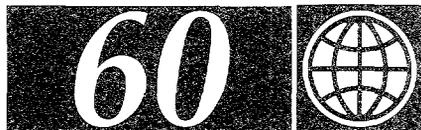


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# Fighting Malnutrition

An Evaluation of Brazilian  
Food and Nutrition Programs

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Philip Musgrove

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Food and Nutrition Programs

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Philip Musgrove

The World Bank  
Washington, D.C.

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Philip Musgrove is economic adviser to the Pan American Health Organization and a frequent consultant to the World Bank.

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## PREFACE

Beginning in the mid-1970s, the World Bank undertook to support substantial projects designed to reduce or prevent malnutrition in four countries to which it was providing major financial and technical assistance. Brazil was one of these countries; Colombia, India and Indonesia were the other three. The Brazil Nutrition Research and Development Project, begun in 1977, included a large number of components directed to one or another of the presumed sources of malnutrition in the country. The principal effort went into an experimental scheme to subsidize basic foodstuffs in poor neighborhoods, while other components addressed food supplementation, nutrition education, linking nutrition programs to health services, improved food marketing, and assistance to peasant producers. Both before and after the Bank Project, which ended in 1980, the Brazilian government introduced a series of food and nutrition programs, operated by different agencies, using different techniques, and based on different views of the nature and causes of malnutrition.

Most of these programs have at one time or another been subjected to some kind of evaluation. The Bank included some of these evaluations as part of its Research and Development Project; others were stimulated by other international agencies such as the Pan American Health Organization and UNICEF, and still others were undertaken, financed or encouraged by the government of Brazil. Until now, however, there was no overall assessment on all the available information and previous analyses. Thus the study of all the large programs directed primarily at consumers, undertaken by the Pan American Health Organization in 1983-1988, unifies these efforts and complements the Bank's attempts to derive lessons from the Brazilian project and those in other countries. This study is published in Spanish by the Pan American Health Organization; the Bank hopes to bring the results of this research to a wider audience by sponsoring their publication in English.

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## GLOSSARY OF ACRONYMS

BNDES	National Bank for Economic and Social Development
CISAM	Amaury de Medeiros Integrated Health Center
CNRH	National Center for Human Resources
CNPq	National Council for Scientific and Technological Development
COBAL	Brazilian Food Company
ENDEF	National Study on Household Expenditure
FAE	Student Assistance Fund
FINSOCIAL	Social Investment Fund
FIPE	Institute of Economic Research Foundation, University of Sao Paulo
FUNDAJ	Joaquim Nabuco Foundation
IBGE	Brazilian Institute of Geography and Statistics
IFPRI	International Food Policy Research Institute
IMPEP	Institute of Preventive Medicine, Sao Paulo School of Medicine
INAN	National Institute of Food and Nutrition
INAMPS	National Institute of Assistance and Social Security
INTA	Institute of Nutrition and Food Technology (University of Chile)
IPARDES	Paraná Institute of Economic and Social Development
IPEA	Institute of Economic and Social Planning
LBA	Brazilian Assistance Legion
MEC	Ministry of Education and Culture
MPAS	Ministry of Social Security and Assistance
MS	Ministry of Health
PAHO	Pan American Health Organization
PAP	Program to Supply the People
PAT	Workers' Food Program
PCA	Complementary Food Program
PIAC	Integrated Child Assistance Project
PINS	Integrated Nutrition and Health Program
PNAE	National School Meals Program
PNLCC	National Milk Program for Needy Children
PNS	Nutrition through the Health System Program
PROAB	Project to Supply Basic Foods in Low-Income Areas (at times called Program for Basic Foods in Low Income Areas)
PROAPE	Program to Benefit Pre-Schoolers
PROCAB	Project to Acquire Basic Foods in Low-Income Rural Areas
PRONAN	National Food and Nutrition Program
PSA	Food Supplement Program
SEAC	Special Secretariat for Community Action
SEPLAN	Planning Secretariat in the Office of the President of the Republic
SIVAN	Food and Nutrition Monitoring System
UNICEF	United Nations International Children's Emergency Fund
UFC	Federal University of Ceará
UFPE	Federal University of Pernambuco
USP	University of Sao Paulo



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## 1. BACKGROUND

Toward mid-1983, the Pan American Health Organization (PAHO) began to study some of the public programs in Brazil designed to improve food consumption and consequently the nutritional status and health of poor consumers. This focus on consumers initially restricted PAHO's interest to programs providing free and/or subsidized foodstuffs, excluding--except tangentially--those relating to food production, whose aim is to reduce the costs and/or increase the incomes of small producers. Furthermore, the institutional link between PAHO and the Ministry of Health (Ministério de Saúde-MS) led to attention initially being concentrated on two programs directed by the National Institute for Food and Nutrition (Instituto Nacional de Alimentação-INAN), which is part of the Ministry: the Nutrition through the Health System program (Programa de Nutrição em Saúde-PNS) and the Project to Supply Basic Foods in Low-Income Areas (Projeto de Abastecimento de Alimentos Básicos em Areas de Baixa Renda-PROAB). These two programs offer an interesting contrast, both conceptual and operational, and merit close attention. The PNS provided free foods in fixed portions; identified individual beneficiaries; and was implemented through health posts, the aim being to provide health care to children, pregnant women and nursing mothers. The PROAB, on the other hand, operates through retail traders, subsidizes foodstuffs without any quantitative limit on the client, and identifies not individual beneficiaries but low-income neighborhoods within which every family has a right to and, it is assumed, needs the subsidy.

The scope of the inquiry went beyond the investigation of the PNS and PROAB programs and the design of various studies for their thorough evaluation, to cover the experiences not only of INAN but also of other agencies, both Brazilian and international, particularly the World Bank, and those of other programs or experiments in Brazil. The most significant of these for the purposes of this study are the Integrated Nutrition and Health Program (Programa Integrado de Nutrição e Saúde-PINS), financed by the World Bank in Recife in 1978-80 and implemented by INAN; the SOMAR Network, a chain of retailers supplied and advised by the Brazilian Food Company (Companhia Brasileira de Alimentos-COBAL), which is responsible to the Ministry of Agriculture; and the Complementary Food Program (Programa de Complementação Alimentar-PCA), operated by the Brazilian Assistance Legion (Legião Brasileira de Assistência-LBA), which answers to the Ministry of Social Security and Assistance (Ministério de Previdência e Assistência Social-MPAS). The PINS is important, because it introduced a food subsidy limited to certain population groups (rather than a general subsidy) and experimented with four groups differentiated by level of subsidy, while also requiring certain beneficiaries to have medical-anthropometrical examinations on a monthly basis. The SOMAR Network is significant because it is operated by the same

company that chiefly supplied the PNS and PROAB programs, with the same objective of reducing the price of basic foods to poor consumers, but without intervention by INAN or any subsidy, and covering a wide range of foodstuffs. Finally, the PCA is an alternative to the PNS, similar to the latter as regards the free distribution of food and the identification of beneficiaries, but different in that it uses specially prepared nutritious compounds or "blends," and is executed by a different government agency. The emphasis in what follows is on the PCA, the PNS, the PINS and the PROAB, with fewer references to the other programs mentioned. The PINS terminated in 1980; the other three programs continued to operate until 1985, when the PNS was somewhat modified and given the new name of Food Supplement Program (Programa de Suplementação Alimentar-PSA). The most recent information in this study generally refers to late 1987 or early 1988.

### 1.1 Objectives and Structure

This study has three basic aims:

- to summarize the principal characteristics, both conceptual and operational, of the programs and their evolution during the period 1974-1986;
- to synthesize and review the findings of the various studies or evaluations made of these programs; and
- to arrive at recommendations for both research and operational purposes that will lead to better understanding and more efficient operation of the programs studied, or of others that may replace them.

The first objective will be met principally by using the administrative data generated by the agencies running the programs and presented in their official reports (Arruda 1980 and 1982; LBA Foundation; INAN) and internal documents (LBA Foundation 1985b and 1985d; INAN 1978 and 1984a; INAN, unpublished statistics). These data have been supplemented by descriptive analyses by researchers who in some cases worked in these agencies (Peliano 1984, Wilberg 1984) or in others which participated in program design or evaluation, and who in other cases were associated with universities (Coimbra 1985, Sampaio 1979, Carvalho da Silva) or other research centers (Cavalcanti et al. 1980, 1981, and 1984). The second objective relied mainly on the studies made independently of the present investigation (Cavalcanti et al. 1981 and 1984, Chaves et al. 1984, Ferriani et al. 1985, INAN 1984b, IPEA 1981? a and b, Kalil et al. 1984a and b, Lerner et al. 1985a and b, Moldau et al. 1982, Peliano et al. 1985, Rios 1981, Rosenberg 1976, Salomón 1979, LBA Foundation and UNICEF 1982, Nunes da Silva 1985, World Bank 1985b), but it should be pointed out that this is not merely an "evaluation of evaluations." Partly this is because I have very often returned to the original data in order to reinterpret them, and partly it is due to the fact that various studies have been produced or contracted as part of PAHO's research (Coimbra 1985, Galindo 1985, Musgrove 1986a and b, Musgrove 1988, Oliveira and Medeiros 1985) for the particular purpose of filling gaps in the information available.

The third objective is twofold. On the one hand, this analysis hopes to contribute to improving food/nutrition assistance to poor families in Brazil. On the other, it is part of a broader study, on which PAHO collaborated with the Institute of Nutrition and Food Technology (Instituto de Nutrición y Tecnología de Alimentos-INTA) of the University of Chile. This study (PAHO 1987) brings together summarized information on programs of this kind in all the countries of Latin America and the Caribbean with the aim of providing data and useful recommendations for the design, implementation, operation and evaluation of food assistance programs in any member country of PAHO. To this end, Brazil is one of the most interesting countries to analyze in detail, in light of the great variety of experience accumulated there and the relatively ample documentation available. The bibliography therefore consists mainly of studies carried out in Brazil or by international organizations which have studied Brazil's programs. With a few exceptions (Butler 1984, Coe 1983, Cook and McAnamy 1982, Heysen and Musgrove 1986, Kennedy and Pinstrup-Andersen 1983, Kennedy and Alderman 1985, Keusch and Scrimshaw 1986, Kotelchuck *et al.* 1984, Musgrove 1985b, Piwoz and Viteri 1985, Shrimpton 1984, Timmer *et al.* 1983, Townsend *et al.* 1982, World Bank 1983b), no references will be made here to studies in other countries that might permit inferences regarding the impact of one or more programs in Brazil. Brazil's own experience is already quite sufficient to answer certain pertinent questions; while to those as yet unanswered responses can be found through research in Brazil itself.

