Nutritional Issues in Food Aid – Nutrition policy discussion paper No. 12

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UNITED NATIONS **NATIONS UNIES**

ADMINISTRATIVE COMMITTEE ON COORDINATION – SUBCOMMITTEE ON NUTRITION

ACC/SCN SYMPOSIUM REPORT

Papers from a Symposium held at the ACC/SCN 19th Session
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Information on the ACC/SCN Symposium Series, as well as additional copies of papers, can be obtained from the ACC/SCN Secretariat. Inquiries should be addressed to:

Dr John B Mason

Technical Secretary, ACC/SCN

c/o World Health Organization

20, Avenue Appia

CH–1211 Geneva 27

Switzerland Facsimile No: (41–22) 798 88 91

UNITED NATIONS

ADMINISTRATIVE COMMITTEE ON COORDINATION – SUBCOMMITTEE ON NUTRITION (ACC/SCN)

The ACC/SCN is the focal point for harmonizing the policies and activities in nutrition of the United Nations system. The Administrative Committee on Coordination (ACC), which is comprised of the heads of the UN Agencies, recommended the establishment of the Sub–Committee on Nutrition in 1977, following the World Food Conference (with particular reference to Resolution V on food and nutrition). This was approved by the Economic and Social Council of the UN (ECOSOC). The role of the SCN is to serve as a coordinating mechanism, for exchange of information and technical guidance, and to act dynamically to help the UN respond to nutritional problems.

The UN members of the SCN are FAO, IAEA, IFAD, ILO, UN, UNDP, UNEP, UNESCO, UNFPA, UNHCR, UNICEF, UNRISD, UNU, WFC, WFP, WHO and the World Bank. From the outset, representatives of bilateral donor agencies have participated actively in SCN activities. The SCN is assisted by the Advisory Group on Nutrition (AGN), with six to eight experienced individuals drawn from relevant disciplines and with wide geographical representation. The Secretariat is hosted by WHO in Geneva.

The SCN undertakes a range of activities to meet its mandate. Annual meetings have representation from the concerned UN agencies, from 10 to 20 donor agencies, the AGN, as well as invitees on specific topics; these meetings begin with symposia on subjects of current importance for policy. The SCN brings certain such matters to the attention of the ACC. The SCN sponsors working groups on inter–sectoral and sector–specific

topics.

The SCN compiles and disseminates information on nutrition, reflecting the shared views of the agencies concerned. Regular reports on the world nutrition situation are issued, and flows of external resources to address nutrition problems are assessed. State–of–the–Art papers are produced to summarize current knowledge on selected topics. SCN News is normally published twice per year. As decided by the Sub–Committee, initiatives are taken to promote coordinated activities – inter–agency programmes, meetings, publications – aimed at reducing malnutrition, primarily in developing countries.

ACKNOWLEDGEMENTS

We are most grateful to the following people who contributed as presenters or discussants in the ACC/SCN's symposium on "Nutritional Issues in Food Aid", 24–25 February, 1992, at WFP Headquarters, Rome: Joachim von Braun, Jens Schulthes, T C Moremi, Simon Maxwell, George Beaton, Juan Rivera, Philip Musgrove, Reynaldo Martorell, Eileen Kennedy, Ken Bailey, Mike Toole, John Seaman, Basra Hassan and Rita Bhatia.

We would also like to thank WFP for hosting the symposium, particularly Mr James Ingram, Executive Director of WFP, who opened the meeting and gave the keynote address, and Dr Judit Katona–Apte for chairing the meeting and assisting so effectively in its development.

We are also indebted to Viki Elliot and Stuart Gillespie for valuable assistance in editing and assembling the report.

John Mason
Technical Secretary
ACC/SCN

FOREWORD

In the past, critics of food aid have argued that it encourages dependency, both by undermining incentives to local food production as well as biasing tastes towards imported commodities. However, as we approach the mid–1990s, there is now a growing understanding that –– when managed appropriately – food aid can provide a positive boost to food security, at national and household levels. It can make a significant impact on nutrition, both directly through being chanelled through supplementary feeding programmes, and indirectly as an economic resource as payment for public works schemes, including food–for–work programmes.

Important nutritional issues within food aid, dealt with in this report, include the role of public works and supplementary feeding programmes and the means of protecting refugees' nutrition. Public works providing they are labour–intensive, and preferentially self–targeting to the poorest population groups, particularly women, can have significant pay–offs for nutrition. Within supplementary feeding concerns, the targeting of food with respect to the age and nutrition and health status of the proposed recipient, the effect of such feeding on the growth of children with infection, and the educational aspects of these programmes are described.

Finally, the importance of timely and sustained delivery of acceptable food aid, adequate in quantity and quality, to refugee and displaced populations is paramount where external sources are not available. Within this, the micronutrient requirements of such populations, and the need to ensure their access to a balanced diet is essential.

We hope that this document will be useful to all those concerned with improving nutrition and health in developing countries including specialists in related disciplines from agriculture through economics to social sciences, as well those in nutrition and health.

Dr Abraham Horwitz
Chairman, ACC/SCN

SECTION I. Introduction and Background

Keynote Address

24 February 1992

James Ingrain

Executive Director of the World Food Programme

Mr Chairman, delegates, ladies and gentlemen. It gives me great pleasure on behalf of the World Food Programme to welcome members of the ACC Subcommittee on Nutrition and to introduce this symposium on Nutritional Issues in Food Aid.

Nutritional issues are naturally of concern to a food aid agency. WFP is the main international source of food aid for victims of natural disasters. WFP is now also the main channel for food for refugees and displaced people. Altogether this relief work counted for just under half of all shipments of WFP food aid last year to bring succour to 21 million people.

Relief work is always challenging. Effective interventions in such situations mean much more than merely providing food. Over the past year in a number of disaster–stricken countries, WFP staff have been called on to coordinate food aid arrivals from all sources, arrange the unloading of ships, ensure food is properly stored in ports, organize onward transportation and monitor its final distribution to beneficiaries. At different times, WFP has arranged for ports to be rehabilitated, transport, loading and storage facilities to be upgraded, railways to be refurbished, bridges to be provided at strategic crossings and, last year, even for tug boats and pilot boats to be supplied.

WFP's work in delivering food to civilians on both sides of conflict zones has helped strengthen international efforts to get the notion of safe passage of emergency food aid accepted by both governments and opposition groups.

In channelling help to refugees, more than logistics is called for. Many refugees in developing countries have been living in often rudimentary camp conditions for more than a decade. In a number of cases they are almost entirely dependent on WFP for nearly all their food requirements. The food aid commodities provided by the international community are, understandably, of limited variety. Thus, it is inevitable that refugees trade a portion of their basic rations for other commodities to provide variety to their diet. Because the non–food needs of refugees are often not fully met, they are also likely to exchange food for such things as soap, matches, clothing and so on. This is not irrational behaviour but, as a result, their nutritional intake may well suffer.

If we are to ensure that long–term refugees lead healthy lives, then we have to understand better the mechanics of intra–household food management, along with the management of other resources in refugee camps. In the past WFP has investigated these aspects in refugee situations in Asia and Africa, as part of specific evaluation or management review. However, we now plan to commence a more systematic study of refugee households over the coming years, to gain a better understanding of how those households behave, so that we can improve the provision and management of food aid for them. We believe that this will be an important contribution to both refugee and nutritional studies, and we look forward to reporting the results at a future meeting of the Sub–Committee.

In the meantime, we look forward to the discussion of refugee issues at this Symposium.

However, WFP's relief work, important though it is, accounts for only part of our activities. Through some $3 billion worth of development resources that provide food aid to more than 80 million people, WFP tackles the root cause of hunger and malnutrition – namely poverty.

From a nutritional point of view, some of our development interventions are direct, such as in feeding programmes for vulnerable groups or for school children. In this regard, the discussions later today on targeting of children are of direct interest to the Programme.

However, most of our development projects work more indirectly to improve nutrition.

Food aid used by WFP provides poor people with important supplements to their incomes or their 'diets. The savings that they make through participating in WFP–assisted projects can be used to buy more, or more nutritious, food than they would normally consume. Or they can invest those savings in small farms or other enterprises that will provide them with more sustained incomes. These are important development benefits.

But the spin–off effects of WFP's development work go further than that. If the poor are going to really become better off, then they have to be given the means to improve their production and income–earning skills in sustainable ways. That might come from the rural infrastructure and other activities undertaken through WFP food–for–work – such as farm–to–market roads, new or rehabilitated irrigation works, tree–planting, terracing on steep hillsides, water and soil conservation works and so on. These works, if properly maintained, go on providing benefits, year after year. We tend to consider these activities mainly for the economic benefits they provide; the nutritional effects of the higher incomes they bring are often overlooked. The first of the symposium discussions considers the nutritional impact of food–for–work.

For other people, WFP food aid has helped them to be trained in better agricultural practices or has improved their income–earning skills by sustaining them, and often their families, while they took time off to attend courses. Food aid used in this way also ensures that poor people become permanently better off.

Hence, WFP food aid does much more than merely feed people. However, its full developmental impact is best realized when provided in conjunction with financial and technical inputs. These inputs will mainly come from other international development agencies or bilateral donors. In this regard WFP actively seeks to coordinate its activities with other agencies – including those represented here today. While there has been considerable progress, much remains to be done to integrate food aid more effectively with the assistance in support of the development programmes of recipient countries.

We look forward with interest to your discussions over the course of this week. I would expect that your conclusions will make a useful contribution to the International Conference on Nutrition to be held at the end of this year. I wish you well in your endeavors.

Issues in Food Aid and Nutrition

Judit Katona–Apte

World Food Programme

Introduction and Scope of the Paper

Undernutrition is one of the major problems in the developing world today. A large proportion of the world's population – perhaps as much as one fifth – does not have enough food to lead healthy and productive lives. An even larger number is at risk of specific nutrient deficiencies because people are too poor to acquire foods containing essential vitamins and minerals.

Malnutrition has many causes; it results from a complex set of interacting elements, including the biological, social, cultural, political and economic environments. Malnutrition cannot be overcome by simply improving access to an adequate diet; disease, especially infections, or poor maternal health and child care practices may be as important a cause of malnutrition as inadequate food intake.

Therefore, although food aid by itself can make a significant contribution, it cannot be expected to solve a complex problem such as malnutrition. It is when food aid is combined with other inputs, such as health care, education, improved agricultural technology and so on, that it can be most effective in overcoming poverty and malnutrition.

Direct nutritional improvement is not the only – or even necessarily the most important – objective for food aid. In fact, it is difficult to demonstrate the direct impact on nutrition from food aid alone. In terms of sustainable development or indirect nutritional benefit, transfer of income to poor people or support to government budgets may be more important.

Thus, the challenge for an agency such as the World Food Programme (WFP), the food aid organization of the United Nations system, is to use food aid not only to feed the poor temporarily, but to ensure that the assistance provided also addresses malnutrition over the longer term by attacking the poverty of which it is

the most severe symptom.

There has been a strong trend in the 1980s to treat food aid less as relief and more as a resource for economic and social development. Although the persistent image of food aid as just a giveaway from surplus stocks has not yet been totally erased, there are a variety of ways, many quite creative, in which food aid can be used to promote development and support lasting solutions to hunger and malnutrition.

No other form of development assistance transfers such a large level of resources directly to the very poor. WFP's portfolio of development projects currently provides food to some 15 million people annually. In addition, millions of victims of natural disasters, refugees and displaced people – more than 25 million in 1992 –receive relief food from WFP.

The purpose of this paper is to examine the potential of targeted food aid to improve nutrition in developing countries over the long run, as well as some of the constraints on its effective use, and to identify ways in which the nutritional benefits from this kind of food aid can be strengthened.

The Nutritional Effects of Food Aid

There are two main ways in which food aid such as that provided by WFP – for development projects or disaster relief – can improve nutrition (Reutlinger and Katona–Apte 1984). One is direct: the food distributed is consumed in addition to food purchased or produced by the household. This is most likely the case where recipients have limited access to food from other sources, such as in disaster relief or refugee situations.

The other is indirect: the food given to the household is consumed in place of food that would normally be purchased or produced. This releases household resources that may be spent, at least in part, on additional or more nutritious food.

Food as an in–kind resource transfer has a number of advantages over other types of assistance in many circumstances:

– Income conveyed in the form of food is more likely to improve nutrition than if the equivalent income were transferred in cash.

– Malnutrition disproportionately affects women and small children. Food is usually controlled by women, who process, prepare, cook and dispense it. Female–controlled income is more likely to be spent on additional and better quality food than male–controlled income. In many food–for–work projects, food rather than cash is preferred because, according to project authorities and social scientists, women would not have access to their husbands' cash earnings, nor would they be allowed to keep their own.

– The risk of diversion is less with food aid than with cash. Food is more likely than financial resources to reach and stay with poor people, as it is less attractive to non–poor people.

– Low–status foods, such as coarse grains, and foods with little market value or appeal can be more effectively targeted to vulnerable groups.

– Food is a more efficient resource than cash in countries with high inflation and overvalued exchange rates. In many WFP school feeding projects, for example, schools receiving food instead of cash have been in a better position to provide meals to students, as they are protected from frequent price fluctuations.

– Food is a more useful resource than cash to fund development activities in situations where food supplies are inadequate or unreliable, or markets are inefficient.

– During emergency situations that interfere with the operation of markets, such as those caused by drought, flood or warfare, direct distribution of food aid may be the only way that people in distress can be helped.

– Food aid, especially for humanitarian purposes, is sometimes politically more acceptable to donors than other forms of assistance.

– Food aid can provide concrete help to government efforts to build up buffer stocks and stabilize prices on cereal markets.

– Project food aid is largely self–targeting; the poor are more prepared than those better off to work for food rather than cash or to accept food as an incentive to undertake activities.

– Most food aid is an additional development resource in the sense that it is unlikely to be replaced in totality by financial aid if it were not provided.

Nutritional "Gateways" for Project Food Aid

Food aid is an obvious resource for nutritional improvement. Provided to the poor in the form of disaster relief, vulnerable group feeding, school feeding or food for work, it can improve individual or household food security.

Disaster Relief

Relief food aid is the most direct means for conveying nutritional benefits: needs are usually not complex, the timeframe is often limited, sustainability is not an issue and those in need are usually quite obvious. In sudden natural disaster situations, the objective is to get enough food to people to sustain them until they are able to recover. In other words, the simple provision of food is most important, with special attention to the needs of vulnerable groups. Typically, WFP emergency food rations consist of cereals with small portions of other foods such as pulses and oil.

In the case of drought victims, refugees or displaced people, the nutritional situation and the actions needed are more complex. In a number of instances people are already malnourished when they arrive at food distribution centres or places of asylum because of food shortages before and during flight. In fact, lack of food often contributes to people's decision to leave their homes.

In prolonged refugee situations, where people are totally dependent on external assistance, the available food –either provided as food aid or obtainable from other sources – has to meet micronutrient as well as energy requirements. WFP and the United Nations High Commissioner for Refugees (UNHCR) have jointly agreed on "Guidelines for Calculating Food Rations for Refugees", which address this issue. Micronutrients are best delivered through fresh foods, but refugee camps are often located in remote, food–deficit areas, where these may not be available or are very expensive. In such cases, micronutrient fortification of food aid rations might be required or micronutrient supplements may have to be provided.

Food fortification, such as adding iodine to salt, has been done for a long time. Fortifying food aid, however, is not necessarily straight forward. Specific nutrients may only be needed in some feeding operations, but distributing specific fortified commodities only to certain areas may result in logistic difficulties. Fortified foods often have relatively shorter storage lives, requiring faster transport and distribution. Fortification in the recipient country is not always possible, as local food processors often have neither the equipment, technology or supplies to carry out the fortification nor a system of quality control; however, with the assistance of bilateral donors and local institutions, trials are currently under way in several developing countries to enable local fortification to be undertaken.

Careful attention has to be paid to food distribution systems in refugee camps. Particularly in closed camp situations, food may form the main currency unit for trading or purchasing non–food items (e.g., water, fuel, shelter, clothes, soap) or services. In such situations there is greater temptation for more powerful groups to divert food rations, with the result that the powerless, more vulnerable refugees will not receive their full allocation.

Obviously, the food pipeline for refugees and displaced people has to be assured. This is no small task considering the numbers of people involved: in 1992 WFP provided food to nearly 14 million refugees in 30 countries at a cost of nearly $600 million.

Many people in need of relief live in remote areas, often in the midst of civil unrest and conflict, making distribution of food to them particularly difficult. In many countries, special agreements have to be negotiated with all sides involved in conflicts to prevent famine by permitting delivery of food to civilians caught up in the fighting.

DROUGHT EMERGENCY IN SOUTHERN AFRICA

For the people of Southern Africa, 1992 will be remembered as one of the grimmest years they have ever faced. The worst drought in decades devastated their crops, particularly maize, dried up water sources, already scarce in many areas, and placed the lives of at least 18 million of the most vulnerable people at risk from starvation and disease. In those countries already affected by conflict or insecurity, the drought added to already catastrophic conditions, placing additional heavy burdens on people who could no longer cope with further adversity.

Based on the region's cereal requirements for the 1992/1993 marketing year, the cereal import requirement of the ten drought–affected countries (not including South Africa) is estimated to be an unprecedented level of 6.1 million metric tons, compared with less than 2 million tons in a normal year.

WFP has undertaken in the region its largest emergency operation ever, totaling over 700,000 tons of food at a cost of more than $300 million for distribution in ten countries.

To ensure timely and cost–effective delivery of sufficient food supplies, cross–border formalities for deliveries of food were simplified or altogether waived to reduce delays. For land–locked countries in particular, it was imperative to import as much cereals as possible to build up stocks to safeguard against any breakdowns in distribution.

The ability to meet the needs of all the affected countries required a continuous and accurate exchange of information. To facilitate this, the UN, in conjunction with the Southern African Development Community (SADC), established a Logistics Advisory Centre in Harare, managed by WFP, to collect and provide timely information on food aid pledges vis–a–vis requirements, food aid and commercial food import shipments, deliveries and distribution in the region; shipping schedules; and port and internal transport status. While WFP assisted in ensuring smooth coordination, it was its traditional partners, in particular governments and NGOs, who delivered and distributed food supplies to the hungry.

FOOD AID IN CONFLICT ZONES

Warring parties often use food as a weapon, cutting off the supply in an attempt to weaken the opposition. Naturally, it is the civilians – particularly women and children – who get caught in the middle, and who suffer the most. The World Food Programme has strongly supported international efforts to negotiate the safe passage of humanitarian relief through war–torn countries – including areas held by rebel groups.

"Corridors of tranquillity", through which relief food and personnel could safely travel, were established in 1989 in Sudan, when the United Nations, the Government of Sudan, and the rebel faction agreed on terms for safe passage under the banner "Operation Lifeline Sudan". As a result, an estimated 1.5 million people received food, and 1989 was deemed a year in which no starvation took place in the south of Sudan. Nutrition surveys in late 1989 and early 1990 confirmed widespread nutritional improvement.

In early 1991, following a successful conclusion of negotiations with the former Ethiopian Government and the Eritrean People's Liberation Front (EPLF), WFP re–opened the Port of Massawa in Eritrea, delivering over 90,000 tons of relief food through it to civilians caught by fighting in Eritrea.

In Mogadishu, Somalia, where control of the city remains fiercely contested, months of tortuous negotiations culminated in acceptance by the warring parties to permit the passage of relief convoys between areas controlled by different warring factions. These passages are far from tranquil, however. Yet against enormous obstacles, WFP has managed to deliver food to some of the most badly–affected areas in and near the city, often while being fired upon. In the absence of UN escorts to convoys outside of the city, WFP has been able to provide only limited amounts of food to severely malnourished populations located in the interior through airlifting and airdropping. This is a provisional measure until agreement can be reached on establishing safe land corridors to allow larger quantities of food to be delivered.

The concept of corridors of tranquillity was also employed for the implementation of the "Special Relief Programme for Angola" (SRPA). From November 1990 to May 1992, when the cease–fire was signed, WFP convoys were permitted by both sides to travel safely into war zones. Battlelines were often crossed to deliver urgently needed food to the war displaced and drought affected. Many times landmines had to be cleared to allow the passage of WFP convoys.

In July 1992, WFP participated in the long−running negotiations in Rome to arrange a peace agreement between the Government of Mozambique and the RENAMO rebel forces. As part of the agreement, both sides undertook commitments "not to take military advantage of the humanitarian operations" and they promised relief workers "free circulation" throughout the country. WFP will assume the lead role in organizing and coordinating the road, river, sea and air transportation of a massive 500,000 metric tons of emergency food, to be delivered within the next twelve months under some of the most difficult and dangerous conditions ever experienced to starving people in different parts of the country.

Vulnerable Group Feeding

Whenever the amount of food available is inadequate, nutrition gaps inevitably exist. Households often struggle to maintain the household as a unit, even at the expense of individual members; those who do not provide immediate economic benefits may receive less than their equitable share of the available food. Household members such as pregnant or nursing women and small children are particularly at risk of becoming malnourished as a result of household coping strategies to ensure that working members are strong enough to keep on working.

However, individuals can be malnourished even when their household as a whole has adequate food; there is no guarantee that food will be divided within the household according to need. Nor are all micronutrient requirements necessarily met, even when there is sufficient food to meet energy needs.

Supplementary feeding of pregnant or nursing women and infants promotes the child's growth and development, reduces morbidity and mortality and often provides a vehicle for micronutrients. WFP takes care that its support to supplementary feeding programmes does not interfere with exclusive breastfeeding; guidelines have been issued to WFP staff on the safe use of dried milk powder and the need to limit weaning foods to children over six months of age.

Food aid provided to vulnerable groups supplements the local diet or increases household incomes. In a number of situations, the WFP assistance complements government programmes to support vulnerable groups during the adjustment process. Food entitlement programmes have been supported by WFP in some countries, as a way of providing benefits more efficiently to the poor.

The issue of "caring capacity", or enabling women to have more time for "mothering", is very important for children's nutrition and health. One of the major difficulties is ensuring that young children are fed more often than two or three times per day. Food aid contributes to this by providing mothers of young children health care and health education as well as income, so that they have more time for child care, including feeding.

School Feeding

Hunger interferes with the physical and mental capacity of poor children. Large numbers of school children in developing countries suffer from both wasting and stunting. Many also do not have adequate intakes of vitamins and minerals, which may result in illness that reduces attendance rates. The strong relationship between a woman's educational level and her children's health and nutritional status is well known. For that reason, WFP promotes primary education, specifically for women in countries where females are traditionally at a disadvantage.

There is now strong evidence that when children go without breakfast, alertness, attention span and learning capacity are significantly reduced by the end of the morning. The provision of school meals can thus make a direct contribution to the effectiveness of education. The problem of setting up school feeding programmes in developing countries is massive, and often beyond the financial resources of governments. Food aid is an obvious and effective means of supplementing government and community efforts.

WFP PROMOTES BREASTFEEDING IN SEVERAL WAYS

Food aid organizations such as WFP can play a significant role in promoting breastfeeding. WFP has issued a number of policy guidelines to this end.

Food aided supplementary feeding projects should not interfere with exclusive breastfeeding. In fact, breastmilk substitutes are not recommended for children under six months of age. In addition, weaning food should be culturally and physiologically appropriate. Whenever possible, growth monitoring and nutrition education should accompany child health projects.

Pregnant and nursing women particularly benefit from supplementary feeding, as it results in increased birthweight, builds up resources for lactation and provides economic support for the mother while nursing. Special food aid commodities can be provided to improve the impact of supplementary feeding.

In many countries health professionals as well as mothers may have to be motivated to participate in breastfeeding. Food aid can be used to improve both attendance and the quality of services at primary health care centers.

Most poor women in developing countries work in the informal sector, without maternity benefits. These women cannot forego an income while nursing. Food aid can function as an income transfer to compensate women for the opportunity cost of breastfeeding.

Nursing mothers who participate in food–for–work projects need facilities, such as shelter and supervision for their infants while they work, and time to continue breastfeeding. Food aid resources can also be used to provide the necessary conditions and encouragement for women who are breastfeeding, for example, by using food or generated funds to provide shelter and supervision and to compensate for time spent nursing.

GUIDELINES FOR THE USE OF DRIED MILK POWDER IN ALL WFP–ASSISTED PROJECTS AND OPERATIONS

(1) The WFP commodity list currently includes three types of dried milk products: DSE – dried skim milk enriched with vitamin A; DSP – dried skim milk plain (not enriched with vitamin A); and DWM – dried whole milk, which contains fat and vitamin A. Country offices should be aware of the differences between these products.

(2) It is important to note that DSE and DSP are not substitutes for fresh milk, as the fat content has been removed. This commodity, therefore, should not be reconstituted as a beverage and consumed by itself, but should be consumed only with other foods.

(3) The greatest danger in the use of dried milk powder is its potential substitution for breast milk. This must be strictly guarded against in all situations. Dried milk products should not be reconstituted in feeding bottles for children of any age.

(4) As Vitamin A deficiency is an important public health problem in the majority of countries receiving WFP food aid, current WFP policy regarding the use of dried milk in non–dairy development projects is that it must contain Vitamin A. DSE, rather than DSP, therefore, should be specified in all project documents and Plans of Operations and requested for procurement.

(5) In non–dairy development projects dried milk products should be used exclusively in on–site feeding situations, and even then only with the following stipulations: the food prepared with it is consumed on the spot under strictly supervised hygienic conditions and nutrition education including demonstrations and instructions are provided on the appropriate use of this commodity.

(6) Exceptions to the "on–site only" rule may be made in situations where milk is part of the traditional diet and assurance exists that the WFP– provided commodity will be safely used, i.e., never as a breastmilk substitute; only after boiling; and DSE only as an ingredient or with other foods, such as in tea or coffee, or as yogurt with staple foods, and so forth.

(7) Where the necessity for increasing dietary protein arises, blended foods can replace dried milk products.

Food for Work

Lack of infrastructure is often an impediment to development. Major public works programmes can build infrastructure and provide employment for poor people at the same time. Such projects usually raise the food needs in an area, either because the increased work output demands more food energy for the workers, or because people move into an area when work is available. Food aid can help meet this increased demand.

Food energy is essential for work performance. The capacity to work is increased when additional food is available to workers. In many projects workers prefer to be paid in food rather than cash because food is scarce in the area, inflation rates are high or markets either do not exist or are inefficient.

Food for work interventions contribute to nutrition in two ways: in the short term, the food contributes to overall

household resources. In the long term, the projects create a sustainable asset that increases agricultural production or marketing or creates community facilities that make a lasting contribution to development.

CHILD CARE AND FOOD FOR WORK

In many countries, the majority of workers in WFP−assisted food−for−work projects are women. WFP has taken steps to ensure that these projects do not adversely affect the welfare of young children. For example, in Lesotho, WFP has been experimenting with creches for the road workers' children in order to ensure adequate child care and nutrition during the mothers' absence on the project worksites. Supervised day−care centres were seen as a solution to the problem of women bringing young children to road construction sites where they could not be properly cared for. Each centre was to have up to 100 children and four to five day−care attendants.

Despite considerable efforts by WFP and the Government, developing suitable day−care services has not proved easy. Workers at road construction sites often come from several villages. Taking a child, or several children, first to the village where the day−care centre operates and then walking to the road construction site may require considerable travel. The Government has been unable to provide facilities, such as tents, to establish mobile centres at road construction sites situated far away from villages. Establishing day−care centres has been particularly difficult in the mountain areas, because many mothers do not trust other women enough to leave their children in their care.

Lack of fuel and cooking equipment for the day−care centres has occasionally presented problems. Mothers of the children or the communities where day−care centres are located are responsible for providing these inputs, but often are unable to do so. WFP and the Government have approached donors for non−food assistance, such as cooking utensils, toys, blankets and mattresses, to help furnish the day−care centres. However, donors have been reluctant to provide non−food items to the mobile centres; the centres move as road construction progresses, and so material inputs and possible extension services would have to be moved with them. Some donors fear that this would make follow−up of the effectiveness and appropriateness of these inputs difficult.

Given the novel and experimental nature of the road construction day−care centres, it is not surprising that problems have been encountered. Nevertheless, both WFP and the Government are confident that the problems eventually can be overcome, and are working to attract additional non−food assistance for the centres.

Other Nutrition−Related Benefits

Additional nutritional benefits can accrue from activities associated with food aid projects. For example:

(a) the preparation of weaning foods is usually ancillary to WFP−supported projects, but may make use of WFP−provided resources;

(b) the sheer variety of food types available to WFP may alone help to overcome micronutrient deficiencies;

(c) overall health is improved by supplementary feeding, thus reducing infant mortality;

(d) well−timed market interventions can assist in attaining food security.

Weaning Foods Preparation

Many children in developing countries traditionally receive as weaning food a liquid porridge made from the staple dish – e.g., maize, cassava or rice – diluted with water. Nutritious side dishes are usually in short supply, and whatever is available is often given to males and older members of the household. Although the stomach of the child may be filled, the porridge usually contains insufficient nutrients – often no more than half the desired amount.

Initial attention has focused on increasing the protein content of weaning foods, but more recently the emphasis has changed to improving energy density, total calories per unit of weight of food and ensuring that weaning foods are available at affordable prices.

In some countries WFP provides assistance, often with specific donor inputs, to develop locally–prepared weaning mixtures. Typically the mixes consist of 75 percent locally available staple cereals (maize, rice, sorghum), 15 percent pulses for extra protein (cowpeas, mung beans) and 10 percent oilseeds (groundnuts, sesame) to provide energy; alternatively soya–beans may be used to replace both the pulses and oilseeds. If required, sugar and flavouring, such as vanilla, or vitamins and minerals can be included. When such foods are prepared from locally–available, inexpensive ingredients, mothers learn both the nutritional advantages and the importance of proper use. WFP is currently helping to produce weaning foods in a number of countries, including Bolivia *(Leche Avena),* Burundi *(Musilac),* Ethiopia *(Faffa),* Ghana *(Weanimix),* Kenya *(W–Mix),* Malawi *(Likuni Phala)* and Zambia *(Heps and Golden Soy).*

The main advantage in producing weaning food locally is to increase the demand for local commodities, enabling countries to become self–sufficient in producing a food that is important for the health of young children.

Agricultural production, local processing and marketing skills are also improved, and employment is created. Local production also ensures that disincentive and displacement effects will not occur. Other important benefits include the reduced workload for mothers in using precooked weaning foods.

Alleviation of Micronutrient Deficiencies

Nutrient deficiencies are usually associated with insufficient energy intake or with improper utilization of food (malabsorption). Diets deficient in energy are often also inadequate in micronutrients. Even when energy needs are met, micronutrient deficiencies may still occur, depending on the foods consumed. Foods rich in certain micronutrients can be distributed as food aid (e.g., groundnuts for their niacin content), vitamins and minerals can be added to foods (iron in wheat flour) or micronutrients can be provided as a pharmaceutical supplement such as vitamin A capsules.

WFP assists in overcoming micronutrient deficiencies in a number of ways. Micronutrient problems are most likely to develop in situations of heavy dependence on externally–provided food, such as protracted feeding operations for refugees and displaced people, In these and other similar situations, WFP attempts to prevent deficiency symptoms from developing by including fortified cereal blends (e.g. com–soy–milk and wheat–soy–blend) in the ration, by adjusting the types of food or the quantities distributed, and by fortifying specific food items.

There are limitations to this, however. Only some of the products available to WFP are micronutrient fortified. Vitamin A fortification is found in processed cereals donated by the US, in vegetable oils from several donors and in most dried skimmed milk made available to WFP. In projects implemented in goitre–prevalent areas, iodine–fortified salt is provided. Other commodities donated to WFP, however, are less appropriate for micronutrient supplementation. Few are fortified with iron, vitamin C, niacin, or thiamin – just to name the micronutrients responsible for some current major deficiency problems in refugee camps.

Governments often recognize the value of micronutrient fortification; for example, the government of Guyana pays the cost of iron fortification of biscuits distributed to school–aged children. At the household level, food aid frees up income, which can then be used to purchase other foods that help meet micronutrient requirements, such as fresh vegetables, fruits, meat and dairy products.

In addition, the logistical systems that WFP uses to bring food to very large numbers of people on a regular basis can also be used to distribute micronutrient–rich food supplements or pharmaceutical agents.

LIKUNI PHALA

In common with most African countries, Malawi's birth rate is high, but the survival rate for children under five is low. Government figures show that 56 percent of all Malawian children have stunted growth, largely because of malnutrition occurring particularly during the weaning period. WFP has been instrumental in helping to produce a local weaning food called Likuni Phala, produced from maize and soy–beans, Malawi's local crops. WFP supplies most of the ingredients for the Likuni Phala produced by two major milling companies based in Blantyre, which also package and distribute the product nationally. To avoid transporting all the ingredients to one centre and then redistributing them, WFP, with the help of the Dutch Government, is setting up five small regional processing centres, which will also offer employment and provide new markets for nearby farmers.

Health

The malnutrition–infection cycle is well recognized: infections interfere with growth, development, work performance and general quality of life, while people who are undernourished are more likely to catch infections. Adequate food, in terms of both quantity and quality, is essential for the prevention and treatment of infectious conditions.

The ability to fight infection is increased at all ages as a result of nutritional supplementation. Food aid, if it is an additional resource to the household, often improves the quality of food consumed, either through the nutrients in the food provided as aid or indirectly through the income transfer effect. It can also have other benefits.

For example, children with diarrhoea appear to benefit in terms of growth and development if they are continuously fed during diarrhoeal episodes – even without other inputs (Briend et al. 1989). Government officials on the island of St. Vincent reported that after school feeding started, skin rashes almost disappeared in the primary schools (Soso and Stapleton 1992). Food supplementation is also the most cost–effective means of decreasing perinatal and neonatal mortality.

Market Intervention

Simply ensuring that food is physically present in an area has important effects in times of deficit, when prices are high and beyond the reach of poor people. In some cases WFP assists in market interventions to bring food prices more within reach of poor households, while not undercutting incentive prices to local food producers.

As part of a structural adjustment programme in Madagascar, the Government wanted to encourage increased rice production by raising the prices paid to farmers – at the same time discouraging speculation and protecting consumers from sudden price increases. Using imported rice, including from WFP, the Government created a buffer stock, from which rice could be sold when the price on the open market exceeded an established level for three consecutive days. As a result, rice remained available throughout the year at a reasonable price for consumers, while farmers received an attractive remuneration that encouraged them to produce more.

Linking Food Aid with Other Inputs

While the nutritional benefits of food aid are not inconsiderable, additional and more far reaching benefits are achieved when food aid is provided in conjunction with other inputs, particularly technical, financial and managerial assistance. WFP–assisted projects that help poor people increase their incomes or improve their productivity are likely also to result in improved nutrition, even though direct nutritional improvement may not be their primary objective.

Supplementary feeding projects, which often have the objective of improving the nutritional situation of beneficiaries, have greater development impact if the food aid is provided in association with other inputs, as shown by the following illustrations.

