matched for accessibility of regular health services. A high correlation at the individual level between immunization and feeding program participation may be non-causal, just a function of residence near a clinic.

Morbidity can be considered either an outcome of feeding plus primary health care as an intervention or as one of the determinants, with food intake, of child growth. Unfortunately, the incidence of some of the more important diseases is hard to measure through self-reports. Diarrheal diseases are particularly important and particularly hard to measure in the community setting. Also, there is recent evidence that malnutrition is associated more with the severity than with the frequency of diarrhea.

Clinic reports of morbidity, of course, are greatly affected by accessibility and utilization of health services; it has frequently been found that a successful vertical campaign against a disease actually increases the number of case reports, even if incidence is probably decreasing. Household surveys, by contrast, are an undeveloped resource that could be used more for certain diseases and deficiency conditions. Family reports of night blindness, for example, have been found to correlate well with vitamin A status. WHO has urged lameness surveys in areas where polio is suspected to be prevalent. Women's recall of neonatal tetanus cases has been found very reliable,

and in some populations, measles has been reported accurately in recall data. All of these might be targets of nutrition or health education associated with child feeding and weighing programs, thus potential outcome indicators for impact evaluations.

## MANAGEMENT INFORMATION

Our major purpose here is to discuss impact evaluations, but some attention to the needs for management information and the experience of management information systems (MIS) is warranted. For policy purposes, there is an important distinction between programs that did not have an effect because they never happened or did not reach the intended beneficiaries and those that happened as planned but proved inappropriate or inadequate.

MIS, or program monitoring, can include all the activities producing information for the use of those concerned with a program, ranging from straightforward auditing reports (What happened to the food?) to information on coverage (Who is receiving food? Who is not? and Why not?) to information on gross outcomes (Are the children in the program growing satisfactorily?). Good program managers and clinic staff (and where community participation is real, the beneficiaries themselves) ask these questions. Answers to them are generated in diverse ways: by routine data collection and reporting, but also by decentralized information gathering, special-purpose studies of varying degrees of formality, and occasional prodding from above or below, or inside and outside, a program hierarchy.

There is a clear danger--everyone knows of sincere complaints--that excessive reporting requirements are a burden to everyone involved and get in the way of adaptive management. Perhaps the problem persists because auditing reports have inappropriately been used as the model for all information processing. One might require that every truckload of food be accounted for without requiring that every weighing of every child be transcribed on a master card and sent off to the capital city. The problem may also persist because of halfhearted attempts to get impact evaluations that have not been built into project design. For purposes other than auditing, some of the useful questions to raise include:

- How can coverage be assessed and compared with what was intended? Can the reasons for dropouts and non-participation be determined? Ways to analyze and present coverage data have been proposed (for example, by Mason *et al*, 1983) -- what is needed is a body of results from different settings.

- How is food used by families? (This topic is being discussed in other workshop sessions.) How does feeding actually fit in with other parts of the maternal and child health program? How does it affect the community? These are topics that should concern both planners and managers: In the present state of knowledge, they call not so much for routine reporting as for *ad hoc* study and the building up of case reports.

Asking ourselves how to "build in" evaluation systems to answer such management (as opposed to planning) questions should not pre-judge the answer to be routine reports or household surveys. Despite the risks of ungeneralizable anecdotalism, perhaps what should be recommended for MIS is the development of more case studies, by oper-

ating agencies. There have been some interesting attempts to describe what efficient feeding programs look like. If our goal is to work backward from actual management decisions to information needs and ultimately to (formal and informal) data collection, these descriptions could be the best place to start.

## CONCLUSIONS

We have presented reasons for thinking that nutritional impact evaluations of supplementary feeding projects are technically difficult, but not impossible. Complexity is not an invention of the technicians; it is a characteristic of the world they are trying to describe. By all means, we should seek simplicity in evaluation studies, but we should also be aware of the trade-off entailed.

Given the humanitarian importance of child nutrition, the unlikely future will eliminate child malnutrition without targeted interventions, and the considerable resources now devoted to such programs, it is clearly important despite the difficulties, to know more about what programs affect nutritional status in what circumstances. The path to improvement, we have suggested, is more on the "demand side" than on the supply side. There is a range of policy questions to be addressed; what agencies need is not a standardized evaluation component to attach to all, or even more, projects, but an agency-wide evaluation strategy for getting the answers that are really needed. The most cost-effective strategy may be a few well selected and carefully executed impact evaluations, designed to address the issues of confounding and measurement raised above, and a larger number of less intensive, project-specific, almost routine systems. A strategy, and a cumulative base of knowledge, will not emerge out of single projects or single studies; it will only come in response to a felt (and articulated) need of policy makers.

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## NUTRITION EDUCATION'S PROMISE: CAN IT BE KEPT?