In order to shorten this report, three other issues will only be very briefly touched on, since they are fully discussed in the works cited. One of these is nutritional status in Brazil, as revealed primarily through the National Study on Household Expenditure (Estudo Nacional da Despesa Familiar-ENDEF) at the national level, and studied on a reduced scale in other surveys. It is generally agreed that there is a serious nutrition problem in Brazil, in that much of the population suffers from a protein and calorie deficit, and that this problem is concentrated, though not exclusively, in the North and Northeast and in the urban areas of other regions. Another topic mentioned only occasionally and briefly is Brazil's economic development in the last decade. Although its impact on nutritional status and the programs studied herein may be considerable, there is no need to analyze it in quantitative terms since this has been comprehensively done in other documents. Finally, although Brazil's nutritional needs and the results of attempts to satisfy them are intimately related to the performance of Brazil's agriculture over the last 15 or 20 years, this is not a study of the agricultural sector. Agriculture will only be referred to insofar as it is necessary to provide a context for the main focus of the study, which is public assistance in the form of free or subsidized food. Consistent with this approach, no statistical or quantitative data will be presented that are not directly related to one program or another.

This introductory chapter is followed by five substantive chapters. These discuss, in order, the following issues: malnutrition in Brazil and its determinants; the ideology or orientation of the programs studied; quantitative changes in these programs; the evaluation of their operational aspects; and the evaluation of the results or benefits obtained for the target

population. As far as possible the approach in these chapters is always comparative. It should be noted that comparative evaluations of food programs are few and far between: Kennedy and Alderman (1985, pp. xiii-xiv) found only nine programs in the entire developing world with enough information to make this kind of evaluation. In the case of Brazil, there is a comparative evaluation of two models for the provision of health services (Pinto, 1984), which has the same objectives as are sought here, but there has been no comparable evaluation of nutrition programs. Campino (1985, p. 290), in evaluating the PINS, notes the lack of comparative studies that would enable that program to be judged in relation to other assistance programs such as the PNS. Chapter 7 discusses the food and nutrition components of the Program of Social Priorities (Programa de Prioridades Sociais) announced in May 1985. This program includes a new plan for the free distribution of milk and a new scheme combining some elements of the PROAB with others of the SOMAR Network, in addition to changes in existing INAN and LBA programs. The eighth and final chapter presents the main recommendations that seem warranted on the basis of the information analyzed.

## 1.2 Historical Background

For more than four decades a number of programs have existed in Brazil with the objective of stimulating food production, or of making the supply of foods more efficient and predictable, or of stimulating consumption by different population groups. During the 1960s, in particular, various programs financed by outside agencies (mainly in the U.S.) distributed imported foodstuffs (principally powdered milk) to groups defined as needy. Two important differences should be noted between that period and more recent years: the dependence on external assistance and the selection of one product (milk), more because it suited the supplier--it was a way of disposing of milk surpluses in the United States generated by a minimum price policy--than because it met the needs of the beneficiaries. It could be said that at that time there was no general national diagnosis of malnutrition in Brazil. It was generally believed that the principal deficiency was one of protein (which seemed natural, since protein foods are generally more expensive than calorie foods), and a considerable part of this malnutrition was attributed to ignorance and superstition on the part of the poorer sections of the population. The history of the period up to the 1970s is summarized briefly by a number of authors: Coimbra (1985) reviews it in light of policies and objectives, Peliano (1984) and Wilberg (1984) in frankly more polemical terms, and Campino (1987) and Carvalho da Silva (1982) in light of the specific programs adopted. For a detailed account of these matters, see also Carvalho da Silva and Iunes (1981, pp. 1-172, and 1986), and for a brief survey, see Sampaio (1979).

Although today's programs or those of the recent past show some continuity with those of previous decades, they are more notable for their innovations. In general terms, one can speak of a new age in the conceptualization of food and nutrition programs beginning in the first half of the 1970s. This change was the result of a number of factors, including the termination of much of the external food assistance to Brazil, and the "rediscovery of poverty" in that country. As is explained in more detail in Chapter 2, a key event in this conceptual change was the ENDEF survey in

1974-75; but the decision to carry out a survey of this kind, with its marked emphasis on food consumption and nutrition, already reflected a process of change in the way the problem was viewed. At this time the World Bank executed a relatively large nutrition project in Brazil which included experimental and evaluation components in relation to different kinds of programs (World Bank, 1983a). Brazil was one of four countries, Colombia, India and Indonesia being the others (World Bank 1983b), in which the Bank carried out similar experiments (Berg 1987). Although none of the current programs in Brazil is a mere creation of the Bank, a number of them originated in an experiment designed in conjunction with Brazilian institutions and financed by the Bank.

In the years since 1970 a great variety of programs (including some experiments of limited duration) has existed in Brazil at one time or another, with very heterogeneous objectives, procedures and clientele. The catalog prepared by Carvalho da Silva (1983a) referred to 16 programs, although two of these are merely surveillance or education programs, not involving any distribution of food; two are directed only at micronutrient deficiencies (iron, iodine and vitamin A); and two are not nationwide in scope, being programs of the state of Sao Paulo. The list also includes three kinds of Federal Government programs that distribute or subsidize meals rather than food, which are not discussed in this evaluation. These are the National School Meals Program (Programa Nacional de Alimentação Escolar-PNAE), operated by the Ministry of Education and Culture (MEC); the Program to Benefit Pre-Schoolers (Programa de Atenção ao Pré-Escolar-PROAPE), begun as an experiment under INAN's direction and then transferred to the MEC; and the Workers' Food Program (Programa de Alimentação do Trabalhador-PAT), of the Ministry of Labor. There are two basic differences between that group of programs and those studied here.

First, they distribute or finance prepared meals rather than food to be prepared and consumed at home. Secondly, consistent with this approach, they are not targeted at the family but at individuals--school children, pre-schoolers or workers. True, the distinction is not absolute, because the PNS and PCA are also aimed at certain individuals within the household, but in these cases the link with the family is much stronger. The PNS, PCA and PROAB are also more oriented toward poverty, although once again the distinction is not absolute: although in principle the PNAE is designed to benefit all the school children in Brazil, PROAPE is directed at poor families. The PAT may help low-income workers (nonetheless employed within the relatively formal sector of the economy), but once a company associates itself with the program all its employees can benefit from the subsidy. A summary of the features of the programs excluded from this study, and in some cases an evaluation of them, can be found in a work by Carvalho da Silva (1983a), another by Carvalho da Silva and Lunes (1981, pp. 165-168a) and one by Knight (1982), which preceded the World Bank report (1983a), and in the documents cited above. A summary of Brazil's nutritional situation, together with a short description and assessment of the main programs designed to improve it, can be found in the INAN Pro-Memória (Batista Filho and Barbosa 1985) on the decade 1974-1984.

### 1.3 Economic Background

The early years of the period studied here (1974-1986) coincide with the end of Brazil's "economic miracle." The PNS and PCA were also started during this period. By contrast, the last five years saw, first, reduced growth and then a severe economic recession. It was during this period that the PROAB was developed, having been started in 1979. For the purposes of this study it would be ideal to analyze the performance of all these programs throughout the entire decade, but this is impossible; apart from the fact that the PROAB is more recent than the other programs, the evaluations that have been made up to now do not coincide in time. With some exceptions, the largest amount of information available relates to the years 1978-1980, which coincide approximately with the duration of the PINS experiment, the precursor of the PROAB (Cavalcanti et al. 1980, 1981 and 1984, Nunes da Silva 1985), and with five partial evaluations of the PCA (LBA Foundation 1979, LBA Foundation and UNICEF 1982, Salomón 1986) and PNS (IPEA 1981?a, Cavalcanti et al. 1980), and with all the programs included in the National Food and Nutrition Program (Programa Nacional de Alimentação e Nutrição-PRONAN) in the years 1976-79 (IPEA 1981b). Evaluations also exist for the PNS based on the years 1976-78 (INAN, no date, Rios 1981) and 1980-82 (Chaves et al. 1984, Kalil et al. 1984a and b, Lerner et al. 1985a and b). Much of the information, therefore, relates to a time that can be described as one of transition between a period of economic expansion and one of clear recession. More recent studies are also available covering only the years of recession (INAN 1984a, Oliveira and Medeiros 1985) and the subsequent economic recovery. The statistical data, unlike the qualitative evaluations, are more or less uniform for the entire period.

Developments in the Brazilian economy have been fully studied in recent years and there is no need to summarize them here; a good survey can be found in World Bank 1984 and 1985a. Three basic points should nonetheless be kept in mind. First, any loss of income must lead to a reduction in expenditure on food. For non-poor families this is not necessarily reflected in a reduced consumption of nutrients, since initially they can reduce the quality or variety of their diet; but for poor families the consequence will necessarily be a smaller intake. Engel's Law, according to which a decline in income produces a less pronounced reduction in food consumption, does not mean that there is not a significant nutritional deterioration, concentrated in those families who previously were eating merely adequately. We should therefore expect a deterioration in nutrition up to 1985, given the prevalence of poverty in Brazil, that will be incremental to the malnutrition existing ten years ago.

Second, this general trend will have been partly alleviated by the more liberal wage policy of recent years (particularly 1986), which tried to protect, at least in relative terms, the lowest income earners. However, any beneficial effects will have been offset by two other factors. One is unemployment, which gives rise to a much larger fall in income for those it affects than the average decline for the population as a whole. The other is inflation, which tends to worsen income distribution in economies such as Brazil's. Both employment and inflation have notoriously increased in Brazil in the last ten years. Furthermore, the inflation in food prices has tended to be somewhat more rapid than in other prices.

The influence of these factors makes it impossible to tell whether food assistance programs have managed to reduce malnutrition among the population as a whole. It would in fact amount to an injustice to evaluate the programs from this standpoint, in an environment and during a period in which malnutrition may be affecting an increasing proportion of the population. Therefore no nationwide comparisons will be made in what follows; the evaluation of the programs will be based on what they have achieved for their particular target groups, when this can be identified. Any assessment, however, is complicated by the influence of economic factors that are not systematically controlled for or taken into account. Nor has any use been made, in any of the evaluations of one program or another, of a non-beneficiary control group, with only two exceptions, involving estimates of the impact on weight at birth of the PNS (INAN no date) and PCA (LBA Foundation 1985a). In the PINS case the benefits varied among different groups in the study, but there was no non-beneficiary control group. This makes it necessary to infer more and measure less than would be desirable.