Nutrition Education

Malnutrition is often aggravated by ignorance. Poor people frequently lack knowledge about efficient ways and means of acquiring food for the household. Food allocation within the household may be affected by superstitions or prejudices. Infant feeding practices may be inappropriate or even dangerous. Inadequate food hygiene, storage, preparation and safety contribute significantly to family health and nutrition problems. Misinformation about the disproportionately greater food needs of growing children and pregnant or lactating women often contributes to age or gender discrimination in household food allocation. Ignorance by food handlers in schools, hospitals and other institutions about food contamination and spoilage can cause health problems.

Changes in attitude, knowledge and practices are essential for achieving desirable, long–term, lasting results. Food expenditure patterns within the household can be influenced by nutrition education, especially if both food and nutrition education are provided at the same time. In the absence of sound nutrition knowledge, households may remain undernourished even with access to sufficient food. On the other hand, nutrition education cannot be effective if households are too poor to be able to acquire the range of foods and other inputs necessary to ensure proper nutrition.

Food aid can serve as an incentive for increasing participation in nutrition education programmes, encouraging regular attendance at health centres where nutrition education is provided, and compensating for the opportunity cost of attendance. An example is a WFP−assisted project in Sri Lanka. Malnutrition in Sri Lanka results from a number of causes, including poverty, inadequate public health facilities, deficient infant feeding habits, lack of knowledge about proper maternal and child health practices and poor hygienic food handling and preparation. Childhood morbidity is high. A WFP−sponsored pilot nutrition education project began in 1986 to inform people in rural areas about better approaches to health and nutrition. Food aid was used to compensate the poor people who attended the courses for the loss of a day's earnings that would otherwise have prevented their participation.

A review of the project found that food aid had been a determining factor in reducing drop−out rates and maintaining regular attendance at the courses. Positive changes were recorded in the attitude of the participants towards sanitation, the use of nutritious low−cost foods, increasing food production through home gardening and better child weaning practices. On the basis of this review, WFP assistance was expanded in 1991. A new aspect of the expanded project is that seminars will be organized to upgrade the skills of selected participants in the adult nutrition education programme to enable them to spread health and nutrition information when they return to their villages.

FOOD AID AND MICRONUTRIENTS

The problem of the lack of specific micronutrients in local foods has been a consistent concern of WFP. A number of measures have been taken to ensure that the food WFP supplies not only provides extra calories of energy, but meets micronutrient needs as well.

WFP helps prevent and alleviate micronutrient deficiencies by distributing fortified commodities such as iodized salt, vitamin A fortified dried skimmed milk, edible oils and flours, and blended foods fortified with a variety of vitamins and minerals.

Prolonged refugee feeding situations are especially prone to micro−nutrient deficiency problems. WFP helps by changing the composition and quantities of commodities provided and occasionally by fortifying specific food items. For example, in order to combat an outbreak of beriberi among Liberian refugees in Guinea, the quantity of cow peas in the ration was increased because of its thiamin content. In Malawi, groundnuts were provided for their niacin content, and maize flour is also being fortified with niacin. In many refugee feeding situations, blended foods are included in the ration specifically for their micronutrient content.

WFP's development activities can also help overcome local micronutrient deficiencies. The people of landlocked and impoverished Paraguay have long suffered from the lack of iodine. One consequence of iodine deficiency is endemic goitre, which affects nearly half of all students between six and 15 years of age and four out of every 10 pregnant women. The Government has requested WFP's assistance to distribute, through the system WFP has established in the country to handle food aid, an iodine solution called LUGOL, which is being given out in the interim until iodine−fortified salt can be made more widely available.

In Guatemala, a biscuit made from WFP commodities is distributed to 1.3 million primary school students every day. In association with the Institute for Nutrition in Central America and Panama (INCAP), the technology has been recently established to fortify the biscuit with vitamin A, some B vitamins, iron and iodine. INCAP will undertake a study into what changes in micronutrient levels occur during cooking and storage, as well as the nutritional impact of consuming the biscuit on children living in areas with a high prevalence of goitre and vitamin A and iron deficiency. If the micronutrient fortified biscuit is shown to be an effective nutrition intervention, WFP will support its use in other countries where micronutrient deficiencies are major problems.

Assistance to the Health Sector

Food, nutrition, health, education and productivity are interdependent: lack of food causes poor health, which in turn reduces productivity. Work capacity in adults is increased with improved nutritional intake.

In vulnerable groups feeding projects, WFP food aid is used to encourage greater and more regular attendance of mothers and young children at health centres. In Niger, for example, a survey has demonstrated that women are more likely to visit mother and child health centres regularly for prenatal care when take−home rations are distributed. As the women usually bring their younger children with them, they also receive immunization and other health care. The number of women participating in health and nutrition education sessions held at the centres increased with WFP food distribution, in part because the food was

used in demonstrations of cooking, hygiene and nutrition. The survey also revealed that the best time to reach women with health messages was during their prenatal visits, which led the health centres to organize education sessions at those times.

WFP's arrangements for reaching large numbers of individuals on a regular basis can be used for additional health benefits. A WFP–supported school–feeding project on the Island of Rodrigues in Mauritius, for example, includes a parasite infection control programme supported by UNICEF. Intestinal infections, especially high worm burdens, retard growth in children as well as causing anaemia, diarrhoea, digestive disturbances and abdominal pain. The pharmaceutical agents used for deworming are transported to the schools and kindergartens along with the WFP–provided food. A 1991 survey found that since the programme started worm infestations had been reduced by more than half. Food aid may also provide budgetary support to governments, allowing them to expand or improve health and nutrition services or other social welfare programmes. This has proved to be particularly useful during structural adjustment programmes when public expenditure on basic health and other social services has been adversely affected.

Social Development Activities

When it is feasible, WFP tries to combine social development activities, such as training, with activities that provide poor people with opportunities to increase directly their income–earning potential, so that they are better able to meet their nutritional needs in a sustainable way. A large WFP–assisted development project to help vulnerable groups in Bangladesh, for example, provides food supplements to the households of nearly half a million destitute women (a total of some two million needy people) over a two–year period. As well as receiving WFP food, the women are also provided with credit and given training – most commonly in small livestock raising, vegetable gardening, or working with cane or bamboo. The increased income generated from such activities improves household food security over the long term.

These activities are small in scale, but they are appropriate for people who have no land and very little income or material resources. They can be undertaken by unskilled, uneducated people with relatively little outside assistance, while providing them with skills leading to economic self–reliance. The WFP–assisted project includes a volunteer banking element that helps women save regularly, introduces them to the banking and credit system and mobilizes resources to provide seed capital for investments. The women have very limited access to formal financial institutions, yet credit is their greatest need. Consequently, in conjunction with bilateral donors, food aid is monetized for a revolving fund that provides credit to them.

Cultural values and lack of female teachers are responsible for the fact that as few as eight per cent of the females ever attend school in some provinces of Pakistan. WFP initiated a project in two of those provinces. With this innovative approach, girls, if they attend primary school for twenty days per month, receive a food aid package worth approximately one week's minimum wage. It is hoped that the income transfer value of the food aid will be an incentive for parents to send their daughters to school.

In supplementary feeding projects for economically and nutritionally vulnerable groups in Bolivia and Peru, WFP food aid has been used to support investments in group–based production and service enterprises. These became major assets for substantial groups of women and their households during the prolonged periods of economic and political crises that afflicted the countries, and helped to prevent deterioration of their nutritional situation.

Development activities, if they are to be successful, must also be sustainable, so that the benefits continue after external assistance, whether food aid or in some other form, is withdrawn. This requires time–bound objectives and clear preparation for the withdrawal of assistance when the project becomes independent. It is often easier to achieve this in economic development projects, which may have more obvious time–bound goals, than in social development projects, which tend to be more open–ended. Nevertheless, social development projects also require time–bound, achievable objectives and clear directions for the phasing–out of external assistance and for ensuring their continuity and sustainability if beneficiaries (individuals, households or governments) are not to become dependent on food aid.

Issues for the Future

There remain a number of areas where improvements in the effectiveness and efficiency of project food aid may be possible, both in terms of the type of food aid commodities provided and in the design and implementation of the development projects and relief operations supported. Some of the major issues are discussed below.

Sharing and Displacement

Foods distributed to households as take−home rations or fed to individuals on site do not necessarily constitute additional consumption − they might be shared with other household or community members or replace foods that otherwise would have been eaten. While adequate data on the occurrence and effects of displacement and sharing are not available, a few assumptions have been verified:

− When sharing takes place, it is often with other needy members of the household.

− While school children may receive less food at home because parents assume that they are adequately fed at school, the net effect is likely to be positive, as the household food withheld is usually less than the food provided at school. In addition, the food thus saved is usually given to preschool−aged children, who also benefit from the additional consumption.

− On−site feeding of vulnerable groups is more likely to become additional consumption if the food is not provided at usual meal times. Food given to school children mid−morning, for example, is considered to be a snack by the household; thus it is less likely to displace home−provided food than the same food given at "breakfast" or "lunch" times.

As is apparent from the above, increments in the household food supply tend to disproportionately benefit children (Garcia and Pinstrup−Anderson 1987). Sometimes this is due to the fact that food items have different status. Some foods, such as those that are cheaper or easier to acquire and those that are unfamiliar, are considered of lower status than foods that are more expensive or familiar. Lower−status foods are usually given to women and children. Since food provided as aid is often considered to be of low status, it may specifically contribute to increased consumption by vulnerable groups.

Nevertheless, more information is needed on household practices in sharing available food supplies and the effects of food aid on such practices under different situations. Amongst other aspects, increased knowledge is needed about:

− the effects of specific food aid commodities on household food sharing and consumption;

− the effects of different distribution systems (e.g., individual or family rations, take−home rations or on−site feeding) on household food sharing and consumption (Beaton and Ghassemi 1982);

− the effects of distribution of cash or food or a mix of cash and food on household nutrition;

− the effects of timing of food distribution (e.g., different times of day, week, or year) on household food sharing and consumption.

Income Transfer and Cost−Effectiveness of Food Aid

In many situations the income transfer effect of food aid commodities is more important than their nutritional value. The commodities provided by donors, however, usually do not take into account their economic value from the point of view of the beneficiaries. Canned foods, for example, while expensive to provide as food aid, are not likely to be fully valued by recipients. Some other items, such as dried fruits and lyophilized soups, have little nutritional or income transfer value. Food commodities highly subsidized by governments (e.g., wheat in many North African or Middle Eastern countries) are unlikely to be cost effective when distributed as food aid.

The cost−effectiveness of food aid is also reduced when there are losses due to damage or spoilage. High−value commodities, particularly vegetable oil and dried milk, tend to have larger losses than other foods. Oil containers often do not stand up to the rigours of handling and transport in developing countries, with resultant breakage and leakage. Dried milk spoils quickly once it is opened. In many school feeding projects, 50 or 100 kilogram sacks are provided to schools, where they are expected to last several months; after opening, the contents may quickly deteriorate, especially in humid climates. These losses are often borne by the recipients, who get less food as a result, especially in on−site and disaster relief situations (it is less easy to short−change food−for−work participants, who are more aware of what they should receive in terms of that part of their wages that is provided as food).

Another cost–effectiveness issue is evaluating the appropriateness of food aid as a development input, and allocating assistance to countries or regions where food has advantages over other forms of development resources, such as cash. Where food prices are low because of government subsidies, food aid has very little comparative advantage, because neither nutritional nor income transfer value can be conveyed cost–effectively. Maximum impact of food aid on nutrition is more likely in areas where other forms of assistance are less advantageous.

Commodities for project food aid tend to be examined for their appropriateness to each specific project rather than in the context of regions and population groups where they would be most effective. To move in this direction would require considerable country–specific information that is not always available. If, however, commodities could be used where they convey the most value (whether nutritional or income transfer or both) most efficiently, either larger transfers could be made to poor households, or more poor households could be helped at the same cost.

Nutritional Assessment

Whether or not food aided projects should be evaluated for nutritional impact has been a controversial issue; nutritional impact may be too difficult to measure and to attribute specifically to food aid.

Nutritional assessment, however, can be used for purposes that improve project design and implementation, such as ration composition and targeting. Refugees, for example, are regularly monitored for nutritional status and rations are adjusted accordingly. In Northeast Brazil, a surveillance programme has been initiated to help allocate school feeding assistance to those areas with the highest malnutrition rates. However, the means for evaluating nutritional inputs and the degree to which nutritional surveillance and monitoring help improve the effectiveness of assistance, remain problematic.

Targeting by Age

An important issue is raised by recent research findings related to the age at which children are supplemented with food (Walker et al. 1991, Martorell et al. 1992). Evidence from epidemiologic observation, examination of secular trends, and experience in feeding interventions indicate that to prevent linear growth failure and to improve a child's later learning capacity, pregnancy outcome and work capacity, it is best to provide nutritional supplementation early in life, preferably before age three (Beaton 1992a, Pelletier et al. 1991).

This has important implications for providers of food aid. For example, currently, in terms of supplementary feeding for children, WFP targets either primary school–aged children in school feeding projects, or under–five–year olds in vulnerable groups feeding. In the latter type of project, it may not be cost effective to separate the preschool–age group into under and over–three–year olds as few very young children are fed on site, and it is difficult to target take–home rations to specific individuals, even though they may benefit the most.

Another consideration is that it is more efficient for an organization such as WFP to reach school–aged children than to identify and supplement under–three–year olds. Moving large quantities of food for school feeding builds on existing mechanisms. Identifying and delivering food to specific households with under threes, however, is more difficult and costly. Moreover, school feeding has non–nutritional objectives such as increased enrolment and attendance and improved learning capacity.

These trade–offs of costs and benefits, in nutritional and other terms, of school feeding versus pre–school feeding, and of under–three versus under–five feeding of undernourished children, would benefit from more systematic analysis.

Targeting by Commodity Type

Providing low–status foods, or not distributing high–status foods, can ensure that more food aid reaches the poorest people in both relief operations and development projects. Provision of less preferred foods as food aid also helps ensure that traditional markets are not unduly disrupted by imported food aid commodities.

Some commodities, such as blended foods or coarse cereals, can be successfully targeted at specific groups within households. Not enough is known about the utilization of foods within households, however, to be able to fine–tune the provision of food commodities for this purpose (Katona–Apte 1983).

Nevertheless, more appropriate commodities could be acquired and used in order to be more effective in situations where specific groups of individuals (e.g., women and children) need to be reached. This is especially true for weaning foods. When commodities such as fortified cereal flour, oil and sugar are provided to households to mix for weaning purposes, the higher−status, more expensive commodities tend to be consumed by the whole household rather than by the targeted child. In such situations a premixed weaning food is more likely to reach the child and would be a more appropriate choice.

Timing of Food Aid Intervention

There are two aspects to be considered here. One is the issue of "seasonality". In many countries food shortages are seasonal, and food aid could be used during the pre−harvest season to maintain nutritional standards, especially as the need for additional feeding is greater during the lean season, when ploughing, planting and cultivating take place, than at other times. In fact, considerable effort has gone into ensuring that food−for−work activities do not interrupt local agricultural production – that they take place only during the agricultural low season when there is little on−farm employment. On the other hand, little consideration so far has been given to the temporal aspects of different types of food aid interventions. The seasonality concept could be incorporated into supplementary feeding projects more often than is currently done. For example, WFP has incorporated seasonality in a project in Malawi for vulnerable groups; preschool−aged children and pregnant or nursing women receive larger rations during the lean period than at other times.

The second temporal aspect has to do with the timing of meals or snacks in on−site feeding projects. In this regard, there has been greater concentration on what to feed than when to feed it. Yet it is important that food aid be consumed in addition to usual food intake. As already noted, there is some evidence indicating that in on−site feeding situations, such as many vulnerable groups feeding projects or school feeding, the food supplement is more likely to be additional intake if it is not provided at meal times, but rather as a snack between meals. This knowledge could be used more in the design and implementation of such projects.

However, in many situations this may pose a dilemma, as the timing of feeding is also important for the school learning process (Meyers et al. 1989). When a school snack or meal is served early in the day to assist those children who have not eaten an adequate breakfast, households that do provide their children with a sufficient breakfast may start withholding it, knowing that the children will be fed again when they arrive at school. If, on the other hand, the food is provided later in the day, children who usually don't receive a breakfast at home will be at a disadvantage.

Size of Food Aid Ration

An important issue is determining the value, either in terms of nutrition or in terms of income transfer, of the food aid ration needed to achieve the objective of the food−assisted project. If the value is too small, the objective may not be reached. If it is too large, it may foster dependence and eventual phase−out could be difficult.

When food aid is used as an incentive to attract women to a nutrition education programme, for example, if the value is too small it may not compensate the women sufficiently for the travel and opportunity cost of attending nutrition education classes. If, on the other hand, it is very large, the women may attend the classes only for the food aid and not because of the education programme. It is important that those who do attend nutrition classes convey the benefits of programmes to other women, who will then seek them for their own sake and not because an incentive is provided. Successful nutrition education programmes must eventually be able to continue without the provision of food aid.

The size of the rations to be provided is also controversial in refugee feeding. A 1988 conference on "Nutrition in Times of Disaster" established 1900 kilocalories of energy as a minimum daily per capita food requirement. How much of this is to be provided by food aid, however, depends on the prevailing circumstances in which the refugees find themselves. Providing too little food will leave the population malnourished; providing too much is wasteful in light of the tremendous strain on available resources.

Conclusion

Providing food alone does make a difference to people's wellbeing. An "increase in the level of food intake is a prerequisite to development". (Beaton 1992b:172). For an agency whose main resource is food, this is an important consideration. In the case of food−insecure, destitute households and emergency and refugee situations, food aid keeps people alive and functioning, though not necessarily at optimal levels. For that, other inputs are also necessary. Food aid will not only help avert starvation but will improve recipients' quality

of life either directly through nutritional supplementation or indirectly, through the transfer of income.

GUIDELINES FOR CALCULATING FOOD RATIONS FOR REFUGEES

Guidelines and sample food rations for refugees have been agreed upon by WFP and the Office of the United Nations High Commissioner for Refugees (UNHCR). They are intended to assist in planning for refugee assistance and to provide a framework for the technical input of health and nutrition experts, who need to be consulted regarding the adequacy and appropriateness of refugee food rations. The food items required may be provided from a variety of sources: by the refugees themselves, host governments, non–governmental organizations and the international community – primarily WFP, UNHCR and bilateral donors.

In order to meet the nutritional requirements of refugees, food rations should complement any food which the refugees are able to obtain themselves, such as through agricultural or income–generating activities or from other sources. If such activities are restricted or impossible for economic or political reasons, the food ration should, as far as possible, meet all nutritional requirements. A thorough assessment of the degree of self–sufficiency and level of household food security is therefore a prerequisite for ration planning.

When refugees are largely dependent on the provision of food from external sources, the international community should provide a variety of food items to ensure nutritional adequacy and palatability. Appropriate foods include cereals, oil, a protein–rich food such as pulses (beans, peas or nuts) or fish or meat in canned, dried or fresh form, vegetables or fruits, fortified blended cereals, sugar, condiments (e.g., soy sauce, tomato paste) salt and spices. When refugees are dependent on externally provided food, the total food available to them from all sources should provide an intake of no less than 1,900 kilocalories of energy per person per day, of which at least eight percent should be in the form of protein and ten percent in the form of fat. The calories of energy, however, can be modified depending on the circumstances of the population.

Food by itself can contribute significantly to improving the health and nutritional status of people. People who are well nourished withstand infections better and recover more quickly. Pregnant and nursing mothers who receive proper nourishment have healthier babies. Children are better able to learn when they are properly fed. Workers can be more productive if they eat a sound diet.

Food aid is far more effective, however, when combined with other inputs, particularly financial and technical assistance. Food–aided nutrition interventions, for example, are likely to be more effective and sustainable if they are integrated in a package of assistance including health care and nutrition education. Soundly constructed rural infrastructure can help raise rural productivity and raise incomes. Integration of food aid with other development assistance within national development programmes is the surest way to improve the efficiency and effectiveness of food aid in overcoming poverty and hunger in sustainable ways.

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SECTION II. Public Works as a Nutrition Intervention

Labour–Intensive Public Works Programmes Supported by Food Aid as a Nutrition Intervention

Joachim von Braun

Currently Chair on Food Economics and Food Policy, University of Kiel, Germany Previously Director, Food Consumption and Nutrition Division, International Food Policy Research Institute

Introduction

Despite substantial improvements in the world's nutrition situation in the past 20 years, considerable food and nutrition insecurity continues to prevail, with unacceptable effects for people's welfare through shortened lives and reduced human productivity. The need to address food and nutrition insecurity in poor households remains urgent in the developing world, especially in Africa, where it appears as if the number of households experiencing food consumption shortfalls will increase even further in the coming years, unless conditions change.

By supporting appropriate interventions and instruments, food aid can play a role in promoting food and nutrition security and in reducing poverty. Food aid can be used both to increase demand for food (by backing higher employment policies) and to decrease the cost of production (by supporting labour–intensive investment) (Mellor and Pandya–Lorch 1991,522). Large volumes of food aid have flowed to the developing world in recent decades, but it must be noted that there has been a tendency to give food aid for purposes of political expediency to "favoured" countries or populations groups––which are not necessarily the neediest––and for emergency purposes (usually famine relief) with weak linkages to developmental action. Food aid has not been used to its fullest potential.

Today, the political and economic climate seems more conducive to considering future food aid policy directions for improved utilization of food aid. The emerging new international relationships can facilitate a less politicized allocation of food aid and a more needs–oriented allocation *across* countries. Moreover, the nascent political transformations in many low–income countries should facilitate a stronger focus on utilization of food aid on needs *within* countries in the coming years. In this changing political economy environment, the nutrition policy community should find it easier to communicate its messages and rally support for food and nutrition security interventions, including those instruments supported by food aid.

Food aid's actual role, potentials, and limitations need to remain in perspective. The instrument needs to be "demystified" and viewed as a resource. Food aid operations, that is, the technical distribution and monetization mechanisms, need to be viewed as an important institutional response capacity. A range of alternative policies is available to improve food security[1] including macroeconomic policy and development

strategy, production–oriented policies and programmes, storage and trade–oriented policies for stabilization, credit for consumption stabilization and self–employment, targeted feeding programmes, food stamps, food subsidies, and emergency relief programmes. When making food security policy choices, the specific characteristics of a country's or region's food security problem and its population, market integration, and institutional capabilities all need to be considered.

[1] Food security is defined, in its most basic form, as access by all people at all times to the food required for a healthy life (von Braun *et al,* 1992)

Scope for Labour–intensive Public Works Programmes

This paper focuses on a particular instrument: labour–intensive public works programmes. These are public programmes that provide employment and, typically, generate public goods, such as physical infrastructure, through labour–intensive means[2]. Through employment subsidies and through appropriate targeting, labour–intensive public works programmes can be an important element of a policy for nutrition improvement. Appropriate labour–intensive public works programmes can provide for short–term food security by creating employment and providing wages. By creating assets such as roads and waterworks, they can expand employment and productivity in the long run and thereby provide for long–term improvement and maintenance of food security.

[2] The public goods focus is not imperative. While public works programmes are publicly supported, they need not be implemented by the public sector, implementation may rest on private sector and community initiatives. Thus, "public works" may often be "private works" in actual execution.

Labour–intensive public works programmes have been widely applied in Asia as a key instrument for addressing food insecurity. Bangladesh and India have a particularly long and rich history of experience with such programmes. China expanded such programmes on a gigantic scale in the 1980s. However, until recently, such programmes were rarely used in Sub–Saharan Africa, although there are exceptions such as Kenya, which has a long–standing general public works programme, and other countries such as Zimbabwe, Botswana, and Ethiopia, which have experience with public works programmes designed specifically for achieving food security.

As the nature and scale of food insecurity changes and as the macroeconomic environment (due to high costs of capital or constrained access to credit) increasingly favours labour intensity, labour–intensive public works programmes have become more attractive in recent years, especially in Africa. Food insecurity is increasingly becoming a problem for people dependent on the labour market in both rural and urban areas (Drèze and Sen 1989). For instance, the malnourished poor in rural Africa derive 40 to 60 percent of their income from off–farm sources (von Braun and Pandya–Lorch 1991). The changing employment and income source structures of the poor and related household food security risks demand a new focus on productive employment for the poor to achieve and maintain household food security. Labour–intensive public works programmes can play a key role in this context.

Macroeconomic incentives, in the form of increases in the capital/labour price ratio in Africa, are inducing more labour–intensive investment. The price of labour relative to capital has drastically fallen in recent years. Many African governments have or are about to respond to this new development. The nutrition policy community should be aware of new potentials for direct and indirect nutritional improvement through investment in labour–intensive public works programmes. These programmes may sometimes provide a delivery mechanism for nutritional improvement, including community–based action.

Other arguments that favour establishment and expansion of labour–intensive public works programmes for food security in low–income countries include limited and rapidly deteriorating infrastructure and natural resource bases. Fiscal and foreign exchange constraints inhibit maintenance and new construction of basic infrastructure by capital–intensive technology. Yet, provision of these public goods is indispensable for stimulating agricultural and economy–wide growth in low–income countries.

The Labour–Intensive Public Works–Food Security Linkages

Labour–intensive public works have both transfer benefits and stabilization benefits, decreasing the risk of consumption shortfalls among the poor. Generating these food security benefits requires both resources and effective management. Amongst other things, the net benefits of rural public works are influenced by how well they fit into the rural labour market in peak and off–peak agricultural seasons. Figure 1 provides an overview

on linkages and on policy and programme concerns related to five key areas of the public works programme–food security interface:

- resources for labour–intensive works programme;
- public works programmes and implementation choices;
- creation of short–term employment and long–term assets;
- household income increase and risk reduction;
- and household food security outcome.

There are three major direct welfare effects that result from public works programmes: (i) income enhancement through wage employment in the short run; (ii) risk insurance––where public works are designed with the desirable feature of employment guarantees at survival wage rates; and (iii) direct and indirect employment and income effects from assets created and improvements in human resources, including skills and nutritional status, in the long run. Combined, these three effects simultaneously address both transitory and structural food security problems of the poor. The relative importance of each of the three welfare effects differs by type of household and its food security risk profile.

Two behavioural parameters at the household level determine the actual effects of labour–intensive public works programmes on food security: (i) substitution in employment and income sources, which determines the effect of net income from public works (gross income from public works minus foregone income); and (ii) household consumption and expenditure behaviour with regard to income from public works versus income from other sources. The time allocation effects induced by participation of selected household members in public works may have broader ramifications, beyond income and consumption, for nutrition and health.

The distribution of benefits and burden of incremental employment and income from public works is influenced not only by effects at the aggregate household level, but also by who actually participates in the public works programme from the household–men, women, or children. The latter issue may impinge on intrahousehold resource control and allocation and may have a further impact on household spending for food and nutritional improvement (for example, spending preferences of males differ from those of females in some settings). An important issue that requires attention in this context is the effect of participation in public works on child care. When household labour, especially female labour, is increasingly allocated to public works programmes, it may affect child care quality and, perhaps, child labour and school attendance. For instance, other home production chores, for example, wood collection, water fetching, and caring for small children, may be shifted to older children.

A more general link of labour–intensive public works to food security is via the assets created, especially when these include expanded opportunities for the poor in combination with improved access to health services and sanitation.

Reaching the Target Group

The target group for labour–intensive public works programmes is usually the underemployed poor or the food–insecure population, which, depending on the setting, can include women, persons dependent on wage labour or self–employment, and persons who are seasonally food–insecure. Public works programmes reach the target group through a variety of mechanisms and design features that include wage rate policy, regional targeting, seasonal targeting, and specific selection of households (for example, displaced households) and household members (for example, women).

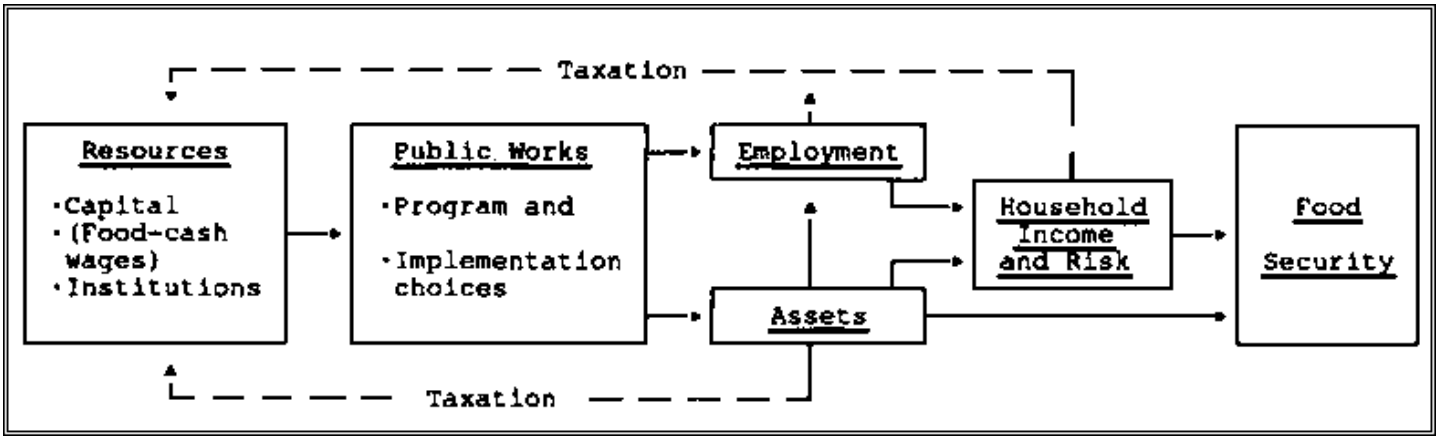

Figure 1 – Links between labour–intensive public works and food security

Research shows that public works programmes can and do successfully reach the poor. IFPRI household–level surveys from Niger and Botswana show that participants in labour–intensive public works programmes in both countries have much lower per capita income than nonparticipants in the same or similar rural communities (Webb 1992; Teklu 1992). Similarly, in India, the Employment Guarantee Scheme (EGS), one of the largest such schemes in the world, significantly reaches the rural poor, including landless households and small and marginal farmers (Dev 1992). Women frequently participate to a greater extent in public works programmes than they do in their respective local labour markets. Female participation in the EGS is sizable, with the proportion of females often more than 50 percent of participants (Dev 1992).

Properly designed public works have a unique feature in favour of poverty alleviation with low administrative impacts: self–targeting. At properly defined wage rates, the working poor identify themselves by turning up at public works schemes. The self–targeting feature of public works programmes only operates effectively with an appropriate (low) wage rate policy and a flexible absorption of applications without rationing workplaces. An improved understanding of labour market features and wage formation is essential for an optimum deployment of public works programmes for food security.

Wage rate determination in labour–intensive public works programmes is a critical policy issue. Wage rates ought not to be set too low to reach into the desired skill and productivity levels or to overextend labour intensity; yet, wage rates ought not to be set too high, which can defeat the self–targeting feature of public works and can result in employment rationing and exclusion of relatively more of the poorest segments of society under usual fiscal constraints.

Whether wages should be in the form of cash or kind (food) depends on local circumstances relating to the risk of market failure. The scale of programmes and thinness of food markets are core considerations. Labour–intensive public works programmes, through incremental employment and income of the absolute poor, can increase demand for food. Food supply must be forthcoming locally or inflation may result, hitting nonparticipating households as well. Food aid can play a role in mitigating such effects if supply is expanded according to demand induced by public works programmes.

The wages component in labour–intensive public works programmes is the point of entry for the use of food aid. Its useful share in such programmes is determined by the degree of labour intensity of the programme (which is a function of technological choice and type of works among others), the income level and related consumption response of participants, and the risk of market disruption in the areas concerned.

The labour content of labour–intensive public works programmes ranges from 35 to 60 percent in the case of dirt roads, to about 70 percent in afforestation projects, and 70 to 95 percent in anti–erosion works. The difference–the capital component–is often constrained. Often, optimal scale effects of programmes are not reached because food aided programmes are starved of cash. Two options to overcome the cash constraint can be considered: (i) sell excess food aid and use partly for capital component of programmes; and (ii) find exogenous additional resources for the capital component. This second option is the one theoretically preferred and requiring strengthened interagency cooperation (donor capital) and/or improved interlinkages of infrastructure investments with financial markets (domestic or borrowed capital).

Incremental income earned by the absolute poor is, to a substantial extent, used for incremental food consumption, but substitution of purchased food for food aid wages does, of course, occur in works

programmes as does resale. Households thereby implicitly "monetize" food aid. The "monetization" by saved food purchases may be larger than by direct resale. These relationships at the household level tend to be overlooked in dogmatic debates over food aid monetization at domestic market or international trade levels. This fact should not be a matter of concern to programme planners. Related local market effects, however, require attention.

Tapping the Nutritional Benefits

There are few comprehensive "before and after" studies of the effects of employment programmes on food security and nutrition, just as there are few comparative studies of food security and nutrition outcomes "with and without" employment programmes. Research on these issues is still at an early stage.

Research on the developmental impact of the Food For Work (FFW) programme in the Bangladesh (an important component of the rural public works programme, with the capacity to provide more than 100 million days of employment in the mid−1980s) study found that dietary intakes improved for all age groups in the project sites relative to control sites (IFPRI/BIDS 1989; Ahmed and Hossain 1990). Cereal consumption was slightly higher among landless and near−landless project participants in comparison to similar nonparticipants in project villages. In general, there may have been an equalizing trend in the project sites for nutritional differences between boys and girls at various ages; otherwise, girls were significantly worse off in the younger age groups. Agricultural production increased by an average of 27 percent and per capita household income by about 10 percent, as a result of direct and indirect effects of the project. More productive employment generated substituted for very low productivity employment among rural households. Wage employment increased by about 13 percent while self−employment declined by about 10 percent.

Household−level research on labour−intensive public works programmes in Botswana and Niger confirm the income−increasing effects of participation in such programmes; in Botswana, project wage income contributed about 40 percent of the income of participating households, and, in Niger, it contributed about 20 percent of total household income of the poor (Teklu 1992; Webb 1992).

Several important insights and lessons can be gleaned from the in−depth household−level research conducted by IFPRI in Bangladesh, Botswana, and Niger, and from a review of experience with public works programmes in India, China, Guatemala, and some African countries:

- The household food security effects of labour−intensive public works programmes are a function of the programme design. For instance, a short−term project may result in expenditure patterns by the poor that treat project income as "windfall profits." A longer−term project may have more stable effects on consumption.

- Policy needs to emphasize public investment through public works programmes and, thus, creation of productive and sustainable assets. Income effects for the poor derived from public works programmes can also have favourable private savings and investment effects, as observed in the Bangladesh and Guatemala settings.

- Public works programmes can be a viable instrument for famine prevention, as demonstrated by the EGS in India. The "employment guarantee" feature also triggers "relief works" automatically at local levels, enabling governments to deal with crises that otherwise might be too small to trigger public action−−an important lesson for dealing with the problem of the small, localized famines in Africa. Programmes that include an employment guarantee, such as the EGS with its self−targeting feature, have important employment stabilization and insurance effects.

The nature of the food security and nutrition problem in affected areas and communities must be properly assessed and understood in order to maximize the food security and nutritional benefits of labour−intensive public works programmes. It is also important that the target population−−the food insecure and malnourished−−be properly targeted with employment; in this respect, the setting of wage levels on the projects and the mode of payment play crucial roles.