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*Marcia Griffiths*

We nutrition educators promise the sky--increases in knowledge about nutrition, changes in attitudes and daily practices, and ultimately, as the promise goes, the nutritional well-being of those who have learned and applied the knowledge. The reasoning is sound and for several decades program planners have made funds available to us for nutrition education. After all, they reasoned, malnutrition is caused in part by lack of knowledge about simple preventive measures and the appropriate use of limited resources at the household level. Additionally, nutrition education is a modest investment compared with other interventions embracing similar goals. But theories eventually must be substantiated. And nutrition educators have had a difficult time showing that what they have done has made a difference. Some projects have shown substantial knowledge and attitude changes. Evaluations of a few have shown general nutritional improvement, but, for want of an adequate evaluation design, the role of nutrition education in the improvement has been difficult to document. The performance overall has caused planners to question the value of nutrition education.

This has been especially true of nutrition education in maternal/child feeding programs. The basic educational approach of the 60s and 70s, comprised of nutrition talks about food groups, protein and calcium requirements and sources, accompanied with posters of dancing liver, carrots, and milk, produced few results. In 1980, when a review of nutrition education components of PL-480 programs was conducted, these components were found to lack either a coherent strategy or the impetus to consistently implement one except in the few cases where there was an Operational Program Grant specifically for educational work.<sup>1</sup>

But despite this uncomplimentary history, there is reason to renew the promise made years ago that nutrition education can improve the nutritional well-being of a population.

- The evaluation of Morocco's nutrition program<sup>2</sup> indicated that nutrition education had made a difference in the outcome of a MCH feeding program. The evaluation showed that the nutritional status of children in the program was better when the program consisted of education and food than when, as before, it consisted solely of food distribution.

- Anecdotal evidence from (mostly Latin American) breast-feeding promotion programs with strong communications components indicates that the trend away from breastfeeding can be halted, and in the case of Brazil, it seems, reversed.

- A nutrition education pilot project in Indonesia demonstrated changes in nutritional status in children under five through a program where the sole intervention was education.<sup>3</sup>

However, I must qualify my statement that nutrition education's promise can be renewed. It will not be renewed by the old methods, but through a new approach and a greater openness to experimentation. The fact that one model for nutrition education programs did not work does not justify abandoning the entire enterprise any more than the shortcomings of feeding programs, which have not solved the problems we supposed, would justify discarding the notion of assisting people with food. New approaches must be sought to make the assistance more effective.

In my opinion, one important aspect of a new approach is to combine education with feeding. For too many years, nutrition planners have divorced the two, seeing the options as either a preventive/educational program or a curative/feeding program. The two do not have to be mutually exclusive; the activities of each simply have to be planned with respect to local realities and realistic goals from the program's conception. If nutrition educators are part of early planning, the research they do prior to strategy planning can help to structure the feeding program and address problems encountered in feeding programs, such as low participation and food targeting.

To support the notion of increasing the role for nutrition education in what are now solely feeding programs, I would like to address the rest of my remarks first to a new approach and the results of its application, second to how a few programs oriented exclusively toward food distribution have begun to expand into community-oriented nutrition programs with strong education components, and lastly to recommendations for how agencies can facilitate the development of such programs.

#### THE NEXT STEP

Over the years, nutrition educators have seen that food patterns can change in response to fluctuations in the economy and the enticements of commercial marketing. With ample evidence of the nutritionally negative results of these forces, no one denies the need for equipping nutrition educators with better skills and tools than many had formerly supposed necessary. But the question of which skills and tools has lingered. The late 70s saw a desperate attempt in the nutrition community to compete with commercial forces by mimicking commercial slogans and catchy jingles. While these efforts often caught people's attention, they did not realize meaningful behavior changes or improve nutritional status. The failure occurred because the substance had not changed; the slogans and jingles were only the old messages in new clothes. The messages were still concerned with trying to turn parents into para-nutritionists, supplying them with theories about the nutritional value of "The Four Food Groups" and other nutrition facts. The result was mothers who could repeat the theories but did not have an inkling about how to feed children when they reached the weaning age, failed to gain weight, or succumbed to diarrhea.

Only recently, with the advent of the behavior change orientation of nutrition education and with the study of the disciplines that make commercial marketing persuasive, has a new approach emerged for nutrition education. The approach is social marketing--

a systems approach using specific disciplines to arrive at strategic decisions about products, services, or behaviors to be advocated, and how this advocacy can best be done. As UNICEF's 1985 State of the World's Children report says,

The potential of social marketing is only just beginning to be explored.... It is already possible to say that social marketing is one of the most important tools for taking child protection strategies out of the medical chest and putting them into the hands of parents.<sup>4</sup>

The beauty of the social marketing approach, applied correctly, is that the nutrition-educator-turned-social-marketer can create a program based on consumer needs and desires rather than apply the same technology or solution everywhere. The nutrition educator of old specified during project planning the number and type of materials needed--often without ever stepping foot in a village. And, when faced with a problem such as poor nutritional status among weaning-age infants, s/he used standard nutrition messages calling for more eggs, milk, and liver. Today's social marketer faces the problem differently. He or she does not automatically recommend a specific weaning food, nor a radio program or flipcharts before exploring with project participants the feasibility of different solutions, the problems or resistances they have to changing harmful practices and adopting new ones, and the most reliable and authoritative media to bring them new information.