The third point to bear in mind is that Brazil's food and nutrition situation does not depend merely on what happens to incomes, including their distribution, and the general price index. It also depends to a considerable extent on developments in agriculture and on the availability and prices of the foodstuffs making up the basic consumption basket. This issue deserves further discussion.

#### 1.4 Agriculture and Food Supply

According to the distinction noted by Timmer, Falcon and Pearson (1983, p. 65), what is generally termed "food policy" in fact contains two components: the policy for foodstuffs, regardless of who consumes them, and the policy for nutrition, which relates to the distribution of consumption and its consequences for nutrition, in conjunction with other factors. These two elements may conflict, especially as regards food prices and their impact on the population's purchasing power. Seen in this light, nutrition policies in Brazil and the programs in which they are embodied are partly in conflict with a food policy whose effect on the whole has been negative (INAN 1981a, Sampaio 1979). This has occurred despite the fact that agriculture as a whole can be regarded as a notable success, since among the successful crops are sugarcane and products (coffee, soybeans, oranges, etc.) destined for export. Where there has been a deterioration, perhaps even a failure or crisis, is in the traditional crops representing the staple consumption items of poor families--beans, corn, manioc and (to a lesser extent) rice. The "technological imbalance" between the products in the first group and those in the second has been fully documented by Homem de Melo (1983), and the consequences and possible solutions have been discussed by him and a number of other authors (Campino 1986b, INAN 1977, Knight 1984, Martine and Garcia 1984, Pellano *et al.* 1985--the first version of this last work was called "Crisis and Hunger").

To put it very briefly, pricing policy and other incentives over the last 15 to 20 years in Brazil have not been unfavorable to agriculture in general, but they have promoted export crops and agricultural inputs for industry rather than the production of basic foodstuffs. These policies have also favored large and technically sophisticated production units rather than

the traditional small farmers. The areas devoted to staple consumption items have expanded, though slowly, while yields have been constant or have even fallen. The net effect has been a decline in the per capita availability of certain basic foodstuffs. At the same time other crops have expanded, in some cases displacing foodcrops and bringing about a greater concentration of land ownership. There have been two basic consequences from the nutritional standpoint: an increase in the prices of staple consumption items and in the number of people who have exchanged the status of independent producer for that of agricultural wage-hand or who have abandoned the land and migrated to the cities.

Three factors have unquestionably contributed to a relative deterioration of agriculture, even in the most favorable circumstances. First, the economic recession, as already noted, reduced the demand for food. Second, given the crisis caused by the rise in oil prices, Brazil had to expand its exports--or reduce its imports even further--and agriculture provided excellent opportunities for this. Finally, the prolonged drought in the Northeast of Brazil resulted, as always happens in dry periods, in lower production, accelerated migration and a tendency toward increasing concentration of land and income. But even when these factors are taken into account--and it should in particular be noted that the first of them would have reduced food prices--the conclusion reached by all the investigators cited is that:

- the policies adopted made the problem more acute, especially as regards manpower use and the bias against traditional crops;
- agriculture also offered, and continues to offer, major opportunities for expanding food production (Knight 1984), in a way that could help promote Brazil's economic recovery without necessarily reducing agriculture's contribution to exports; and
- the situation with regard to food supplies and prices has become so critical, given the ways in which they stimulate inflation generally and impoverish an already poor urban population, that policies must be reoriented. Until this is done, efforts focused strictly on nutrition will have very limited success and at an unnecessarily high cost. It is against this background that the following chapters should be considered. The specific consequences in terms of prices will be discussed in section 5.5 in particular.

#### 1.5 Note on Information Available

It is appropriate to conclude this chapter by noting that although there are many gaps in the information available and in the analyses made in Brazil up to this time, there is in general terms a wealth of empirical data and also a relatively solid conceptual base. In addition to the background, economic and agricultural studies already cited, there is an analysis of changes in food consumption (Campino *et al.* 1984). Other works provide a theoretical structure to evaluate consumers' behavior and the probable impact on them of one or another assistance program (Moldau 1982 and 1985, Musgrove 1985a). The bibliography at the end of this report contains only a selection

of the works available on this issue in Brazil. A more extensive bibliography can be found in Batista Filho and Barbosa 1985, CNPq 1985, Kennedy and Pinstруп-Andersen 1983, Klein et al. 1982, Piwoz and Viteri 1985, Sahn et al. 1984, Sampaio 1979, Carvalho da Silva and Iunes 1981, and Timmer et al. 1983. There are a number of collections of works of varying quality (Castro and Coimbra 1985, CNPq 1985, Klein et al. 1982, Minayo 1985, Nóbrega 1986, Sahn et al. 1984, UFPE 1978), among which many useful studies as well as provocative polemics can be found.



## 2. MALNUTRITION AND ITS CAUSES

The principle source of information on malnutrition in Brazil at both the regional and national level is the ENDEF survey of 1974-75. This nationwide study included not only financial data on incomes and expenditures but also anthropometric measurements and direct estimates of quantities of foods consumed (without any intrafamily breakdown). The data obtained have been the basis for a description of food consumption patterns in two regions, Sao Paulo and the Northeast (Silveira *et al.* 1985), an analysis of the human resources situation in Brazil (World Bank 1979), detailed studies of the nutritional situation of mothers and children (IBGE Foundation 1982), a discussion of the need for food interventions (Alves *et al.* 1985), and estimates of food consumption functions (Gray 1982, Musgrove 1986b and 1988), among other uses. It does not seem an exaggeration to state that almost all of what is generally accepted at the present time as an analysis of Brazil's nutrition problems is derived from the ENDEF survey, prior to which much less information was available (Sampaio 1979, pp. 911-913). However, this does not mean that all the conclusions making up this consensus are universally accepted or immune from criticism. Nor does it exclude from consideration many studies based on small samples that do not permit inferences at the aggregate level, but which analyzed one or more aspects of malnutrition in greater depth (Batista Filho and Amigo 1985), and whose findings very often coincide with those of the ENDEF survey.

### 2.1 Description of Malnutrition

The ENDEF analysis appears to have found that:

- in children, malnutrition principally takes the form of low stature and weight for the age in question, rather than low weight for a given stature. In other words, malnutrition is much more chronic than acute, with many apparently healthy children among the chronic cases.
- the main dietary deficiency involves calories rather than proteins, despite the fact that foodstuffs rich in calories are cheaper and that there is a tendency for consumption of proteins to increase when income rises. It should be noted that this refers to the total content of the family diet; ENDEF did not inquire into the intrafamily distribution of food, nor have other studies done so. As a result, it cannot be inferred that the deficiency is greater for calories than proteins for each family member. Comparisons between protein-calorie supplements (natural milk or a substitute made from soybeans) and purely caloric supplements, for pre-school children, reveal better anthropometric effects for the former, which suggest that the children also suffer from protein deficiencies (Costa *et al.* 1985). Consumption estimates are somewhat less

precise with regard to micronutrients--vitamins and minerals--but serious deficiencies exist for iron, iodine and vitamin A (Batista Filho and Amigo 1985). The vitamin A deficiency is particularly noteworthy in the rural Northeast (Ferraz de Lucena et al. 1984).

- aside from these deficiencies, the typical diet of the poor family is adequate in quality but insufficient in terms of the quantity consumed. There are marked differences in the staple consumption items of the poorest group as compared to families with larger resources, the former depending on a small number of foods for almost all their calories and proteins (Silveira et al. 1985).
- those most affected by protein-calorie malnutrition, or who are most at risk, are pregnant women, nursing mothers and children under six years of age, especially those between six months and two or three years (IBGE Foundation 1982).
- malnutrition, measured anthropometrically or inferred from consumption, is clearly associated with low incomes or poverty, in both urban and rural areas.
- at the same absolute low income levels, urban dwellers allocate a smaller proportion of total expenditure to food, making calorie deficiencies larger in these areas. In other words, the higher income levels in the cities are offset by the need or the decision to spend more on other items, leading to large-scale urban malnutrition.

These findings would seem to justify orienting activities toward poorer groups (rather than towards groups identified through other variables), at least as regards calories and proteins; toward the urban as well as the rural population, including the peripheries of the large cities; and putting the emphasis on higher calorie consumption. It is a common feature of the programs studied here that they accept these criteria to a greater or lesser extent, but differ in their relative emphasis on one or another supposed cause of malnutrition. These causes are discussed below.

## 2.2 The Importance of Income

Low income emerges as a main cause of malnutrition not only in the ENDEF analysis (World Bank 1979) but also in other studies (Alves 1978; Campino 1986b; Sampaio 1979, pp. 911-912; Sampaio and Coelho 1978). Reviewing a number of investigations, Shrimpton (1984, pp. 59-60) concludes that income is a main determinant of the quantity, and at times the quality, of the family diet, and that "it is significantly associated with the prevalence of malnutrition among children, measured through direct (anthropometric) indicators." The same author, however, notes that "confusion" exists in the literature regarding the association between socio-economic level and nutritional status, and that there is no very strong correlation between the nutritional status of a child and the total availability of food within the family. Batista Filho and Amigo (1985), also reviewing a number of research works, conclude that income is the principal factor for explaining protein-calorie malnutrition, and that it is also associated, though not so clearly, with micronutrient deficiencies. Silveira et al. (1985) also confirm

the importance of income, noting the extent to which it limits the consumption of foods clearly desired by the consumer and of high nutritional value. Campino and Casselo (1983) relate the nutritional status of children to the employment situation of their fathers. Weight at birth, which is associated among other variables with the nutritional status of the mother when pregnant, also differs according to a group's income level, as Zisman (1987) shows by comparing the distribution of birthweights among the different social strata in Recife. The most extensive review of the studies on this question, by Carvalho da Silva and Iunes (1981), also confirms the central role of income in explaining inadequate nutrition (pp 75 to 90). Ferraz de Lucena *et al.* (1984), in classifying families according to their landholding (as an approximation for income) discovered that all nutritional deficiencies decline as wealth increases.

To be able to conclude that malnutrition is basically the result of a lack of resources rather than inefficient application of the resources available to the family, we must demonstrate two other propositions: first, that the typical poor family allocates its income efficiently in satisfying its food needs; and second, that where a food deficit exists as a result of low income, an increase in income is reflected in higher consumption, to the point of eliminating the deficit. Both propositions have been studied in Brazil, and the evidence for them is favorable, although not entirely convincing.