Public works programmes can, themselves, act as a vehicle for nutritional improvement by influencing the choice of food in food wages, including paying attention to specific deficiencies, and by providing complementary measures for health and sanitation to project participants directly and to the communities indirectly.

Conclusions for Institutional Requirements

Delivery of nutritional benefits can be hindered by institutional weaknesses and deficiencies in management capacities. Typically, rural health systems in low–income countries are already overburdened with basic functions. Improved rural infrastructure and greater community participation in programme choice and design can also benefit nutrition–related public goods delivery (for example, in the area of potable clean water).

Links between nutrition–related institutions and public–works–related institutions need to be strengthened. Food and nutrition issues (for example, their regional and seasonal dimensions) need to enter policy formulation of public works.

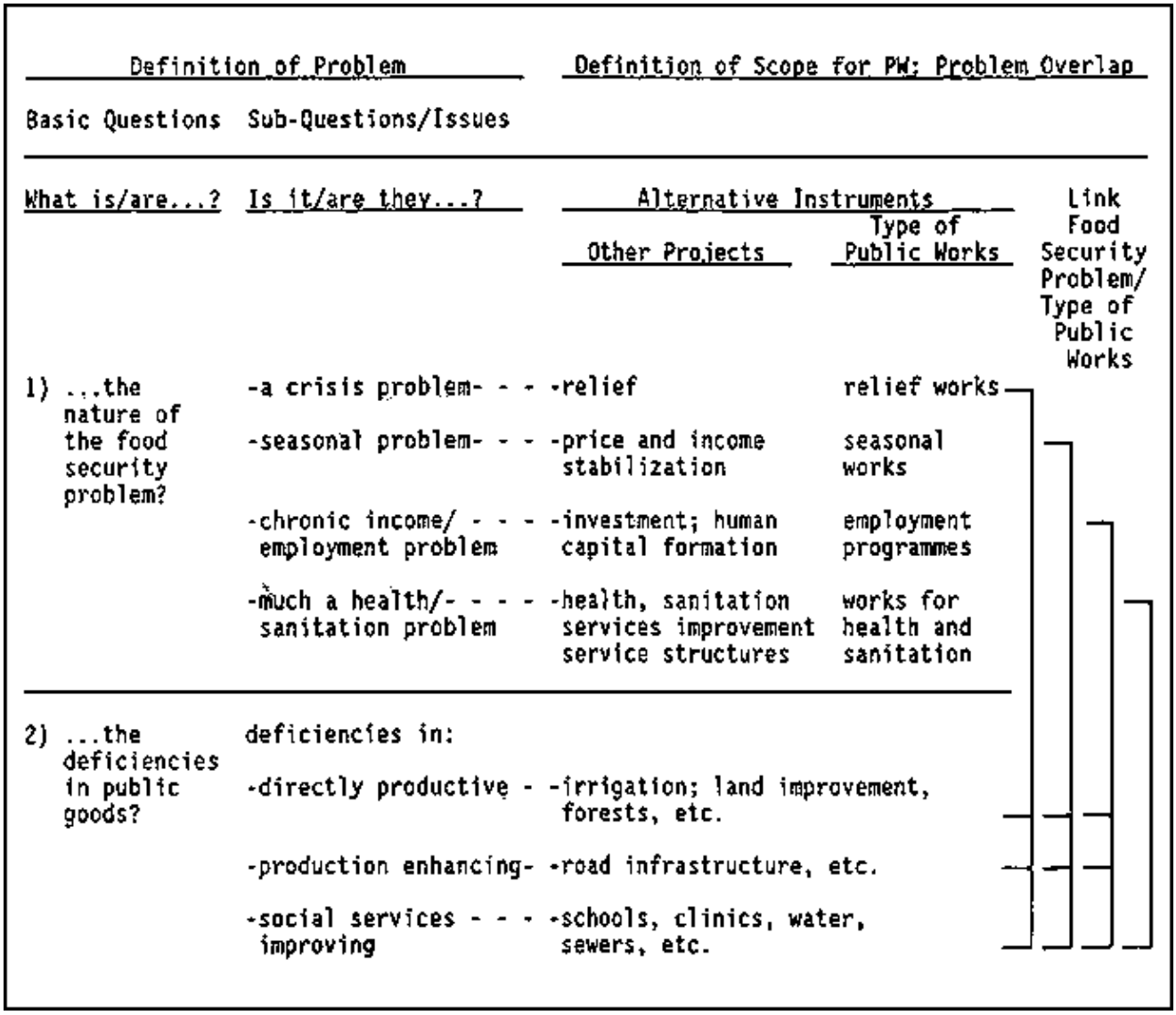

Figure 2–What types of programmes?

As public works programmes, especially in Africa, are increasingly being promoted because of food security concerns, health ministries need to get more involved with labour–intensive public works programmes, and agriculture, labour, and specific "public works" ministries need to coordinate their activities better. Relief and rehabilitation agencies, which typically have a strong focus on nutrition, would benefit from expertise in all of the above–mentioned line ministries. Strengthening these institutional links would be an important contribution of donor–supported institution building. Food aid support for labour–intensive public works can also set incentives in this direction.

Nutritional effectiveness in public works programmes requires proper monitoring for adjustment in scale and scope, just as does any other nutrition interventions. Very few programmes––although aimed at nutritional improvement––have a related monitoring and impact analysis component. Monitoring must include labour market effects, not just food and nutrition–related issues. However, interestingly, labour–intensive public works programmes provide food security monitoring information by themselves: when food security risks

increase, more people turn up to offer their labour time in open−ended schemes. This feature is being used to monitor actual needs for emergency employment programmes in "test−work" programmes.

While labour−intensive public works can measurably improve food consumption and nutrition, they are not a cure−all, and potential problems that may influence the nutrition outcome need to be addressed in implementation. These potential problems include health and sanitation conditions at work sites, that is, if these are camp situations, and child care issues (time and quality), which relate to mothers' work and related absenteeism. The intrahousehold effects (both positive and negative ones) of labour−intensive public works require attention. Complementary health and sanitation actions along with public works are called for to maximize their nutritional benefits for the most vulnerable household members.

A frequently encountered initial reaction to labour−intensive public works is "institutional capacities are not sufficient for public works programmes." A review (von Braun, Teklu, and Webb 1991) suggests that while the lack of adequate institutional capacities is a real constraint, it can be overcome. Furthermore, although public works programmes are labour intensive, they are not skill extensive. The general lack of medium−level technical administrative preparedness is a major constraint. Training to overcome these deficiencies is of paramount importance.

Labour−intensive public works programmes offer certain features that make them complementary to a package of development instruments for poverty alleviation. An appropriate assessment of the scope for labour−intensive public works to improve food security must place them within the context of a defined development strategy and of alternative (and possibly complementary) policy instruments. Figure 2 attempts to place these programmes in the context of different problem scenarios and alternative policy instruments for food security.

While there are important macroeconomic and institutional issues that determine the scope of and constraints for labour−intensive public works, many policy questions for screening the scope of such programmes for food security improvement remain country−, location−, and situation−specific. These policy questions relate to wage rate policies; mode of payment−−cash, in kind, or both, seasonal and regional targeting, and institutional arrangements.

The complementary measures for labour−intensive public works programmes to enhance food security and nutritional effects, including health care and child care, are under−researched and deserve more attention. The creative search for appropriate complementary measures to optimize short− and long−term food security and nutritional improvement needs to be scaled up.

The effectiveness of labour−intensive public works programmes is closely related to institutional arrangements at the community level and in labour markets. Capitalizing on institutional arrangements for the appropriate design of labour−intensive public works programmes seems promising. Investments in basic understanding of the institutional arrangements may have high payoffs and can lead to more systematic approaches toward implementation that go beyond learning−by−doing approaches for labour−intensive public works programmes.

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Comments

Jens Schulthes

World Food Programme

If public work schemes can be targeted on people who are poor and food insecure, and if they can provide them with the necessary income to become less food insecure, then that is a very important contribution in the field of nutrition. The stakes in this discussion are really very big. The potential of food or cash–for–work, or public works programmes, for developing countries is very large. Food aid seems to be almost the only major resource for massive financing of running costs – that is mostly labour. I do not know of any large and continuous programme that is financed with international foreign exchange. But food aid is available for that purpose.

Just to give an idea of the order of magnitude, consider that one might pay a worker two kilos of wheat as a daily wage, say 500 kilos a year. A thousand tons of food thus finance a work force of two thousand people for a whole year. That is a large work force, and a thousand tons is not such a huge amount of food in aid terms. There is an enormous potential of labour available, and food of course is available too. Since the bulk of food aid today goes to non–targeted programme food aid, it should not be difficult to somehow target on these public work schemes. Only about 20% of the food aid is today targeted, and out of that about half goes to direct feeding schemes. You can see that food–for–work schemes at the moment take up less than 10%. Retargeting to public works schemes should be feasible, and would have a big effect.

The issue of whether people should be paid in food, or whether it has to be cash, I think is not really the key issue, although there is much debate on this. But if one could effectively target food aid to the most food insecure people, it would become only the technical question of whether it might be better in a particular situation to pay to them with food or pay them cash.

The labour content of public work schemes is very important. The cost of labour is relatively low; as I said, even if you maintain a work force of two thousand people for a year, it is only a thousand tons of food. An important issue is to maintain and to guide the work force so that it contributes effectively to development. The non–labour costs are very significant. I think the figure quoted for roads (of 40% as labour costs) is not so different from some other schemes I have seen. In one well–known public works project, for instance, with impressive labour intensity, the result was big water holes with a few canals to catch water, but it was nonfunctional. If you take the other inputs necessary for a useful result – engineering, for surveying, for soil testing, for materials, for cement, plus the effort needed to get it to that particular place, offices, cars,

transportation, external expertise which is also often needed – if you add it all up, it becomes a very formidable input. However labour intensive the project, to be effective you need other inputs and these must be financed.

Other projects like forestation, for instance, raise questions such as title for land, which is very important in many of these projects. If this is not solved, they are unsustainable. So, on many occasions some policy changes have to be made, for example for land redistribution – something which becomes very expensive.

There is a highly successful project in Lusaka in the urban areas. Here, slum dwellers, mainly women, are employed in water supply works. There are something like a thousand workers, with about 15 or 20 engineers, financed by other donors, because such projects can be attractive to financial donors. But still the projects are cash intensive, not only food–supported.

We have another example at the moment, in Vietnam where dykes are being built. This seems to be almost an ideal – everybody knows how to do the work, there is no question of to whom the land belongs, there is no debate on who would benefit from it, so it seems in many ways to be almost an ideal approach. We need to be more selective in choosing such activities. We have many so–called food–for–work projects where the labour component really is quite small; the challenge is to organize the other, multi–disciplinary inputs.

There is lack of practical knowledge of the particular conditions for public works. The ILO has tried with their special public works schemes – which started from their massive employment schemes under emergency conditions, and went further down to the local grassroots level of institution building. It is from such initiatives that one needs to try to develop national authorities which can handle large–scale work schemes in a central and at the same time decentralized way. Particularly in Africa, one has to work at village level, through the village authorities. But this cannot be done without a strong central administration.

So, to close, what is lacking is the concept of the public works administration – which has worked in India, for example – to guarantee employment. In Africa, where this is now most needed, there is little of the required administrative infrastructure yet. I think this is where we have to concentrate.

T C Moremi

Gaborone, Botswana

There has been a major debate in Botswana on how to alleviate the effects of drought on the able–bodied members of our society, in rural communities. A lot of effort was put into designing a programme – labour–based relief – as part of the drought relief programme in Botswana. The experience from the labour–based relief programme was that it became very important by providing cash for the rural economy, and by making sure that our people can use the cash to buy much needed food. Of course, it was also coupled with emergency supplementary feeding programmes supported largely by WFP and bilateral agencies. But we also had problems of low productivity in the projects. There was no training, because all these projects were hastily developed at the local level to deal with emergencies. We beat the drought; but we have also had problems of maintenance of the projects.

The wage rate was made deliberately low so that we could attract as many people as possible into the projects – as many of the poor people as possible. We did not want to compete with other employment opportunities. In this respect, the programme became self–targeting. In practice, women were the ones who mostly participated in these projects.

The issue of public works programmes has now entered a much broader policy debate in Botswana now the drought has ended. The labour–based relief and the cash– for–work projects, as we came to implement them, are now important tools for addressing the continuing problems of employment – we have a very major problem of unemployment and under–employment. We realize that a way of ensuring food security at the household level in our country is through greater employment because the natural resource base in our country is very poor. So, we have now over the last couple of years had this wider policy debate on the role of public works (in non–drought times) and I think it is agreed that they have a very important role to play.

One major problem in the policy debate at the moment, is the question of the wage rate: how do you set an appropriate wage rate? So far, we have set it necessarily low; but we also realize that actually we cannot be fixed about it: we have to take into account regional differences and to come up with locally appropriate wage

rates. We have also had to deal with the need to improve supervision, and the need to improve training to implement proper public works projects which can generate long–term infrastructure in our country.

One of the problems that Joachim von Braun mentioned was providing cash (as well as food) for these projects. We are trying to overcome this. We are going to try to get all of the ministries to look at their own ongoing development projects to see to what extent they can be implemented labour–intensively. So we hope that through this we can integrate the whole question of the public works programme into the normal development projects being implemented by ministries, and thereby overcome the problem of capital. These projects are in the development plan and have funding sources, so the most important thing is to see to what extent they can be implemented *labour–intensively,* as opposed to the capital–intensive methods of the past. This debate is changing from just dealing with emergencies, to now become part of the normal policy discussions. In the long–term, this involves not only ministries dealing with drought relief, but other ministries as well.

The question of the food–for–work versus cash–for–work projects is most important, and I think the issues have been ably described by Joachim von Braun. In Botswana, we opted for cash–for–work projects. Other countries have had problems because of market failure. We have had good markets, and we thought that in the end it was better not to have a parallel food distribution programme running. We have good outlets by and large, even though we have a very large country, we do find stores in most of our localities. So, we thought the most important thing was to provide cash that would enable us to avoid dealing with the logistics that are embodied in trying to deal with food–for–work programmes. So we ran cash–for–work projects. But I also want to say that this does not necessarily mean that there could be no role for food–for–work projects, I do believe that in certain countries they may be the most appropriate way of dealing with the problem, and indeed in our own country, we would use food–for–work if we had areas where we had no food stores. But, by and large, the policy that we have adopted is that we run cash–for–work programmes, and this has worked for us.

In the current macro–economic setting in our country, with underemployment and unemployment as major constraints, we have to address the problem of enhancing income to improve food security. We have to improve the productivity of agriculture, but we also recognize the natural resource constraints that we have. Moreover, a lot of the poor people do not depend only on agriculture, but to a very large extent on other sources of wage income. So labour–intensive public works programmes have become a very important component of our national development planning. I do believe that these could be used for food aid – in our context we are trying to see to what extent we can monetize food aid to support the cash–for–work activities.

I want to agree with my colleagues about the administrative problems in promoting an increase in the utilization of public works programmes. The issue of the institutional capacity, both at the central government level and the local level, will have to be given attention, if we really want to widen the use of labour–intensive public works as a way of addressing employment issues.

I think for the wide sub–region of southem Africa, I would like to say that I do see the important role that public cash–for–work programmes can play. Not least in South Africa, which we hope is going in the next couple of years to become a multi–democratic country, with hopefully a lot of increased UN roles in that country.

Summing–up

Simon Maxwell

Institute of Development Studies. Sussex, UK

My job is to wrap up the discussion on public works and food aid. This is not a new issue. WFP commissioned a literature survey on the subject as early as 1977, and another in 1985, both of them on food aid, food–for–work, and public works. While I do not see very many new issues coming out of the current discussion, what we do have are more of the excellent IFPRI studies. The Bangladesh Food–for–Work Evaluation was one of these, and we are very much looking forward to the work that comes out of their new research in Africa.

One very important conclusion of the present discussion is that there is huge scope for public works: for building local roads, access roads, erosion control structures, check–dams, reforestation. In almost all the countries where there is underemployment of labour there is also an enormous amount to do. Unfortunately in some places it is quite hard to think what you could do if you had the labour. Northern Sudan is perhaps an example – no stone, not much need for roads, very difficult to plant trees because they might die, and so on. Jens Schulthes' example was very telling, of the enormous effort that goes into digging one hole in the ground, but employs not many people, and uses little food. So it is not always the case that there is great potential. But often there is enormous scope, and this should be emphasized. Some of that would be in emergencies, but also much of it is in non–emergency situations.

Carrying out public works, as the discussions show, can benefit the income and possibly the nutritional status of very many poor people, both in the short–run and in the long–run (because the works themselves generate further income and employment.) The real nutritional impact of food–for–work and public works in specific situations is not well established and perhaps this is something that needs to be explored. There are some groups that are clearly excluded from participation in public works –labour short households particularly. Quite a lot of female–headed households who are amongst the poorest groups – the aged, the disabled – who may together account (in those groups) for something like 25% of the absolute poor in Sub–Saharan Africa, and are simply not able to participate in public works because they do not have time or they do not have the labour. So we need to be careful about assuming that public works is a "catch–all" and a "cure–all". But still, the first conclusion from the discussion is: we have good experience (Botswana provides a very good case) of successful public works; there is enormous scope, and we ought to pursue it.

The second conclusion is that food aid can play a very large role in supporting public works, both directly through food–for–work, and indirectly through monetization. Monetization is an extremely important issue, and hotly debated at present. We have tried to produce guidelines on the conditions under which monetization is or is not a good thing (Maxwell & Owens, 1991). The argument is that the default mode –the normal thing to do – is to give people cash, because that is the mode of distribution which strengthens local markets, and which very often people prefer. The way to finance this with food aid is to sell it in the capital city and use the proceeds to fund public works. Sometimes of course that may not be appropriate. The thing to do next then is to provide food to the community for sale through fair price shops or through the market, so giving people cash, but using the food aid to make sure that food is available in the area.

So far there are two optimistic conclusions. First, public works benefit nutrition. Second, food aid is an important resource, both directly and indirectly, to fund public works.

The third conclusion is perhaps less optimistic, but we should not underestimate the real practical problems. In practice public works are extremely demanding in terms of preparation and design, in terms of the technical administration, the institutional problems, the need for complementary programmes, such as health, and as has been referred to a number of times, in terms of cash needs. It used to be thought that you could send out the food and people would run public works with no support whatsoever; we now know that really is not true. If public works are to work you have to provide cash with it – cash for wheel barrows, cash for spades, cash for inputs, cash for wages in some cases for supervisory staff, and cash for many other things too. It is very easy to run bad public works which are no more than outdoor relief – completely unproductive, their only benefit providing food to people with no long–term benefit whatsoever. Cash is crucial.

All these difficulties are real, but they can all be overcome. They can not be overcome immediately, and we need a process of expansion of public works to districts, then states, regions, and eventually to countries. on a step–by–step basis. Public works are not an immediate large–scale panacea because the institutional development has to go hand–in–hand. But with adequate institutional capacity, they could have a most important effect in the long run.

Finally, the fourth conclusion is that there is quite a lot we do *not* know about public works. Particularly what the nutritional impact is – which is ironic because that was our main topic. The nutritional impact depends on many factors – the flows of food and income to the household and within the household. If we change the wage rate we may have quite a big impact on the nutrition, especially of children and other vulnerable groups within the household. Monetization is another issue which is very under–explored – what we need is more information about under what conditions monetization works and does not.

So public works are a good thing and they should be expanded. Food aid can play a very major role in expanding them. We should not underestimate the difficulties. And there is quite a lot we do not know. So where do we go next? I have three suggestions to make on the basis of these discussions.

First, we need to do much more to look at the *scope* of public works. We should start with district plans, even village plans, and work up from there, to take a bottom–up approach to assessing the scope of public works. Questions include: exactly *which* works? What is going to be the labour intensity, the nutrition impact, and the long–term employment effect of different kinds of works? Roads or forests? Erosion control structures or drains? School buildings or health centres? All these may be possible, but we do not yet know enough about which are the most appropriate under different circumstances. In some countries the solution to this has been to have pilot projects and to work towards national disaster prevention and preparedness strategies. Experience in Ethiopia provides a good example of the way in which that can be done. The organizations represented here might want to consider both how they can support the preparation of disaster prevention and preparedness schemes in the most vulnerable developing countries; and look into the possibility of employment guarantee schemes on the Indian model, especially in the African countries with high levels of underemployment.

The second step would be to substantially *increase* the amount of food that is used to support public works. There is obviously scope for increasing the rather low level that Mr Schulthes referred to, of only 10% or so of total food aid being used for public works. Counterpart funds could be used more imaginatively in supporting public work programmes. Funds generated by programme food aid can enable local governments, local communities, and NGOs to undertake more rural employment and more public works. To hand out food in an emergency is a failure of disaster preparedness, of relief supply; it is a failure to use food aid in the most constructive way possible. More emergency food aid should be channelled through longer–term disaster preparedness schemes, utilizing public works.

Finally, there is a lot we still need to know. Important questions remain about the appropriate means of monetization, about nutrition impact, about how to set the wage rate, and so on. There is little operational research going on these questions. So my third conclusion is that there needs to be a great deal more operational research, moreover on quite a large scale: not one or two villages, but districts, even countries, to see what works and what does not, and how we can make more constructive use of food aid. We need to work more on the choices: maybe you cannot have supplementary feeding *and* food–for–work, so we need better information on relative costs and benefits of these different interventions.

References

Maxwell, S. & Owens, T. *Commodity Aid and Counterpart Funds in Africa.* IDS Discussion Paper No. 291. IDS, Sussex.

SECTION III. Supplementary Feeding

ACC/SCN Statement on the Benefits of Preventing Growth Failure in Early Childhood

Growth in young children tends to falter very early in many developing country populations, usually beginning by four to six months and ending by two to three years of age. This growth failure is often pronounced, so that by three years of age the size of the majority of children is outside the normal range expected in a well–nourished, healthy population. Once this faltering has occurred, linear growth tends to resume at a rate similar to that observed for children of that age in healthy populations.

The growth failure which occurs in young children is only one result of the common combination of inadequate child feeding, high rates of infection; and poor child care. It is now realized that there are other very important effects that need to be prevented. Small size indicates other risks, such as reduced nutrient stores, depressed immunocompetence, increased severity of infections, and poor motor and mental development. It is also a marker of risk of long–term functional impairment, including poor educational and intellectual performance.

Among the direct consequences of early growth failure are very short stature and reduced lean body mass in the adult, characteristics which constrain reproductive performance in women and work capacity and productivity in adults engaged in hard physical labour.

Attention to child feeding, the control of infections, and good care results in improvements in child growth and other crucial functions. Specifically, some significant recent evaluations have shown that *supplementary feeding programmes, where enough food is delivered to and consumed by young children in need, are* effective in:

– preventing growth failure;
– protecting against the negative effects of diarrhoeal diseases on child growth;
– improving educational performance, in later years.

Programmes that integrate interventions designed to attack the multiple causes of growth failure are most effective in improving child growth. These programmes can be viewed as investments in the future, for they lead to adults with a greater capacity for healthy, productive lives. Interventions that prevent growth failure in early childhood, it is now clear, can be expected to have a range of important short– and long–term benefits.

Which Age Groups Should be Targeted for Supplementary Feeding?

George Beaton

University of Toronto

Ten years ago, Beaton and Ghassemi (1982) completed a review of feeding programmes for young children in developing countries. That review was undertaken on behalf of the Subcommittee on Nutrition. In many quarters, that review was interpreted as concluding that the reviewed programmes had little or no effect. In fact it suggested that most research studies "had apparent effect but that few operational feeding programmes (except those that were specifically targeted to individuals with evidence of active very recent malnutrition) had demonstrable effect upon anthropometric outcomes (growth).

In the present paper, the objective is to discuss the desirable age range for targeting supplementary feeding programmes. It seems appropriate to quote one of the major conclusions from Beaton and Ghassemi (1982):

The general impression gained from this review is that food distribution programmes directed toward young children, ***as now being operated,*** *are rather expensive* ***for the measured benefit.*** *However, the reviewers remain unconvinced that the benefit usually measured, physical growth and development, is either the total benefit to the family and community or the most important benefit. Therefore, it would be deemed unwise to withdraw such food distribution programmes until there has been opportunity to assess their true effects and benefits." [emphasis added]*

The general situation does not seem to have changed very much. We continue to attempt to assess the impact of such feeding programmes in terms of anthropometric responses. Habicht and Butz (1985), in a paper addressing the health and nutrition effects of large scale nutrition intervention projects, concluded from sensitivity considerations, that the preferred measure of evaluation was change in length. They specifically concluded that morbidity and mortality were relatively insensitive indicators and that weight change was less sensitive than was length change. This was an excellent paper; but in keeping with the realities of existing measurement capabilities and existing perceptions of purpose, they did not address other possible outcomes.

Table 1 sets forth some of the effects of food distribution programmes that have been mentioned as potentially desirable outcome effects. Note that not all of these are commonly identified as "health" outcomes. These are not presented in any hierarchy of presumed desirability. The list is not even complete. The reasons for listing these now are: i) to provide a framework for addressing the assigned topic; ii) to again emphasize that there are many potential effects of such programmes (that would not be expected to necessarily move together); and (iii) to make the reader aware of the fact that "beauty lies in the eye of the beholder" (different planners may have quite different ideas of the real purpose of such programmes). A subsidiary theme is that which emerged in Beaton and Ghassemi: "if we base programme planning, or evaluation, on one category of effect, is it possible that we will miss the impact in another age group?" There is relevance, then, in asking "Are there differences in the preferred age targeting for these different effects?"

Linear Growth Protection and Promotion

Today, as in 1982, the most commonly perceived purpose of offering complementary feeding programmes in communities that are judged to be in need of such assistance is to promote physical growth. It is generally accepted that if physical growth is protected (maintained at close to genetic potential) through feeding or other interventions, there will be commensurate benefits in terms of other dimensions of human development. In this paper, this assumption is questioned but not directly challenged. As noted in an SCN report on Appropriate Uses of Anthropometric Measures in Children (Beaton *et at,* 1990), growth failure appears to serve as a valuable marker of situations in which a number of aspects of functional development have been impaired. However, while these different failures may stem from the same cluster of environmental deprivations, it does not follow that they are linked through the same physiological processes and hence that correction of growth failure will *necessarily* confer the same benefit as addressing the original causal situation – or that the other aspects of functional development might not be influenced without evidence of a growth response.

Table 1. Some Perceived Purposes of Supplementary Feeding Programmes

- Prevent growth failure o Prevent starvation o Treat current malnutrition
- Promote normal development including psychological development
- Control morbidity and mortality
- Provide vehicle for micronutrient supplementation
- Provide program participation incentive and/or income transfer effects and/or food for work

It is the judgement of this author that if improved linear growth is the goal of food distribution, there is an easily described age target of opportunity.

Three lines of argument will be presented to support the personal conclusion that such interventions are most likely to have *programmatically significant* effects on linear growth between the ages of about 6 to 18 or 24 months, although smaller effects can be seen at older ages, even to 5 years or more. The emphasis is on "programmatically significant" effects, not whether there is any effect. This, of course, goes back to the perception of the purpose of the programme.

The three lines of argument are based on:

i) epidemiologic observation of patterns of growth failure in developing countries.
ii) epidemiologic observation of "natural intervention" in the form of age specific secular trends.
iii) consideration of experience in carefully analyzed operational programmes.

Patterns of Growth Faltering

John Waterlow was probably among the first to give prominence to the fact that linear growth tended to falter very early in many developing country populations. He noted also that once this faltering had occurred, linear growth tended to proceed along expected channels for the now–smaller child. This was the basis of his classification of "stunting" vs "wasting" (e.g. Waterlow, 1976).

The phenomenon has now been extensively documented in many populations. Zerfas and Teller (1990) examined data from DHS/IRD survey databases. Figure 1 presents an example from their analyses. They presented their data in an unusual manner – as the percentage of children *without* stunting – to make the point that growth faltering/failure started very young. What the figure suggests is that "growth failure had occurred in the study population by one year of age and that thereafter the prevalence of stunting was relatively constant through 5 years of age. In the examination of data from other countries they showed relatively similar patterns although the age range during which the prevalence changed differed somewhat between study groups. It can be concluded from their intercountry comparison that early growth faltering is a frequent but not universal observation in developing country populations (poorer segments of the populations).

A more conventional picture of the same phenomenon is presented in Fig 2, based on data collected in Egypt, Kenya and Mexico as part of the Nutrition CRSP (Calloway *et al,* 1988; Beaton, 1992). Here results are presented as z–scores. The artefactual bump at 24–30 months is attributable to the known discontinuity in the reference values for length at this age. Nevertheless, one gains the distinct impression that in all three populations the departure from the reference median begins in the 4–6 month period and is most pronounced in the 8–12 month period. School age children (7–9 years) have z scores only slightly different from those at 2 years; the difference is almost non–existent if one takes into account the effect of the discontinuity in the

reference data. The *impression* is that growth faltering, as a group characteristic, begins by 4–6 months and is complete by about 18 months of age in these three groups.

A similar picture is seen in data collected in the Guangzhou area of China in 1985 (unpublished data provided by Ho Ping), shown in Fig 3. Reported mean lengths, grouped by intervals of age, were converted to z scores for this illustration. (This procedure will give rise to errors in the computed z score, the magnitude of the error reflecting the rate of expected growth and the age span of the interval as well as the distribution of actual ages in the interval). Again one sees an early departure from the North American reference population – a departure that follows a similar age pattern. The figure also illustrates the sharp difference in growth between urban and rural population groups. From an unpublished longitudinal data set, the deviation in early growth is *not* seen in current Hong Kong children. Their lengths in the first year or so were remarkably close to the NCHS reference. This observation is added to suggest that the drop in z score in rural Guangzhou children is likely to have environmental rather than genetic origins. Better evidence for this is presented later.

Since it has been reported by several authors that, judged against existing NCHS standards, exclusively breastfed infants exhibit a departure from reference population norms, Fig 4 presents longitudinal data for breastfed infants followed in Davis, California by Dewey *et al* (1990) as part of the DARLING study. Since those infants had initial lengths about 0.5 SD above the reference, a line representing birth length has been included. The breastfed infants appear to exhibit linear growth patterns that resemble the early failure of developing country populations (Figures 2 and 3). However, this does not refute the conclusion that early and pronounced growth failure occurs in many developing country populations. If one takes into account the differences in the Y axis scales between Fig 3 and the earlier figures, there is no real comparison between the magnitude of deviations seen in breastfed infants reared under good conditions and those seen in many indigenous populations (where most infants were still fed at the breast but not exclusively, and where the other aspects of the environment were less desirable). However, data such as those form the DARLING study do raise important questions about *the age at which true growth faltering begins* – a question that has important practical implications for the definition of the age range for targeting complementary feeding.

The first line of argument, then, is simply that failure to grow is an active process during the period 6–18 months and perhaps beyond although the relative magnitude of failure after the first two years is greatly diminished. If this is the period of active failure, it is also the period in which one would expect the greatest absolute impact of dietary or other interventions aimed specifically at growth faltering. Conversely, the perpetuation of the failed growth in developing country situations cannot be interpreted as marking the end of potential responsiveness. It could simply imply that whatever constrains growth continues to operate as long as the setting remains the same.

Evidence from Secular Trends

Populations in many of the developing countries exhibit secular trends in length and weight. In China, such effects have been very strong in recent years. Large surveys were conducted in each of 1975 and 1985, using generally similar sampling designs. It is possible to examine the secular trends in detail. Fig 5A presents published observations (group means by age intervals) from the two "Nine City Surveys" (Zhang *et al,* 1988). Only data for urban males are presented although similar effects can be seen in urban females and in the rural groups. Again, the early departure from the NCHS reference population is seen in each year. However, it is readily apparent that children in the 1985 survey had grown more, at the same age, than had those examined in 1975 – the secular effect.

If the inferences stated earlier – that the major part of growth failure occurs between 6 and 24 months, and that this is the period when greatest response to an improved environment is to be expected, are correct, one would expect that the strongest secular effects might be seen in this age window.

Fig 5B presents the change in z scores, by age interval, between these two surveys. As expected, the magnitude of change increases after about 6 months, hits a maximum before 2 years and then declines somewhat with increasing age. It must be recognized that these are cross sectional data drawn from a population in which a secular trend is active. When we look at achieved size we are looking at a cumulative history of events occurring in earlier years. The apparent decline of the increment in z score with increasing age can be explained as a function of the secular trend – each succeeding cohort of children (each age group) passed through the period of active failure at a different time, the older the children, the earlier was there exposure to the environment surrounding growth failure and the earlier that exposure, the less favourable was the environment of growth. Secular improvements in that environment would be expected to have had less impact on the growth of older children (Beaton, 1992). The absence of major effect before about 6 months of age again reflects the fact that very young Chinese infants (in both 1975 and 1985)

exhibited rates of linear growth that were similar to those seen in the reference North American population.

The inference to be drawn from this picture is that a "natural" intervention, a progressive improvement in childhood environment, appears to have exerted its greatest effect in the 6–24 month period. It would be interesting to analyze secular trends in this manner in other data sets as these progressively become available (Beaton, 1992).

Experience from Intervention Programmes

Retrospectively, one reason that the programmes reviewed by Beaton and Ghassemi may not have had more impressive effects on physical growth may have been that few of these programmes reached children under the age of 2–3 years. Preliminary reports of the Tamil Nadu intervention, targeted toward young children who appear to be faltering in growth (detected through growth monitoring), suggest that it may be having much greater impact on growth.

It should not be a surprise that failing to grow is most apparent in the 6–18 month period – or that response to intervention is more easily seen in this period. This is the period of very rapid growth in populations of industrialized countries. It is also the period when diarrhoea and other infectious diseases become common in many developing countries. The evidence is quite clear that recurring diarrhoea has a major inhibitory effect on young child growth (Tomkins, 1989). Both reduced food intake and intestinal malabsorption seem to play a part in the impact of diarrhoea. It is likely that recurrent infections also have direct impact on the growth process, unrelated to decrease in food intake or nutrient absorption (Beaton *et al,* 1992).

Lutter *et al* (1989) provided a very important analysis of data from a major supplementary feeding trial in Bogota, Colombia. Their analyses showed that the difference between supplemented and unsupplemented children in attained height at 36 months was about 3 cm. However, then the comparisons were controlled for the occurrence of diarrhoea (number of days with diarrhoea), the increment rose to 11 cm. The authors interpreted these data to suggest that while supplementary feeding had not affected the incidence of diarrhoea, it had overcome the negative effects of diarrhoea on growth. At the same time, supplementary feeding did not increase achieved height to the levels seen in the NCHS reference population – it had appreciably reduced the deficit, particularly in children exhibiting frequent or prolonged diarrhoea (see Fig 10 presented later).

Lutter *et al* (1990) also examined the age–specific responsiveness of children in the Bogota study. They reported that the two periods of greatest response coincided with weaning (3–6 months of age) and the peak period of incidence and duration of diarrhoea (9–12 months of age). They suggested that "targeting supplementation programmes to coincide with periods of high nutritional risk should maximize their effectiveness".