During the past several years, the social marketing approach has been tried in a number of nutrition programs--the most notable of which are Brazil's breastfeeding promotion program and Indonesia's Nutrition Communications and Behavior Change Component. I would like to use the Indonesia project as my example of the social marketing approach not only because I am more familiar with it, but because it was evaluated, and the evaluation documented that the project realized its goal of improving nutritional status through changing basic household practices.

#### THE INDONESIAN NUTRITION COMMUNICATION AND BEHAVIOR CHANGE PROJECT

The Indonesian Government's Family Nutrition Improvement Program (UPGK) began in 1974, targeted primarily for the nutritional problems of children under five and pregnant and lactating women. It operates on the premise that "the home and community are the most appropriate and effective points of entry for influencing behavioral changes which can best effect improvement in nutritional status".<sup>5</sup> Its principal features are a monthly weighing program and a trained corps of voluntary nutrition workers who are to provide nutrition education, ORS, and referrals to the health center.

In 1977, the Ministry of Health's Health Education Directorate set aside part of the World Bank's nutrition loan to establish the Nutrition Communication and Behavior Change Pilot Project in five subdistricts of three provinces--Central Java, South Sumatra, and the Special Territory of Yogyakarta. The project's purpose was to test communications techniques for nutrition education that would accomplish the national nutrition program's goal of achiev-

ing household-level feeding practice changes to improve nutritional status.

Four years later, in 1981, the pilot project's evaluation, which compared households in the pilot areas to those with the normal nutrition programs in neighboring areas, was conducted. How did they compare? Here are highlights of the findings:

Key Foods: Project children consumed more of the recommended foods than comparison children.

Nutrient Intake: Children and nursing mothers in the project sample had significantly higher protein and calorie intakes.

Nutritional Status: Children in the project sample grew significantly better than comparison children after five months of age. The mean weights of project children never fell below the normal zone, whereas the mean values for the comparison children dropped below the normal zone after the thirteenth month of life. At the end of the second year, 20% more project children were better nourished than their peers in the comparison group. And, *the mean weight of project children at 23 months of age was 1.5 kilos greater, or a half a standard deviation.* Finally, these results were consistent in all five subdistricts.

Impact on Mothers: Not only did project mothers have higher scores on knowledge of nutrition, but those with less formal schooling who normally have less well nourished children had a score equal to the score of mothers with more education--indicating that the project met its special objective of reaching the most at risk population in pilot areas.

Impact on Kaders: Twenty percent more project kaders taught nutrition concepts to mothers. They taught and trained 12% more mothers. They reached 15% more children with the weighing program. Their sessions had a 10% higher monthly attendance rate. Thirty-one percent more of the project kaders made home visits and made 5.7 more visits per kader per month. They spent an average of more than 6.9 more hours at nutrition work.

What made the difference? After all, project and comparison communities were matched demographically. That is, mothers were the same age, with similar education levels, occupations, food expenditure, and media patterns. Both sets of communities and nutrition programs organized along the same lines, with monthly weighing programs and volunteer workers, and addressed the same priority nutrition problems through education.

What made the difference in the results was the project's application of a social marketing approach to the tasks of concept development, message design, and media planning; more specifically:

- The way target audiences were identified, analyzed, and segmented.
- The way villagers were brought into the preparatory inquiries into health and nutrition problems--identifying the particulars of problems and proposing and testing solutions.

- The way the villagers contributed to decisions about the messages, media, and media materials.
- The way the project designed messages and planned and executed the media strategy.
- The way the project trained kaders to focus on priority issues, while enhancing morale and making the most of their precious donated time.
- The way the program was monitored.
- The way flexibility was built into research and the design and execution of the program. Social marketing's hallmark is responsiveness to target audience perceptions and attitudes toward a set of problems, not only the obvious ones but also the more subtle "resistance points" that thwart educational efforts. While much of the work to uncover and understand the perceptions and motivations of the target audience takes place during program conception, consultations continue and adjustments are made when the program is underway. In Indonesia, the project conducted concept testing, materials pretesting, and tracking studies to provide repeated consultations with the mothers about their perceptions and needs. Regular consultations with field staff and kaders were equally important to ensuring the project's effectiveness by keeping it continually responsive to new developments.

### Concept Testing

In this first phase, the project explored the priority nutrition problems that had been identified by project management through nutrition and health surveillance activities. Those problems were

- Protein-calorie malnutrition in infants 0-4 months of age (probable cause: mothers' lactation practices)
- Protein-calorie malnutrition in infants 5-8 months of age (probable cause: delayed and inadequate supplementation)
- Protein-calorie malnutrition in toddlers 9-24 months of age (probable cause: inadequate total food intake and protein-calorie depletion from illness)
- Infant diarrhea
- Undernutrition of pregnant women
- Undernutrition of nursing mothers

There were other problems--vitamin A deficiency and goiter--but these were not addressed by the project because programs for distributing vitamin A capsules and iodized salt were not in place.