First, Rosenberg (1976) studied the diet and expenditure of poor families in Sobradinho, using price data and linear programming techniques to establish various reference diets that are economically efficient (they minimize costs) and allow various levels of diversity in terms of the foods consumed. Her main conclusions are that poor families are efficient in obtaining the nutrients they actually consume (unlike richer families, who pay more than they need to for their nutrients), but that they are not completely "sensible," in that they could with the same expenditure obtain a better-balanced diet. Second, Gray (1982), using the ENDEF data, calculated income elasticities for calorie consumption for families that are poor in terms of either income or calories, obtaining strikingly low estimates, of the order of 0.2 to 0.3.<sup>1/</sup> This suggests that the typical family with a calorie deficit does not regard it as the sole or even principal deficiency in its consumption; when income increases, the family spends more on more expensive food, improving the quality of the diet but raising the price per calorie obtained. It should be noted that among different income levels the price

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<sup>1/</sup> (An elasticity is a ratio between two relative or percentage changes. To say that the income elasticity of calorie consumption is 0.2 means that if income rises by 10 percent, calorie consumption will increase by 2 percent. The use of percentage changes make the ratio independent of any units of measurement of the two related variables, which would not be the case, for example, if the number of calories consumed were related to the amount of income in monetary units. In the same way elasticities can be defined and estimated for other consumption--proteins, or specific foodstuffs--and for other factors that influence consumption --food prices, family size, etc.).

differences for a given food seem considerably smaller than the differences in the amounts consumed (Silveira *et al.* 1985, pp. 214-216). Thus elasticities calculated in terms of expenditure on food would not differ much from elasticities based on quantities. These estimates suffer from being based on aggregate data and from excluding other socio-economic factors from consideration. The first factor (aggregation) tends to skew the estimated impact of income downwards; since malnutrition depends on the interaction of income and other socio-economic factors, excluding the latter may skew the income effect in any direction. It is worth noting that other authors have obtained different results, as is clear in the summary by Carvalho da Silva and Iunes (1981, pp. 87 and 90). Although the income-elasticities for the quantity consumed are of the same order as Gray's estimates for certain staple items (0.3 or less for rice, beans, bread, sugar, manioc, potatoes and pasta), the estimates for products with a higher protein value (meat, eggs, fresh milk) are 0.5 or higher. What is most striking is the appearance of elasticities of 0.7 and greater, even for basic caloric foods, when the calculation is limited to the poorest 14 percent of the population, which suffers from the largest calorie deficits. The main limitations of these others studies, compared with that by Gray, is that they involve relatively small groups in only a few cities. Nonetheless, they suggest that low income is indeed the main cause of inadequate consumption and that increases in income are reflected in higher consumption, at least among very poor families. The same data as were utilized by Gray, but analyzed at the individual family level, provide estimates that reinforce this conclusion in the form of high income-elasticities among poor families, both urban and rural, in the Northeast (Musgrove 1988). These issues will be discussed in section 6.1 below.

One factor which complicates the interpretation of income as a determinant of malnutrition is its marked irregularity. It can fluctuate significantly from one week to the next, even in families where one member has a relatively stable job, and all the more so for families all of whose members depend on informal self-employment. This is one of the findings of the PINS experiment in 1978-1980 (Cavalcanti *et al.* 1984), and it has important consequences for the design of assistance programs, to which we will return later. Although poor families compensate for the low level and instability of their money incomes by a variety of "survival strategies," which were studied in Recife by Motta and Scott (1983), in urban areas these strategies do not increase available resources by more than ten percent, as Haguette (1982) shows for the population of Fortaleza. Thus the low elasticity of calorie consumption--if it really exists--does not seem to be explained by the acquisition of food by non-monetary means. On the other hand, temporary fluctuations in income may be skewing the estimates of this elasticity towards zero, so that increases in income may perhaps give rise to larger increases in consumption than those calculated. It should be noted that no study has distinguished between the effects of stable or "permanent" income and those of temporary fluctuations. This is a particularly important difficulty when families are stratified according to their observed income in an attempt to isolate the effect of another variable, such as, for example, education (Sampaio and Coelho 1978); almost all the variation observed in incomes within a given stratum may be temporary and therefore may explain very little.

Most of the studies relating income to food consumption and/or nutritional status involve urban groups whose incomes are almost exclusively money earnings from remunerated labor. As regards the rural poor, various studies (Ferraz de Lucena *et al.* 1984, Carvalho da Silva and Iunes 1981, p. 91) show that the structure of income, not just its absolute level, is also important for nutrition. Infant malnutrition in particular tends to be more frequent among workers with no access to land and who produce none of their own food consumption, as compared to peasants who produce at least part of their diet. Even when there are no changes in the production of any foodstuff, the alterations in agriculture that have increased the number of workers without any land or production of their own may have worsened the nutritional status of the rural population.

The importance of economic factors as a cause of malnutrition is also complicated by changes in relative food prices. In theory, changes in food prices affect real income and must be taken into account in the determination of wages and salaries. However, adjustments to the latter, because they are based on a global price index, may only reflect very imperfectly the income effect of a change in food prices, and tell us nothing about the price effect or the substitution effect among foods of such a change. It is possible that the tendency for relative food prices to rise in Brazil in during the last two decades has reduced the apparent importance of income as a determinant of malnutrition for this reason. Few studies have estimated price-elasticities that enable these substitution effects to be taken into account (Gray 1982, Musgrove 1988), and a number of the estimates made are unreliable.

All the studies cited measure income at a moment in time (typically for a period of a month, or less), and observe food consumption and/or anthropometric status at that same time. This makes it much easier to establish a link between income and consumption than between income and malnutrition, since chronic malnutrition represents a cumulative process throughout the entire life of the child, not merely the influences of the present moment. In practice, there will only be a close relationship between current income and present anthropometric status if income has been stable over time, and also if the other causes of malnutrition have maintained a stable relationship with income during that period. Both conditions are true in part--typically, today's poor were also poor in the recent past and they tend to be less educated than the non-poor, to live in more insanitary conditions, and to suffer more severe and repeated illnesses. But no relationship is so close as to make malnutrition exactly the same thing as an inadequate consumption of food. As a result, an adequate income can be regarded as a necessary condition for an adequate level of consumption, and hence for satisfactory nutritional status; but it cannot be regarded as a sufficient condition, particularly in the very short term. There are at least two other crucial groups of factors that play a part in determining nutritional status, namely health and cultural aspects. These are discussed in sections 2.4 and 2.5 below.

### 2.3 Family Size and Composition

Family "income" can be understood to mean total income, ignoring the number of family members it supports, or income per head (or some other concept, such as that of adult-equivalent). Most of the studies cited in the previous section refer to total income, perhaps on the assumption that income varies much more from one family to another than does family size, and that therefore the influence of family size in determining poverty or malnutrition is secondary. For non-poor families this is true, since if they contain more members there is no problem in spending somewhat more on food and offsetting this by spending less on other budget items that are less essential or that offer larger economies of scale. But for poor families changes in the number of family members may govern the possibility of adequately feeding all of them. Undoubtedly this factor contributes to the weakness of the relationship observed between income and nutritional status.

Classifying families according to income per family member eliminates this bias and provides a better differentiation between poor and non-poor. Nonetheless, family size may play a role in malnutrition irrespective of its contribution to determining income per individual. Put another way, total family income and the number of family members do not necessarily produce symmetrical or compensating effects on food consumption or other determinants of nutritional status. Also, good or bad nutrition may depend on family composition as well, and especially on the relative numbers of dependent children and adults within the same total number of family members. A study by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística-IBGE), in conjunction with UNICEF, of the nutritional status of mothers and children in Sao Paulo and the Northeast (IBGE Foundation 1982, pp. 52-57 and 194-199) utilizes the ENDEF data to classify families in terms of income quartile per head, and then examines the relationship between the satisfaction of the family's calorie needs (total consumption) and family size, for families containing children under five years of age. Unfortunately, the same analysis was not done in relation to individual anthropometric measurements. Therefore one cannot tell from the analysis if there are malnourished children in a family whose total calorie consumption is adequate; the bias of the study is toward not finding nutritional effects that result from family size or composition. It is also worth noting that the income per head quartiles are defined independently in each of the four groups studied. As a result, to be "poor" in the rural Northeast is to be very much poorer than in Sao Paulo. In practice, the third quartile in the Northeast coincides with the first quartile in Sao Paulo.

Despite these limitations, it can be established from the study that small children are very concentrated in families consuming less than their calorie needs; that the number of these children, per family with one or more children, declines slightly in each region as income per head rises, and also as diet adequacy improves; and finally, that total family size (also among families containing at least one small child) falls as the energy intake improves, in each of the four regions studied. It seems clear that family size and composition have an impact on food consumption and on the probability of malnutrition that is incremental to the effect stemming from the income per member. However, the aggregate analysis by quartile cannot reveal whether the families with the most children are typically the poorest ones within each quartile.

It appears that the only study taking family size and total income into account simultaneously at the individual family level (without aggregation) is an analysis also based on the ENDEF data and restricted to the Northeast (Musgrove 1986c). This study shows that the two variables affect family consumption of certain staple foods in different ways. In general, consumption is more sensitive to family size in urban areas than in rural areas, and in both areas consumption per head declines when the number of family members increases without a compensating increase in total income. Particularly for very poor families--who could only obtain sufficient calories if they spent their entire income on rice and beans--there is no way of protecting the quantity or quality of the diet when more members are added. Per capita consumption of higher-quality foods, especially proteins, is sacrificed to a greater extent, but there are significant reductions even in the consumption of basic, cheap foodstuffs such as sugar and manioc flour. Only at levels of income four times higher does family size cease to have such a strong impact on consumption and therefore on nutritional status.