In an early study of supplementary feeding, Gopalan *et al* (1973) were able to show significant linear growth improvements in interventions with children as old as 48–60 months. The reported results are shown in Table 2. The magnitude of effect was greater in young children but effects were seen up to the age of 5 years. Again it is emphasized that in the present discussion, an attempt is made to differentiate between age limits for *any* biological effect and age windows for programmatically substantial biological effects. Gopalan *et al* (1973) also reported that linear growth of the supplemented children was not appreciably affected by measles occurring in the study population; the growth rate of the unsupplemented children was depressed by measles. This aspect is in keeping with the recent findings of Lutter *et al* for diarrhoea, discussed above.

Table 2. Gain In Length During Supplementary Feeding in Hyderabad, India

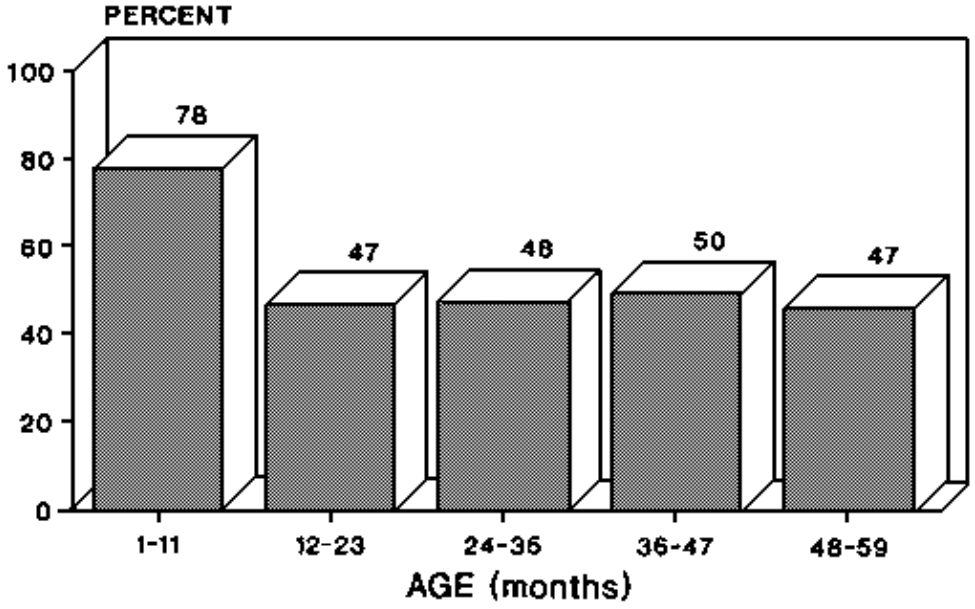
(Treated – Control)	
AGE (years)	Difference in Rate of Height Gain (cm/14 months)
1–2	2.8
2–3	1.7
3–4	1.7
4–5	1.1
Based on Gopalan et al (1973)	

Perhaps a bit of perspective would help. Fig 6 presents the length increments of the median lengths in the NCHS reference population. Increments have been estimated for successive three month intervals. It is readily apparent that growth *rate* is initially very high and falls off quickly with age although, of course, growth continues for many years. Also marked in Fig 6 is the age period in which active growth failure appears to be seen. This is not unexpected. Periods of rapid change are intuitively expected to be periods of vulnerability. Fig 7 displays the Gopalan *et al* (1973) study results (now expressed as growth rate per 3 months but extending across the 14 month intervals examined by Gopalan *et al)* superimposed on the growth rates inferred from the reference population. What is very noticeable is that the supplementary feeding appears to have supported growth rates that are comparable to those seen in the reference population and significantly higher than those seen in the control. This was noted also by Gopalan *et al* (1973). There is no indication that the children "cvergrew" as a catch up. One interpretation of this could be that the "maximum" growth rate might be set by age–related physiological mechanisms. In this perspective it might be concluded that the Gopalan study was extremely effective, restoring *growth rate* to expected levels for age (Habicht and Butz, 1985). However, one might also suggest that the study illustrates the relative ineffectiveness of supplementation of older children –while preventing further loss of growth potential, there is little evidence of restoration of past losses.

What then about the reanalysis of Bogota data by Lutter *et al* (1990)? Fig 8 portrays the Bogota data in the same manner as were the data of Gopalan *et al* (1973) in Fig 7. Again the plot suggests that the intervention was very effective in older infants in preserving growth rates close to age expectations (even in the presence of diarrhoea). It may have fallen a bit short in younger ages even though there was still evidence of significant effect. What is also interesting is that, as would be expected, the absolute difference in growth rates between supplemented and unsupplemented children was greater in the very young than the older. Again it appears that while responses can be generated up to three or more years, these do not *appear* to represent true catch up as much as what might be called "damage control", or prevention of further losses. The practical implication is that one might expect to *see* greater impact of food distribution programmes during the period of physiologically normal very rapid growth – a window of opportunity. There is an inference being drawn, without specific test in any of the data sets reviewed here, that if the opportunity is missed, the growth faltering marks a real departure from genetic potential. This then leads us to the very old question – "can true catch up growth occur and if so, till what age?"

For many years, John Waterlow has attempted to collect data that would address this question. In a 1988 article (Waterlow, 1988) he again pointed out that there is a well documented clinical literature from industrialized countries showing that given good clinical care, children recovering from a number of serious illnesses have the potential for catch up growth (recovery of losses incurred during the acute illness?) at least until puberty. It has been documented also that children recovering from severe clinical malnutrition and offered high intakes of energy and protein can exhibit remarkably high rates of linear "catch up" growth. Such children tend to be young (under 5) when treatment was initiated but long term follow up studies suggest that recovery continued for many years.

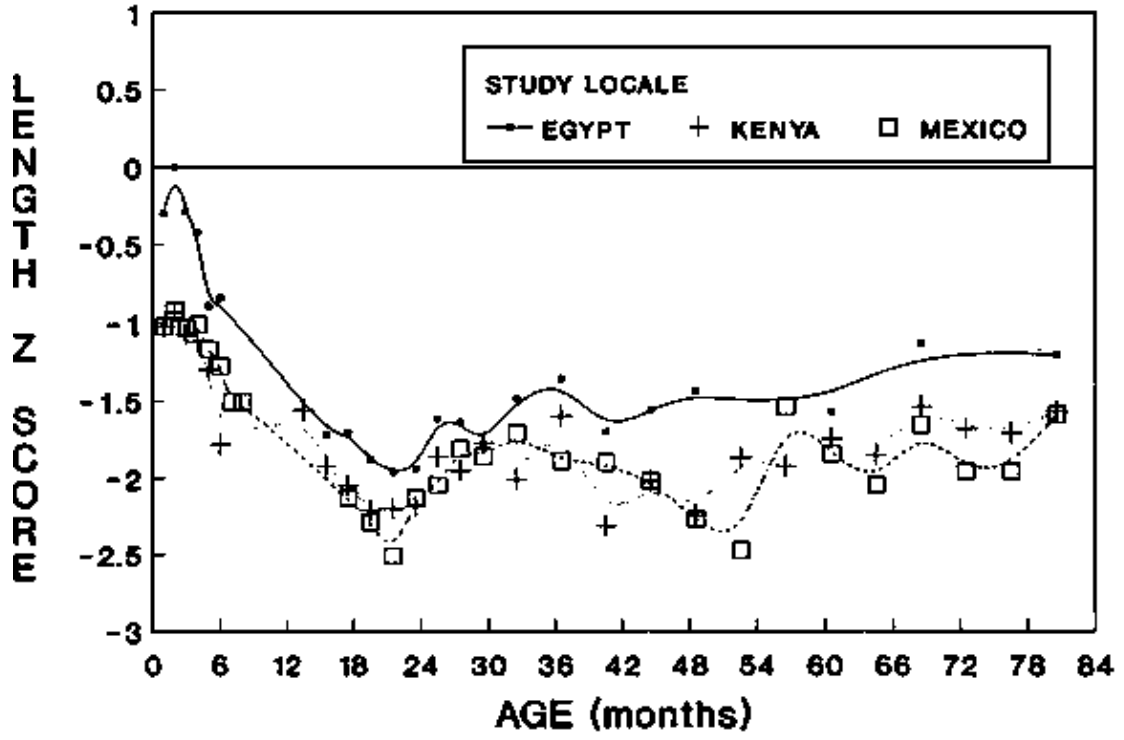
Dr Waterlow's question remains incompletely answered. In physiological terms linear growth continues until the bone epiphyses close. Theoretically some catch up is possible. Nevertheless, experience has tended to suggest that supplementary feeding has a smaller effect on older children than seen in the very young – without evidence of restoring past deficits. A difficulty of interpretation, of course, is that a small increment in growth rate, sustained over many years might yield major catch up yet go undetected in one or two year studies. Rat models seem to suggest that growth failure induced by severe dietary restriction in early life has lasting effects on growth after return to ad libitum feeding. In those models, the later the insult, the greater the degree of potential recovery. Perhaps there is a parallel phenomenon in the human – perhaps very early failure to grow truly alters the individual's potential to grow while later insults may be more amenable to recovery given a favourable environment. It may be, also, that the nature of the cause of growth failure is a critical determinant of subsequent responsiveness – perhaps this is why acute malnutrition cases or children with other severe illnesses seem to be more responsive to feeding than do children exhibiting the general growth faltering typical of many developing country populations. This author is unaware of evidence that would answer this intriguing question. However, it is suggested that for practical purposes we must assume that real catch–up growth would be an unexpected outcome of supplementary feeding. In offering this assertion a distinction is made between two different perspectives of catch–up growth. The phenomenon of catch up growth ("recovery") in the intervals between intercurrent bouts of infection, undoubtedly occurs in the presence of adequate food intake and is likely to be a pan of the explanation of the results reported by Lutter *et al* (1989) and Gopalan *et al* (1973) in terms of the role of supplementary feeding in the avoidance of effects in infectious diseases on linear growth. It is the longer term catch–up to restore failures occurring months or years earlier, that is in question.



"Adequate" = over -2 SD of reference

Taken from Zerfas and Teller (1990)

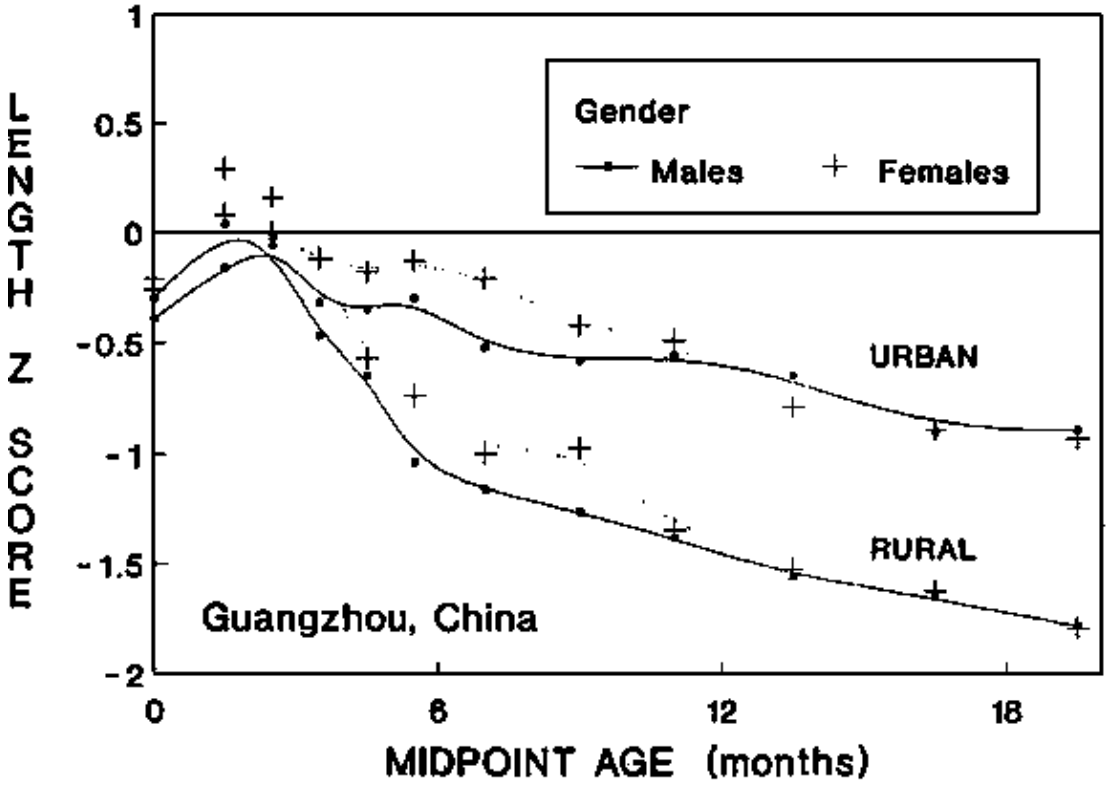
FIGURE 1 CHILDREN WITH "ADEQUATE" HEIGHT–FOR–AGE UGANDA



Mixed cross sectional and longitudinal data. Nutrition CRSP.

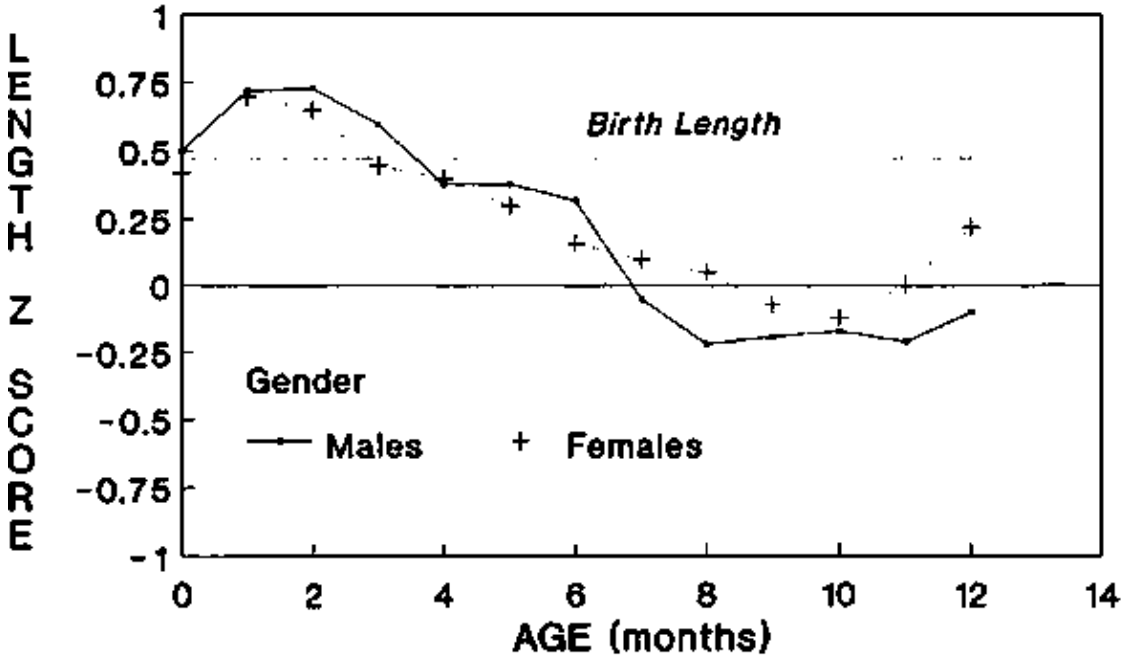
based on Calloway *et al*, 1988 and Beaton, 1992

FIGURE 2 OBSERVED ATTAINED LENGTH IN CHILDREN IN THE THREE CRSP STUDY SITES



Data provided by Ho Ping, 1990

FIGURE 3 REPORTED LENGTH OF CHILDREN IN THE GUANGZHOU DISTRICT OF CHINA



Redrawn from Dewey et al (1990)

FIGURE 4 LENGTH FOR AGE Z SCORES OF BREAST FED INFANTS THE DARLING STUDY

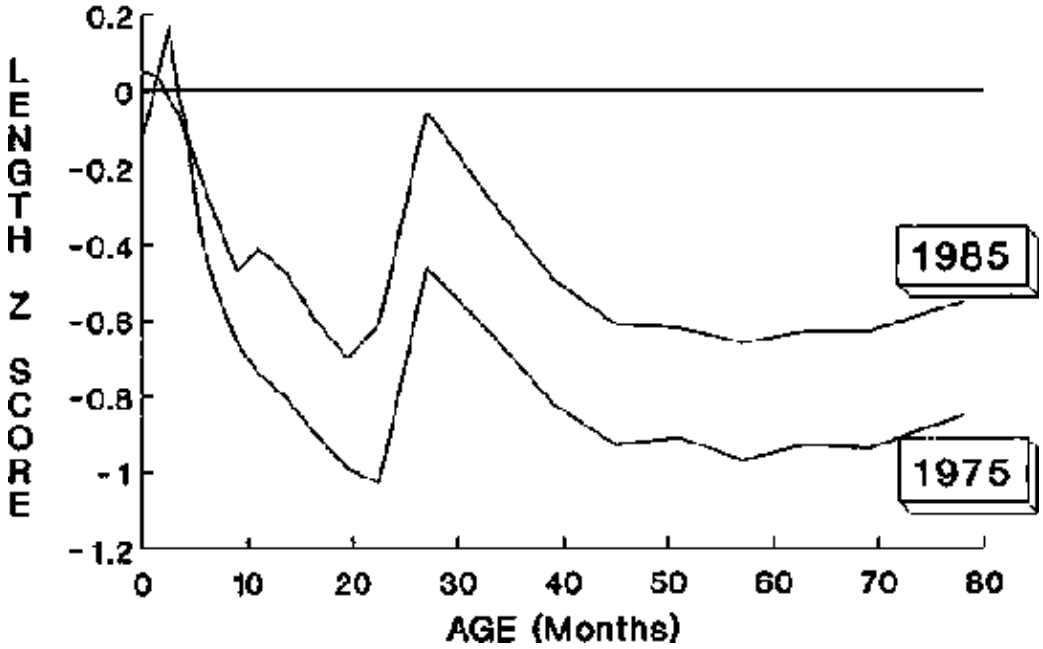
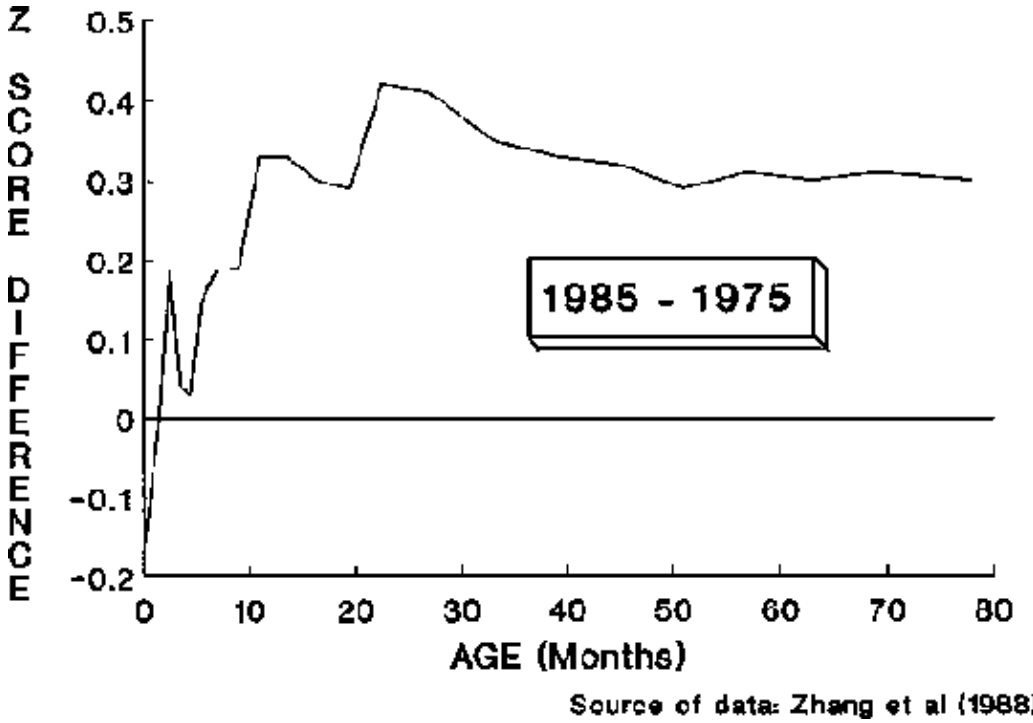


FIGURE 5A 1975 AND 1985 CHINA "9 CITY" SURVEYS URBAN MALES A. OBSERVED LENGTH Z SCORES



Source of data: Zhang et al (1988)

FIGURE 5B 1975 AND 1985 CHINA "9 CITY" SURVEYS URBAN MALES B. AGE–SPECIFIC SECULAR TREND

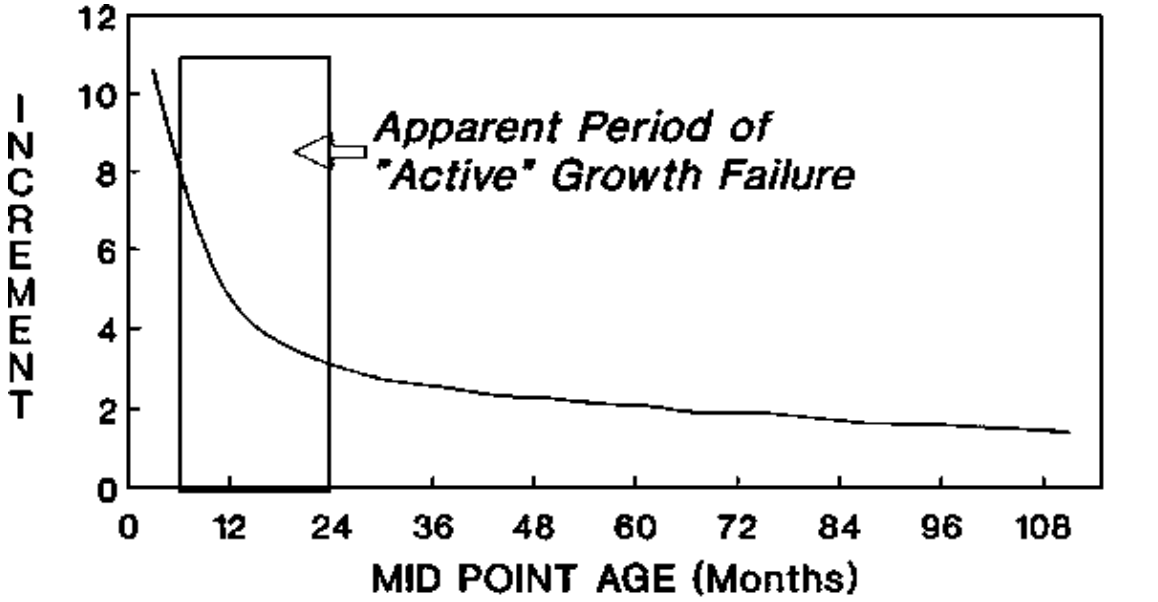


FIGURE 6 LENGTH INCREMENTS BY AGE IN BOYS (cm/3 months)

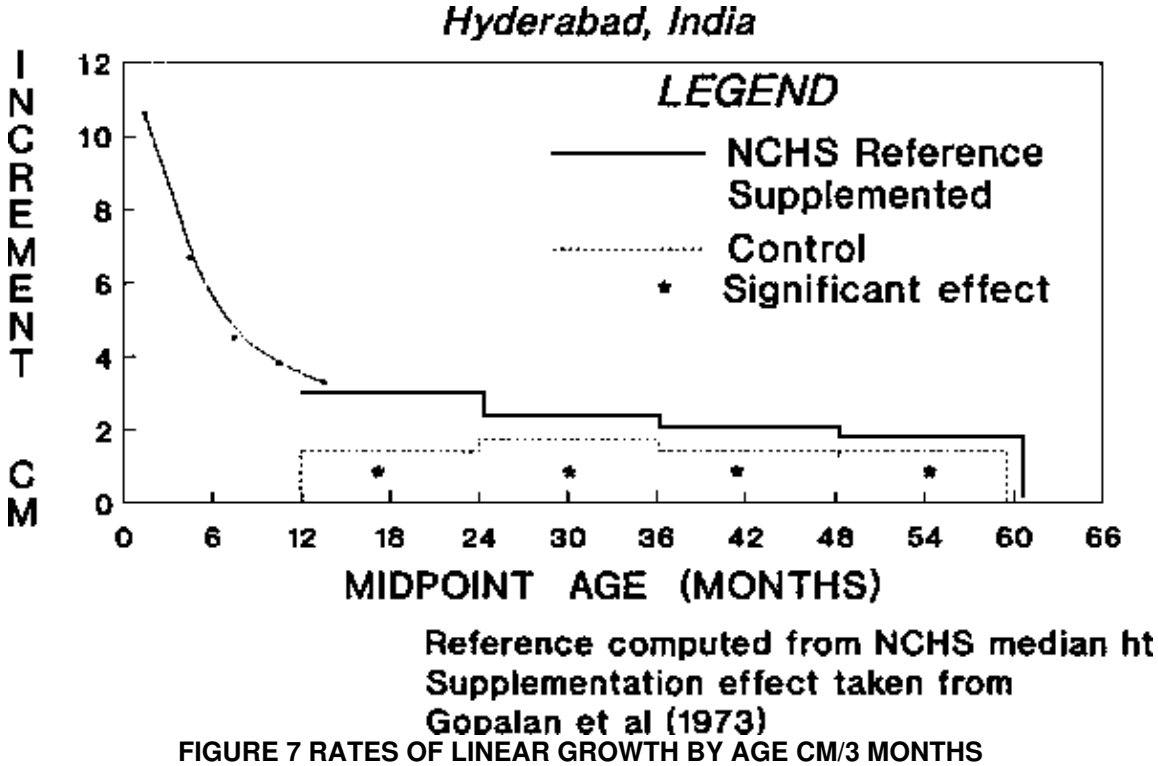


FIGURE 7 RATES OF LINEAR GROWTH BY AGE CM/3 MONTHS

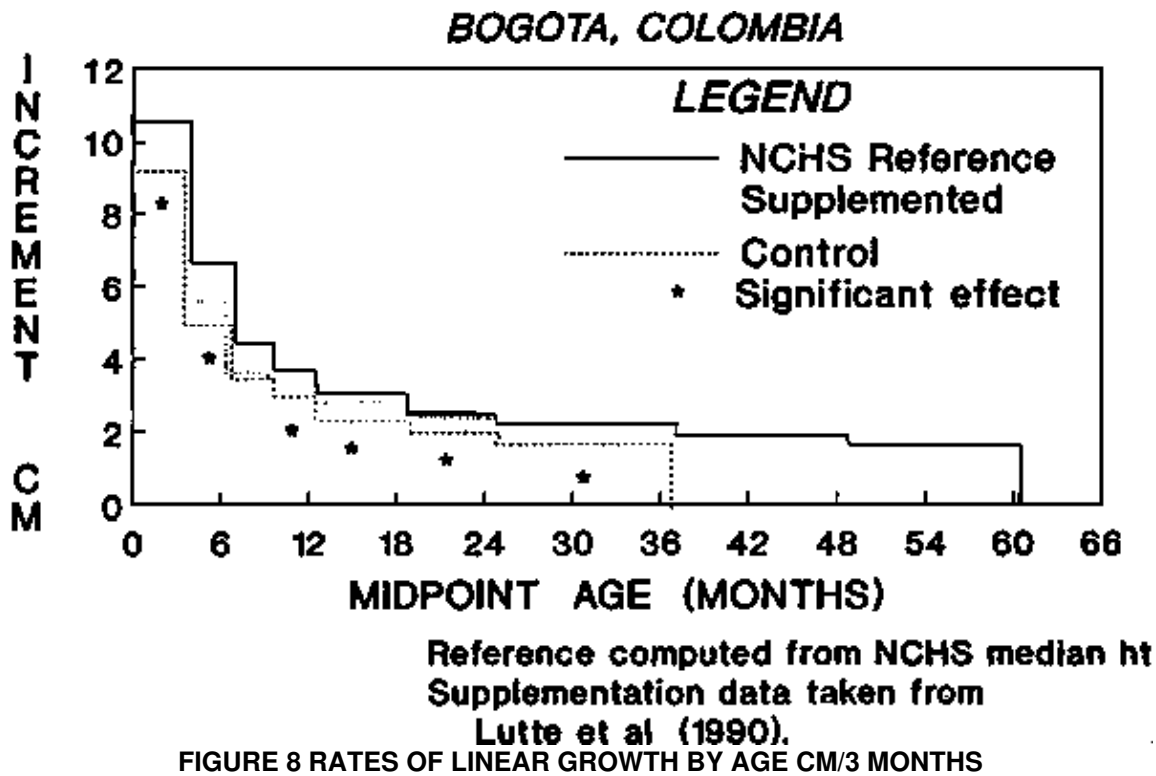


FIGURE 8 RATES OF LINEAR GROWTH BY AGE CM/3 MONTHS

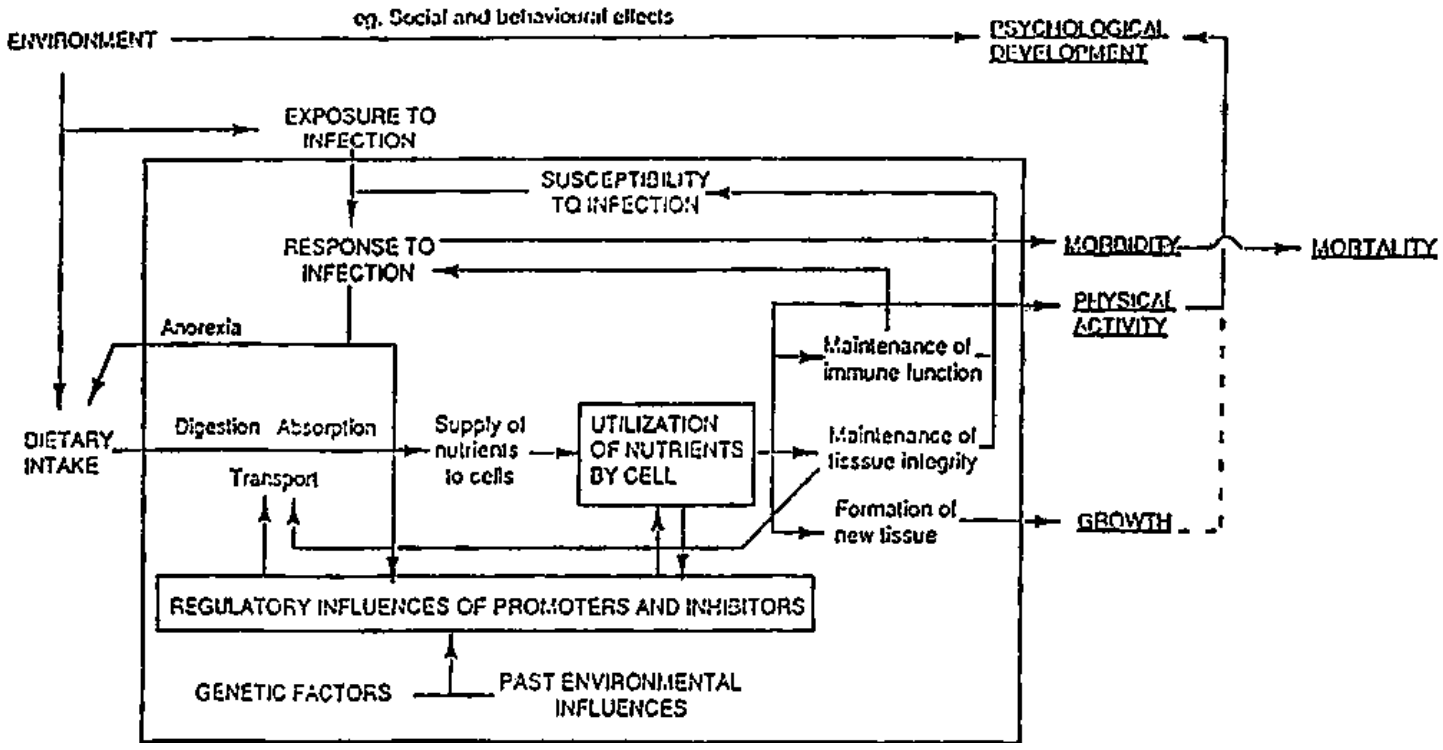


FIGURE 9 A SCHEMATIC PORTRAYAL OF POSSIBLE PATHWAYS OF ENVIRONMENTAL EFFECTS ON CHILD DEVELOPMENT

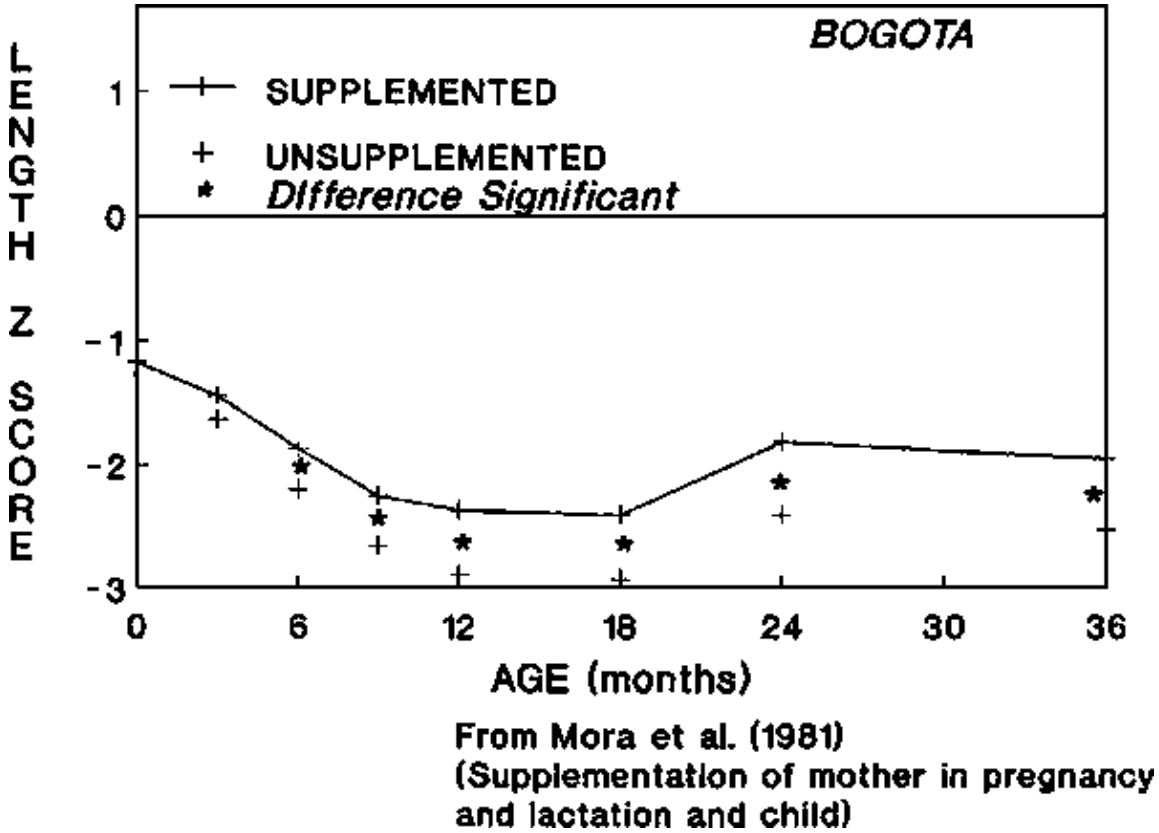


FIGURE 10 REPORTED LENGTHS OF CHILDREN IN BOGOTA, COLOMBIA

In summary, then, three lines of evidence

a) observation of patterns of "spontaneous" growth faltering in developing countries
b) observation of age specificity in secular trends

c) examination of age–specific responses to supplementary feeding all seem to point to the same conclusion: If one wishes to *prevent* linear growth failure, the window of maximum opportunity is in the 6–18 month age interval.