In formulating basic educational objectives and messages to address each of these problems, the project adapted commercial marketing's concept testing--the trial of ideas and products with the intended audience--developing a highly qualitative, program-oriented, and inexpensive research methodology to learn the changes mothers might make in feeding practices to improve infant health and the resistances or problems they might have in changing critical practices.

The concept testing plan called for intensive work with a small sample. Therefore, in each subdistrict, two villages were selected, or a total of 10 villages out of 60 in the project, to participate in this initial phase. The steps in the investigative process were these:

1. The community conducted a "self-survey", which consisted of weighing all children and charting their weights on a single community graph.
2. A community meeting was then held to discuss the self-survey and to allow mothers and village leaders to suggest some solutions to problems identified in the survey. The meeting also was the forum to announce the household investigations and to get the village leaders' endorsement of them.
3. Central level staff met and developed a question guide based on the solutions that mothers and others had proposed to address specific health problems. The question guide (not a questionnaire with precoded responses) was structured to stimulate discussion and to explore the experiences of mothers in greater depth. Each guide contained four parts:
  - 1) a set of demographic questions,
  - 2) a topic section addressing a specific problem,
  - 3) a food recall section, and
  - 4) a behavior trial section oriented toward improving specific practices.

For example, the second part of the guide for interviews with mothers of 5-8 month olds contained key questions on breast-feeding practices, foods and combinations of foods appropriate for babies that age, problems encountered in mothers' first attempts to give foods to infants, perceptions about the digestive abilities of infants at this age, etc. The behavior trials for this age group recommended in the fourth section included the enrichment of the usual homemade weaning food, adding a fat source to the food and feeding the child more either at each meal or with greater frequency. In addition, questions were provided for the follow-up visit, up to a week later, to document the results of the trial.
4. In each province a small investigation team was hired and trained in qualitative research and participant-observation techniques. All the members were women. Those who completed the work most satisfactorily had high school training in home economics, worked at the provincial level for a community program, and had children of their own.
5. The investigation team lived in the villages where they worked. In each of the villages, the families for the investigation were selected because they included a pregnant woman, a nursing mother, a malnourished child, or a child with diarrhea, preferably under the age of two. It was reasoned that if they could change their practice, so could others. A total of 330 households participated. No more than two relevant topics were investigated per household. Village midwives, shopkeepers, health workers, and officials also contributed.
6. Village kaders assisted investigators in locating the selected families. In the household, the investigators' work went as follows:
  - a) Infants were weighed to confirm that their classification in monthly weighing records was correct.

- b) The investigator then used the question guide for one or two topics in the informal, leisurely conversation that followed, and she observed such things as the condition of the home and backyard garden, if one existed. In almost all houses, the entire discussion was taped to spare the investigator extensive note taking. The investigator later transcribed the tapes, making special note of key phrases and important concepts to come from the interview.
  - c) A 24-hour dietary recall was taken, using a sheet designed by project personnel that allowed the investigator to record the foods eaten and to quickly calculate whether the infant's or the mother's diet was deficient in protein, calories, or vitamin A.
  - d) At this point, the interview departed significantly from the conventional household survey. Based on the age of the child and the outcome of the dietary recall (for mother or child), the investigator worked out particular dietary changes with the mother that would improve her own or the child's nutrient intake. For example, the mother of a six month old with an inadequate intake of major nutrients would have been asked to suggest what she could add to her child's porridge that would be good for the baby's health and what she thought about several predetermined alternatives. The investigator and the mother then worked together to develop a recipe for an enriched weaning food. Since they did not follow a rigid format, they were able to use the ingredients that the mother had in the house, her methods for preparing foods, and her recipes, but adding critical ingredients, such as oil. The mother fed the new food to her child while the investigator was there, and she and the investigator discussed what she liked or disliked about the food.
  - e) Before leaving, the investigator promised to return in three to four days and asked the mother to continue to try whatever activity they had agreed upon. In the case of the weaning food, the mother would continue to give this food to her child several times every day until the investigator returned.
7. When the investigator returned, invariably the mother had modified the recipe to suit her needs and had some comments or questions. This opportunity for "product development"--for trial, adaptation, and retrieval--in the mothers' homes was one of the most important elements of the methodology. It was social marketing's adaptations. This opportunity for "product development"--for trial, adaptation, and retrieval--in the mothers' homes was one of the most important elements of the methodology. It was social marketing's adaptation of commercial product testing.

#### Establishing Objectives

At the study's completion, the project had a comprehensive picture of current attitudes and practices and of the rural mothers' openness to altering them. The qualitative research provided the

substance of the program, which drew on the trials of new practices for the behavior change objectives and on the mothers' remarks for the motivational elements in the messages and for ideas for translating them into materials.

Of the many insights afforded by the investigation, one of the most important was identifying the practices susceptible to change. For example, women routinely discarded colostrum because they were told it was unclean. This had been shown by other studies. Women's responses during the investigation indicated that the belief was not firmly held. Many women thought the custom was old-fashioned and had heard of other women giving colostrum to their infants with no harmful effects and were willing to try themselves.