#### 2.4 Disease as a Determinant

Acute malnutrition, and especially deaths associated with it, is concentrated among children aged between six months and three years. This is also the age band when diseases are most frequent, particularly diarrheas and parasitic infections. Even when family income and diet are adequate these illnesses are capable of halting growth, through their direct effects in loss of nutrients and the indirect effect of anorexia in the child (Keusch *et al.* 1986; LBA Foundation and UNICEF 1982 p. 3.13). Shrimpton calculates (1984, p. 18) that in Brazil the *Ascaris* alone, excluding other intestinal parasites, consume the equivalent of 11 million of liters of milk a year. Leslie (1982), studying nutrition and health in children in a poor neighborhood on the outskirts of Fortaleza, concludes that controlling diarrheas would be a much more effective contribution to improving nutritional status than the provision of larger amounts of food. A more recent study on a similar group (McAuliffe *et al.* 1985) confirms the high incidence of diarrheas and respiratory diseases and the frequent tendency to anorexia as a result. The significance of illness (especially diarrheas and respiratory diseases) as a cause of malnutrition in small children, or in compounding its effects, was also fully recognized by the Food and Nutrition Committee that the Ministry of Health organized in 1983 to recommend integrated health and nutrition actions (MS 1983). In addition, a recent review of the relationships between disease and malnutrition (Keusch *et al.* 1986) concludes that the three top priority actions to combat infant malnutrition are immunization (especially against measles), oral rehydration in diarrhea cases, and breast-feeding. Interventions involving food supplements and fortifying diets with micronutrients (particularly vitamin A and iron) can also be effective, especially in combatting specific deficiencies, but are considered as secondary in cost/benefit terms; the three priority steps cost very little and yet have a significant impact.

The importance of diseases may, in particular, explain why the relationship between malnutrition among children and the availability of food in the home, and therefore with family income, is so weak. It also helps to explain the emotional abandonment and eventual death of children in families which are certainly poor but appear capable of keeping their children alive,

as analyzed by Scheper-Hughes (1984). It may in addition partly account for the different performance of assistance programs as a function of the age of the beneficiary child. We will return to this question in section 6.5. In general terms, if diseases are not taken into account it is not even possible to estimate the effect of income on nutrition with any confidence, given the high correlation between poverty and disease produced by the causal interactions in both directions between them. The same can be said of factors relating to hygiene, such as potable water and sewerage. A study has been made for Peru of the relationship between life expectancy--where differences between one department and another principally reflect differences in infant mortality--and three assumed determinants: income, potable water availability and the frequency of medical consultations (Heysen and Musgrove 1986). The study is not confined to deaths associated with malnutrition, but it is known that these represent a major proportion of infant deaths in Peru; it also suffers from the limitation that medical consultations do not merely reflect the population's state of health, but more than anything else its geographical and economic opportunities for access to medical services. Nonetheless, taking the three causal factors simultaneously into account shows how misleading, in terms of the correlation among factors, any analysis would be that was based on a single determinant. No studies are known for Brazil that consider both economic and health factors in the same way, but one investigation (Thomas *et al.* 1987) relates infant survival to family income, education of the fathers and other household characteristics.

## 2.5 Nutrition Education and Awareness

The third group of factors that can be linked with nutrition includes the family's knowledge, which can be imparted through formal schooling or education directed specifically at nutrition and health. In Brazil various studies have related the formal education of the father and/or mother to the nutritional status of the child; some of these studies include controls for the effects of income, sanitary conditions or other factors operating simultaneously. Education, especially that of the mother, seems to show a systematic relationship with nutrition, but the evidence is mixed and difficult to compare between one study and another. If income is not simultaneously taken into account, education appears to have a great impact, since it is one of the principal determinants of income; if one controls for income, the apparent effect of education is significantly reduced, as pointed out by Sampaio and Coelho (1978) and Alves (1978). Furthermore, formal education takes years to accumulate and there is no way to pass it on as part of a food assistance program in the same way that income, for example, can be transferred. All this no doubt partly explains why the role of education in nutrition has been relatively little studied (Shrimpton 1984, p. 54), and why the results have been mixed and somewhat unreliable.

Formal education is relatively easy to measure, but what affects nutrition is the consumers' knowledge of their nutrient needs and the nutritional values of different foods; this knowledge may be only very tenuously related to formal education. This means that we must look at the impact not of education in general but of nutritional or specific education. In more general terms, it is evident that all the "traditional" behavior of today's poor consumer is the result of an accumulation of knowledge, or

beliefs, which in principle can be changed. Assistance programs may very often include, with varying degrees of conviction, a specific education component. Two of the programs studied here, the PNS and the PCA, in theory incorporate such a feature. Unfortunately, no analysis exists in Brazil of the impact on nutrition of an educational effort, as distinct from economic effects and any direct health interventions. In particular, no one has confronted the evidence that the scope for education is limited because the consumer is already acting efficiently in his or her purchases; a study such as that by Rosenberg (1976) enables this notion of efficiency to be clearly defined, and then the possible marginal effect of educational activities to be estimated. The efficacy of nutrition education may be a function of the specific foods associated with this effort and the image communicated by those responsible for the process. Castro and Peliano (1985) note, for example, that the soya products conceived as "food for the poor" have not been generally accepted in the Brazilian market. However, the same soya is accepted when incorporated into a variety of commercial products, including as a partial substitute for meat, despite the fact that meat is an item much desired by the poor, as is clear in its high income-elasticities.

To put the problem of knowledge about food in the form of the question: Do the poor know what foods are good to eat?, as is sometimes done, is to raise a false issue. The equivalent null hypothesis would be that the poor have no idea what they should or should not eat and that therefore one must begin by teaching them the most basic principles. There seem to be no grounds for such an extreme assumption; on the contrary, the ENDEF evidence is that poor families know the value of eating a range of basic foods which, if consumed in sufficient quantities, can provide all their calorie and protein needs at reasonable cost. The problems of food awareness and its expression in purchases and daily consumption must be formulated in very specific terms in order to discover the extent to which an educational effort can improve nutritional status without the need for additional expenditure by the family or for transfers through a public program. From this standpoint, the evidence from the studies carried out in Brazil gives rise to the following questions regarding the nutritional knowledge of poor consumers:

- do they know about the calorie and protein needs of small children or do they tend to systematically underestimate them, and therefore to underfeed the youngest family members?
- do they know how to feed small children during attacks of diarrhea and other diseases so as to check rather than aggravate the nutritional effects of the disease?
- are they aware of the importance of micronutrients, particularly iron and vitamin A, and do they know which foods provide these nutrients at the lowest cost?

It should be noted that neither ENDEF nor many other studies can answer these questions, but the available evidence allows us at least to infer that in these three specific areas there are gaps in nutritional knowledge, and that these limitations are important for obtaining a precise picture of the malnutrition found in Brazil.

It seems legitimate to conclude that whether or not education has less impact than income on nutritional status, it is certainly a more subtle factor and must be more specific in order to have any marked effect on nutrition. Furthermore, it may be more closely linked to the intrafamily distribution of food (Piwoz and Viteri 1985), thereby affecting the nutritional status of particular family members even when it does not seem to have much effect on the total family diet. From this standpoint, the most important specific knowledge is probably that regarding the virtues of breast-feeding, which is closely related to the nutritional status of infants (Freitas *et al.* 1987). The good effect of lactation lies not in the quantity consumed, nor to a large extent in the quality of the food, but in the hygiene and immunological protection that it provides. It seems beyond doubt that establishing the importance of income as a determinant of malnutrition has reduced the influence previously attributed to the population's beliefs and knowledge, especially those of the poorly educated population. Nor is there any doubt that this represents an advance, as is stressed by Batista Filho and Barbosa (1985, p. 78). The problem is that the justified emphasis on income cannot lead to the conclusion that popular beliefs are unimportant or that there is consequently no place for education efforts in a campaign against malnutrition.

The role of nutrition education can therefore be regarded as ensuring that in the final analysis the only thing that limits a proper diet is purchasing power. In other words, if increases in income are not reflected in improved nutritional status to the extent that seems feasible, nutrition education must be designed to intensify the income effect by ensuring that all the potential benefits associated with an increase in employment, or wages, or transfers (grants or subsidies) through public programs, are indeed obtained. Even if this approach is accepted, the question of the appropriate education content remains. Given the importance of a series of factors not strictly pertaining to food--income, consumption habits, intrafamily distribution, hygienic practices--nutrition education should perhaps be broad and critical in nature, which in turn will have consequences for the training of nutritionists and other professionals responsible for consumer education (Valente 1986). This controversy is not explicitly integrated into any of the programs, as will be seen in the next chapter.

## 2.6 From Malnutrition to Assistance

The various kinds of malnutrition, and the different factors that cause it, enable the problem to be attacked from many different directions. Sampaio (1979, p. 914) lists four, viz. policies designed to: raise the incomes of poor families; increase the availability of food and/or improve its quality; correct specific micronutrient deficiencies, typically by fortifying one or more foods; and to provide free or subsidized food. This study will be limited to programs in this fourth category, generally planned as emergency programs to be applied during the interval pending the production of more fundamental modifications in income distribution and the country's production structure. Although reference has been made in this and the previous chapter to the importance of changes in the economic and agricultural situation, it is not the purpose of this study to propose policy measures in these areas, or to

evaluate food programs as if they were alternatives to specific changes that may come about in production and consumption structures. Only in section 8.7 will the consequences of such socio-economic changes for food and nutrition programs be considered.

Even if there were a commonly shared view of malnutrition and its principal causes, this would not justify combatting it through a single assistance program only. Rather, it is natural that differing views regarding the relative weight to be assigned to the different causes should lead to the existence of programs with notably different approaches. These differences will be discussed in the next chapter, in qualitative terms. Meanwhile it is worth noting that all the programs discussed coincide in seeing the problem of malnutrition essentially as one of inadequate food consumption, so that their main activity is to provide food to their target populations. The variations involve the selection of foods and beneficiaries and the ways in which the former are provided to the latter. Conversely, none of the programs gives priority to disease or lack of education as determinants of malnutrition, although two of them do include smaller health and education components among their activities, and even recognize the high incidence of disease among the beneficiaries (LBA Foundation and UNICEF 1982, p. 13), as well as the latter's low level of formal education.



### 3. PROGRAM OBJECTIVES AND IDEOLOGIES

Food and nutrition assistance programs may vary because they are pursuing different objectives, in other words, because they are attacking distinct fundamental problems. This is not true of the three main programs studied here, as regards their principal goal; they all aim to increase food consumption by those suffering, or at risk, from malnutrition. However, there are important differences regarding secondary objectives. INAN, which operates the PNS, PSA and PROAB, includes among its objectives stimulating agricultural production by peasants on smallholdings, while the LBA, through the PCA, aims to stimulate the industry producing blends or formulated foods. It is worth noting that in both cases this secondary purpose is not a mere derivation from the principal goal; rather, the incorporation of the second objective affects the way in which the basic goal is conceived and pursued.