A definite *closure* date cannot be assigned to the targeting of supplementary feeding when linear growth is the desired outcome. However, based on the three lines of evidence reviewed, and in keeping with the suggestion of Lutter *et al* (1990), the effective target range for substantive impacts on linear growth seems to be 6 months to 2 or perhaps 3 years. It is not suggested that no response can occur after that age, only that the linear growth response in older children *may* be of such small magnitude that its practical importance would be questioned (was this what led to the conclusions of Beaton and Ghassemi (1982)?).

Supplementary Feeding as an Adjunct to Clinical Treatment

A clearly documented extension of the above arguments is the importance of adequate dietary intake in the treatment of clinical illness and in the immediate post–illness recovery period. Whether or not linear growth is subject to influence, it is absolutely clear that losses in muscle mass accompanying prolonged or severe illness are reversible with adequate diet at any age. by inference, this suggests that food distribution linked to treatment facilities, servicing all ages, remains an important aspect of the integration of nutrition into primary health care. Many have commented upon the utter frustration of the health care worker when faced with a case of acute malnutrition and equipped with nothing but advice to offer, knowing that the family is not able to follow the advice. Providing supplemental food as a pan of treatment of illness in deprived settings yields important benefits not only to the individual under treatment but also to the responsible health worker.

Prevention of Starvation – Emergency Feeding

A situation that needs no argument is the use of food distribution in the face of a major economic, political or other disaster which disrupts the ability of the individual or family to acquire food. While we may argue about relative priorities and cut–off points for screening in such situations, few would argue that in reality, starvation and semi starvation know no age limits. A particular, and very upsetting example of this lesson is presented in

the examination of the current situation of refugee feeding presented later in this symposium.

Supplementary Feeding, Work Capacity and Social Function

Physical work requires energy. That energy must ultimately come from food ingested or from progressive catabolism of body tissues. However, the energy needs of occupational activity might be met, in part, by reduction of nonoccupational activities. Thus we have a situation in which there is a physiological rationale for an association among energy intake, work capacity, and social activity. The equilibrium state is undoubtedly influenced by incentives and perceived "wants" –– thus expected effects are intertwined in the fabric of societies. IDECG has been attempting to bring together information in this area. For obvious reasons, research design is difficult. Study planning and implementation *should* include both physiologists and social scientists since the questions span both domains. Personally, this author has no reservation in concluding that food supplementation in older children and adults (as well as in the young children who are also responsive in terms of growth) in food–constrained environments should be expected to have social effects (Beaton, 1985). This author does not have the qualifications to render judgement on the importance of children playing, or of soccer clubs emerging (documented spontaneous associates of the introduction of supplementary feeding) – he can postulate effects on individual and community development, but cannot prove his rationalisations are valid.

Supplementary Feeding and other Aspects of Human Development

The early part of this paper focused upon linear growth and its age–responsiveness to food distribution. In fact, we probably are not interested in improving linear growth per se. *There are few explicit advantages to being big; there are many disadvantageous associates of becoming small, particularly in deprived societies* (Beaton, 1989). We most often use achieved size or observed growth rate as an indicator for a number of dimensions of human development. Originally this was based on epidemiologic observations of the association between achieved size/growth retardation, morbidity, mortality, and psychological development. With the INCAP long term follow up of a food intervention in young children, now beginning to appear in publication (Martorell *et al,* 1992), and reported in this symposium, we have direct evidence of the long term functional significance of a young child feeding intervention.

Short and moderate term effects of supplementary feeding on motor and cognitive development have been reviewed by Ernesto Pollitt (1988, 1991) and many others. There is now convincing evidence that some degree of impaired psychological development is a very frequent associate of early growth failure – and that interventions that ameliorate the growth failure also tend to improve psychological development although it is not easy to be sure what aspect of the intervention exerted the beneficial effects. Thus, for example, food distribution also changes effective income and this may have influences upon the environment of early development. Increased intake by others in the household may influence the care and attention given to the study child. It is not clear that the psychological effects are a part of the same physiological processes that lead to failure to grow. A recent SCN report (Fig 8) attempted to make this distinction (Beaton *et al,* 1992).

In Fig 8, based on the SCN report, growth failure is a marker of a disadvantaged environment in which a number of processes may operate with a range of developmental effects. There are at least two relevant implications of this portrayal.

> i) rectifying growth failure, without modifying the environment (if that were possible) might not result in improvement in all functions. While it is entirely reasonable to target growth failure, we should always recognize that in reality we should be targeting the situation in which growth failure occurs.
>
> ii) If the process of failing to grow and the process of altered psychological development are not physiologically linked, we should not suppose that the age range of peak responsiveness of growth marks the age range of peak responsiveness of psychological development –or for protection of other human functions. It is likely that the same early period is important for both but it is at least conceivable that the period of potential major influence extends longer for psychological benefits than for linear growth.

Pollitt and Gorman (1990), analysing data from the INCAP long term follow up of a young child food supplementation programme suggested that the physical activity response to supplemental feeding may play a role in motor development and that this in turn influences both physical activity and, through interactional behaviours, aspects of psychological development. In these analyses, measures of linear growth were as good predictors of psychological performance in the preschool years as were measures of motor

development. However motor test scores at 15 months were stronger than anthropometric measures as predictors of adolescent functional measures of literacy, reading, vocabulary and maximum grade attained in school. These associations suggested that while anthropometric development was indeed an indicator of psychological development, separate pathways of effect were operating; these may have included activity−mediated pathways. Pollitt and Gorman (1990) cautioned that the analyses and interpretations presented were preliminary. Others (e.g. Grantham−McGregor *et al,* 1990) have challenged such a postulated activity−mediated path of effect. A recent study of total energy expenditure in Gambian and U.K. children (Prentice *et al,* 1990) has even challenged the notion that physical activity reduction is a pan of the coping response of infants and young children suggested from observations in experimental settings as reviewed by Torun (1990).

Clearly much work remains to be done before we understand the operational influences on early childhood psychological development and hence the expected impact of supplementary feeding. In spite of these limitations to existing knowledge, it is a reasonable supposition that there is a beneficial effect of adequate feeding of the child and household during the early developmental period,

Mention has already been made of the association between growth failure and morbidity. There is abundant evidence that smaller children are at greater risk of morbidity and mortality. There is less evidence that supplementary feeding reduces the incidence of disease episodes. However, there is a growing body of literature to suggest that the response to infectious disease, or the recovery from infectious disease is enhanced in the presence of supplementation (e.g. Gopalan, 1973; Lutter *et al,* 1989; Tomkins and Watson, 1989). Fig 8 suggests that the immunologic responses of the individual may be altered by dietary inadequacies affecting either susceptibility or response to infection. The literature abounds with documentation that the physical recovery from infection is influenced by the level of feeding. There is no *a priori* reason to believe that this effect is restricted to very early childhood although, as Lutter *et al* (1989) pointed out, the effects on growth are more evident in periods when disease is more likely to occur −− and when expected growth rates are high.

School Feeding

As an example of effects of supplemental feeding at later ages, one may point to the continuing uncertainty about benefits of school feeding. There is little evidence suggesting effects on linear growth except perhaps in very dire circumstances. Conversely, as Pollitt (1990) pointed out, there is evidence to suggest that attentiveness and other classroom behaviours impacting on learning are influenced by supplementary feeding in the face of chronic underfeeding. Associations seen in the descriptive data of the Nutrition CRSP studies, particularly in the Kenya data, support the hypothesis that current intake affects learning behaviour.

Pregnancy and Lactation

There are now several studies that document the fact that food distribution programmes directed toward pregnant women can have beneficial effects on intrauterine growth as measured by birth weight (e.g. Adair and Pollitt, 1983; Lechtig *et al,* 1976; Mora *et al,* 1978, 1979; Prentice *et al,* 1983, 1987). The effects may be relatively small in absolute magnitude but they appear to be sufficient (at least in severely constrained settings) to have impact on infant morbidity and mortality. There is less convincing evidence that supplementation of lactating women carries benefit to the nursing infant (except with regard to specific micronutrients such as vitamin A (Stoltzfus *et al,* 1992)).

The important perspective for food supplementation in pregnancy and lactation may be the mother rather than the infant *in utero* or at the breast. Women in developing countries face major responsibility for the health and well being of the household. Pregnancy and lactation in the face of inadequate food intake have an unquestionable negative impact on the mother. In turn, this is likely to have negative impact on her subsequent health and function even though that may be difficult to measure and document.

If once we accept this argument then we must also accept the logical argument that we should be concerned about the adequacy of food intake of girls before pregnancy begins. This then extends the potential beneficial age of food distribution from birth through reproduction and child rearing.

Food Distribution as a Vehicle for Micronutrient Supplementation

Food distribution programmes can serve as a vehicle for micronutrient supplementation (National Academy of Sciences, 1982). While this is seldom seen as a primary purpose, it is to be recognized that some of the functional outcomes mentioned in this paper are known to be influenced by micronutrients. To some extent,

except in very carefully controlled trials, effects of the distribution programmes may be attributed in pan to improved micronutrient intake or availability. The opposite experience is very real in refugee camps – the development of clinical micronutrient deficiencies on an epidemic scale in mass food distribution programmes –the reappearance of problems that we though had disappeared by the 1950's. We may also see increased attention to the potential role of food distribution as a vehicle for micronutrients given our increased awareness of the importance of vitamin A and iron deficiencies.

Incentive and Other Related Effects of Food Distribution and Feeding

It has long been argued that school attendance is influenced by the provision of meals, whether that be mediated by an incentive effect or by an improved learning environment and hence increased self–satisfaction. There is practical evidence (e.g. Gopaldas et al, 1975) that the nature and perceived worth of food packages distributed at MCH clinics is an incentive for attendance. This was certainly a part of the argument for inclusion of vegetable oil in such packages in CRS programmes in Africa (Father Capone, personal communication, 1981). Obviously, such effects are not limited by age in any physiological sense.

Income Transfer–Mediated Effects of Food Distribution

This topic is not developed with the present paper since it has been well discussed in a National Academy of Sciences (1982) report and is discussed in the present symposium in the connotation of Food for Work. However, the opportunity must be taken to again remind all of us that even though we may think we are targeting food distribution programmes on individuals, we are really directing the food, and its implicit economic value, to "at risk" households in which those individuals live. The "leakage" of distributed food to the household as a whole should not be seen as a loss but rather as an unmeasured potential benefit (Beaton and Ghassemi, 1982; National Academy of Sciences, 1982). In this modality, there is no age limit. One might argue that there is a greater potential advantage in a household in which a younger sib is present or expected than in a household in which all other children are older. The perceived worth of the benefit achieved through these indirect effects depends upon the goals of the programme. All that can be done in this paper is to issue a plea that the potential, but usually unmeasured, benefits not be ignored.

Summary and Conclusions

The moral from these observations, is that we must assume, until established otherwise, that supplementation of underfed individuals may have beneficial functional effects beyond the ages when we can see effects on physical growth. This is not a comment on priorities for targeting. Rather, it is an observation on the topic assigned to this author. He is unable to place an age limit on the potential functional benefits of improving food availability in developing countries.

The linear growth data reviewed early in this presentation strongly suggest that to *prevent* growth failure, interventions must begin early, certainly within the first year and likely by six months. It is clearly recognized, as many authors have pointed out, that this presents a serious quandary. It appears that even full breastfeeding does not prevent the beginnings of growth faltering, but the introduction of supplementary foods opens the door for infectious disease with its pronounced effects on growth. The operational choice of action must be based upon a careful weighing of the existing patterns of infant feeding in the particular community and the potential benefits and risks associated with whatever action, or non–action, might be chosen. The real programmatic challenge lies in developing strategies and approaches that will promote [exclusive?] breastfeeding for the first four to six months of life –– a current focus of many programmes and activities – but will *concurrently* promote appropriate complementary feeding from that time onward – not a widely featured goal at present. Future food distribution programmes *may* have a role in active promotion of appropriate complementary feeding.

It seems unlikely that food supplementation, by itself, can totally prevent growth failure. Even in the Bogota study, Fig 10, where supplementation of the total household began early in pregnancy, and hence where we are looking at the combined effects of supplementing the mother in pregnancy and lactation as well as direct supplementation of the infant, there remains evidence of early growth faltering that was not reversed during the period of the study (to three years). Conversely the analyses by Lutter *et al* suggest clearly that growth *rates* can be "normalized" by supplementary feeding after 1–2 years. That is, the supplementary food has an effect on growth but without evidence that earlier deficits are restored. The much earlier study of Gopalan *et al* suggests the same thing. Their energy supplements appeared to raise mean growth rates to NCHS levels but did not, within the period of that study (to 5 years of age), restore earlier deficits.

What is also interesting and important is that both the Gopalan and Lutter analyses suggested that the effects of measles in India and diarrhoea in Colombia, on linear growth were essentially prevented even though there was no evidence that the incidence or duration of these disease conditions were affected.

Lutter *et al* (1989) present the argument that targeting of food distribution should be based on the risk of malnutrition – the peak ages for diarrhoea or other adverse factor effects. The rationale here might be seen as trying to use food distribution to minimize the damage done by other aspects of the environment but the focus is on minimizing adverse effects on growth, not necessarily on other functions.

From that work one would likely conclude that targeted distribution of food should begin early and could be expected to have some growth effect through at least three years of age and perhaps much longer. The absolute magnitude of the beneficial effect appears to decrease with increasing age. One might legitimately ask whether the small effects in older children are worthy of pursuit. The answer undoubtedly lies in one's perception of other beneficial effects that might move with the growth response.

It would be expected that weight as well as length would increase in the situations discussed. However, weight deficits attributable to either illness or simple underfeeding can occur at any age and are likely to be responsive to feeding, perhaps after severe illness is controlled. There is ample evidence (not presented in this paper) to support the assertion that feeding programmes targeted to persons exhibiting evidence of underfeeding will lead to weight responses and probably improved functional health.

In this paper an attempt has also been made to offer a reminder that there are other functions, apparently associated, in part at least, with adequacy of food intake and apparently responsive to food distribution and feeding. These are not *necessarily* marked by conventional anthropometric indices. This of course presents the programme planner and manager with a double barrelled problem – how to select target populations and how to evaluate the non–anthropometric effect of the programme. Extreme examples of this are the income transfer and incentive effects of food distribution.

The main conclusion that this author comes to was probably apparent to all before the paper was written. There are no definable age bounds for effectiveness of food distribution. Food distribution programmes have multiple effects (see Table 1 for examples), many of which are very poorly understood. Depending upon the effect one wishes to maximize there is likely a preferred target age window. If we continue to evaluate the programmes in terms of anthropometric responses and/or prevention of growth failure, we will have predetermined the target age groups. But we may also be missing important potential benefits for other ages. We must be careful that we do not act like the drunk who was looking for his car keys under a street lamp – because it was too dark to look where he lost them!

POSTSCRIPT: ADEQUATE NUTRITION AS AN UNALIENABLE RIGHT

To a not small degree, 1 am disturbed about making a presentation such as this. It is likely to again lead to long discussions about relative priorities for allocation of scarce resources – arguments which in the end lead to attempts to weigh the relative importance of different dimensions of human development and function. I have the terrible feeling that we are imposing a Western medical perspective that may lead us to miss the important underlying human issues. We cannot, we must not, accept the present condition of the great majority of the world's population as something to be dealt with through application of band aids. If food aid is a major resource at our disposal, we should seek ways of using it toward development of communities and betterment of the human condition, not just as another part of our medicine chest.

I know that several member agencies of the SCN have joined in an effort to raise adequate nutrition to the level of a human right – to make the whole of the UN family recognize that a major reason it exists, and a major reason we come together in meetings such as the SCN, is to recognize that international justice demands that we recognize the rights and needs of all peoples of this world we inhabit – and that we work. jointly, toward a common goal of betterment of the human condition.

In that perspective, debates on the appropriate ages for targeting food distribution seem almost irrelevant.

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Effects of Supplementary Feeding on the Growth of Children with Infection

Juan Rivera

Institute of Nutrition of Central America and Panama

Two opposite views prevail concerning the relative importance of infection and dietary intake on growth. At one extreme there are those who postulate that the principal factor affecting the growth and nutritional status of children is the high frequency and duration of infections, particularly diarrhoeal diseases. At the other extreme are those who place more emphasis on dietary intake. Ample evidence indicates that both factors are causes of growth retardation and that the weight of each specific factor varies in different populations. I will present evidence of the interactive effects of dietary intake and infection or diarrhoea and dietary intake on growth, and argue that both views presented above are incorrect. The effect of inadequate dietary intake on growth depends on the level of diarrhoea, just as the negative effect of diarrhoea on growth depends on the level of energy intake.

Supplementary feeding has been shown to have positive effects on the growth of young children who are mild–moderately malnourished. In a literature review of controlled supplementation trials in malnourished young children of developing countries (Habicht and Butz, 1979; Rivera J. 1988), thirteen reports were found. Nine of these reports also presented evidence of improvements in dietary intake as a result of supplementary feeding. In the nine reports where improvements in dietary intake were demonstrated, effects on growth were shown, although in two of them effects were not shown for certain age groups. Of the four trials where dietary improvement was not shown, three did not show an effect on growth, the fourth did, but only in girls.

These results indicate that dietary improvements in children with mild to moderate malnutrition do result in measurable improvements in growth. In theory, young children's diets can be improved through different types of interventions including agricultural and development projects directed at improving family income, food subsidy programmes, food for work programmes, supplementary feeding programmes for young children, and others. However, such programmes often render little or no impact due to problems encountered in their implementation or in the design of the programme itself. For example, in their well known literature review of over 200 reports of supplementary feeding programmes, Beaton and Ghassemi (1982) conclude that few such programmes have resulted in measurable improvements in child growth. their review focused on actual programmes and not on carefully done supplementation trials. As they report, in some cases effects could not be well measured because the design of the evaluation was flawed, measurement was deficient, and/or the sample size was often inadequate. However, they also report that the amount of food provided was often too small to have an impact. Intended recipients did not always receive the expected benefit due to sharing between and within families. The results of this review indicate the need for improving the operation of supplementary feeding programmes in order to have a greater impact on the nutritional status of young children. To improve the operation of such programmes and to have an impact on the nutrition and growth of young children, it is necessary to identify the characteristics of the programme and of the beneficiaries which maximize the impact of supplementary feeding on nutritional status as assessed by growth. This information can be used for designing and targeting programmes and interventions. The following are some beneficiary–related characteristics that have been associated with the impact of supplementary feeding on the nutritional status of young children, as assessed by different anthropometric indicators: type of malnutrition (wasting vs stunting), degree of malnutrition, time elapsed since the onset of malnutrition, and morbidity, particularly diarrhoeal disease. In addition, the quantity of supplement intake as well as the duration of supplementary feeding are also associated with the size of the impact. Little has been published about the differential effect of the supplement quality on the nutritional status of the beneficiaries.

The rest of this presentation will focus on the evidence of an interaction between supplementary feeding and infection.

The effects of both inadequate dietary intake and diarrhoeal disease have been well established. However, the debate continues concerning the relative importance of each of these factors. Three recent publications provide evidence of interactive effects of dietary intake and diarrhoeal disease on child growth; two of these are results of supplementation trials.

The Longitudinal Study of Bogota, Colombia

Between 1973 and 1980 a longitudinal study on malnutrition and mental development was conducted in Bogota, Colombia. The sample consisted of 456 families belonging to low socioeconomic groups and with a high prevalence of undernutrition, as assessed by weight–forage, in young children. Lutter et al, analyzed information from 241 children who were followed from birth to 36 months of age. The families of these children had been randomly assigned to either a supplemented or an unsupplemented group. Supplements were distributed weekly at a field station and were consumed at home. In order to ensure adequate food intake by the target children, supplements were provided to all family members and were designed to meet a substantial portion of the Recommended Dietary Allowances of the family. At 36 months of age, length, diarrhoeal morbidity, and dietary intake were compared between supplemented and unsupplemented children.

Supplemented children consumed 220 and 253 mcal/d more than the unsupplemented group at 18 and 36 months respectively. Differences in the incidence of diarrhoea between the two groups were not statistically significant. Results showed a statistical interaction between diarrhoea and supplement groups. In supplemented children, attained length at 36 months of age was not affected by diarrhoea. In non−supplemented children, however, diarrhoea did have a negative effect on attained growth. In the unsupplemented group, each day with diarrhoea was associated with a reduction of 0.03 cm in attained length at 36 months. The cumulative effect of this deficit in unsupplemented children with the greatest degree of diarrhoea was 5 cm. In the absence of diarrhoea, no difference was found between supplemented groups, indicating that supplementary feeding has a positive effect on growth only in children who have diarrhoea.

The INCAP Longitudinal Study in Guatemala

Between 1969 and 1977 INCAP conducted a longitudinal study of growth and development in four rural villages in Guatemala. Two of the villages were randomly selected to receive a high−energy high−protein supplement (atole) and the other two villages received a low−energy no−protein supplement (fresco). Both beverages had similar amounts of vitamins and minerals. Martorell, Rivera and Lutter examined the relationship between the percentage of time ill with diarrhoea and growth in length, by type of supplement, in children between 3 and 36 months of age. Children supplemented with atole consumed significantly more supplemental energy than those supplemented with fresco (124 Kcal/day). Energy from the home diet did not differ significantly between the two treatment groups. No difference was observed in the percentage of time ill with diarrhoea between supplement groups. In children receiving atole, the percentage of time spent with diarrhoea did not have a statistically significant effect on growth. In children receiving fresco, the percentage of time with diarrhoea was negatively and significantly related to diarrhoea. For this group, the difference in growth between those with the greatest and the least degrees of diarrhoea was 3.7 cm. As opposed to the findings in the Bogota study, in the absence of diarrhoea, growth of children supplemented with atole was 1.5 cm greater than that of children supplemented with fresco.

A Study in Lima, Peru

Brown and colleagues studied the effects of energy intake (including breastfeeding) and diarrhoeal prevalence on the weight gain of poor urban Peruvian infants. Between 6 and 12 months of age the interaction between energy intake and prevalence of diarrhoea on weight gain was found to be statistically significant. Among infants whose usual energy intake was greater than 75% of the recommended intake, no relationship between diarrhoea prevalence and weight gain was found. However, among infants whose usual intake was less than 75% of the recommended intakes, diarrhoeal prevalence was negatively related to weight gain.

The evidence from the three studies presented argues that the effects on growth of supplementary feeding and diarrhoeal disease are interactive. This implies that supplementary feeding is likely to have a greater impact on growth in children with a high incidence of diarrhoea. Therefore, investments in improving dietary intake (like food aid) directed to groups of children with a high prevalence of diarrhoea is not only desirable but is likely to be more cost effective than such investments directed to groups of children with a low prevalence of diarrhoea. In the absence of diarrhoea, supplementary feeding had an effect on growth in Guatemalan but not in Colombian children. This may be due to a larger deficit in the baseline dietary intake and in the nutritional status of Guatemalan children. A possible mechanism explaining the larger effects in children with diarrhoea is a possible increase in appetite immediately after the diarrhoeal episode. To the extent that appropriate foods are available to meet the increased appetite, the negative effects of diarrhoea on energy balance may be offset.

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Feeding Latin America's Children*

Philip Musgrove

World Bank

*Dr Musgrove's presentation was based on the World Bank publication of this name (Musgrove, 1991); the text here is taken directly from the article published in January 1993 in *The World Bank Research Observer,* **8,** 23–45 – reproduced with the permission of the World Bank.

More than US $1.6 billion is spent annually on 104 programs in nineteen Latin American and Caribbean countries to subsidize or provide food for people supposedly at risk of malnutrition. This amount constitutes only 0.2 percent of these countries' gross national product. If there is no double–counting, these programs reach more than 80 million people, or 21 percent of the population, at a cost of $20 per beneficiary or $4 per capita. Yet some 10 million children are malnourished, which suggests that the expenditures are poorly directed or ineffective. There is little hard evidence that these programs are preventing much malnutrition; even curative results are seldom measured. The effort is too small in some countries with great needs, while other countries have nearly eliminated malnutrition. Where coverage is high, programs – although generally targeted and with sensible criteria – do not always reach the neediest. They may also fail to provide enough food or to combine food with the health care and nutritional education necessary to attack all three root causes of malnutrition: poverty, disease, and ignorance. The evidence, limited mostly to program inputs rather than results, suggests that greater progress against undernourishment is possible even with current spending levels.

It is a commonplace that malnutrition is unacceptably widespread in Latin America and the Caribbean, particularly among preschool–age children (United Nations 1989); that economic growth alone would be very slow to eliminate it; that other means are available to reduce malnutrition more rapidly and surely; that among these means are targeted programs providing some combination of food, nutrient supplements, health care, and education to vulnerable children and their families; and that such programs need not cost an enormous share of a country's resources. These conditions create a need to understand what efforts are under way in the region to reduce malnutrition through such programs, to determine what makes programs more or less effective or efficient, and to improve them where they appear inadequate and extend them where they appear to work as intended.

Answering these questions, which are at the heart of any effort to end malnutrition, is difficult primarily because of poor information. One problem is that information on the prevalence of malnutrition is incomplete and out of date. There are survey data for one country each for 1990 (Paraguay) and 1989 (Brazil) and for two for 1988 (El Salvador and Mexico). But some data are from as long ago as 1978, and those for several countries refer to 1981–82. Many small surveys refer to particular sub–populations, usually defined by geographic region, but it is impossible to tell how well they represent a country's population. And even national samples may be based on 2,000 or fewer children, so that estimates of the prevalence of wasting –low weight for height, the least common form of malnutrition– are derived from just a few dozen underweight children.

A second problem is that almost nothing is known about whether existing programs prevent children from becoming malnourished or restore malnourished children to normal nutritional status. Prevention is intrinsically hard to measure, but curative results are easy to detect; yet even this information is almost universally missing. As a result programs tend to be judged only by measures of input, such as how many

people they enroll, how much food they distribute, or how much it costs to reach one beneficiary or to deliver a given amount of calories, protein, or other nutrients.

A third problem is that the typical program provides surprisingly little information even about its inputs, beneficiaries, and costs. Important data are often missing, incomplete, or open to suspicion. For example, an internal World Bank inventory of nutrition programs in 1990 found that program–level data on beneficiaries in Brazil do not correspond well to household–level responses to questions about enrollment or participation. Using measures of inputs to make inferences about outcomes can be misleading, particularly if inputs are poorly measured to start with.

To enlarge the information available on nutrition programs in Latin America, the World Bank produced a detailed inventory of supplementary feeding programs for mothers and children (and some other programs) under way in mid–1990, with as much detailed information as possible about implementation of programs with the highest coverage in each country (Musgrove 1991). Information was obtained on 104 programs in nineteen countries. This article summarizes the findings of that larger study. Because there are so many programs, tables show data for entire countries only; some program–level data are displayed graphically.

Nature, Size, and Consequences of Malnutrition

In an entire population "malnutrition" can include obesity and diet–related risks of cardiovascular disease, diabetes, or other health problems, but for young children, only two conditions matter. One is being too small according to some physical criterion, defined by a reference population of healthy, well–nourished children (Zerfas 1991; Carlson and Wardlaw 1990; Frisancho 1990). Because this condition is associated with inadequate intake or utilization of macronutrients, it is referred to as protein–calorie or protein–energy malnutrition. The other condition encompasses all the specific or micronutrient deficiencies, of which the most important are iron–deficiency anemia and inadequate intake of vitamin A and iodine.

Protein–calorie malnutrition is defined by low weight for age (underweight), low weight for height (wasting), or low height for age (stunting). Stunting indicates failure to grow normally over extended periods, and it is often considered a sign of chronic malnutrition, such as routine failure to eat enough. It can also result from repeated brief interruptions to growth caused by frequent episodes of illness. Wasting is often described as acute malnutrition, because it tends to result from actual loss of weight. A stunted child may have survived various episodes of wasting, with subsequent recovery of weight but not of normal height. Being underweight for age is a common consequence of stunting, but it can, of course, also result from wasting. Underweight is therefore sometimes used as a measure of global malnutrition reflecting unknown proportions of stunting and wasting.

Children who are malnourished during their early years were often born small or prematurely because their mothers were malnourished during pregnancy. If one measures a child's age from conception rather than birth, then low birth weight at normal gestational age is a form of malnourishment. There is thus no clear separation of maternal and infant malnutrition, which justifies the practice of directing nutrition programs to pregnant women as well as to young children.

In the reference population of U.S. children adopted as a standard by the World Health Organization (WHO) and UNICEF (United Nations Children's Fund), the distributions of all three anthropometric indicators are essentially normal. This means that there is no natural limit below which one can be sure a child is malnourished; any cutoff point is arbitrary. It is becoming standard practice to define moderate malnutrition by values lying between two and three standard deviations below the mean, and severe malnutrition by values more than three standard deviations below the mean, with both the mean and the deviation defined by the reference population.

Defining malnutrition relative to a point on a reference distribution has three important consequences. First, even in the reference population, 2.3 percent of children get identified as malnourished (whether they are or not); therefore, the prevalence of malnourishment should be estimated by the excess over this share. Second, if children in the reference population who look malnourished are considered "small but normal" rather than unhealthy, small–but–normal children can similarly be present in any other population. Thus, aside from the question of excess prevalence, there is a problem of identifying individuals. A child whose height or weight falls more than two standard deviations below the mean may not really be malnourished; if the prevalence of malnutrition in the population is low, this error becomes more likely. Conversely, a child not classified as malnourished may in fact have grown more slowly than is normal. These errors matter little when estimating prevalence in large groups–in part because they cancel each other out–but they complicate assessing how well a program is targeted. And third, the status of an individual child is better judged by growth through time

than by current weight and height. Every child can be thought of as having a growth path, and failure to grow along that path is a surer sign of trouble than simply falling far below the mean.

The most recent country–level data on the prevalence of malnutrition in eighteen Latin American countries show that some 10–11 million preschool children in these countries are underweight for age (table 1). (There are no recent national data for Argentina.) Even more–perhaps 15 million–are moderately or severely stunted. Wasting is much less common, affecting perhaps 1–2 million children (no estimate is available for Brazil). Comparison across countries is hampered by differences in timing, definition, and accuracy of national estimates. Even so, there is no doubt that the bulk of malnutrition is found in a few countries with very large populations (Brazil and Mexico), with substantial concentrations of poverty (Bolivia, Guatemala, Haiti, and Peru), or both. Prevalence of low weight for age appears to exceed 30 percent in Brazil, Guatemala, and Haiti and to fall below 10 percent only in Chile, Costa Rica, Jamaica, Paraguay, and Uruguay. The prevalence of stunting is estimated to equal or exceed 40 percent in Bolivia, Guatemala, and Haiti, while the prevalence of wasting never surpasses 10 percent and often is less than 1 percent.

Causes of Malnutrition and Interventions to Reduce It

How to combat malnutrition depends on its causes, which fall into three broad classes: poverty, illness, and ignorance. For poverty to be the only cause of malnutrition, it is not enough for the two phenomena to be closely associated. It is also necessary that increases in income be translated into increases in food consumption and reductions in the prevalence of malnutrition; removing the cause should remove the effect. The close association of poverty and malnutrition (World Bank 1979; Gray 1982) has sometimes led to the erroneous conclusion that illness and ignorance are minor contributors and that the only intervention necessary is to give poor families more money. This conclusion ignores a second finding of these same studies, which is a very low tendency to spend additional income on food, particularly on calories.

The evidence that responsiveness of food intake to income changes is very low has in turn been challenged on two fronts. Elasticities are estimated to be much larger among the poor than for the population as a whole (Musgrove 1985; Musgrove 1989, table 22; Senauer 1990), so that poverty appears as an important cause of malnutrition. And since nutritional state does not depend on food consumption alone, higher income can mean better nutrition because of its contribution to the other determinants of nutritional status, such as health and education (Schiff and Valdes 1990). In any case, whether attacking poverty in general is the best way to improve nutrition also depends on how quickly poverty can be reduced.

Illness contributes directly to malnutrition in three important ways. A sick child may eat too little or fail to eat a balanced diet. Illness can lead to loss of nutrients, particularly during diarrhea, or interfere with nutrient absorption. And parasites such as helminths compete with the host for the nutrients in food, causing iron–deficiency anemia through loss of blood. By some estimates sickness is the most important cause of malnutrition and the factor that does the most to explain why some poor children are malnourished and others–even siblings–are not (Shrimpton 1984). Illness is more likely to lead to malnutrition among the poor than among those who are better off, because poor children are likelier to have marginal nutrient reserves at the start of an illness and because poor families can less easily buy food or medical care to promote a child's recovery.

Of the three general causes of malnutrition, ignorance is the most difficult to measure and the most subject to emotional interpretation. To say that children are malnourished because their parents do not know how to care for them sounds like blaming the victims for the problem. It is not true that the poor are malnourished simply because they are ignorant about what they should eat and so spend their limited incomes on the wrong foods. But there are three important ways that more specific kinds of ignorance contribute to malnutrition. The first is that people may know nothing about micronutrients, especially vitamins, so they fail to eat even the cheap and readily available sources. The second is ignorance about disease and its causes and consequences. Valuing good health is not enough; neither is depending solely on one's immune system. Third, people are often specifically ignorant about how to care for very young children: they may undervalue breastfeeding, or believe that food and even water should be withheld from a sick child, or simply not recognize that growing children need to eat more, in relation to their weight, than adults.

If there are three general causes of malnutrition, there are three corresponding interventions to combat it. One is to create or transfer income, in the form of money or goods such as foodstuffs. The second is to prevent or cure the illnesses that contribute to childhood malnutrition. This can include providing health care services, improving sanitation, and distributing micronutrient supplements. Because such supplements may be fortified foodstuffs, there obviously is no clear line between giving away food (basically an income transfer) and giving away a particular nutrient (a health intervention). The third intervention is to change what people know or

believe–to educate them about nutrition, child care, and health.