Other findings led to alterations in the standard breastfeeding messages. In the rural areas of Indonesia where the project took place, frequent breastfeeding was practiced by all the mothers well into the child's second year of life. Breastfeeding practices, which initially appeared to conform to medical guidelines, did not seem to merit special attention in the educational campaign. However, through the concept testing, it was learned that mothers were experiencing problems and, believing their infants were not satisfied with breast-milk alone, fed the infants solids soon after birth. Further exploration brought to light the mothers' belief that one breast contained "food" and the other "water", which caused them to favor the breast with "food". A baby who seemed content after being suckled at that breast was never offered the other. Subsequently, the project approached this topic in terms of the mothers' concern for their infants' satisfaction: "Each time you breastfeed, use both the right and the left breasts: be sure your child is satisfied."

The concept testing highlighted the need for local adaptations of some recommended practices. After numerous trials, a home prepared weaning food made of local ingredients was developed. Although the ingredients were remarkably similar in all the subdistricts, the preparation methods were distinct, especially concerning the addition of a fat source. For example, oil was added to the porridge in one area by frying the *tempe* or *tempe* before it was mashed in the porridge; in another area, a few drops of coconut oil were added to the cooked rice; and in another, the mixture of ingredients was cooked in coconut milk.

### The Message and Media Strategy

The concept testing had brought into sharper focus the differentiations among the ostensibly homogeneous target audience of mothers. The mothers were segmented by their differing concerns--pregnancy, childbirth--and after childbirth their concerns changed with each advance in the age-related dietary need of their infants.

The opportunity to make the audience segmentation work came in using the weighing session for education. The weighing session is ideal for the precise delivery of the precise message to the precise mother at the precise time of her precise need for the instruction. *This is social marketing's primary tactic: focus on priority need when, where, and for whom it is essential and minimize all extraneous factors.*

Concept testing also provided the opportunity for finding out the mothers' sources of information and the impact of the mass media. It was learned that mothers' radio listening in Java was "lighter" than had been anticipated from the available data on ownership of working radios. Having planned a significant role for radio, the planners found it necessary to find ways to compensate for radio's shortcomings. The medium of the kader network would have to be relied on to a greater extent than planned. This placed an additional burden on their training and the materials they were to use: these had to be designed for a more intrusive effect on the target audience in terms of message impact and the frequency than is usual.

The seven individual messages for each audience segment were translated into scripts for radio and posters for the kaders to teach from and distribute to mothers. The radio scripts were short message, mini-dramas. But the posters were a radical departure from traditional poster design to meet the new media requirements of intrusive impact and message frequency. The response to this was the Action Poster, which produced a new dimension of audience involvement with the poster medium several times a day in much the same way that radio intrudes into audience awareness simply by repeating the message. An example of one of the seven Action Posters appears below.

The Action Poster illustrated here was used by kaders to instruct mothers of infants five to eight months of age on proper feeding: breastfeeding from both breasts and feedings of *bubur campur* (the specially developed weaning food) four times a day. The boxes beneath the illustrations are a "scorecard" for the mother to mark or pierce each time she completed a prescribed feeding. The 30 vertical boxes under each illustrated action allow space for a month's "scoring". The concept behind the Action Poster was that the "scorecard" feature made it more involving for mothers than recommended dietary practices whether or not she actually marked the poster.

### Pretesting the Materials

The Action Posters and radio spots were tested with both the kaders and the mothers after they were developed. The testing showed that the basic messages were well understood and that mothers easily recalled the important points. The radio spots and the posters needed only minor changes in language and presentation. Most importantly, from the pretesting insights were gained into special training needs of kaders.

### Training Kaders

The training of kaders was designed to familiarize them with the priority messages of the project and where and under what circumstances the messages were to be delivered. Kaders were trained with the same messages and materials they were eventually to use in educating mothers. The training taught them to use Action Posters in conjunction with the weighing and the maintenance of growth charts and to only give mothers Action Posters relevant to the mothers' dietary needs or to the needs of their children. Kaders also were instructed in the proper weighing procedure, in how to use the growth chart, and in how to conduct home visits.

### Tracking-and-Feedback

A monitoring system through monthly reports from the villages and monthly meetings of kaders with field staff kept the project's headquarters informed of developments. Furthermore, a management decision to allow local adaptations in the project prevented the rigidity that often discourages field personnel. The suggestions of kaders and field staff were considered and implemented. This not only contributed to better morale but to a more responsive program.

### Cost

The cost per beneficiary in this project was the lowest of six interventions in nutrition projects assisted by the World Bank<sup>6</sup>. To analyze the project, actual expenditures were used to calculate the initiation phase costs, then estimates for an expansion phase were made with the actual figures. Both nonrecurrent costs (vehicle and equipment purchases, consulting services, one-time training, and message and materials design, etc.) and recurrent costs (supervision, salaries, materials production, etc.) were included in the analysis. The Bank calculated that the annual cost per project beneficiary (children 0-24 months old and pregnant and lactating women) was \$3.94 during the pilot project stage, but that if the project were to be expanded to more areas in the country, the annual cost per beneficiary would be reduced to \$2.05. (This can be contrasted with costs of between \$20 and \$56 per beneficiary in feeding programs.) Based on the Bank's project cost estimates and the finding that 40% of the project children were growing better by 24 months of age than children in the comparison sample, the cost per child with nutritional status improvement was \$9.85 per year for the pilot project and would be approximately \$5.13 per year for an expanded program, figures which indicate that nutrition education programs are not without cost but can be among the most cost-efficient.