Furthermore, two assistance programs may differ because their diagnosis of the problem facing them is not the same. To be consistent, their prescriptions for solving this problem must be derived from their analyses or explanations of it. It is in this sense that each program can be described in terms of its "ideology," this being understood as the totality of the diagnosis and prescription that it offers. The most profound and interesting differences between these programs are the result of their marked ideological differences, despite the fact that they coincide in various respects. Finally, there may be strictly operational differences within a shared ideology; these are apparent not so much between programs as within a given program, where they are typically due to regional and/or institutional differences.

Given the concentration of poverty in the North and Northeast of Brazil, all the programs are geographically concentrated in these regions. The PROAB operates only there (and the PINS only in Recife); outside these regions, the PCA operates only in the Federal District, Minas Gerais, Espirito Santo and Rio de Janeiro; and most of the beneficiaries of the PNS, although it is nationwide in scope, are located in the North and Northeast. The program for purchasing food from smallholders (PROCAB) has also operated only in this part Brazil. However, this regional concentration has no ideological basis; any program may operate in any part of the country, provided that the logistical requirements are fulfilled.

Table 1 summarizes the main differences in objectives and diagnoses between the PCA, the PNS, the PINS, the PROAB and the PNLCC. These differences are discussed in greater depth below. There are two basic features that separate one or two of the programs from the other three or four.

#### 3.1 Differences in Mechanisms

First, the PROAB subsidizes foods (up to 11 products), as did the PINS (only four products), while the PNS, PCA and PNLCC provide them free.

TABLE 1

## PRINCIPAL CHARACTERISTICS OF THE PCA, PNS/PSA, PROAB, PINS AND PNLCC PROGRAMS

	Complementary Food Program (PCA)	Nutrition through the Health System Program/ Food Supplement Program (PNS/PSA)	Integrated Nutrition and Health Program (PINS)	Program to Supply Basic Foods in Low-Income Areas (PROAB)	National Milk Program for Needy Children (PNLCC)
<b>INSTITUTIONAL</b>					
Executing Agency	LBA	INAN	INAN/World Bank	INAN	SEAC
Ministry Responsible	MPAS	Health	Health	Health	Office of the President
Physical Distribution of Food Coverage	MPAS North and Northeast (15 states), Federal District, Espiritu Santo, Minas Gerais and Rio de Janeiro, urban areas.	COBAL* Nationwide, urban areas and municipalities	COBAL Recife	COBAL Northeast (8 states), large urban areas	Commercial retailers Nationwide, urban areas
Point of Delivery	Health posts, churches, community centers, etc.	Health Posts**	Cobal establishments	Participating retailers	Community organization, traders.
Mechanism	Monthly donation	Monthly donation	Quantitatively restricted subsidy	Unrestricted subsidy	Coupons
<b>PROBLEM AND BENEFICIARIES</b>					
Determinants of malnutrition					
Low income	Family	Family	Family, within neighborhood or zone	Neighborhood or zone	Family
High prices	No	No	Yes	Yes	No
Poor intra-family distribution	Yes: specific foods for family member	(Partial: includes milk)	Partial: included anthropometry for children	No	Yes
Nutritional deficiencies					
Calories	Yes	Principal	Principal	Principal	Yes
Protein	Yes	Secondary (milk)	Secondary (milk)	Secondary (milk, meat, eggs, fish)	Yes
Micro-nutrients	Yes: blends	No	No	No	No
Target Population					
Pregnant women	Yes: equal ration	Yes: equal ration	Entire family	Entire family without individual rations	No
Nursing mothers	Yes	Yes			No
Children 6-12 mos.	Yes	Yes			Yes
Children 1-3 yrs.	Yes	Yes: equal ration			Yes
Children 4-6 yrs.	No	Yes***			Yes
<b>OTHER OBJECTIVES</b>					
For the family	Health care Nursing mothers Nutrition education Training for employment	Health care Nursing mothers	Yes, for a sub-group of families	No	No
For other groups					
Producers	To stimulate the blended foods industry	To stimulate peasant production	No	To stimulate peasant production	To stimulate the milk industry
Traders	No	No	No	To increase retailers' incomes	No

Sources: Arruda 1982, LBA Foundation 1979 and 1985b, INAN 1978a and 1984a, IPEA 1981b, LBA Foundation and UNICEF 1982; SEAC, 1986.

\* Exclusively up to 1986.

\*\* In São Paulo, consultations at health posts and physical distribution elsewhere.

\*\*\* Eliminated in the PSA; age limit of three years.

From this difference a series of other distinctions are derived or can be inferred:

- the PROAB implicitly assumes that there may be significant relative price effects, since there is no limit to the subsidized amount that a consumer may purchase. By contrast, both the PNS and PCA implicitly assume that the important food price effect operates through real income; true, the price of the food provided is zero, but the prices of the other foods that the consumer must buy are not affected. The quantities distributed are intended to supply 40 percent (PNS) and 20 or 25 percent (PCA) respectively of calorie and protein needs, thus making the consumer buy the rest of his consumption at market prices (unless he also has access to the PROAB). The PNLCC gives away only milk. It should be noted that none of the current programs uses the hybrid scheme of controlling the amount but partially subsidizing the price; this approach was used in the experimental PINS program but was abandoned in the PROAB.
- the PROAB does not register individual beneficiaries, or distinguish among family members. The PINS, given its limited and experimental nature, did identify individual families, but it was never intended to retain this restriction for a regular program. The PINS also identified small children for purposes of studying their physical growth, but neither the quantity nor the type of food provided depended on the family structure. The PNS and PCA, on the other hand, used both family (income less than twice the minimum wage) and individual (biologically vulnerable) criteria in determining their clients. From this standpoint, the only difference between the two donation programs is that the PNS included children between three and six years of age while the PCA does not. Their needs are supposedly met by an MEC assistance program oriented toward pre-schoolers, the PROAPE. In any event, this difference was eliminated when the PNS was changed in 1985 and renamed the Food Supplement Program (Programa de Suplementação Alimentar-PSA). The PNLCC follows similar criteria, but with a longer age interval.
- since its clients are not individually identified, the PROAB uses geographical restrictions to prevent the subsidy being enjoyed by many non-poor families. The program can only be implemented in urban areas containing neighborhoods with relatively large and homogeneous poor populations, served by small retailers who can affiliate with the program. The fact that PROAB has up to now been limited to the Northeastern states is not an intrinsic feature of the program; it could in principle be extended to cities in other regions of Brazil. In contrast, both the PNS and PCA can reach all the clients of health posts or other potential distribution points; only the scattered rural population is beyond its scope. (However, the PCA is limited to urban areas only; the only program that reaches small municipalities is the PNS). The PNLCC depends on an infrastructure of food retailers and therefore does not easily penetrate rural areas.

- since it does not identify its beneficiaries, the PROAB is not involved with their health, except for the effects attributable to higher food consumption. However, the donation programs promote breast-feeding and health care for mothers and children, using health posts, either almost always (PNS) or only occasionally (PCA), as delivery points. The PNS aims to provide basic health care at the same premises at which food is distributed, while the PCA must send its clients to health facilities belonging either to the MPAS itself or the Ministry of Health. For more complicated treatment the PCA refers its clients to the INAMPS, under the terms of an agreement made in 1984 (LBA Foundation 1985b). The PINS included the monitoring of the physical growth of children, but did not provide health care directly. The PNLCC, at least up through 1987, did not concern itself with health care or health education.

### 3.2 Differences in Products

Second, the two programs for which INAN is responsible, as well as the PNLCC, use "natural" or "traditional" foodstuffs, while the PCA, which depends on another ministry, only uses prepared foods. It should be noted that this distinction is somewhat exaggerated, as Castro (1985) points out; powdered milk, included in the PNS, PINS and PROAB baskets, is highly processed, and the same can be said of the pasta subsidized by the PROAB. In practice, "natural" has little meaning in this debate. If there is any valid distinction it is between the foods that the beneficiaries already consume, whatever the level of processing involved, and those which it may be necessary to persuade or encourage them to consume. Nonetheless, this distinction is not fixed over time; as Castro and Peliano (1985) point out, foods that today are "traditional" for a given population group were an innovation at some moment in the past.

The arguments for and against the different approaches have been fully aired (IPEA 1981?b, pp. 47-50; Peliano 1984, pp. 103-105) and are evident in the respective approaches of the PNS and PCA (Arruda 1980, LBA Foundation 1979, INAN 1978, INAN 1981b, LBA Foundation and UNICEF 1982, pp. 4.1-4.2). They can be summarized as follows:

- traditional foods cost less, mainly because less processing is involved, but possibly because of the oligopolistic structure and small scale of the formulated foods industry. This argument is generally acknowledged by the defenders of the blends, who reply that although the cost per calorie is higher, the cost per kilogram of weight gained by a malnourished child may still be smaller as a result of the low intrafamily dilution of the product. They also argue that production costs are partly offset by the long shelf life and low loss factor of the blends, and by their simple and fuel-efficient preparation. Finally, the relative prices of the formulated foods seem to have declined significantly over time.
- no effort is needed to stimulate consumption of traditional foods, thereby avoiding both the cost of educational campaigns and product losses as a result of non-acceptance. On the other hand, this

shortcoming of the blends--their lack of traditional acceptance--is regarded by their defenders as a virtue, since it ensures a minimum of intrafamily dilution and maximum consumption by the specific clients the programs are intended to benefit.

Two points not always acknowledged deserve mention. First, the cost comparison depends on which natural product is being compared with the blend. Maize meal (fubá) is unquestionably cheaper than a blend based on maize and soya, but this is not true for meat and eggs. The latter are not provided by the PNS--its only product of animal origin is powdered milk--but they are subsidized by the PROAB, which also uses "traditional" products and defends them with the same arguments used for rice, sugar, maize meal and manioc flour. This issue will be discussed in more detail in section 5.4. Second, the argument regarding the good conservation and low losses of the blends would seem to be more relevant to distribution in remote areas where supply is hampered by logistical problems; but the blends are used only in an urban program.

The debate over traditional versus processed foods very largely reflects a difference in the diagnosis of malnutrition. INAN regards the calorie deficiency as the principal factor; the inclusion of powdered milk in the PNS indicates a lesser concern for protein. The PNLCC also emphasizes protein, since it distributes only milk. The LBA, by contrast, puts relatively more emphasis on proteins and also on micronutrients, estimating the deficit in various minerals and vitamins of its target groups (Salomón 1978, table 4) and including micronutrients in the formula foods. If the donated food were all that that the family consumed, there would be no doubt that the blend would be superior because it is better balanced. A diet consisting only of PNS foodstuffs would not be healthy, and it would also be impossible to obtain all the necessary micronutrients by eating only the food subsidized by the PROAB. INAN aims to attack specific deficiencies through individual programs, separate from the programs oriented toward the protein-calorie problem (Batista Filho and Barbosa 1985, pp. 64-66.).