Table 1. *Estimated Prevalence of Malnutrition among Children under 5 Years, by Country*

		Type of malnutrition[b]			
Country	***Year***	***Global (number)***	***Global (percent)***	***Stunting (percent)***	***Wasting (percent)***
Bolivia	1981	609,000	14.5	42.7	0.7
	1987[c,d]	760,200	18.1	–	–
Brazil	1989[e]	5,024,200	30.7	–	–
Chile	1986	35,000	2.5	9.6	0.5
Colombia	1977–80	684,700	16.7	22.4	4.6
	1986[f]	487,900	11.9	22.7	1.0
Costa Rica	1982	24,000	6.0	7.8	2.0
	1987[b,c]	10,800	2.7	6.4	–
Dominican Republic	1986[f]	125,000	12.5	20.8	2.3
	1987[b]	58,000	5.8	12.8	1.8
Ecuador	1986	264,000	16.5	34.0	1.7
El Salvador	1988	123,200	15.4	26.8	2.3
Guatemala	1987[f]	502,500	33.5	57.9	0.4
Haiti	1978	342,000	37.4	39.6	8.9
Honduras	1987	164,800	20.6	33.9	1.9
Jamaica	1985[g]	43,800	14.6	7.1	5.1
	1989[h]	21,900	7.3	29	2.1
Mexico	1988[i]	1,584,600	13.9	22.3	6.3
Panama	1980	47,100	15.7	22.0	6.4
	1980[c]	47,400	15.8	25.1	6.1
Paraguay	1990[i]	25,200	4.2	20.3	0.4
Peru	1984	428,800	13.4	37.8	0.9
Uruguay	1987	20,500	7.4	15.9	–
Venezuela	1981–82	275,400	10.2	6.4	1.3

– Not available

Note: Except as indicated, prevalence is calculated using the reference median minus two standard deviations, or according to the World Health Organization (WHO) definitions of less than 80 percent of the reference median for global malnutrition (weight for age) and wasting (weight for height) and less than 90 percent of the reference median for stunting (height for age). These two definitions coincide approximately for the 0–5 year age group; estimates based on the Gomez definition (less than 75 percent of the reference median) would be lower.

a. Data for Argentina are not included because no recent national estimates were available.
b. Data from WHO (1989), except as indicated: same data reported in Carlson and Wardlaw (1990)
c. Data from PAHO (1990), vol. 1, tables 86–88; sample sizes and age ranges not indicated.
d. Data refer to children brought to health service centers; not a representative sample.

e. Data from INAN (1990); malnutrition defined as less than 75 percent of reference median (Gomez definition).
f. Children aged 6–36 months or 4–36 months, rather than 0–60 months. Estimate of number of malnourished children assumes the same prevalence for the entire population under 5 years of age.

g. Jamaica Ministry of Health (1985).
h. Statistical Institute of Jamaica (1991)
i. World Bank staff estimates. j. Institute for Research Development/Westinghouse (1991).

Source: Musgrove (1991)

Consequences: Malnutrition and Human Capital

Malnutrition may cause no apparent problem because the body compensates for inadequate nutrient intake by growing more slowly or by reducing its physical activity. But compensation works only for low levels of deprivation, and even then an apparently successful compensation can be costly. A child who is anemic or calorie–deficient will be lethargic and will develop and learn more slowly, perhaps retaining a permanent deficit. Malnourished children are also subject to more frequent and more severe infections (Frisancho 1979, ch. 13; Tomkins and Watson 1989), which exacerbate the initial malnutrition, as well as interfering with their early learning and later with their schooling (Pollitt 1990). Malnutrition therefore leads to a waste of resources in both education and health, apart from the damage to children's development. Conversely, children who benefited from an effective program to protect their nutritional status may show the gains in schooling, health, and income many years afterward (Martorell 1991).

Because information on the prevalence of malnutrition is so sketchy and the consequences for health, learning, and productivity are often hard to quantify and are just beginning to be well understood (Behrman 1991), it is not possible to estimate the total economic damage caused by malnutrition in Latin America and the Caribbean. But it is increasingly clear that such damage exists, beyond the pain and suffering associated with more severe nutritional deficiencies, and that the damage is probably substantial, particularly when all the interactions among nutrition, health, and development are taken into account (Selowsky 1981).

Major Findings: A Summary

Some results of the study merit more extensive discussion, but it will be helpful first to summarize the principal findings that emerge from the review of detailed program information.

• There are now a very large number of food programs in Latin America and the Caribbean. Nonetheless, some countries still have few or no programs. Perhaps the most striking cases are Haiti, with a serious problem of childhood malnutrition but only one small maternal and child health program, and the Dominican Republic, which has only a small school feeding program covering 7 percent of the target age group.

• Food transfers per beneficiary vary enormously. Some are undoubtedly too small to have any effect on nutrition or even to alleviate poverty significantly; others may be overgenerous. However, there does not seem to be any standard for the "right" size of transfer.

• The calorie–protein composition of food transfers varies much less than the total amounts. Most programs pay no attention to possible micronutrient deficiencies, but there is no systematic evidence that the composition is incorrect or that the wrong foods are being used. The criteria for selecting foods are generally sensible, at least within the limits set by dependence on foreign donations in many programs.

• Costs per beneficiary per year vary enormously, chiefly because of variation in the amount of food provided. Food costs and total costs are highly correlated: variation in total costs primarily arises not from differences in administrative costs, but from differences in what is

spent on food.

• Costs per nutrient unit (calories or protein) bear surprisingly little relation to costs per beneficiary or to the number of beneficiaries. There is no evidence of economies of scale over the large range of program sizes considered.

• If no beneficiaries are double–counted, then coverage of the target population is often very high. When several programs are directed to the same age group or when the target population spills over the intended age limits, coverage can exceed 100 percent. In countries where many people participate in one or more programs, malnutrition is due not simply to a lack of coverage, but to some combination of poor targeting, insufficient food transfers, and failure to attack the other causes of malnutrition.

• Most programs include sensible targeting criteria, but too little is known about the population excluded from programs to tell whether targeting in fact works well. Simple failure to target is generally not the only, and perhaps not the principal, reason for poor effectiveness.

• Unrestricted subsidies are rare, except in school feeding programs, where they may be justified. As the number of programs has increased in the past decade, more have been targeted on maternal and child health.

• Although most maternal and child health programs–and some programs of other types–claim to provide complementary services (health care or health and nutrition education), there is little evidence that these services correspond to needs or are effective.

• Nearly all programs suffer from logistic inadequacies. Programs need adequate storage facilities, vehicles for transport, and systems of supervision to prevent spoilage and theft. Cost–effectiveness does not mean minimizing total cost, and it particularly does not mean minimizing nonfood costs.

• Most programs proclaim reasonable objectives, but only in such vague and qualitative ways that it is difficult to tell whether they are being met. Espousing a variety of goals also leads to treating progress toward any of them as an indication of program success.

• Most programs have never been evaluated, or at least their effect on the beneficiaries has never been measured. The programs that have been evaluated show mixed and generally disappointing results, although a few evaluations are much more favorable.

Type and Number of Beneficiaries

Of the 104 programs, 54 are intended to cover infants aged 5 or younger, 31 involve pregnant or lactating women, 30 are for school children, 23 focus specifically on malnourished children, and 28 are addressed to entire families. In some cases food is regularly distributed to other classes of beneficiaries, such as the elderly or handicapped, or as a payment in kind to volunteers, day–care providers, or other collaborating personnel.

Except when a program is open to the public and does not identify its beneficiaries, it is easy to describe the intended beneficiaries. Much more difficult is finding out how many beneficiaries there really are. Some errors arise for conceptual reasons: individual beneficiaries may participate irregularly, so that the number of people benefiting at a given moment and the number benefiting over an interval are quite different. But often the difficulty of counting beneficiaries arises from a failure to keep accurate records, perhaps aided by political pressures to inflate the numbers.

On the input side of a program that involves giving away or subsidizing food, there are three fundamental quantitative variables: the number of beneficiaries, the amount of food distributed, and the expenditure on the program, all during some interval. There is much other important information, but it is generally qualitative–the mechanisms of beneficiary selection and food transfer, the nature of the food provided, and so on–or, if quantitative, it refers to other program inputs such as immunizations, micronutrient supplements, or educational interventions. From the three basic variables–people, food, and money–ratios for judging the adequacy of a program are commonly created. These ratios are the amount of food distributed per beneficiary, the unit cost of food, and the amount spent per beneficiary.

In principle, any of these ratios can be derived from the other two, since they are tautologically related–a program that spends a lot per kilogram of food will either spend a lot per beneficiary or give each beneficiary rather little food. Differences in cost per beneficiary between two programs can always be "explained" by differences in the amount of food a beneficiary gets or by how expensive that food is to obtain and distribute. Unfortunately, all three variables are subject to errors in measurement, and an erroneous value in just one variable leads to two erroneous ratios. For example, overcounting beneficiaries makes a program appear less costly per person than it really is and "explains" that result by a small food transfer per person.

The number of beneficiaries covered by the 104 programs varies greatly, from fewer than 1,000 individuals in one program in Bolivia to almost 28 million in the Brazilian school lunch program. The average is slightly under 1 million. Eleven programs have more than 3 million beneficiaries, and 18 each have more than 1 million. At the other extreme are 53 programs with fewer than 100,000 beneficiaries each; these are almost all maternal and child health programs.

To estimate the total numbers of individual beneficiaries, individuals in families covered by some of the programs had to categorized and counted. For those purposes it was assumed that 20 percent of the family individuals were mothers, 30 percent were children under 5 years, 30 percent were children of primary school age, and the remaining 20 percent were older children and adults. The total number of pregnant and lactating women could not be estimated because many programs do not report that information. With these adjustments, individual coverage, aggregated for each of the nineteen countries, reaches about 9.8 million adult women, 27.3 million preschool children, 51.9 million school–age children, and 10.3 million other beneficiaries (table 2). Ninety percent of these estimated 99 million beneficiaries are concentrated in six countries: Brazil (58 million), Mexico (almost 15 million), Peru (more than 8 million), and Argentina, Colombia, and Venezuela (more than 3 million each).

Looking at this beneficiary count by country and by type of program–take–home food distribution, direct feeding (including school feeding), or subsidy–shows essentially equal numbers of take–home and direct feeding programs (table 3). Direct feeding programs, however, cover almost twice as many beneficiaries on average–a little under a million people versus half a million for the take–home programs. Subsidy programs are the largest, on average, with nearly 2 million estimated beneficiaries. The size ranges overlap considerably, with the greatest variation found among the take–home programs (figure 1).

Comparing the program totals for preschool children in each country (Argentina and Panama are excluded for lack of data) to the numbers of malnourished children (from table 1) shows a rough proportionality, but a malnourished child's chance of participating in some kind of program still differs enormously according to country (figure 2). Pan of this variation arises, of course, because maternal and child health programs are directed not only at children who are malnourished, but also at children at risk. If the group at risk were adequately covered by programs that effectively prevented malnourishment, there would be more beneficiaries than malnourished children. What is clear is that enrolling large numbers of beneficiaries can still leave many children suffering from malnutrition.

Information on beneficiaries as a percentage of the target population by country and by type of beneficiary is fairly complete for age groups (table 4); much less is known about coverage according to other criteria, such as poverty or the presence of specific risks of malnutrition. Coverage of children varies widely among countries: from 1.9 percent in Haiti to 96 percent in Chile for children under 5 years of age (the average is 50 percent) and from 7 percent in the Dominican Republic to more than 100 percent in Brazil and Uruguay for school–age children (the average is 80 percent). (Coverage above 100 percent reflects two kinds of double–counting: the same child may participate in more than one program, and the primary enrollment rate can exceed 100 percent because repetition keeps some children in school beyond the normal age limit.)

The proportion of the total population covered also varies widely, with one person in every seven receiving some kind of benefit from a food or nutrition program in ten countries (Bolivia, Brazil, Chile, Colombia, Costa Rica, Guatemala, Honduras, Mexico, Peru, and Venezuela). Finally, under the generous assumption that all programs are limited to the poor, or at least concentrated on them, 55 percent of the estimated poor population of eleven countries is reached by some kind of program, with coverage ranging from 5.8 percent in Haiti to 88 percent in Brazil and Uruguay. The higher the coverage, of course, the less plausible is the assumption of perfect targeting.

These estimates suggest three conclusions. First, malnutrition does not persist solely because the programs directed against it are too few and too small. Second, the relatively high coverage is far from universal; in some countries only a small share of a target population appears to participate, and fewer than half of schoolchildren benefit in seven of the countries studied. Third, "coverage" is just head–counting unless more

is known about the characteristics of beneficiaries and what a program does for them.

How adequate is this coverage, relative to the magnitude of malnutrition in each country? And how large and how adequate is the expenditure on food and nutrition programs? Before trying to answer these questions, it will help to look at what food the programs actually provide and how much the programs actually cost.

Food Distributed and Program Costs

All the data refer to food "delivered," that is, brought to the point where beneficiaries can eat it. Delivered amounts may not represent additional consumption by the intended beneficiary, however, for three possible reasons. First, the food may be wasted and therefore not be eaten by anyone. Second, the food may be consumed by someone other than the person for whom it was intended. By definition, this problem can arise with take–home programs but not with programs that directly feed the beneficiary. For that reason take–home programs commonly include some effort to persuade the family not to share the food, and in some cases they provide food designed to be palatable only to the intended recipient. Third, even if the beneficiary eats all the food provided, wasting none and sharing none, total intake may increase by much less than the transfer. The family may compensate by feeding that member less of other foods, so as to be "fair" to the other members. This is most likely to occur when the beneficiary is a small child who receives meals away from home.

Table 2. *Total Number of Beneficiaries by Country and Type of Beneficiary (Redistributed)*

Country	***Women***	***Children under 5 years***	***Primary school children***	***Older children and other adults***	***Total number***
Argentina	383,263	968,228	1,827,182	31,787	3,210,460
Bolivia	188,743	482,227	317,764	110,288	1,099,022
Brazil	4,670,713	13,957,298	33,142,040	5,936,408	57,706,459
Chile	116,316	1,342,208	461,041	1,910	1,921,475
Colombia	465,106	1,197,966	1,559,477	50,079	3,272,628
Costa Rica	11,527	64,554	386,135	–	462,216
Dominican Republic	–	107,095	70,000	–	177,095
Ecuador	28,050	172,955	795,939	–	996,944
El Salvador	41,398	110,820	224,804	–	377,022
Guatemala	14,137	254,292	1,239,520	–	1,507,949
Haiti	8,630	16,946	–	–	25,576
Honduras	32,256	140,000	548,578	16,129	736,963
Jamaica	40,000	169,620	95,000	80,000	384,620
Mexico	1,931,149	5,037,724	5,941,721	1,945,149	14,855,743
Panama	–	–	58,860	–	58,860
Paraguay	18,365	21,565	82,500	–	122,430
Peru	1,712,065	2,704,801	2,478,194	1,452,130	8,347,190
Uruguay	7,122	139,564	367,266	406,516	920,468
Venezuela	110,266	448,185	2,323,685	240,400	3,122,536
Total	9,779,106	27,336,048	51,919,706	10,270,796	99,305,656

– Not available.

Note: Beneficiaries covered as families were redistributed as follows: 20 percent to women (mothers), 30 percent to children under 5 years, 30 percent to primary school children, and 20 percent to older children and other adults.

Source: Musgrove (1991).

Table 3. *Numbers of Programs and Beneficiaries by Country and Mode of Food Distribution*

	Take–home		***Direct feeding***		***Food subsidies***	
Country	***Programs***	***Beneficiaries***	***Programs***	***Beneficiaries***	***Programs***	***Beneficiaries***
Argentina	1	990,521	3	2,219,939	n.a.	n.a.
Bolivia	8	333,006	9	366,016	1	400,000
Brazil	3	16,031,162	1	27,993,257	3	13,682,041
Chile	1	1,354,404	6	567,091	n.a.	n.a.
Colombia	1	29,117	3	2,385,028	2	858,483
Costa Rica	3	58,858	2	403,358	n.a.	n.a.
Dominican Republic	1	89,095	1	88,000	n.a.	n.a.
Ecuador	1	66,045	6	920,899	1	10,000
El Salvador	1	152,218	1	224,804	n.a.	n.a.
Guatemala	3	268,429	1	1,239,520	n.a.	n.a.
Haiti	1	25,576	n.a.	n.a.	n.a.	n.a.
Honduras	2	107,520	2	629,443	n.a.	n.a.
Jamaica	1	4,620	1	80,000	n.a.	n.a.
Mexico	3	610,633	n.a.	n.a.	7	14,245,110
Panama	n.a.	n.a.	1	58,860	n.a.	n.a.
Paraguay	1	21,565	2	100,865	n.a.	n.a.
Peru	3	527,435	4	4,554,895	2	3,264,860
Uruguay	6	638,242	3	263,880	1	18,346
Venezuela	3	168,266	5	2,954,270	n.a.	n.a.
Total	43	21,476,712	51	45,050,125	17	32,478,840

n.a. Not applicable
Source: Musgrove (1991).

Table 4. *Program Coverage as a Percentage of the Total Population, by Country and Type of Beneficiary*

	Population under 5			***Primary school population***			***Total population***			***Poor***
		Covered			***Covered***			***Covered***		
Country	***Total (millions)***	***Millions***	***Percent***	***Total (millions)***	***Millions***	***Percent***	***Total (millions)***	***Millions***	***Percent***	***Total (millions)***
Argentina	3.2	0.968	30.3	3.2	1.827	57.1	31.9	3.211	10.1	–
Bolivia	1.2	0.482	40.2	1.2	0.318	26.5	7.1	1.099	15.5	–

Brazil	18.7	13.957	74.6	27.0	33.142	122.8[a]	147.3	57.706	39.2	
Chile	1.4	1.342	95.9	2.6	0.461	17.7	13.0	1.921	14.8	
Colombia	4.1	1.198	29.2	3.3	1.559	47.2	32.3	3.199	9.9	
Costa Rica	0.4	0.065	16.3	0.4	0.386	96.5	2.7	0.462	17.1	
Dominican Republic	1.0	0.107	10.7	0.1	0.070	7.0	7.0	0.177	2.5	
Ecuador	1.6	0.173	10.8	1.6	0.796	49.8	10.3	0.997	9.7	
El Salvador	0.8	0.111	13.9	0.8	0.225	28.1	5.1	0.377	7.4	
Guatemala	1.5	0.254	16.9	1.5	1.240	82.7	8.9	1.508	16.9	
Haiti	0.9	0.017	1.9	0.9	–	–	6.4	0.026	0.4	
Honduras	0.8	0.140	17.5	0.8	0.549	68.6	5.0	0.737	14.7	
Jamaica	0.3	0.170	56.7	0.3	0.095	31.7	2.4	0.385	16.0	
Mexico	11.4	5.038	44.2	11.4	5.942	52.1	84.6	14.856	17.6	
Panama	0.3	–	–	0.3	0.059	19.7	2.4	0.059	2.5	
Paraguay	0.6	0.022	3.7	0.6	0.083	13.8	4.2	0.122	2.9	
Peru	3.2	2.705	84.5	3.2	2.478	77.4	21.2	8.347	39.4	
Uruguay	0.3	0.140	46.5	0.3	0.367	122.3[a]	3.1	0.920	29.7	
Venezuela	2.7	0.448	16.6	4.6	2.324	50.5	19.2	3.123	16.3	
Total	54.4	27.337	50.3	65.0	51.921	79.9	414.1	99.232	24.0	

– Not available.

a. Coverage can exceed 100 percent, reflecting participation In more than one program and/or children who remain in school beyond the normal age limit (5–9)

b. Assuming one–half of all subsidy beneficiaries and one–fourth of all school lunch beneficiaries are poor.

c. Percentage of the estimated population under the poverty line in the countries with data on poverty; the real value of the poverty line may vary among countries.

Source: Musgrove (1991).

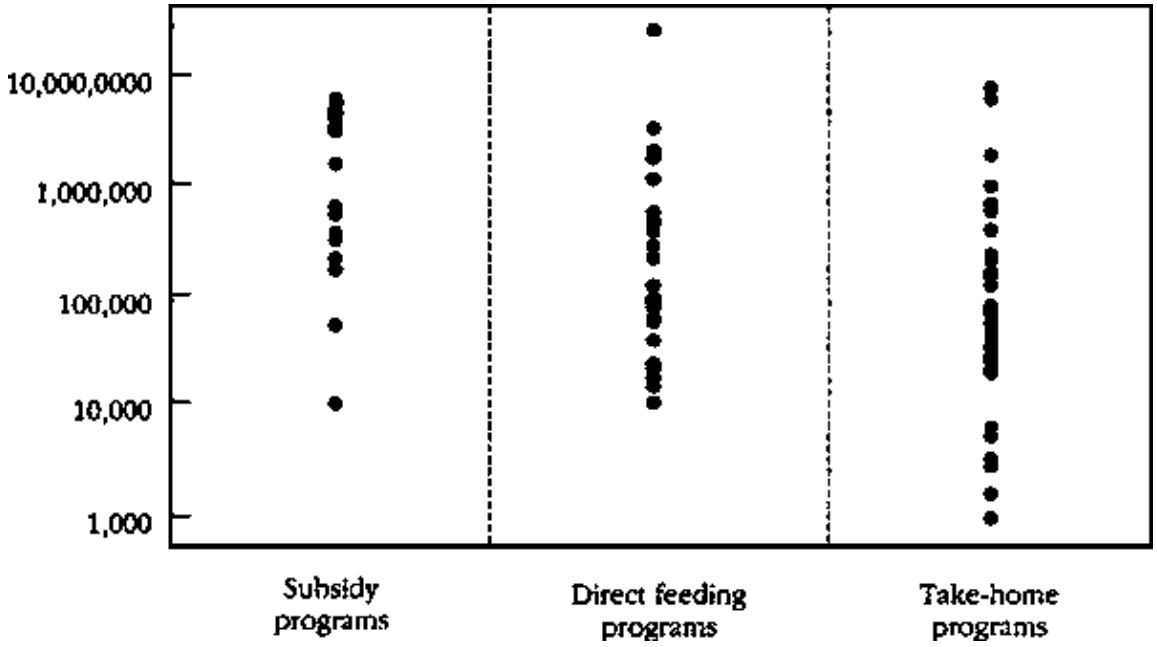

Figure 1. *Number of Beneficiaries by Type of Program (logarithmic scale)*

Source: Musgrove (1991).

Figure 2. *Number of Malnourished Children and Beneficiaries under 5 Years in Seventeen Latin American Countries (logarithmic scale)*

Note: Data for Argentina and Panama were not available.
Source: Musgrove (1991).

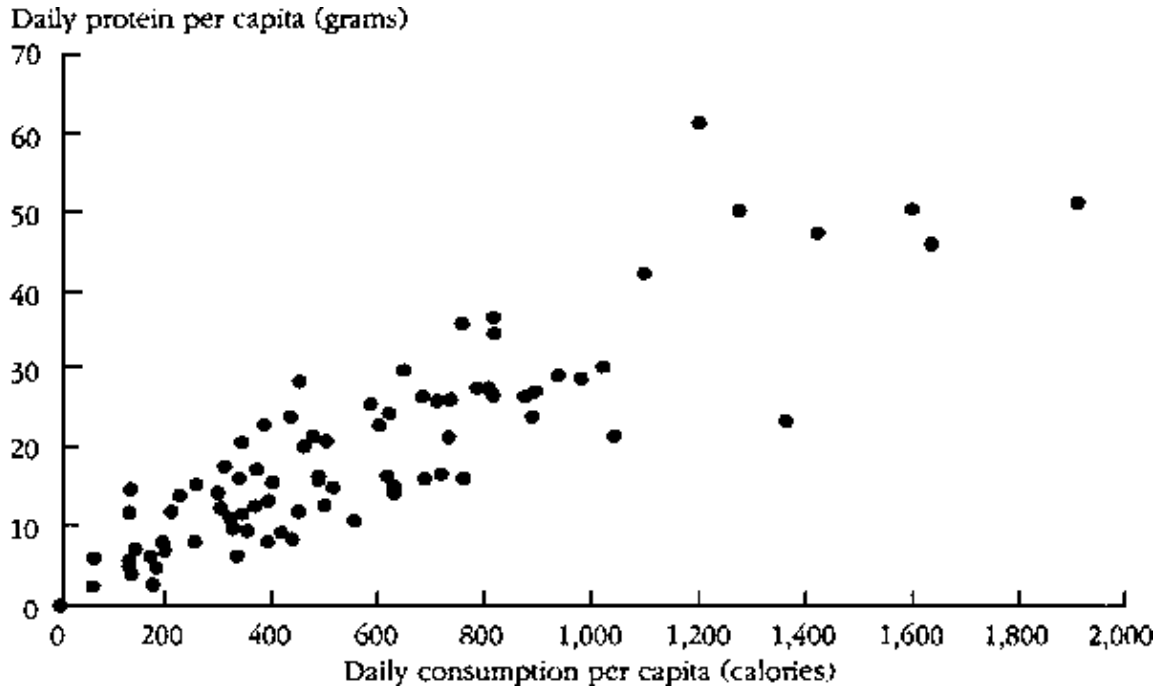

Figure 3. *Planned Daily Supply of Calories and Protein per Individual Beneficiary for All Programs*

Source: Musgrove (1991).

Data on the daily supply of calories and protein per individual beneficiary show planned rations ranging from 75 to 1,936 calories and from 2.5 to 50.8 grams of protein, with a mean of 616 calories and 20.6 grams of protein. Because many programs operate for less than a full year, annualized figures are lower (494 calories and 16.3 grams of protein). Displaying this information for all kinds of programs together (figure 3) demonstrates how much programs vary in the amount of food provided and in the protein–calorie balance, which shows considerable dispersion around a trend of approximately 30 calories per gram of protein. Actual supplies (not shown in figure 3) tend to fall below those planned–generally, the greater the planned supply, the larger the shortfall. Unexpectedly, the actual supply shows less dispersion in the ratio of calories to protein; calories supplied fall short of planned amounts more often than protein supplied does, despite the higher cost of protein–rich foods.

Programs to combat malnutrition should be judged by the cost of obtaining some nutrition–related result or some other outcome, such as improved health or learning. In the absence of information on outcomes, data on costs are usually related to the number of beneficiaries and the volume or nutritional value of food distributed. Estimates of program costs per beneficiary are subject to errors in either the numerator or the denominator; beyond that, they are poor proxies for program efficiency because high spending per beneficiary may be associated with low cost per case of malnutrition prevented or cured.

A comparison of beneficiary numbers and costs per beneficiary shows no apparent relation, in particular no evidence of economies of scale across programs. At very small size, high unit costs might be expected because of some minimum administrative expenditure, but the evidence is that all the programs studied are large enough for their costs to be unaffected by size or else that errors in the data hide any relation. Estimates of food cost and total cost per beneficiary show clearly that food costs are an almost constant share of total costs and that the variation that does occur is independent of cost per beneficiary (figure 4; for the many programs that provided only one of these estimates, the observations are presented along the corresponding axis of the figure). If the cost per calorie transferred were constant, then the caloric content of the ration and the food cost per beneficiary would be proportional. A comparison of the data shows only a rough proportionality (figure 5). More food per beneficiary means more cost, but the cost per calorie is far from uniform, in part because of variation in the composition of the ration.

To assess the overall adequacy of program effort by country, table 5 pulls together data on country population and gross national product (GNP), estimates of the prevalence of malnutrition, and cost data and beneficiary numbers for the eighty–three programs for which cost estimates are available. More than one–fifth of a total population of 414 million in the nineteen countries appear as beneficiaries, so if programs were well targeted and transferred enough food and other services to make a difference, the coverage attained should be sufficient to reduce malnutrition to very low levels. Of course, the share of the population benefiting is far from uniform: it reaches more than one–third in Brazil but falls below one–tenth in the Dominican Republic,

Ecuador, El Salvador, Haiti, Panama, and Paraguay.

The total cost of these programs exceeds $1.6 billion, which is just under $20 per beneficiary, or about $4 per capita. 1 Costs per beneficiary of $10 or less are found only in Guatemala, Mexico, and Venezuela. Relatively high expenditures occur in Chile, Costa Rica, Jamaica, and Peru. On average, expenditures on these programs represent one–fifth of 1 percent of GNP, which is not a trivial sum but is still far from being an unbearable burden. If these expenditures were concentrated on the nutritionally neediest one–tenth of the population, that would mean a transfer on the order of $40 per beneficiary per year.

Comparing the number of "potential" beneficiaries to the number of malnourished children provides some notion of how well the programs in a country are responding to its nutrition problems (last two columns of table 5). To estimate the number of potential beneficiaries that could be covered for the same total cost, total program expenditure is divided by a constant cost of $35 per beneficiary per year. This $35 unit cost is equal to that of a large, relatively successful maternal and child health program in Chile, the Programa Nacional de Alimentacion Complementaria, or National Supplementary Food Program (Castaneda 1985; Torche 1985). It is also comparable to unit expenditure in several of the countries studied, including some of the poorer countries such as Ecuador and Honduras, which suggests that it is affordable. At that unit cost the $1.6 billion spent on these programs could adequately cover 47 million beneficiaries, or about 56 percent of present total coverage and 12 percent of total population.

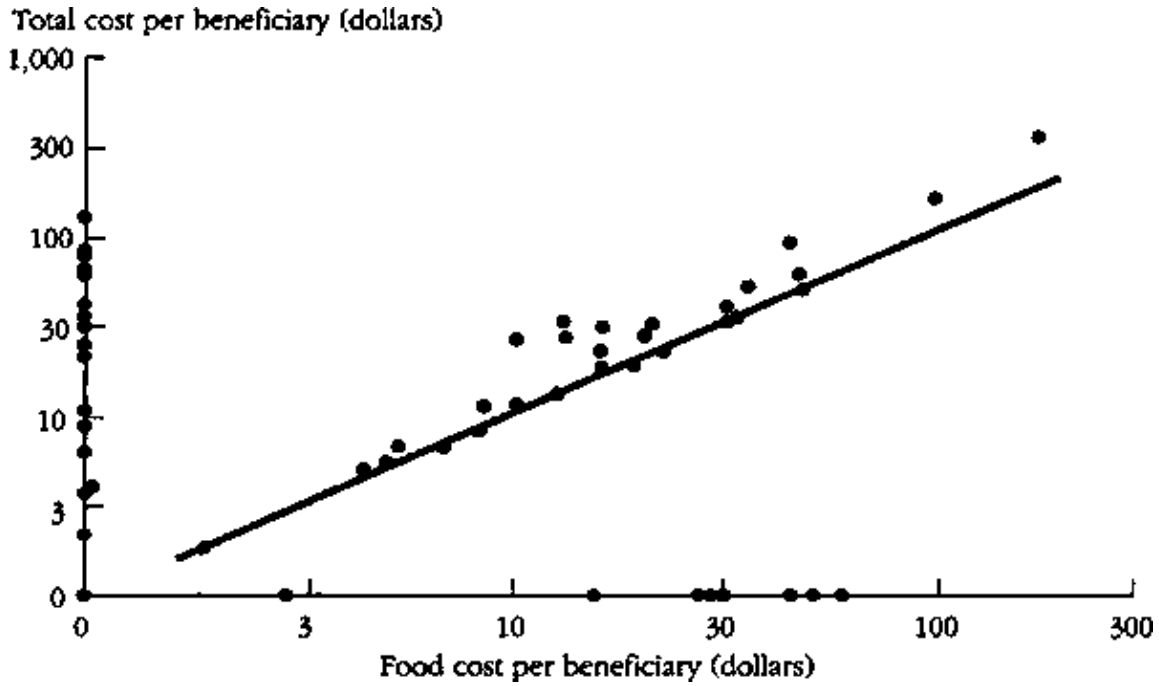

Figure 4. *Food Cost and Total Cost per Beneficiary per Year (logarithmic scale)*

Source: Musgrove (1991).

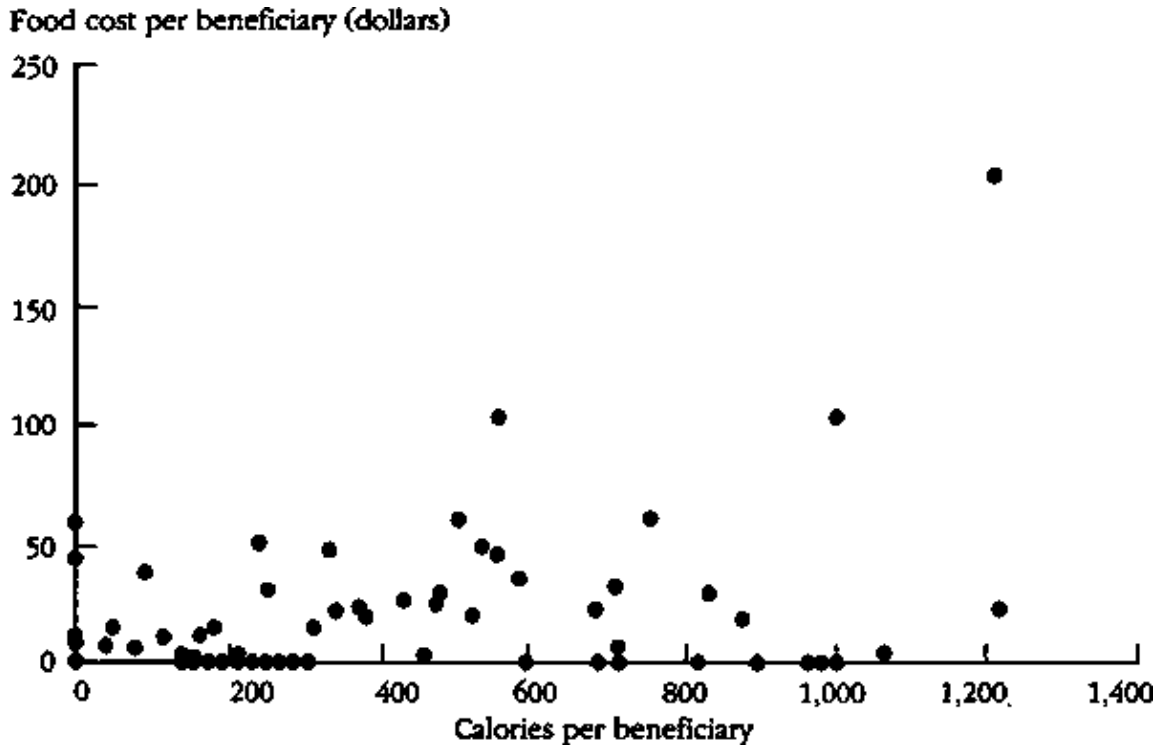

Figure 5. *Number of Calories and Food Cost per Beneficiary for All Programs*

Source: Musgrove (1991).

Forty–seven million beneficiaries is only a little more than the current coverage, but it is nearly five times the number of malnourished children in eighteen of these countries (data for Argentina are unavailable, see last column of table 5). Of course, programs should not be limited to children who are already malnourished. For every malnourished child, several others are at risk of being malnourished and should be covered if a program is to have any preventive effect; mothers of children who are malnourished or at risk should also be covered to protect their own health and to ensure greater benefit to their children. If the resources now being spent were concentrated on currently malnourished children and on about four other needy beneficiaries for each such child, it seems plausible that malnutrition could be largely eliminated from the region.