*What are the implications of the social marketing experience in Indonesia for food supplementation programs?*

Social marketing is indispensable to developing and implementing nutrition communications programs that have the potential to

- 1) improve practices at the household level that will affect nutritional status;
- 2) make the program attractive to families, creating a demand for the program's services and thereby increasing participation (one of the most glaring failures faced by development programs); and
- 3) assist in overcoming problems faced by feeding programs regarding the intra-household distribution of the supplement.

In promoting this approach, we have found program planners resistant. Many maintain it is too time consuming, others that it is too costly, still others balk at the need for specialized expertise, and some are uncomfortable with what is implied in a behavior-change orientation. To overcome these resistances, we have persuaded planners in two countries, the Dominican Republic and Ecuador, to test the approach used in Indonesia in their feeding programs that are working toward the long-term goal of making program participants self-sufficient. They are making use of many of the lessons we learned in Indonesia, particularly: careful concept testing, segmentation of the

audiences, use of growth monitoring sessions for individual counseling, careful pretesting of materials, job-related training, tracking studies, and special attention to communications within the program as well as with project participants. However, some adaptations have been made as well:

- 1) The problems that each of the current programs addresses have been narrowed. The Indonesia program worked on some priority problems simultaneously. In both of the feeding programs, the principal focuses are infant feeding and dietary management during diarrhea. They plan to address hygiene, maternal nutrition, and specific nutrient deficiencies in later phases.
- 2) Both of the current programs have reduced the length and thus the expense of the concept testing phase by combining focus group interviews with the in-depth individual interviews used in Indonesia. Using this combination, the time-consuming individual interviews are used only to verify what is learned in the focus groups.
- 3) The media plan is being implemented in stages. In both the Dominican Republic and Ecuador, the first step has been to develop the individual counseling materials to use at the growth monitoring session and the promotional materials for the program, including some targeted to enhancing the authority of promoters and health center personnel. The second step is the development of materials for group discussions and demonstrations, and the third developing radio spots for families and a program for the promoters and health center personnel.
- 4) The materials have been designed by program staff in both cases, and their reproduction has been contracted out. There has been no long-term adviser present.

With these modifications, the programs in the Dominican Republic and Ecuador have been developed on very limited budgets. Reliance only on short-term technical assistance at critical stages has meant that program personnel have truly built the educational components and take great pride in the process they have undertaken and in the products. Although the programs have not been evaluated, the first tracking study in the Dominican Republic showed good use of the materials by the promoters and widespread knowledge and acceptance of their advice in the communities.

*How can this approach be used by other feeding programs?*

Based on the experiences in Ecuador and the Dominican Republic, it seems possible to use the social marketing approach as it was applied in Indonesia, adapting and refining it to the budgetary and scale limitations of each program, as is being done in the Dominican Republic and Ecuador. The challenges seem to be maintaining an openness to experimentation; having flexibility in budgeting; having patience with project development; and providing good management of the program. To meet these challenges, agencies can take several actions on both policy and operational levels:

- 1) Provide orientation to key agency planners on problems faced by field programs and the role that a strong educational component could play if conceived as part of the total program package to overcome common problems (i.e., low participation

- rates) and avoid unwanted outcomes (i.e., declining rates of breastfeeding initiation and duration).
- 2) Work towards instituting a policy that every program will have an educational component that is undertaken from a problem solving point of view in a serious, systematic way and not fulfilled by simply printing pamphlets and posters designed in the program's office.
  - 3) Brief key program managers about the process of developing a communications component so they know the timetable for planning and how to budget. Such briefings will also make managers aware of the key decisions that must be made and in what order so that they can monitor the work. The steps outlined below offer some idea of this process. The program manager needs to know that considerable money will be spent prior to the reproduction of materials and that there are seven steps that precede materials design and at least eleven before implementation.

Process for the Development of an Educational Plan

1. Identify general problems and general objectives.
  2. Gather quantitative information on the priority problems.
  3. Determine educational priorities.
  4. Gather qualitative information in the community through focus groups and individual interviews.
  5. Analysis of qualitative information-action objectives and educational content.
  6. Selection of appropriate media.
  7. Development of an educational strategy, including materials to be produced.
  8. Materials design and production.
  9. Materials testing
  10. Improvement of materials based on test.
  11. Training workers in basic messages and use of materials.
  12. Implementation.
  13. Evaluation and continual refinement.
- 4) Make special funds available for the development cost of a communications component that can be obtained without a proposal that specifies the number and kinds of materials the component must produce. Such specifications only lock field personnel into a plan that may not be the most appropriate.
  - 5) Look for continuity in the technical assistance. Most programs will need periodic guidance for different steps. Because not all sources share a common perspective, it is important to know the methodology a communicator uses in developing programs so that field staff will not be confused by conflicting methods and become discouraged.