This being the case, the ideological difference among programs relates to how the consumer is assumed to behave with regard to the additional purchases which he (necessarily) must make, and to their distribution among family members. The logic of the PROAB is to rely on the client showing good sense in both areas, viz. buying a proper diet and distributing it correctly among family members. The PNS fully shares the former expectation but less so the latter, since the food it provides is in principle for specific family members, those classified as the most vulnerable. It is apparent that if the idea of the PNS were to give food to families that are so poor that few could benefit from a subsidy, there would be no justification for focusing on certain family members only, or for limiting the amount to less than half of their requirements. On the other hand, if the PNS was seen as a substitute for the PROAB in areas in which for operational reasons the subsidy cannot function, the quantitative limitation would be justified but not the discrimination among family members. The logic of the PCA, from this standpoint, appears to place less reliance on the consumer's good sense with regard both to total diet and its distribution, but this does not have to be the case. If the formulated foods are appropriate precisely because they will

only be consumed by the designated family members, then what is important is the family distribution and not diet quality as a whole. Seen in this light, the ideologies of the PCA and PNS are not so dissimilar. The question of intrafamily dilution will be taken up in section 6.2, and the problem of very small children, identified by both donation programs as especially vulnerable, will be discussed further in section 6.5.

A final observation should be made regarding these ideological differences: they are features of the programs rather than the agencies that administer them. While INAN has consistently favored natural foods and openly expresses its faith in the rationality and nutritional knowledge of its clients, the LBA situation is different. The same agency that only uses blends in the PCA also operates a Nutrition Promotion Program (Programa de Promoçao Nutricional), which distributes powdered milk (LBA Foundation 1985c, p. 36). Part of this milk is combined with maize meal and sugar, in practice turning it into a blend, but another part is distributed without being processed, just as in the PNS. The target group--pregnant women, nursing mothers and small children--is identical to that of the PCA. More different from the PCA is a program for children under six who receive meals prepared from natural foods. Since this program provides meals rather than food for household consumption, it is not studied in this report. It should nonetheless be noted that the program is as typical of the LBA as the PCA; perhaps more typical, because both the PCA and the emphasis on blends was invented by a group in the Social Assistance Secretariat, in conjunction with the Department of Food Technology at Campinas Federal University (LBA Foundation 1985b; Peliano 1984, pp. 93-97; and oral information from the Department of Mother and Child Nutrition at the LBA). Program execution was assigned to the LBA; only later was it integrated into the agency's other operations, particularly its health activities. For those responsible for the PCA, the use of blends is not a necessary or intrinsic feature of the program. They believe that blends may be more effective in stimulating the growth of children less than a year old--this point will be discussed in section 6.5--but have no firm evidence on the matter.

### 3.3 Differences in Secondary Objectives

As already noted, three current programs are intended to stimulate food production, but using different approaches. The PNS and PROAB aim to buy directly from small producers of basic foods in the Northeast (Arruda 1980 and 1982), through the Project to Acquire Basic Foods in Low-Income Rural Areas (Projeto de Adquisição de Alimentos Básicos em Areas Rurais de Baixa Renda-PROCAB) (INAN 1979-84), thereby providing a more stable market and better prices. The PCA, on the other hand, was devised partly to provide a market for the formulated foods industry (LBA Foundation 1979), by helping it to expand sales. This distinction merits four additional comments:

- INAN's emphasis is more consistent with the aim of redistributing incomes, since the smallholder clients of the PROCAB are generally poor. This program fits particularly well with the PROAB, which has the most redistributive approach of the food programs. Promoting the formulated foods industry cannot be defended on these terms; its justification must lie strictly in the area of improved nutrition.

- the argument in favor of the industry depends on the superiority of formulated foods in one area or another. If this cannot be shown, the argument is circular and invalid: the blends are justified because they stimulate the industry, and the industry is justified because it provides the blends.
- the use of traditional foods by the PNS and PROAB and the incentives to small producers provided by the PROCAB are naturally but not intrinsically linked. The peasants grow maize, which is used to prepare maize meal but which could also be used to prepare maize and soya blends. On the other hand, if the economic return were greater, the peasants could be helped to change their crop by being given a market for their new products.
- assistance to small producers is the only component which aims to increase the beneficiaries' incomes directly, thereby achieving a more permanent or structural change, rather than a mere palliative. This does not mean that a program incorporating this objective is better than another which does not, since production and income incentives for the peasants can be provided through other public policies.

There is another sense in which different programs seek different secondary objectives, illustrated by the channel through which the food reaches the beneficiaries. The PROAB uses the existing private market, selling subsidized products to the small shopkeepers. These then become program clients too, and because they are almost as poor as the consumers they are supplying, a secondary objective of the PROAB is to increase and stabilize their incomes. The donation programs, by contrast, reduce the retailers' incomes to the extent to which the donated food partially replaces food that the family would otherwise have bought. Only if the client increases total consumption by the same amount as the donation does this effect not occur. If the typical beneficiary of the PNS or PCA is poorer than the typical PROAB client, and therefore poorer than a retailer, the reduction in food purchases represents a transfer of income from the less poor to the poorer. This transfer can be justified, but is in sharp contrast to the objective sought in the PROAB. This question of the relationship between assistance programs and the private market for food deserves attention, and the next section therefore takes up the issue.

### 3.4 The Private Market and Purchasing Habits

The ideology of the PCA in this area follows naturally from its support for formulated foods. If these are superior in some way to a diet consisting of traditional foods, their absence from normal trade represents a market failure. They are not sold because there is no demand, and there is no demand because consumers are not used to eating them. An assistance program could in theory create a market for the blends, creating new habits among consumers and ensuring sales for producers. If this happens, consumers not served by the program will also benefit, since they can use the market for blends to improve their diet and/or reduce their food expenditure. Without this argument the PCA would in practice be a parallel PNS and, as noted in

section 3.2, the LBA has no general ideological objection to working with traditional foods. Indeed, in 1986 it began an experiment in Salvador involving the distribution of natural foods (LBA Foundation, 1986b).

INAN's position regarding the private market for food--and therefore the official ideology of the PRONAN (Batista Filho and Barbosa 1985, pp.45-58; Arruda 1982)--stresses two other factors. First, the marketing of foodstuffs is regarded as inefficient, giving rise to unnecessarily high margins and prices and to unnecessarily low incomes for small producers, who are most affected by market shortcomings. In other words, the poor urban consumers are "unnecessarily" poor in the sense that their incomes are low in relation to what the prices of basic foodstuffs ought to be, and even lower in relation to what those prices are. From this standpoint, the subsidy provided by the PROAB is seen as an attempt to enable the poor to pay the prices that would prevail in the absence of market imperfections. Meanwhile the intervention in food marketing, particularly the purchases through the PROCAB, are designed to pay the small producer the price he would receive if he did not suffer from a lack of credit, a monopsonic market for his crops, and other constraints.

Second, INAN believes that the poor consumer, even in the large cities where other alternatives are available, purchases his food in the small and rather precarious stores located in his immediate neighborhood. The small retailers offer not only geographical convenience but also the possibility of buying in small quantities, which may suit the client's current cash position, and they will provide credit when he has no money. These advantages supposedly explain why the poor consumer is willing to pay the typically higher prices resulting from the small-scale operations and inefficiencies of these retailers. INAN's ideology is to accept this behavior as rational, and rather than trying to change it, to use the traditional shopkeepers as the vehicle for the subsidy in the PROAB.

There can be no doubt that these two assumptions--the general inefficiency of the market and the poor families' tendency to buy food in its most inefficient segment--were supported by the evidence at the time of the creation of the PRONAN (INAN 1977, Peliano 1984, Carvalho da Silva and Iunes 1981). The ENDEF survey demonstrated the importance of the small neighborhood store in supplying the urban poor, and a number of studies have pointed out the technological or monopsonic inefficiency of peasant agriculture. It should, however, be stressed that these ideas are largely based on evidence from a decade ago. They therefore run the risk of not reflecting the current situation very faithfully, given the technological and economic changes in food marketing in recent years. This issue will be taken up in section 5.5 and in Chapters 7 and 8.

It should also be noted that by intervening in the market for food, even if only to purchase what will then be distributed by the PNS and the PROAB, COBAL is juggling with at least three objectives which may easily conflict with each other. Ideally, it wants to buy from the peasants for the redistributive reasons set out above, favoring them over the larger producers. But to obtain the greatest benefit for the consumer, purchases should be made from the cheapest source; while for strictly political reasons each state government participating in the programs through its secretariat of

health wants the purchases for its own population to be made within its own state. These different objectives cannot be reconciled; but even when they obviously clash, they all form part of the ideology.

The National Milk Program for Needy Children (Programa Nacional do Leite para Crianças Carentes-PNLCC), set up in 1986, takes another position toward the private food market. It uses the entire commercial network (not limited to the small retailers) to exchange the coupons that beneficiaries receive in order to obtain free milk. Since the milk is donated and not subsidized, price differences among retailers do not matter and the beneficiary is free to exchange his coupons wherever it suits him best. There is no secondary objective of utilizing the distribution network to benefit a particular group of producers.

### 3.5 From Objectives to Results

Both the distinction between traditional foods and blends, and the associated distinction between stimulating the small producer as opposed to industry, are part of a basic institutional dichotomy dividing food assistance programs in Brazil. This is the division between the INAN/Ministry of Health and the PCA, within the LBA/MPAS. Both institutions were part of the PRONAN, but no agency controlled all its components or could impose uniform criteria or procedures (INAN 1981a, pp. 52-53; Carvalho da Silva 1982, pp. 25-26). The ideological differences between these two currents of thought do not permit of any simple option for one or the other, since somewhat different objectives are being proposed. However, the main goals are basically identical, at least as between the PNS/PSA and PCA. So it is remarkable how exaggerated the debate on this point has been, given the imprecision of the boundary between "natural" and "blend", the lack of a hard and consistent line within the LBA, and the ignorance with regard to a number of empirical matters. It seems that there are three reasons for the intensity of the debate, all of which have an ideological component. One is the question of costs and the associated issue of deciding between spending more on a smaller number of clients or less on a larger number of beneficiaries. Another is the participation of the food industry, especially to the extent that it is linked with large and/or foreign companies (Peliano 1984, Wilberg 1984). The third and most difficult point relates to the views expressed regarding the extent to which the poor consumer is responsible for his own malnutrition or that of his children; to take a position on the question of whether the consumer is rational or not, whether he needs more education on nutrition or not, is either to blame him or exonerate him from responsibility. As noted in section 3.2 above, there is a tendency to move from a conclusion that is relatively well-established--that the diet of the poorer groups is qualitatively adequate and is purchased with a fair degree of common sense--to others much less sound, such as that the poor family takes adequate care of the nutrition and health of all its members.