In fact, malnutrition has not been eliminated: some 10 million children in the countries studied are malnourished. One reason is that the relation of potential beneficiaries to actual needs varies enormously among countries. At one extreme is Chile, where malnutrition has been reduced so far that current spending could cover seventy times as many beneficiaries as there are malnourished children in the country. At the other extreme are countries where current spending simply would not be enough. This is the case in Bolivia and Guatemala, which could only provide for some three–fourths of children in immediate need. Colombia, the Dominican Republic, and Mexico spend enough to reach all potential beneficiaries who are currently malnourished but almost surely not enough to cover all the population at risk.

Ineffective use of resources within countries is the other reason why the substantial level of expenditure reported here has not succeeded in eliminating malnutrition. This is a consequence of diluting resources over too many beneficiaries, spending resources on food transfers with little or no health or educational component, directing resources to adults and families who may be poor but who are often not at risk of malnutrition, and wasting some part even of resources that are well targeted. Brazil provides an example: its expenditure of nearly $1 billion could, at $35 per beneficiary, cover 26 million people, or 5.2 times the number estimated to be malnourished. Yet the prevalence of malnutrition in the country is estimated at 30.7 percent, almost as high as in much poorer countries such as Guatemala and Haiti.

Program Effectiveness

The information on programs does not describe their outcomes, so it does not provide answers about what works and what does not. Such answers can come only from evaluation, and much is already known from a variety of programs in various countries (Anderson and others 1981; Beaton and Ghassemi 1982; Feachem 1983; Mora, King, and Teller 1990; Musgrove 1989) and from the specific experience of the World Bank in promoting and financing nutrition projects or nutrition components of projects (Berg 1987).

To prevent or cure protein–calorie malnutrition, programs need to satisfy a short list of crucial requirements:

• Programs need to target the population according to the risks of malnutrition, not necessarily waiting for nutritional damage to occur, and to be more concerned with errors of exclusion than of inclusion.

• Programs must be stable through time, because the status and needs of beneficiaries vary over time, and a program that cannot deliver food or services when needed is of no use. Programs should off set–not exacerbate–the instability in the lives of their beneficiaries.

• Programs should be able to detect problems or possible sources of problems–growth faltering, illness, pregnancy, failure in school–quickly, and then respond to them rapidly.

• Programs need to respond with the right mixture of interventions, from food distribution to health care and education, to head off malnutrition or correct it once it begins, with relatively small transfers of food and with no lasting damage to the child.

Table 5. *Program Cost and Actual and Potential Coverage by Country*

		Population covered		***Program cost***					***Potential ben***	
Country	***Total population (millions)***	***Millions***	***Percent***	***Total (millions of dollars)***	***Per beneficiary (dollars)***	***Per capita (dollars)***	***GNP[a] (millions of dollars)***	***GNP spent on programs (percent)***	***Millions***	***ma***
Argentina[c]	31.9	0.3	0.8	8.9	35.02	0.28	53,070	0.02	0.26	
Bolivia	7.1	1.0	14.7	22.0	21.07	3.09	4,520	0.49	0.63	
Brazil	147.3	53.7	36.5	907.5	16.90	6.16	319,150	0.28	25.93	
Chile	13.0	1.8	14.0	86.9	47.76	6.69	25,250	0.34	2.48	
Colombia	32.3	3.2	9.9	44.4	13.87	1.37	39,410	0.11	1.27	
Costa Rica	2.7	0.4	15.0	18.0	43.93	6.67	5,220	0.35	0.51	
Dominican Republic	7.0	0.2	2.5	4.9	28.82	0.70	6,650	0.07	0.14	
Ecuador	10.3	1.0	9.6	32.6	32.92	3.16	10,380	0.31	0.93	
El Salvador	5.1	0.4	7.4	11.9	31.29	2.33	5,860	0.20	0.34	
Guatemala	8.9	1.5	16.9	11.4	7.54	1.28	8,150	0.14	0.33	
Haiti[c]	6.4	0.0	0.4	0.7	27.69	0.11	2,370	0.03	0.02	
Honduras	5.0	0.7	14.8	22.7	30.72	4.55	4,320	0.53	0.65	
Jamaica	2.4	0.4	16.0	18.8	49.55	7.66	3,880	0.49	0.54	
Mexico	84.6	9.9	11.7	102.6	10.33	1.21	200,730	0.05	2.93	
Panama[c]	2.4	0.1	2.5	0.1	0.86	0.02	4,550	0.00	0.00	
Paraguay	4.2	0.1	2.9	2.5	20.50	0.59	4,130	0.06	0.07	
Peru	21.2	4.8	22.5	274.0	57.45	12.93	28,610	0.96	7.83	
Uruguay	3.1	0.8	25.0	22.4	28.71	7.22	7,170	0.31	0.64	
Venezuela	19.2	3.1	18.8	38.1	12.20	1.98	48,830	0.09	1.09	

Total	414.1	83.4	20.9	1,630.4	19.62	3.9	782,250	0.21	46

– Not available

Note: Program cost and beneficiary data cover eighty–three programs, including nearly all the largest ones, for which costs estimates, either in total or for food alone, are available.

a. Data from World Bank (1991), referring to 1989
b. Assuming a cost of $35 per beneficiary
c. Data from only one program
d. Excluding Argentina

Source: Musgrove (1991)

Programs that meet these requirements still do not guarantee results. To know whether a program works, there is no substitute for measuring its impact on the intended beneficiaries (Sahn, Lockwood, and Scrimshaw 1984). As noted, most of the programs reviewed here have never been evaluated. One reason for this neglect is that evaluations take money and time–to anticipate and avoid methodological problems, to take account of possible long–term effects, and to track individual beneficiaries rather than just looking at changes in totals or averages.

Evaluation is resisted for two other reasons as well, one humanitarian, the other bureaucratic. If a program distributes food to people who are mostly poor, often hungry, and occasionally malnourished, it seems obvious that it must do some good–and churlish or unethical to question its benefits. But while the direction of the program's effect may be correct, its magnitude may be inconsequential. Or the program may be ineffective because it supplies only one of the needed interventions, not recognizing the potential value of micronutrient supplements, education, or health efforts. The bureaucratic obstacle is one of attitude: in many implementing agencies, operating a program is considered a task to be performed rather than a result to be accomplished. These agencies are seldom required to show results and may be satisfied only to push food through a clogged, bent, and leaky pipeline.

But more surprising and distressing than the paucity of evaluation is the finding of several evaluations that programs have had little or no effect on malnutrition. Three factors deserve particular attention. One is the failure to measure any preventive benefits, even though these may figure among the program's objectives. Another is that rations are often too small to make much difference, unless they are exclusively provided to the needy beneficiary and accompanied by other appropriate interventions. Finally, failure may easily result from the simple irregularity of operation that plagues many programs. Overall, however, the main problem is not scarcity of resources; enough is being spent to reduce malnutrition substantially.

Notes

Philip Musgrove is on the staff of the Latin America and the Caribbean Technical Department of the World Bank.

1. Dollars ($) are U.S. dollars throughout.

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The word "processed" describes informally reproduced works that may not be commonly available through libraries.

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Comments on the Three Previous Papers by George Beaton, Juan Rivera, and Philip Musgrove

Reynaldo Martorell

Woodruff Professor of International Nutrition Center for International Health, Emory University

I agree with Professor Beaton that the conclusions of Beaton and Ghassemi (1982) have been misinterpreted in some quarters. There are many reasons why larger effects of food distribution programs on growth were not found. For example, too little food was given in some programmes, and often, too little was actually consumed by target children. Dr. Juan Rivera referred to weak research designs, and in this session we have heard that many studies included older children in whom an effect on growth would not be expected. Professor Beaton summarized the literature available in the late 1970s (Beaton and Ghassemi, 1982). Since then a number of carefully designed research studies have been carried out – including the INCAP and the Bogota studies summarized by Dr. Rivera – which show a greater impact of supplementation on physical growth. Also important is the finding that there is a protective effect of food supplementation against the negative effects of diarrhoea on growth. Moreover, these recent studies have taken place in populations that were not severely deficient in terms of food, and thus an even greater impact would be expected if severely stressed populations were studied. *One* should no longer feel doubtful about the potential impact of supplementation programmes on growth.

I agree with Professor Beaton that growth failure is a phenomenon of the first few years of life. However, I would be a bit more conservative and define the age range of growth failure as extending from 6 to 36 months of age, rather than to just 18 or 24 months. While it is true that growth retardation is severest in the very young, the process does continue for longer in some societies.

There are many reasons why growth failure occurs in early childhood. Professor Beaton showed us the growth velocity curve by age, and children in this age group (6–36 months) grow very quickly, having very high energy and nutrient requirements. Children at this age and younger are highly susceptible to gastrointestinal and respiratory infections – in fact the incidence of diarrhoeal disease is greatest at 6–24

months of age in most settings. In addition, young children are less able to express their needs and are vulnerable to poor care, whilst older children are more likely to be able to fend for themselves. In the INCAP study that Dr. Rivera referred to, we find two interesting things. First, growth rates after about three years of age were similar in this Guatemalan population to values found in well nourished populations. Secondly, supplement had no effect on growth rates after three years of age; thus, the effect of the supplement was concentrated in what Professor Beaton described as "the window of opportunity".

As many at this symposium have pointed out, decisions as to which population groups should be targeted for supplementation depend on the intended results. If the aim is to provide an income transfer then surely the target population must be poor families. If we want to improve school attendance and such aspects as attention span, then it is the school child in poor areas. If we want to improve economic activity, say of sugar cane workers, then it is the working adult population we must target. However, if our aim is nutritional then I would argue that children in the first three years of life must be at the top of our priority list. Protein energy malnutrition and wasting are most common in this age group, as are diarrhoeal diseases, and even though certain micronutrient deficiencies such as vitamin A more commonly manifest themselves in older children, the biggest drain on tissue reserves occurs in early childhood. We know very little about physical activity, but if this is most constrained in early childhood along with physical growth, improving energy intakes would have tremendous implications for psychological development. I remain convinced that the massive growth failure that occurs in early childhood and at no other period in life is a marker, as Professor Beaton said, of functional impairment in a number of other domains. I also believe that in preventing this massive growth failure through diet and health interventions, we will prevent most of these associated effects.

Professor Beaton referred to the INCAP follow–up study (1987–88), and I would like to say a few words about it. This study was carried out in collaboration with INCAP, specifically with Dr. Juan Rivera, and involved the follow–up study of adolescents and adults who had participated as young children in the INCAP Longitudinal Study (1969–77). Two approaches have been used to look at the relationship between early nutritional status and later functioning. First, analyses were carried out which used the nutritional intervention design described by Dr. Rivera (i.e., Atole vs. Fresco supplements). And secondly, the total nutritional experience, defined in terms of the degree of stunting in early life were related to later outcomes. Both approaches pursue the same objective –– to document that improved nutrition in early childhood results in better functioning in the adult. In one analysis, we divided children who were three years of age into three categories of length–for–age; severely stunted, moderately stunted, and not stunted. We defined as severely stunted those who were three standard deviations or less below the mean. Moderately stunted children were those who were –2.9 to –2.0 sds and those not stunted were above –2sds. Figure 1 (Martorell, 1993) shows the percentage of children below three standard deviations by calendar year in *Atole* (high energy, high protein supplement) communities and in *Fresco* (low energy, no protein supplement) communities. In 1969 the prevalence of severely stunted children was about 45% –an incredible degree of growth retardation. In 1976–77, when the study ended, the prevalence was more or less the same in *Fresco* children, but had declined to about 20% in *Atole* children. Therefore, it appears that the nutrition intervention was effective in decreasing the prevalence of severe stunting. Work soon to be published in a special issue of *The Journal of Nutrition* shows that improvements are also seen later in life. Adolescents and young adults who were exposed to the *Atole* during the first three years of life were taller and had greater fat–free masses, particularly women, than those who received *Fresco.* Work capacity was significantly improved but only in males. Interestingly, intellectual performance was more affected in these subjects in adolescence and adulthood than during the preschool years. Thus, improving the diets of young children in Guatemala had an immediate payoff in terms of reduced prevalences of stunting and also resulted in enhanced physical and intellectual status in adulthood.

The follow–up study has also permitted us to examine whether catch–up growth occurs subsequent to the phase of growth failure in early childhood. We find that growth from three years of age to follow–up is the same regardless of the degree of stunting at three years of age; in other words, there is no catch–up growth. A second finding is that growth from three years of age to adulthood, say to 18 years of age, is just a few centimeters less than that seen in the United States, and in fact, is a little more than that seen in Mexican Americans growing up in the US (Martorell et al., 1992; Martorell et al., 1990). This clearly reinforces the characterization of the first few years of life as the "age of growth failure".

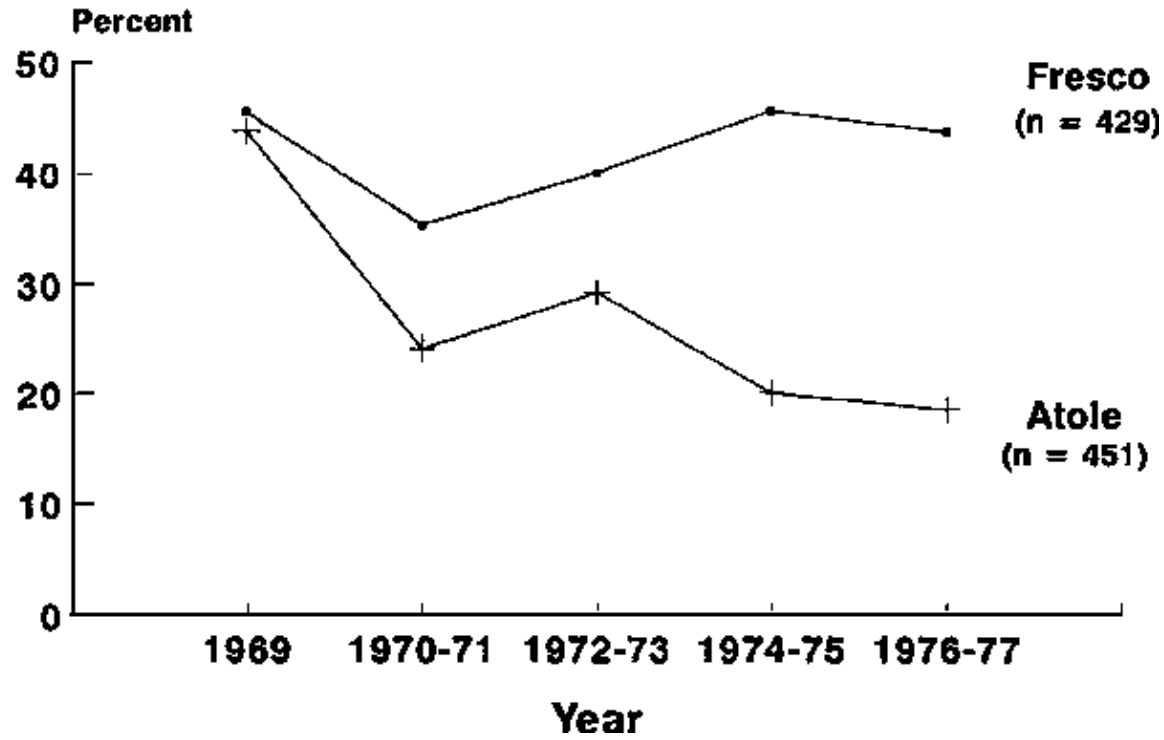

Figure 1 **Changes over time In percent of 3–year–old children with severe growth failure: sexes combined +**

+ Length values 3 S.D. or more below the reference median.
(Reproduced with permission from Martorell, in press)

I would like to discuss briefly some of the consequences of stunting using our follow–up study results. There are several cut–off points used in obstetric work in developing countries as indicators of obstetric risk, and one of them is stature less than 149 cm. In women 18 years or older, those who were stunted at three years have a 65% prevalence of stature less than 149 cm, whilst those who were not stunted at three years of age have a prevalence of around 4% (Martorell et al., 1992). This effect is also seen if one looks at lean body mass which is an important determinant of work capacity. We have begun to study the relationship between stunting and intellectual achievement through analyses which first control for such things as maternal education and family wealth. These answer the question "is there a lingering relationship between length at three years of age and intellectual achievement?" Preliminary analyses indicate that intellectual achievement was constrained in subjects who were stunted as young children. Intelligence, numeracy, literacy and school attainment were all lower in children who were stunted. One interpretation of these results is that the conditions which gave rise to marked growth retardation also affected cognitive development adversely. Growth failure becomes, in this view, not a cause, but a marker of the syndrome of developmental impairment of early childhood.

To sum up, first, early childhood is when massive growth failure occurs. There is now quite a lot of evidence to show this. Secondly, nutritional supplementation in early childhood reduces the degree of growth failure and improves physical status and intellectual performance in the adult. And thirdly, stunting in early childhood has direct consequences such as short maternal stature and reduced lean body mass which are important concerns for obstetric risk and work performance respectively. Finally, stunting also has indirect functional consequences, such as poorer intelligence and limited school achievement. Therefore, the prevention of massive growth failure in early childhood should be a high priority, and I think it should be at the top of our list when we consider nutritional benefits as the outcome we desire from supplementation programmes.

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Eileen Kennedy

International Food Policy Research Institute

One of the major conclusions from Beaton and Ghassemi (1982) was that "...food distribution programmes directed towards young children, *as now being operated,* are rather expensive for the *measured benefit..."* Professor Beaton discussed the "measured benefit" issue –highlighting the fact that there is probably a whole range of unmeasured and unobserved benefits which result from supplementary feeding programmes.

[I would like to highlight the issue of "programme–as now being operated". As an illustration, the examples of programmes Professor Beaton chose to give were well controlled research studies and not typical of ongoing programmes – and this is an issue which also arises in the work of Dr Musgrove.]

I would not have been quite so negative as Dr Musgrove in his paper. The work represents a very useful starting point in finding out exactly what is going on in Latin America and the Caribbean as far as these types of programmes are concerned. It was interesting to note that half the programmes included in this 104 programme assessment begain the 1985–1990 period – after the Beaton and Ghassemi work had been done.

Dr Musgrove is clear that there is little information on effectiveness of these programmes as described by outcome measures, and that programmes "tend to be judged only be measures of input" – but I feel that, on the other hand, well run programmes, or programmes with appropriate mixes of inputs, are more likely than less well run programmes to meet their goal.

One comment in particular in the report intrigued me: "There is no great mystery as to how to design and conduct a programme so that it actually reduces malnutrition. What is needed is to apply these lessons universally." Let me discuss further what I think some of these lessons are. Firstly, that beneficiaries in these programmes need enough food at the right times. But what is enough food? You mention a low in Mexico of 140 calories and a high of slightly over 1000 in Costa Rica. But what was unclear to me outside the context of cost – which is clearly connected with calories – is exactly *how* one decides where to set the level of supplementation to be given. This is especially important when the second lesson is taken in to account – that one needs an integrated package of resources.

Dr Musgrove talks about poverty, illness and ignorance being the three underlying causes of malnutrition. To alleviate poverty, food is given; for illness, health care is provided; and to combat ignorance, nutrition education is given. Dr Musgrove then argues that in most of these programmes too much has been spent on food relative to health care and nutrition education. How do you balance the appropriate mix of inputs? In addition, in his report, Dr Musgrove has indicated that nutrition education in the region does not seem to have been particularly effective. However, it is not that nutrition education services *cannot* be effective, but that the way they have generally been operated, they have not been.

Before leaving the issue of level of supplementation, it is useful to consider supplementation not only in terms of absolute level of calories, but also to ask about recommendations on levels of micronutrients. Additionally, the CRSP data has indicated that there appear to be some foods, at least in children's diets, that above and beyond the level of caloric intake have a beneficial effect on growth. We have re–analyzed some of the IFPRI data from Southwestern Kenya, and have similarly found that, holding total calories in the child's diet constant, there is a beneficial effect of increasing the percentage of animal protein in the diet. Thus, in considering supplementation packages, we should not only be thinking about absolute levels, but also about quality issues, including micronutrients.

From the knowledge gained from the programme implementation assessment reported here, I would like to ask Dr Musgrove what he would do differently. It is not clear to me how a programme planner would use the

information here to plan a more effective form of intervention.

This question comes at a particularly critical time because of current reassessment of some issues related to the US supplementation schemes – the largest one of which is the WIC Programme. This is basically a combination of food, health care, and nutrition education. Food takes the major part of the money going into the programme, and people are now asking what it is about this combination of inputs that is supposedly having an impact.

From a look at a compilation of studies, at least on the prenatal component, it is fairly clear that participation in the WIC programme is associated with improved neonatal outcome. However, when you begin to unpack this black box of food, health care and nutrition education, you find that of the 900 calories a day that are delivered, only about 110 are incremental in the prenatal diet. Can we, then, give less food without sacrificing the efficiency and effectiveness of the programme?

I would like to push Dr Musgrove to think about more than just the broad issue of supplementation, or the other lessons that come out of these 104 programmes that give us a better understanding of where to go when planning the future direction of these very substantial programmes.

I would like to mention briefly three other issues. *Firstly,* concerning the illness–food intake debate which came out in the papers by Dr Beaton and Dr Rivera. Clearly, diarrhoea has a major inhibitory effect on young child growth. One of the conclusions of Dr Rivera was that "supplementary feeding is likely to have more of an effect on children with a high incidence of diarrhoea, possibly through increase in appetite after diarrhoea." I would like to mention that, after repeated episodes of diarrhoea, anorexia may, in fact, be more of a problem than increasing appetite. Some work has been carried out recently by the Dunn Lab group in the Gambia, where they have begun to look at the pathophysiology of the different types of diarrhoea, and whether catch–up growth can occur or not. One of their conclusions has been that in the absence of intestinal injury, catch–up growth in preschool–age children can be rapid. However, if there is damage to the small intestinal mucosa, rapid catch–up growth or any growth may not take place.

Secondly, for a long time, equity issues were used as the basis for justifying many supplementation schemes, and it is right that children should be allowed to reach their growth potential. I think equally important now is the emerging literature that supplementation schemes may not only facilitate equity, but also efficiency. The labour nutrition literature, some of which is coming out of the economic literature, is concluding that better nourished individuals are more productive as adults. Recent work by IFPRI, from Kenya, where the same women have been tracked since 1984, has found that women with better nutritional status, in this case as measured by a higher mean BMI, were more active in the later (1986–87) period, both in terms of home production and farming. Professor Beaton mentioned women in one of his closing arguments as important in the overall survival of the household. I think it is very critical to now look at the links between women's nutritional status – not just mothers – and their roles in health and nutritional activities, and how improving women's nutrition affects or does not affect this responsibility.

Finally, I would like to talk about indicators. We probably have limited ourselves to too narrow a range of indicators for evaluating the full range of impacts of supplementary feeding (and other) programmes. But, given that many of the outcomes are very difficult to measure, what do we do if we are trying to develop a capability at local level for monitoring and evaluating supplementation schemes? Can we try to find a range of indicators which are "friendly" – and such that there is no need for an evaluation of a specific programme every ten years, but evaluations that can be done locally in a participatory way. Is this, in fact, totally in contrast to looking at the full range of impacts that may be taking place?

Response

Philip Musgrove

I would like to start by replying to a comment from Mr Jonsson; even though it was not directed primarily at what I was saying, it leads into a couple of other comments.

He said he was surprised that anybody would expect there to be much connection between nutritional status and food distribution programmes and I entirely agree; there are times when it feels like anything you see is

probably random and if you just closed your eyes it would go away. It is worth thinking a little more about this. One reason for it, of course, is the difference between giving away food, and feeding or making sure that somebody eats it. There are problems of intra–houshold distribution, problems of quality, problems of sanitation.

There is another issue related to the whole series of questions Eileen Kennedy was putting: how do we measure growth response? When we measure a child, we are measuring accumulated failure to grow; the integral of a long process, affected by all sorts of things all along the way. This starts with genetic factors and ends up with what the child ate yesterday. Yet most measurements (unless we do very careful longitudinal studies) are just moments in that process. There really is not any good reason, for example, to discover that food intake last week and nutritional status of children as measured last week in a cross–section survey should have very much to do with each other, unless we know that people who are poor are uniformly poor all their lives and their children are born poor and nothing ever changes. Introduce a little bit of fluctuation in the income stream and it is enough to pull in so much noise that any real relation is going to be very hard to find. That is why it is encouraging when people do really good longitudinal studies. It also means that there probably ought to be an outright ban (I don't know – something where if you break it you can't publish anywhere for five years) on studies that simply report associations on a cross–sectional basis.

Mr Jonsson also remarked that, in his view, any kind of programme that we are talking about ought to be judged on its nutritional outcome and should not be allowed to get away with claiming spin–offs and making comparisons to other projects. I think that's pushing a little too far. If we decide that the objectives are nutritional we ought to demand that these are met – that is true. But there are two problems. One is that there are other legitimate objectives, depending on what the programme is and who you are trying to reach with it: for example, in the case of school feeding. The other problem is that the people who defend these programmes politically do not always do so on *nutritional* grounds –they are just as likely to defend them on the basis of income distribution. In fact that's often the last resort. If you take a look at a long list of objectives that somebody would state for his programme and it was possible (with data) to go knocking them off one by one – say, well you say that the kids will grow faster but here's the data and they don't; and you say that they are going to stay in school longer, here's the data and they don't – when you get them all the way back in a corner, he will throw up his hands and say "but we re–distributed income!" and he's got you there. This is a real serious problem – and it's the scoundrel's last resort. How do we value this? What is worth to us – anything? If nothing then we should not allow this, but if it is worth something, we need a way of judging it compared to the other things that we are trying to accomplish. One of the advantages of claiming a long list of objectives is that you always have this escape. I think we have a problem of not having any idea how to value one objective versus another; we have something much worse than apples and oranges here. We have no notion in general, of whether it is worth more for a one year old to be the right size at age three or whether it is worth more for a seven year old to stay in school for another year. If somebody says "I'll give you what is costs to produce *either* of these results, but you only have on eof them" I think we have no idea what to do next. This takes me back to the difficult questions that Eileen Kennedy was asking. She is really confronting us with the fact that we have a multi–input production function – it takes in food, it takes in health care, it takes in child care and stimulation, it takes in knowledge; and ideally, produces a multi–output function, in which we have a child who is not only normal size, but also has been properly reared, and is going to school at the right age and is going to stay there a while.

The problem is this: turn it around, start at age ten and look back. At age ten, I want a healthy, normal size child that has already been in school for three or four years. Now, what is the best distribution of resources between that child's conception and its tenth birthday, to get there. This is what I think we do not know. All requests for blueprints come down to trying to solve what is just mathematically a fiendish problem. I have tried it – I have tried to write the equations and I do not have a clue how to get started; if anybody does, I hope they publish it soon.

I think that what you can get out of this kind of study that I have done is to say we know something about what is wrong with the starting point – that is, in most programmes (but not all) too much emphasis on food, partly because sometimes the food is, or appears to be free. There is too little emphasis on the other inputs, and this tells you the direction to push in – move away from the present balance towards more health care and more education. But it does not tell us where to stop. It does not fix the optimal mixture of inputs, which is why we do not really have a solution or a blueprint. It only says the present mixture on average is unbalanced. This in turn carries another message – try to figure out what the problem is before specifying the solution.

I tried to classify the problem as a mixture of poverty, illness, and ignorance.

If I can beg your indulgence for a moment, this leads me to want to tell you my favourite science and religion joke because it illustrates perfectly this problem of what do you tell people and how do you make it stick so it does some good? I think the story is the paradigm of this problem. It involves some missionaries who started converting people in some remote place, and converted them so successfully that the recent converts do not want to leave the mission – they want to hang around and sing hymns all day. And so they decide that they need the help of some of these people in feeding the others, and so they pick a particularly bright, very thorough new convert and ask him if he would like to be a cook and help in the kitchen, and he ways he would. So the missionaries take him through the kitchen and insist repeatedly and violently to him on the urgency or always washing his hands and always boiling the water. Of course, he looks at them like they are crazy, and they say "Jacob, you can't see them and I can't see them, but there in that water are things that can make us sick and can kill us," and he turns round and says "I thought we Christians didn't believe in that stuff anymore." Well, that's the problem. How do we get across a message that would be believed and acted on and not either insult or drive people off, or give them what they do not need, or waste money – a lot of which has been spent with not enough results.

Summing–Up

John Mason

UN ACC Sub–Committee on Nutrition

One of the major conclusions from the first paper by George Beaton is that we need to accept that there are multiple benefits from supplementary feeding. Growth is a marker of progress, but not the only important outcome. The overall benefits concern immunity and tissue integrity, physical activity and its contribution to psychological development, and growth. This has been discussed further in the SCN's paper on "Appropriate Uses of Anthropometric Indices in Children" (ACC/SCN Nutrition Policy Discussion Paper No. 7, December 1990).

The second conclusion is that the top priority, the age–group that has to be reached, is the six months to maybe 18 months, maybe 24 months, maybe 36 months old children. Two good reasons were brought out. One is for growth itself, but growth is mainly a marker. The most compelling argument is from the long–term effects which the studies in Guatemala have established: you *have* to reach the six to 18 month old group of children to protect their long–term development, including educational achievement. Beyond this the question of age targeting is a bit fuzzier.

Where there are very limited possibilities of targeting it may be one targets the poorest communities or households, irrespective of age. However, it seems unsatisfactory to only say it depends upon the objectives, because that does not provide guidance as to whether, for example, limited resources should be used for school age children or preschool children. Even if we cannot give a formula, we should try to lay out some of the considerations. How do you compare food as a magnet for bringing children to school and helping their educability with food for, say, the four to five year old children, which will still to some degree help their growth? Moreover, this focus on age–targeting does not give sufficient attention to supplementary feeding for women (in this context particularly for pregnant women). The issue has not been fully resolved as to the relative benefit of feeding the pregnant woman, hence increasing birth weight and contributing to survival and development of the child.

The issue also arose that we have considerably more information now concerning benefits of supplementary feeding than when the original paper was published by Beaton and Ghassemi (1982). It is now quite clear that if you can deliver food to children who need it they will benefit in a series of ways, including growth (as a marker), psychological development, preventing morbidity, preventing mortality. As usual, it comes down to getting enough of the right food to the right people at the right time. The SCN might consider making this very explicit in a statement[1].

> [1] See "ACC/SCN Statement on the Benefits of Preventing Growth Failure in Early Childhood" at the beginning of this section (p.36).

Another look at the benefits of supplementary feeding came from the very specific study reported by Juan Rivera. This concerned the interaction with diarrhoea. One can summarize the findings in various ways. One

is to say that if the underlying calorie consumption is low, then a dietary energy supplement can be shown both to counteract the effect of diarrhoea and also to have an effect on growth when the children are well. When, on the other hand, the underlying calorie availability is somewhat higher, there is still a benefit in terms of preventing the effects of diarrhoea on growth, but no effect on well children, who are growing adequately anyway. So there is an unequivocal yes to the question: "Is supplementation worthwhile without infectious disease control?" Yes, it does have an effect. This does not mean this is necessarily the desirable approach, and Dr Rivera brought out that one needs the conventional but important mixture of interventions, including breastfeeding promotion and primary health care, but that there is a clear role for food supplementation.

I think that a number of us were quite surprised at the extent of the programmes in Latin America, as reviewed by Dr Musgrove. These have a high coverage and a fairly considerable expenditure per head. One conclusion was that there is scope for more targeting, both to ensure that the needy groups are fully covered, and to focus expenditure on these. It could be hypothesized that much of the coverage is not very effective because it is not intense enough. A further point concerns the need perhaps for increasing the non–food expenditure. This relates to another point of food programmes versus feeding programmes: simply delivering food may not have all the intended effects. These require the non–food components i.e. education, health care, and so on.

Finally, to re–emphasize an earlier point, in giving guidance on when and where supplementary feeding is appropriate, we should not constantly throw the ball back, and say that it depends what your objective is. Supplementary feeding and other nutrition interventions *have* been promoted over the years and we should not back off from that. We should be more confident in saying what the benefits are: growth is a *marker,* and there are many *other* benefits which are very important, both in the short and long–term. We should not be timid in laying these out: in sum, better health, better individual development, happier people, higher education attainment: better "human capital".

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Educational Aspects, Weaning Food Supplements and Targeting in Supplementary Feeding Programmes

Ken Bailey

World Health Organization

With your permission I would like to express some points of view, based on experience of reviewing more than 200 WFP projects over a period of 28 years as a WHO Regional Officer in Africa and the Western Pacific. These aspects seem to me important and have yet been expressed at this meeting. Especially, the educational aspect and impact of WFP projects.

In the Regions and countries where I have worked, and I believe in most countries, except at times of stress such as war and drought, shortage of food at the household level is not the basic problem, at least in rural areas. In some cases there are seasonal food shortages. But otherwise the main problems in young child feeding are other factors which come to the fore mainly when the child is from 6 to 18 months old. Such problems include: how to find time to feed the young child more than two or three times a day; use of porridge which is too dilute and consequently leads to undernutrition and eventually marasmus; the fact that this porridge is often consumed without other local foods to provide necessary fat, protein or micronutrients.

Food aid in whatever type of project will usually be in the form of cereals, some beans or a cereal/legume mix like CSB, oil and perhaps some animal protein component. So much depends on the type of communication and education that goes along with these commodities; and usually according to all project reports I ever read, this aspect is painfully weak. The presence of beans may convince the mother that this is a good thing for the young child; or very likely, she may consider the infant unable to digest them, so she may sell them or use them for the older members of the family; and at the same time she is likely to stop growing them or buying them for herself, since she is getting them for free. When food aid stops, what will happen? Sometimes,

worse, she may get wheat or rice, instead of the sorghum or maize she is used to, and so start off on a whole new dietary pattern, for the infant or even for the family.

Surely one of our main jobs in nutrition is to help that mother to cope better with the foods they grow or have available in the community. I am well aware that WFP makes every effort to provide the cereal staple to which the mother is accustomed; but often, especially in Africa, that commodity is not available to WFP, especially when it is normally a tuber. So the risk of changing dietary patterns, even radically, is there.

How many school feeding projects are based on provision of wheat flour for making a small loaf of bread for the children, when wheat is not grown in the country and there is little opportunity for this to be a creative educational experience, since it does not blend well with locally available foods.

So my first suggestion is that, just as every project is reviewed from the point of view of its impact on women, its educational impact, positive or negative, should be critically examined; and if possible, positive educational messages spelled out clearly. Otherwise we risk seeing continuing distortions of local food habits, loss of prestige of local foods, and other anti–educational effects.

An example of the latter is when one tries to encourage mothers in MCH centres or at village level to develop good local recipes for use in the weaning period. It has been my misfortune to work in several communities for self–help efforts along these lines, for instance with beans and vegetables grown individually or collectively by village women, only to have the activity overturned by the provision of food aid (but not by WFP), in situations where there was no basic shortage of food. Thus, the food aid became an impediment to the better use of local foods.