The promise of nutrition education to affect feeding practices and consequently nutritional status can be renewed, as evidenced in Indonesia. It can and should also be extended to feeding programs as they reach out in most countries to embrace broader development goals.

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- <sup>1</sup>Thomas M. Cooke, Richard K. Manoff and Frances Cosstick, "Nutrition Education Components in PL 480 Title II Programs," Manoff International Inc., April 1980.
  - <sup>2</sup>Agency for International Development, Project Impact Evaluation Report No. 8: "Morocco: Food Aid and Nutrition Education", August 1980.
  - <sup>3</sup>Manoff International Inc. "Project Description: Nutrition Education and Behavior Change Component, Indonesian Nutrition Development Program", 1983.
  - <sup>4</sup>James P. Grant, Executive Director, UNICEF, "The State of the World's Children 1985".
  - <sup>5</sup>UNICEF (Indonesia). *The Situation of Children and Women in Indonesia*, Draft Report, January 5, 1984.
  - <sup>6</sup>T. J. Ho. "Economic Issues in Assessing Nutrition Projects: Costs, Affordability and Cost Effectiveness". Staff technical report. Washington, DC: World Bank, 1984.

## NUTRITIONAL ASPECTS OF PROJECT FOOD AID

January 14-18, 1985

Annapolis, Maryland USA

### A G E N D A

#### Workshop Objectives

To consider several of the major issues relating to enhancing the nutritional impact of project type food aid and to develop recommendations for the consideration of those involved in food aid programs.

#### Workshop Format

For each of the six issues on the agenda, an overview paper (or papers) will be presented in plenary session. These papers will frame the issue and either frame or actually propose what needs to be done to address the issue. The presentations will be followed by one or two short comments which will either further define or disagree with the points made in the papers. These comments are intended to help shape the discussion to follow.

The whole group will then divide into three sub-groups to discuss either the entire paper or different assigned aspects of it. At least one member of each group will be designated to serve on a drafting committee. These drafting committees will meet during non-programmed time to produce a short paper summarizing the consensus of the sub-groups. These conclusions will be presented to the entire group in plenary session on Friday afternoon for any final modification.

It is planned to publish the overview papers and these conclusions/recommendations in a single document following the workshop.

Note: The workshop does not attempt to deal with all of the issues involved in food aid as it relates to nutrition. Only several of the most important and unresolved issues have been selected for attention.

Monday, January 14, 1985

Chairman: Martin J. Forman  
Office of Nutrition; US Agency for International Development  
Washington, DC USA

Plenary Session: 2:30-3:30 pm Working Groups: 3:45-5:15 pm

Targeting Food Aid

What is the experience to date with targeting food aid to the nutritionally neediest to achieve the greatest impact? Should projects target individuals, households or communities? How can the neediest be identified? Can they be identified early before malnutrition becomes severe?

Speakers: a) Robert J. Timmons                      b) Mary Ann Anderson  
Community Systems Foundation                      USAID  
Ann Arbor, Michigan USA                              New Delhi, India

Expected Output: Recommendations on when, on whom, and on how to target project food aid for the greatest nutritional benefit.

Tuesday, January 15, 1985

Chairman: M. S. Dayal  
Ministry of Social Welfare  
New Delhi, India

Plenary Session: 9:00-10:30 am Working Groups: 10:45-12:15 pm

Food Aid as Income Transfer

There has been considerable discussion of providing foods that are of the highest monetary value to the recipient and of low relative cost to the donor as a way of maximizing the nutritional impact of donated foods. What are the implications of such an approach? Has it ever been tried? How can we test this approach?

Speaker: Anne M. Thomson  
Institute of Development Studies  
Sussex, England

Comment: Shlomo Reutlinger                      Judit Katona-Apte  
World Bank    Durham, North Carolina, USA  
Washington, DC USA

Expected Output: Recommendations on whether and how this approach might be tested. If possible, a methodology for carrying out a test will be developed.

Plenary Session: 2:00-3:30 pm Working Groups: 3:45-5:15 pm

Catch-up Growth

How can supplementary feeding be used in conjunction with integrated health care systems to bring about catch-up growth after infection or disease? Following diarrhea, oral rehydration therapy (ORT) restores

body fluids and minerals and salts. How can food aid be used to restore good nutritional status and continued growth? How can food aid be used to enable children who have suffered prolonged malnutrition to catch-up to their cohorts in growth?

Speaker: Paper prepared by  
Hernan Delgado  
Institute of Nutrition for Central America and Panama (INCAP)  
Guatemala City, Guatemala

Presented by: Fernando Viteri  
Pan American Health Organization  
Washington, DC USA

Comment: Jon Rohde  
Management Sciences for Health  
Port-au-Prince, Haiti

Expected Output: Recommendations on how project food aid can be used in collaboration with other activities to bring about catch-up growth.

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Wednesday, January 16, 1985

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Chairman: Soekirman  
Ministry of Planning and Development  
Jakarta, Indonesia

Plenary Session: 9:00-10:30 am Working Groups: 10:45-12:15 pm

Phaseover of Programs

What activities can be undertaken to strengthen local institutions and programs so that they achieve lasting impact? What can be done to ease the problem of local assumption of responsibility after donors phase-out aid? What has been the experience with locally prepared blended foods using food aid ingredients? How can partial local financing of project costs help to ease phaseover?

Speakers: a) M.C. Swaminathan Hyderabad, India      b) P. Rod Crowley  
U.S. Department of Agriculture  
Washington, DC USA

Comment: C. Capone Catholic Relief Service New York, New York USA  
M. M. Rajendran UNICEF New York, New York USA

Expected Output: Recommendations on actions that may be taken by program sponsors and managers so that phaseover of programs does not have a negative affect on nutrition.

Plenary Session: 2:00-3:30 pm Working Groups: 3:45-5:15 pm

Evaluation

What is the experience with evaluating programs for nutritional impact? How can evaluation be built into the design of projects? How can good evaluation be carried out at reasonable cost?

Speaker: John Mason  
Cornell University  
Ithaca, New York USA

Comment: David Sahn  
International Food Policy Research Institute  
Washington, DC USA  
Judith Gilmore  
Bureau for Food and Voluntary Assistance  
US Agency for International Development  
Washington, DC USA

Expected Output: A recommended course of action for a feasible approach to carrying out valid evaluations of food aid projects. If possible, a methodology will be presented.

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Thursday, January 17, 1985

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Chairman: Raja Amerasekera  
Ministry of Plan Implementation  
Colombo, Sri Lanka

Plenary Session: 9:00-10:30 am      Working Groups: 10:45-12:15 pm

*Nutrition Education to Promote Improved Feeding Practices*

- a) How can nutrition education help to insure that supplemental foods are used properly? How can we insure that foods do not displace breastfeeding or other desirable feeding practices?
- b) How can we take advantage of supplementary feeding programs to foster better eating habits in the family?

Speaker: Marcia Griffiths  
Manoff International  
Washington, DC USA

Comment: Francesca Ronchi-Proja      Mary Ruth Horner  
Nutrition Program Service      Primary Health Care  
Food and Agriculture Organization      CARE, Inc.  
Rome, Italy      New York, New York USA

Expected Output: Recommendations on how to use supplementary feeding programs and nutrition education to improve feeding practices so that they lead to better nutrition.

2:00-4:00 pm      Tour, United States Naval Academy

Friday, January 18, 1985

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Chairman: Martin J. Forman  
Office of Nutrition; Agency for International Development  
Washington, DC USA

Plenary Session: 9:00-12:00 pm

Innovation

Are there new ideas to make food aid more effective in addressing nutritional goals? For example: How can food aid be used to impact on maternal nutrition?

How can food reach more selective targets, such as only the very poor? What is the experience with using low status foods for this purpose? What is the potential of "self-targeting" foods?

This session will have no single speaker. In advance of the workshop, participants may request time to make short presentations to propose an idea. Presenters should provide information to justify why the concept should be considered, what evidence there is that it could work, and how it should be pursued. The organizing committee will select the concepts to be presented. About three ideas will be discussed and about 45 minutes of presentation and discussion will be allotted to each.

Plenary Session: 2:00-5:00 pm

Conclusions and Recommendations

The drafting committees will have prepared summaries of the conclusions and recommendations which emerged from the sub-group discussions. They will be presented for any additional modifications and for final consideration by the entire group.

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UNITED NATIONS

The Administrative Committee on Coordination  
Sub-Committee on Nutrition (ACC/SCN)

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The ACC Sub-Committee on Nutrition (SCN) was established in 1977. Its main purposes are to keep under review the overall direction, scale, coherence, and impact of the United Nations System's response to nutritional problems of the world. It is a point of convergence in harmonizing the policies and activities in the U.N. System, particularly in accomplishing the objectives of the nutrition resolutions of the World Food Conference of November 1974. It suggests ways to approach specific problems such as the formation of special task forces or working groups.

Members of the SCN are specialized agencies of the U.N. System, such as the World Health Organization, the Food and Agriculture Organization, UNICEF, and UNESCO, whose activities have a direct or indirect influence on the nutritional status of the people. The International Fund for Agriculture and Development (IFAD), the Pan American Health Organization (PAHO), the United Nations University (UNU), and the World Bank are also members. Governments which sponsor international nutrition programs in developing countries are invited to send representatives to the annual meetings.

The SCN has Working Groups on Nutrition in Agriculture and Rural Development; Nutrition and Food Aid; Applied Nutrition Research and Training; and Nutrition, Health, and Development. These groups work on specific issues related to the major fields dealt with and report to the SCN as a whole.

In support of the SCN, the Advisory Group on Nutrition (AGN) makes outside expert advice available to the SCN. The AGN responds to questions posed by the Sub-Committee or by sponsoring agencies and recommends to the SCN approaches to critical issues.

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