One way in which this difficulty can be overcome is through making suitable weaning food mixtures locally, using appropriate technology in the form of simple equipment or existing machinery such as corn mills. In a few countries, WFP is using local weaning food plants to produce mixtures of local beans and cereals, such as *Weanimix* in Ghana, *Misala* in Burundi and *Likuni Pala* in Malawi. WFP purchases these products locally and thus the possibility exists at least, to show the people the proportions used, and how to make these mixtures themselves using local cornmills. Thus it can at least have some positive educational value – if the effort is made to point this out to the people participating in the programme. We have with us here today a distinguished specialist in the field of this kind of technology, Mr Dijkhuizen, who has developed appropriate technology for use at various levels, e.g., in villages and at district level. A heavy input in the forming of training for local women's groups and community leaders for handling such projects is needed. UNICEF and World Bank as well as WFP and the Dutch cooperation have supported such approaches in a few countries and I think such approaches would be valid and feasible in nearly every African country at least, and probably much more widely in other Regions as well. It is one way which can lead to self–reliance in the communities and countries concerned.

So my second suggestion is that organizations responsible for food aid programmes take seriously the possibility of producing these convenience supplementary foods locally, in front of the people's eyes, using inexpensive technology, instead of temporarily providing "wonder–foods" as handouts.

This may sound like a counsel of perfection but the fact that it is working successfully and expanding in several countries gives me confidence to say that we should *not* accept indefinitely, with equanimity, the continued distribution of this sort of cereal–legume mixture from industrialized countries.

Thirdly, my estimate is that food aid is often used in countries and even for vulnerable group feeding, where there is no real shortage of food, or for families or individuals for whom there is no shortage. Considering the high costs of delivery to remote places, is it cost–effective? We need to be more selective in targeting food aid (at least the supplementary feeding type) to those communities and individuals where it is really needed. This includes the aspect of timing. As food shortages are seasonal in most countries, it would be ideal if food aid could be provided to needy families in rural areas exclusively during the pre–harvest season. While it has been said that the organizers of food aid are not able to provide supplementary foods seasonally, I feel it would be possible if commitment existed.

The basic point is thus that we should exercise much more imagination and sensitivity to the socio–cultural situation when designing food aid programmes, especially those of the supplementary feeding type. We should put much more effort into minimizing negative educational impacts and developing positive sustainable approaches. This point was hinted at by a couple of speakers but not, in my view, sufficiently stressed, and without some modifications in our approaches, achievements may in the long term be negative or few, rather than positive and sustainable. There are many other aspects like dependence which could be further

elaborated but time does not permit. I did not find these aspects reflected at all in the WB/WFP Agenda for the 1990s on Food Aid in Africa, which otherwise I found realistic and admirable.

These remarks are not in any way to belittle the positive value of food aid projects especially of food for work, community development type as well as for emergency feeding, nor the excellent work done in planning and executing them. These three suggestions are put forward not as criticism but as a challenge to more imaginative thinking in the organization of food aid programmes.

SECTION IV. Nutrition of Refugees

ACC/SCN Statement on Nutrition, Refugees and Displaced Persons

The ACC/SCN considered the position of refugees and formulated a statement, the specific recommendations of which are that:

a) the protection and promotion of the nutritional well–being of affected populations be fundamental goals of agency policy and programmes concerning refugees and displaced persons;

b) the roles, responsibility and accountability of different organizations, and levels within organizations, be reviewed and if necessary re–defined;

c) routine monitoring of affected populations to be mandatory, in terms of quantity and quality of food supplied and consumed, anthropometric status, the presence of specific nutritional deficiencies, and mortality;

d) reports on these matters be made regularly through the UN system to donor governments and UN governing bodies, which themselves should be more probing in asking questions;

e) NGOs, together with UN agencies and host governments, be recognized in practice, as well as officially, as legitimate partners in these processes;

f) the results of monitoring the operation and impact of relief (see c above) should have an immediate influence on the management of relief operations in terms of action to improve nutritional well–being;

g) management should encourage flexibility and – coupled with accountability – devolution of responsibility for decision–making to intermediate and local authorities;

h) agencies should strengthen if necessary their technical capacity, and give due attention in their decision–making to nutrition and other technical considerations;

i) this process should include, at an early stage, decisions on appropriate goals in terms of alleviating malnutrition and specific nutrient deficiency diseases among refugees and displaced persons.

Protecting Refugees' Nutrition with Food Aid

Mike Toole
Centres for Disease Control

Introduction

The number of refugees dependent on international assistance continues to increase rapidly; of the world's 18 million international refugees, approximately 13 million are living in camps in remote areas of Africa, the Middle East, and Southwest Asia. In addition, up to 20 million internally displaced persons are dependent on some kind of international food aid for their survival. Surveys of these populations have demonstrated wide variation in both early nutritional status and in the rate of improvement that has resulted from international food assistance.

The Problem: Protein–Energy Malnutrition

Acute undernutrition prevalence rates have been elevated in many displaced and refugee populations during the past 12 years, ranging as high as 50% in eastern Sudan in 1985 *(Tables 1 and* 2). Even in 1991, rates were as high as 29% in Kenya, several months after Somali refugees arrived in that country. Undernutrition rates have decreased rapidly in situations where effective emergency relief operations have been mounted promptly, such as Thailand (1979) and Pakistan (1980); however, in other emergencies, such as in Somalia (1980) and Sudan (1985), undernutrition rates have remained high (>20%) for 6 to 8 months. Of even greater concern is the observation that acute undernutrition rates among Somali refugees in Ethiopia (1988–89) actually increased 6 months after a relief programme was launched.

Table 1: Prevalence of Acute Undernutrition among children less than 5 *years of age in refugee populations.*

Dates	Host Country	Country of Origin	Population	Prevalence % Undernutrition
1979	Thailand	Kampuchea	31,900	10.0–18.0
1980	Somalia	Ethiopia	700,000	21.7–28.4
1984–85	Pakistan	Afghanistan	2,500,000	2.3–3.5
1988	Malawi	Mozambique	400,000	2–1–6.1
1988–89	Ethiopia	Somalia	400,000	12.9–29.5
1990	Guinea	Liberia	400,000	5.3
1990	Ethiopia	Sudan	25,000	45.0
1991	Kenya	Somalia	50,000	29.0
1991	Iraq/Turkey Border	Iraq	400,000	4.1

Table 2: Prevalence of Acute Undernutrition among children less than 5 years of age in internally displaced populations

Date	Country/Region	Population Affected	Prevalence Acute Undernutrition
1983	Mozambique		12–28%
1985	Ethiopia (Korem)	800,000	70%
1988	Sudan (Khartoum)	750,000	23%
1988	Sudan (S. Darfur)	>80,000	36%
1990	Liberia (Monrovia)	500,000	35%

Malnutrition and mortality

While most high acute undernutrition prevalence has been associated with inadequate food rations, it appears that malnutrition developed among Kurdish children 1 to 2 years of age in Turkey within a period of 1 to 2 months, primarily because of the high incidence of diarrhoeal diseases in the camps. The synergism between high malnutrition prevalence and increased incidence of communicable diseases explains much of the excess mortality seen in refugee and displaced populations. A study of 42 refugee populations in 1989 showed a strong positive association between acute malnutrition prevalence and crude death rates (CDR). Populations with acute undernutrition prevalence rates of less than 5% had a mean CDR of 0.9/1000/month. Refugee populations with undernutrition prevalences of >/= 50%, however, experienced a mean CDR of 37/1000/month with a range of 4/1000/month to 177/1000/month.

The close correlation between malnutrition prevalence and crude mortality during a relief operation for Somali refugees in eastern Ethiopia in 1988–89 was clearly demonstrated. Malnutrition prevalence was estimated by serial cross–sectional cluster sample surveys of children less than 5 years and monthly death rates were estimated retrospectively by a population–based survey in August 1989. During the period of high malnutrition prevalence and high mortality (March through May 1989), the crude death rate reached 9/1000/month – 4.5 times greater than the non–refugee death rate in Ethiopia. Food rations provided an average of approximately

1400 kilocalories per person per day instead of the recommended minimum of 1900 kilocalories per person per day.

Likewise, in eastern Sudan in 1985, inadequate amounts of food (1360–1870) kilocalories per person per day) were distributed to Ethiopian refugees during the first five months after their arrival in the camps. Malnutrition rates, as well as mortality rates, remained high during this period.

Table 3. Micronutrient Deficiency Disease Outbreaks in Refugee Camps, 1984–1991

Disease	Year	Location	Prevalence(%)
Scurvy	1984	Sudan	22.0
	1985	Somalia	6.9–44–0
	1989	Ethiopia	1.0–2.0
	1991	Sudan	NA
Xerophthalmia	1985	Sudan	NA
Beriberi	1985	Thailand	NA
Pallagra	1989	Malawi (11 camps)	0.5
	1990	Malawi (11 Camps)	6.3
Iron Deficiency	1990	Syria, Jordan,	54.5–73.9
Anaemia		West Bank & Gaza	(Children)
			12.5–62.5
			(Women)
	1990	Ethiopia	10.0–13.0

Micronutrient deficiencies

The importance of micronutrient deficiencies in refugee and displaced populations has only recently been extensively documented. In addition to deficiencies of vitamin A and iron, conditions that have been widely recognized as important childhood problems in developing countries, large epidemics of scurvy and pellagra have also been reported in refugee populations during the past decade (Table 3).

The international community has still not developed an adequate strategy to prevent **scurvy** in refugee camps in the Horn of Africa, as demonstrated by an outbreak that took place among adult males (former Ethiopian soldiers) in a camp in eastern Sudan during 1991. Scurvy has been closely related to the duration of stay of refugees in remote, African camps (in particular, those for Ethiopian refugees) where food rations have been confined to two or three items. The vitamin C content of these rations has been far below international recommended daily allowances.

An outbreak of pellagra occurred in Malawi among Mozambican refugees between July and October 1989, with 1,169 cases reported in 11 camps where the French agency *Médecins Sans Frontières* (MSF) was providing assistance; 20% of the cases were in children under 5 years of age. Another outbreak occurred between February and October 1990 with 17,878 cases reported among 285,942 refugees in the same 11 sites, for an attack rate of 6.3%. More than 18,000 cases were reported from all districts hosting approximately 900,000 refugees in southern Malawi, for an overall attack rate of 2.0%. Food rations contained an average of 4.9 mg of available niacin per person per day; the FAO/WHO recommendations for niacin range from 5.4 mg for infants to 20.3 mg for adults. This outbreak occurred when relief efforts failed to include an adequate supply of groundnuts, the major source of niacin in refugee rations.

Risk Factors for Scurvy in Camps for Ethiopian Refugees

– Length of stay in camps
– **Age (increased with age)**

– Female Sex
– Pregnancy

The lack of variety in basic relief rations is a significant risk factor for pellagra and other micronutrient deficiency syndromes. The inclusion of groundnuts or fortified cereals in daily rations increases the total intake of available niacin and will prevent the development of pellagra.

Risk Factors for Pellagra in Refugees in Malawi

– Young age
– Female sex
– Absence of groundnuts or fish in diet
– Unemployed head of household
– Residence in camp (rather than integrated village)
– Absence of home vegetable garden or poultry

Solutions

The adequacy of the international response to refugee emergencies has been inconsistent, based more on political considerations than on real needs. The avoidance of high malnutrition rates and excess mortality in eastern Thailand (1979) and Pakistan (1980) was probably related to the political importance given to those refugee populations (Cambodians and Afghans) by major donors. In addition, logistical constraints were relatively minor in those countries – both Thailand and Pakistan had important food reserves that could be tapped and fairly good communications and transport capabilities.

The real problems lie in Africa, in particular the Horn of Africa where logistical problems are great and where the political interest among donors is less pronounced. Nevertheless, there have been some successes.

Widespread protein–energy malnutrition was avoided among Liberian refugees in Guinea in 1990; perhaps, we can than the generosity of local Guinean villagers rather than the promptness of the international response. In Malawi, acute undernutrition rates have been low; however, international food aid has been insufficient to avoid large outbreaks of pellagra.

Refugees require the same range of nutrients as other human beings for their survival. The basic human nutrient requirements have long been adequately defined and international guidelines have long existed. If the international community is serious about the protection of refugees, then there has to be an international commitment to protecting refugees from preventable diseases and death. Both protein–energy malnutrition and micronutrient malnutrition among dependent refugees can be readily prevented by the prompt provision of a basic food basket sufficient in quantity and quality. the world's response to refugee and other international emergencies needs to be consistent, based on sound technical assessments, and systematically evaluated to ensure that food and other humanitarian assistance produces the desired impact on the affected population.

There are real practical constraints; the logistics involved in providing an adequate ration to the remote regions of Sudan, Somalia, and Ethiopia are indeed formidable and costly. Regional food reserves, innovative food purchases and exchanges between neighbouring countries, and the use of fortified cereals to provide micronutrients would expedite the prompt provision of adequate food rations. My recent experience with the situation in Russia, however, has taught me – once again – that our political leaders have not yet committed themselves to needs–based humanitarian assistance. Photo opportunities and short–term political agendas continue to dictate the nature of our response to food–related and public health emergencies. Change will only occur if there is a high–level agreement to provide basic human needs to emergency–affected populations, enforced by the type of international conventions that are meant to protect civilians in time of war and which govern the use of nuclear weapons. I will close by proposing a modest goal for the international community to adopt. By 1995, in any displaced or refugee population of 10,000 persons, anywhere in the world, no more than 50 persons should die during the first month of their displacement.

Comments

John Seaman

Save the Children Fund, UK

Dr Toole has made a very solid and well documented case for the very poor conditions of refugees, particularly in Africa.

My discussion begins with two preliminary points. Firstly, refugees have a very special status in the world, in countries which are signatories of the Refugee Conventions. There is a responsibility, morally, if not in international law, to see that refugees are well treated. Secondly, as Dr Toole pointed out, food requirements of refugees are not special to refugees. I would like to discuss this further, although it seems obvious, because there has been a great deal of discussion over many years about the recommended ration –– how much food a refugee requires – and there have been endless meetings on this topic, which so far have not reached a completely solid conclusion. There are UN documents recommending rations of 1900 kcals, and I believe the EEC has also moved to introduce the same standards. But there is as yet no general international agreement that refugees have the same food requirements as everybody else, and that these food requirements should be met. To be fair to the UN, I think that one of the reasons for this is their concern that setting standards on food requirements is quite different from actually getting the food delivered, and that if the donors are only providing food from intervention stocks, they are never going to meet such standards. At the same time I think it is very late in the century, and there are, as Dr Toole pointed out, rather a lot of refugees in the world, to still be discussing whether a refugee requires 1900 kcals or 2200, or indeed, as has often been the case, whether one can get away with 1500 or less.

Dr Toole talked about logistical constraints in getting food through to refugee populations. Whilst there is no doubt that these problems exist in remoter areas where refugees are found, we should be careful not to regard this as an easy excuse for inaction. There are very few parts of the world, even in the remoter parts of Africa, which cannot be reached with reasonable effort. In fact, if we take some of the worst cases where refugees have starved, or where refugees have suffered from serious nutritional deficiencies, these have been in countries where logistical difficulties were minimal. There was a case less than a year ago in Sudan where foodstuffs had arrived in the main port, but failed to be delivered to their destination about half a day's drive down a good road. We have a current case in Kenya where the markets are full of food, the budgets are perfectly adequate to buy the food, where the ports are good, the roads are good, but somehow the food has not been delivered.

Dr Toole discussed the problem of inadequate and unsuitable food rations. Could fortification help? Fortification seems a very easy option, but in practice it has turned out to be rather difficult. One option is to fortify donor foods at source, but because milling grains before they are sent has disadvantages – such as reduced storage life and the added cost of bagging the cereals –the problem is how to fortify whole grains? I believe there is a technology available to do this, but it is expensive which would add a considerable amount to the cost of the foods concerned. If fortification is carried out at local level, again there are difficulties. Camp–level fortification has been tried. Cement mixers full of skimmed milk with vitamin C powder have been used for fortification for local use. However, this is not practical in the long–term in large populations if you consider the tonnages involved – the number of cement mixers needed would be very large, as would be the required administrative control. It would not work. The only situation that we have found so far where we have been able to introduce fortification is in Malawi where there is a sophisticated local commercial milling capacity. It has been possible to successfully add niacin to maize meal, and we should be fortifying most of the rations by next year.

Another concern we have about fortification is that, although the current food technology is effective, donors are clearly not enthusiastic about spending large amounts of money on refugees. In the Malawi case, we have already made some effort to see if we can add further nutrients to the maize meal ourselves, and fortification with iron, zinc, and vitamin C has been discussed. Would it be possible, in fact, to get a cocktail of all nutrients and add it to maize meal? We are reluctant to pursue this route for the obvious reason that, although it might be technically possible to keep populations on maize porridge and nothing else, people should be able to get food roughly in the form that they are familiar with and like – a diet is as important as nutrients. Fortification is a fix. It has its place, particularly in the case of B vitamins, but I think that we should not lose sight of the fact that we should be aiming in general to provide foods adequate in terms of quantity *and* quality to refugees.

Then there is the question of diversification of income. Under some circumstances, refugees may have possibilities of producing their own food. It is true that in many parts of the world, refugees do produce their own food – and in some cases have maintained themselves for many years without any international ration provision at all. But we should not lose sight of the fact that there are large numbers of refugees in parts of the

world where this is really not a practical consideration, particularly the semi–arid and arid zones of East Africa where there are large concentrations of refugees – sometimes 30–50,000 – in one place. There really is very little that they can do to secure an additional food supply; they are completely dependent on international gifts.

Dr Toole mentioned the apparent lack of political interest, particularly with regard to Africa, and I think there is no doubt that this exists. Recently, I was involved in discussions concerning a particular case of refugees in East Africa which attracted quite a lot of media attention. It was pointed out that two years ago, the State Department would have wanted to know what was going on. Now, no matter how publicized the situation is, nobody really seems to care about what's happening to Somalis in Kenya. On the other hand, the fact is that aid flows to Africa for refugees are very substantial. Western donors are giving enormous amounts of foodstuffs to some African countries, much of which is going to refugees. Therefore, although in political terms, there is less pressure to put up the money, the fact is that there is still a great deal of goodwill and a very considerable flow of resources. Why, then, do we repeatedly have these problems in Africa? – problems which, as Dr Toole pointed out, amount to outright starvation in some cases, and great epidemics of diseases which have not been see in epidemic form for a century. Surely there has to be some explanation – if we have got the food, if we have got the markets, if we have got the logistics, and by and large we have got the money, what goes wrong? At Save the Children Fund, we have been searching for the reasons very carefully – over a number of years in many cases – and we have come to conclusions which are of a rather more humble and bureaucratic nature than the conventional conclusions. The problems really come down to accountability, and monitoring and evaluation.

If we look at the international law relating to refugees, the one thing that is clear is that UNHCR has no responsibility whatever for the material welfare of refugees. They can act as a conduit for international assistance – they can act of their own volition if they wish – but they have no legal responsibility for the material welfare of refugees. This situation appears to have its origins at the time that refugee conventions were first drawn up after the Second World War when material welfare was not a major consideration. It was an honest piece of legislation and it was drawn up chiefly for refugees in Europe, where countries were poor, but were able to materially support refugees. The overriding consideration was political protection and the legislation was drawn up in those terms. What this legislation has led to is an ambiguity of responsibility within the international system, and between the international system and the host government of refugees. If any resident representative of UNHCR is asked if he or she is responsible for the welfare of refugees, the general answer is no. Who is responsible? Is the host government responsible? How can the host government be responsible when the host government is frequently bankrupt, at war, or having problems feeding its own population? We seem to have a situation where nobody is responsible, and everybody is responsible.

There are no measures of outcome. All the measures are measures of process – dollars committed, tons committed, rations planned. We have no measures within the system of rations delivered, rations dispersed in populations, and nutritional outcome. There is no requirement for the UN, donors, or host governments to actually monitor the conditions of refugees. Assessments are done, but they are done intermittently. They are also, of course, done by non–governmental organizations, which do not have the right to report their findings within the international system. Documents presented, for example, at UNHCR's Executive Committee, do not usually contain accounts of the nutritional conditions of refugees – they do not contain accounts of scurvy, of pellagra, of starvation. They are all about process, they are all about money, they are all about law. Donors are not officially informed of nutritional problems. Having looked closely at the system in several cases, and having been a donor representative myself for some years, I am aware that donors frequently simply do not know what is going on. We tell our donors what we know, and we bypass the system, and sometimes that is helpful; but it is clear that any system that does not have a measure of performance does not amount to a system.

What we need urgently is the requirement that host governments or UNHCR carry out a minimum monitoring of refugee standards and report that back to donors. If donors then choose to do nothing, that is their right in international law, but at least the donors would have been able to make a choice. Currently, we have a situation where donors are only making a choice when things go badly wrong and reports get into the media. We have had five cases in the last 7 or 8 years where these situations have been brought to the media, and on every occasion the situation has been put right. One case took two years, but all the rest had been put right within the space of a few months. It appears then that once donors are aware that they have a major problem, things start to happen. It seems to me that if donors were aware that there was a scandal – outside the newspapers and off the television – then actually this would often secure action. Resident representatives would not be able to experience these situations and not report them if they knew that a wider constituency was aware of what was going on.

I would like to briefly discuss material supplies. I do not think anybody really knows the truth, but there is a general consensus that current commitments of material to refugee populations are sufficient in quantity (although there is also the question of quality). On the one hand, we know that many refugees essentially feed themselves from their own activities, their own resources, their own work, and from agriculture. But quite frequently, these refugees have been receiving full rations, for reasons such as lack of information or political judgement. Afghan refugees have been mentioned as one group who have been extraordinarily well served with food, housing, fuel and cash over a long period of time, where cereals alone would suffice because people could exchange them. At the other extreme, we also have situations where people have nothing, and need rations for survival. There is a case to be made, then, that if we were better supplied with information we would be able to distribute the available food much more effectively.

Basra Hassan

Save the Children Fund, Sudan

Dr Toole's presentation very nicely summarized the major nutritional problems refugees often encounter, and Dr Seaman has also pointed out very important points regarding refugees and the problems they are facing. I will highlight a few points from Dr Toole's presentation and paper, and make a few remarks.

Table 1 of Dr Toole's paper must have been striking to some of us –– to see that there are groups of refugees receiving adequate, well–balanced diets whilst living or located in very inaccessible places – receiving what they need through planes, whereas in places one can reach with trucks and spend a few thousand dollars, people are starving, and not receiving adequate rations. Who should be blamed for this? Is it the UN agencies, the donors, or those governments? Dr Seaman has touched on this point. As a refugee from East Africa, I really still require more explanation.

Dr Toole also discussed the nutritional status of refugees deteriorating while they are in the camps – there were examples of increases in the prevalence of protein energy malnutrition of under–5 children. In Somalia we have also had experiences of refugees' nutritional status deteriorating while they were in the camps. There was a outbreak of anaemia in children and women of child–bearing age –– in 1986 we discovered that 44 women who were newly delivered or pregnant had died within two months and we had 33 infants aged between two weeks and one month with no mothers, in a camp with a population of 35,000. Before this happened we had contacted all the UN agencies who were working with refugees in Somalia and informed them about the deficiencies in the rations and the problems these would be likely to cause, but nobody took our words seriously. However, when the situation began to deteriorate, and became visible, a dramatic change took place, both in the ration quality and the surveillance quality. The ration was improved in that beans were included on a regular basis and canned meat was brought for all – to be distributed as a supplementary ration for all pregnant and lactating women. More drugs of better quality were provided. Iron injections were included in the regimen for the treatment section. More tents were sent to open more in–patient clinics so that we could admit the severely anaemic women. A liver programme was established whereby all women whose haemoglobin was less than 7 g/dl were admitted, and those who were not very weak and who could take things orally were provided with 150–200g of liver on a daily basis. Iron tablets and vitamin C were also provided. Those who were unable to take the iron tablets that we were using at the time received an iron injection in place of the tablets, plus the liver, and those who were in a very serious situation, and who were in the last trimester were given blood transfusions.

Extensive surveys carried out at that time showed anaemia rates amongst children of 72% (cut–off of <10g/dl). We did not use the WHO cut–off of 11g/dl, because almost everybody would have fallen under that category. About 15% of the women were also severely anaemic. The subsequent surveys that have been done have shown dramatic improvements in all age groups.

I would also like to discuss the issue of rations – where the main discussion focusses on the quality and quantity of rations. If you go to the UNHCR or WFP offices in the countries which have refugees, their plans look fine. They can show you the amount of ration recommended, and the nutritional content of these rations, and these appear adequate on paper, but an important consideration is the regularity of the supply. The UNHCR and WFP representatives in the countries with refugees have been frustrated by the decision–making process. Many decisions about rations require HQ approval, and representatives will often tell you that HQ has not given approval, that someone important at HQ is away, and that they have to wait. Time passes and the problems increase, and there will come a time when little can be done about the situation. For example, one time when the malnutrition rate in under–5 children was very high in the camps in one region, we

contacted the WFP representative, who told us that there was a policy decision that only malnourished children should receive the supplementary ration. We suggested that we give food to all the under–5 children – at that particular time we had food which could feed these people for three months – and we asked if it would be possible to speed up the arrival of the next food supply. We were told that the representative could not do anything unless the headquarters approved it. It is my opinion that similar things are happening in other countries, and this irregularity of the ration supply causes a lot of uncertainty and lack of faith on the part of the refugees.

The following is dialogue between two women, Miss X and Miss Y. Miss Y went to a registration centre and when she came back she met Miss X on the way.

> **X:** "Where are you coming from?"
> **Y:** "I am coming from the registration centre."
> **X:** "What did you tell them?"
> **Y:** "I told them about the members of the family."
> **X:** "How many?"
> **Y:** "Nine"
> **X:** "You are foolish, you know. You are not intelligent enough. Why did you not double the number?"
> **Y:** "I do not like lying and also it is against the religion."
>
> **X:** "Do you want to starve the children? There are times the religion allows you to tell lies when these things touch on your survival."

So for refugees food is often survival, it is not for development. Even when food was required for survival in Somalia, there were times when some food was allocated to the development programme, and WFP were not able to switch the food from the development to the refugee programme. So, I wonder why we seem to be putting more emphasis on having good relations at governmental level while people are starving and suffering when food is available and could very easily we switched to those who need it most.

Another point that made by Dr Toole was the tackling of problems such as scurvy by introducing vegetable gardening and fish farming, etc. I do not think this can be applicable to all situations. For example, the Kenyans would be very happy if the Somali refugees in their country confined themselves to their wired area. And the camp is so crowded that vegetable gardening or any other kind of farming is simply not possible.

Scurvy was a big problem in Somalia, and a number of options have been tried in order to tackle the problem. One of them was the mass distribution of vitamin C tablets, and we found out that this was impractical or impossible. The whole staff working for the refugee health section would have spent all their time just distributing and counting the tablets. The other problem we faced was misuse of the tablets. For these people, tablets and medicine are only for the sick, and although we had offered a lot of education on the subject of who should take the tablets and when the tablets should be taken, people were still using them for headaches and for use when they were sick. We found many tablets just thrown away, and children were taking tablets meant for family members. If children liked the sour taste of the vitamin C, mothers would just give everything to the child rather than sharing them as prescribed. There was a lot of misuse and abuse related to the vitamin C tablets. The other thing we tried was distribution of grapefruits and limes and that was also impossible because of the logistics involved – a great deal of money was required to make this work.

We also thought of fortifying dried skimmed milk (an item in the ration) with vitamin C powder – as Dr Seaman has mentioned. For the first three weeks it seemed that it was working and the milk itself was acceptable – there were no complaints about the taste. We also did laboratory analysis of the fortified milk. Unfortunately, the whole project had to stop because of war and other problems in the country, and we were unable to assess extent of its success.

I would like to end my discussion by saying that for refugees, the UN is their parent, particularly the UNHCR and WFP people. They should think of themselves as the fathers of their families. A concerned father who left his children at home knowing that there was nothing left to feed them would think about and be very concerned about how he would feed his family, unlike a father who is not concerned. What is the use of a father who cannot feed his family?

Rita Bhatia

UN High Commissioner for Refugees

Dr Toole's presentation has shown that over the last ten years we have been seeing high mortality, high malnutrition and outbreaks of nutritional deficiency diseases, and Dr Hassan has discussed the dependency of refugees on international aid. Very recently, when I was in Ethiopia, a refugee came to me – a woman – and told me "the distribution point is my field and the ration card is my hoe". Refugees can be totally dependent. Even if they are peasants, that's where their food and living is.

I would like to discuss another very recent case study. In Sudan, we had about 20,000 – 30,000 male Ethiopian soldiers and ex–soldiers from the Ethiopian regime who took asylum in Sudan and were totally confined to a closed camp for over three weeks. They arrived in a good state of health, but soon developed scurvy, vitamin A malnutrition, and high mortality. There was very little water. They had access to only a small amount of cereal which was in the form of whole grains as there were no milling facilities. This population was totally dependent. At the end of this period, the soldiers were repatriated to Ethiopia, and the statement was made that this was one example of a successful repatriation of asylum seekers or refugees back to their home country. Nobody looked into what happened during the process.

What is wrong then? Why have we been going through these repeated failures? Is it due to lack of political will? Is it due to lack of resources? Is it due to poor management organization of relief services? From my own experience, and having been in the UN for a while, I do feel that there is a big communication gap between the technician and the policy–makers. Most of the food aid which is sent comes from the western world, and refugees can be totally dependent on it. We have very little choice about types of commodities, because aid is not in the form of cash – it is in the form of food – and so we have inadequate supplies, both in terms of quantity and quality. There has been inconsistency in the international response to many of the refugee emergencies, which is often based on political considerations and not on real needs. As we all know, refugees are dependent on this food aid. They often do not have access to markets, or to other barter systems, and what we give them is not enough to meet their needs. The consequences are obvious.

I would like to briefly mention logistical difficulties. As Dr Seaman said, even in some of the remotest places, logistical difficulties can be overcome. In Turkey and Iraq, because there was a political will, the logistical problems were solved by the use of helicopters and all kinds of planes. If there is a political will, I think there is a way. Logistics should not be used as an excuse for not delivering aid in adequate quantities and quality.

As Dr Seaman mentioned, there has been some agreement between the UN agencies, especially between UNHCR and WFP on basic minimum requirements. 1900 kcals has been recommended as the minimum requirement in emergency situations, but we have seen that people have been given less than half of that amount. In terms of the quality of food, which has already been mentioned by all my colleagues here, scurvy has been seen as a problem among refugees alone. I would like to address this issue again. Many experts have been doing a lot of work on vitamin A, anaemia and iodine, but there is no international strategy on prevention of scurvy. Pellagra is another micronutrient deficiency which has been seen in Malawi, among Mozambiquan refugees. Therefore, I would very much encourage and ask the group here to look into other micronutrient deficiencies, and not just to focus on the three or four major micronutrient deficiencies which have been discussed for the last ten or twenty years.

As technicians, we should be aware that our role is also to be advocates for refugees in terms of presentation and dissemination of information. Technicians should focus their advocacy efforts on promoting outcome oriented relief resources and assistance. As has been pointed out, there is no system whereby anyone can be held accountable if the proper information is not available. I think ongoing monitoring evaluation is very important, not just on the part of the UN, but also on the part of our other implementing partners.

I also feel that monetization should be encouraged among refugees, perhaps not in every situation, but in some situations where they have access to the market. One recent example is from Indonesia, on a small island where there are 20,000 Vietnamese refugees. They have free access to the markets, and they can go out of the island on the weekends. These kinds of camps are semi–closed. People are able to go out and look around. Thus, there are some situations where monetization should be tried and donors should be more open and flexible about who should be given cash – not for the whole food basket, but for perhaps some of the commodities which are available in the markets.

Another issue I would like to discuss is that of buffer stocks in the regions, which could be in the form of cash or in the form of kind. WFP has tried to set up regional stocks of food, but it did not work out very well because

of logistical problems and infestation of food items. One suggestion which I would like to make is that perhaps buffer stocks of cash be set up. With cash one can easily go out and buy some of the required food items, and this way the normal procedure of UN which involves waiting for a green light from Headquarters could be avoided, and the procurements could be made at regional level.

Statement to Organizational Committee, 27 March 1992, by John Mason, Technical Secretary, ACC/SCN, Concerning the SCN's Report on Nutrition, Refugees, and Displaced Persons

"The SCN had first become aware of the nutrition crisis amongst refugees because of a conference held in 1988, organized by WHO and UNHCR, under SCN auspices. This conference had been aware of the difficulties of meeting refugees' nutrition needs, and had put forward a statement to the SCN, which subsequently went to the ACC. I will quote briefly from this statement. We said that the problem with famine and disaster had resulted in unprecedented numbers of people depending for their survival upon international food aid, sometimes for prolonged periods of time. It was noted that although the total volume of emergency resources had been generous, this had nonetheless proved painfully inadequate to meet escalating needs, and indeed had at times failed to reach the intended beneficiaries due to severe constraints in recipient countries. The meeting noted that consequently the rations provided very often result in a seriously insufficient and unbalanced diet.

"The SCN had requested the ACC to bring this tragic situation urgently to the attention of donor governments. I am glad to be able to inform the OC that we understand that this did indeed have some effect. The statement was passed from ACC to ECOSOC and thence to a number of member governments, and we understand from participants in the SCN that some awareness had been raised, and indeed some action taken.

"The Sub–Committee had been kept aware of the nutrition crisis in the period since 1989, and at the Symposium held at the World Food Programme at the time of the recent Session in February, one of the three themes was protecting the nutrition of refugees and displaced persons with food aid. During this part of the Symposium, the Sub–Committee heard reports that nutrition in refugee camps was no better now than it had been the last time the situation was considered. It heard of increasing numbers of refugees certainly, so that with no improvement in the prevalence of malnutrition, the number of people suffering must have increased significantly.

"Perhaps the most shocking information for the Sub–Committee were two aspects. First was that during refugees' slays in camps, in sight of help, people remained or become severely underfed, and some died as a result.

"Secondly, that epidemic outbreaks of micronutrient deficiency diseases – scurvy, pellagra, beri–beri, which were thought to have been eliminated in the world – were now re–emerging.

"In the serious discussion that followed, the Sub–Committee focussed on two improvements in the system. The first of these was to improve the clarity of the accountability, who is responsible for this situation and more important who can prevent it happening. Secondly, and related to this, monitoring systems need improvement. It was said that although more resources were needed, it was also the case that better use of resources would be feasible, if the necessary information was available, and the necessary decisions were made. It was noted that all too often information got attention through mass media, and then necessary decisions were made: this could be greatly improved to ensure, as the statement says, "a more timely and effective response to the nutritional needs of refugees and displaced persons".

"It was felt that the SCN was an appropriate forum to identify such deficiencies – there was a collective need to take urgent action, without singling out anyone's particular role.

"These specific recommendations were carefully thought out and worded – as was the whole statement – initially by a group led by UNICEF, drawing on SCN members, and then reviewed by the SCN Executive Session, and the Subcommittee in plenary. The specific recommendations refer most of all to monitoring, and reporting to those who can take action and be accountable for that action. They include the setting of goals for alleviating malnutrition among refugees and displaced persons.

"The SCN had listened to Ms Basra Hassan, a nutritionist from Somalia who had contributed to the 1988 meeting, and who is now working in Darfur, Sudan, for Save the Children Fund. She herself had recently been a refugee from Somalia. She said: "You have to realize that the UN is seen as a parent to refugees – who

else is there? And what use is a parent who cannot feed their children?"

"Finally, the Sub–Committee recommended – appealed might be a better word – to the ACC through the OC to help."

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