Nor can any simple theoretical choice be made regarding the second major distinction mentioned above, namely whether a subsidy is preferable to donated food or vice versa, even if inter-institutional ideological differences did not exist. It is not even obvious which of INAN's programs (the PNS/PSA or the PROAB) transfers more benefits in terms of income to the typical client, because the actual transfer depends on the consumer's income

and behavior and is also a function of the size of the subsidy or the amount provided, together with the selection of foods to which these are applied. For a given combination of these parameters there may be clients who would benefit more in terms of income from the PNS, and others who would receive a greater benefit from the PROAB (Moldau 1982, Musgrove 1985a). It is, however, difficult to compare the two programs, given the fact that they have different secondary objectives, and that there are practical limitations to the PROAB's coverage that affect the PNS to a lesser extent.

When theory offers no definitive answer--as is the case with these two questions--our only resort is an empirical approach. The evidence available for this purpose is incomplete, and even if it were not, some value judgments among conflicting objectives would still be required; however, there is enough of it to permit a partial evaluation of the extent to which the programs have met their objectives. Chapter 4 contains some basic information, both historical and statistical, on each of the programs, thereby enabling certain operational aspects to be evaluated. Chapters 5 and 6 then summarize the various attempts hitherto made at evaluation properly so-called, so as to permit some comparative judgments.

Apart from the question of how to operate an assistance or emergency program--i.e. with what mechanisms, clientele and products--there is the larger question of how to reduce or eliminate malnutrition in general. Not only is it possible that this goal might be more easily and permanently achieved through changes in the structure of production, employment and income than through food programs; at times the programs are even seen as ways of reducing the social tension produced by Brazil's very uneven development in recent decades. From this viewpoint, the very programs that reduce hunger today may hinder the more profound transformations that tomorrow would make the programs superfluous. Thus even the defenders of the programs can feel frustrated not only by what a program manages to achieve for its clients but also by the whole environment in which it operates. This subject is beyond the scope of this discussion, but it is still an important ideological factor in much of the design, defense and evaluation of the programs. At times they are regarded as "failures" or "ineffective" when measured against ambitious objectives, or because the benefits may be cancelled out by other simultaneous changes in society. It is particularly important to be aware of this thinking in order to understand some of the opinions expressed about the programs and the controversies surrounding them (INAN 1984b, Lerner et al. 1985b, Peliano 1984). The logic of the PRONAN, as analyzed by Sampaio (1979, p. 910) and also by Batista Filho and Barbosa (1985, p. 75), was an attempt to reconcile the immediate or palliative objective of reducing hunger with other more structural or long-term objectives, which would entail permanent changes in income levels and distribution; hence the great importance attributed to stimulating the small producers as a way of "closing the circle." However, the discussion below will consider only the benefits to the recipient of food, excluding any possible benefits to producers. The issue of effecting structural changes through food policies will be summarized, in the context of measures to make the market more efficient and thereby to reduce prices, in the final chapters, as also will the extent to which some components of the ideology outlined here are still valid.

#### 4. EVOLUTION OF THE PROGRAMS UP TO 1985

The programs studied here, excluding the PNLCC, are, formally speaking, components of the PRONAN. They were devised and introduced between 1975 and 1979 as part of PRONAN II, which was conceived in 1975, officially approved in February 1976, and terminated at the end of 1979 (IPEA 1981?b). The first year of operations was 1976 for the PNS, 1977 for the PCA, and 1980 for the PROAB. The programs will be discussed in this chronological order.

The PRONAN has existed for longer, having been devised in 1972, when INAN was established, and approved in 1973. However, the programs making up PRONAN II--except for the PNAE, the school meals program--provide little or no continuity with the programs that formed PRONAN I. In 1974 the government intervened to reform INAN when it was spending considerable amounts of resources without producing any visible results pertaining to nutrition, and the agency in effect started from scratch toward the end of 1974 (Coimbra 1985, pp. 94-101). The LBA was also reformed, less dramatically, at the same time. The PRONAN subsequently was redesigned by INAN in conjunction with the National Center for Human Resources (Centro Nacional de Recursos Humanos (CNRH), an agency of the then Ministry of Planning responsible for health, education and nutrition. The PNS and PCA belong to the first generation of programs conceived under this association; the PROAB is of another period and introduces some notable differences in terms of the diagnosis of the problem, collateral objectives and assistance mechanisms, as noted in the previous chapter. Between the establishment of the PNS and PCA and the introduction of the PROAB came the PINS experiment, in 1978-1980. The latter will also be discussed since much of what is known or can be inferred about the results of the PROAB is derived from the data and analyses generated as part of the PINS.

One phenomenon should be noted that has recurred many times in the history of Brazil's food and nutrition programs, namely that operational decisions and conceptual or ideological positions are taken more or less simultaneously with the process of research and/or evaluation, as opposed to waiting for the results of studies in order to design or operate the programs. The design of PRONAN II was justified by its creators after the event by the results of the ENDEF survey referred in Chapter 2; but these results were not available at the time INAN was reformed and the PNS created. Something rather similar occurred with the design of the PROAB, which incorporated some of the PINS experience but did not wait for full evaluations of that program. A third example, at least in part, is the design of the Program of Social Priorities (Programa de Prioridades Sociais) in 1985, at a time when some basic questions regarding the impact of the programs had still not been answered. In this case, however, there was almost a decade of experience on which to base the decisions taken. The existence of this tendency to take decisions before the answers being generated simultaneously were available does not mean that relevant data and studies were not used in evaluating the programs, but rather that on a number of occasions the risk was

run that information would soon be available that would reveal fundamental errors in relevant assumptions. This does not seem to have happened on a large scale--typically, the information made available later has tended more to confirm than to contradict the decisions taken, at least up to 1986--but the numerous cases in which the information is still incomplete or lends itself to different interpretations should be noted. This explains both the importance of ideology noted in the previous chapter and the need to give further study to certain issues that will be discussed in Chapter 8.

From 1980 onwards the three programs continued to function. A PRONAN III, to cover the period 1982-1985, was designed but not approved. Therefore up to 1985 there were no other major changes in programs already approved nor any new initiatives, except for the introduction of a new financing mechanism. This is the Social Investment Fund (Fundo de Investimento Social-FINSOCIAL), set up in 1982 and administered by the National Bank for Economic and Social Development (BNDES) in order to channel a number of public funds toward social programs, including nutrition programs. When the new government took office in May 1985 a new Program of Social Priorities was launched whose food and nutrition components will be touched on in Chapter 7.

#### 4.1 Evolution of the PNS

The PNS is not only the oldest but also the broadest of the programs, being the only one that is almost nationwide in scope and that reaches not just metropolitan areas but small municipalities where the rural population can be served. It takes the form of the monthly distribution of a free food ration to each pregnant woman, nursing mother or child between six months and (initially) six years of age, who, in addition to meeting these biological criteria, is also a member of a family whose income does not exceed two minimum wages, and which has registered for the program. Food is generally distributed through the health posts as a means of taking advantage of existing facilities and promoting health care for the clients; in some cases improvised facilities are used (Kalil *et al.* 1984b). The state secretariats of health are responsible for the distribution, and INAN serves as coordinating agency and financial channel. The program operates in a very decentralized manner, in an attempt to reduce administrative costs and to involve the ministries of the states in the decision as to where to establish the programs. The purchase, storage and distribution of food, as far as the secretariats of health in the state capitals, is contracted by INAN to COBAL. The subsequent distribution to the health posts is the responsibility of the state secretariats. The objectives and operations of the PNS are described in the program manual (INAN 1975), its annual reports (INAN 1979-84) and other documents (Arruda 1980 and 1982, Coimbra 1985, INAN no date).

In theory the food distributed meets 40 percent of the beneficiary's calorie needs (in practice, it is very often less), and includes up to six products: rice, sugar, beans, maize meal, manioc flour and powdered milk. The last-named is the only source of animal protein, and is also the product distributed in the smallest quantities. The ration for children less than one year old consists solely of milk and sugar; the other products go to older children and women. Table 2 shows the growth of the program from 1976 until

1986 in terms of the number of beneficiaries and food quantities, both aggregate and per head. The fluctuations from one year to the next in quantities per head are partly due to changes in the composition of the clientele, but to a greater extent to the varying scarcity of one product or another--in 1981, for example, beans were not distributed--and to irregular participation by the beneficiaries. This scarcity was due to the impossibility of continuing to purchase a product when its price rose sharply, given a budget that has little flexibility and is often executed tardily.

As can be seen, the program almost tripled in size between 1976 and 1978, remained stable over the next four years and began to expand again at the end of 1982. In 1984-85 it served some four million people, and in 1986 almost nine million. The average ration fluctuated around 3 kg per person per month, or approximately 100 grams per day. Table 3 shows the geographical distribution of the population served and the food distributed for the years 1980 and 1986. It is apparent that the program is concentrated in the North and Northeast, where it reaches five percent of the population, while in other regions this proportion does not exceed two percent. In principle, those served ought to constitute the same proportion of the target population, the latter being concentrated in areas of greatest poverty. Table 3 contains estimates of this target population (20 million people in 1980, concentrated in the North and Northeast), but these calculations are very questionable, as Coimbra has shown (1985, pp. 106-111). In practice, INAN calculates the number of potential beneficiaries on the assumption that there is no connection between the distribution of income and the biological distribution of the population by age, sex and condition. This may have led to the number of people entitled to benefit from the program being underestimated by several million, in addition to skewing their geographical distribution. In any event, it should be noted that the PNS was far from fully meeting its objective; revised estimates would merely increase the number of eligible non-beneficiaries. For 1986, the target population was estimated using more restrictive criteria (10 million), which enabled the great majority of them to be reached.

The PNS operating reports also present budget data, but these will not be discussed here for two reasons. First, the rapid inflation in Brazil over the last decade makes any comparisons in nominal values almost unintelligible; while using a price index to deflate the series to "real" values might skew the figures unless it were based on the basket of products purchased by the program. Since in fact the number of products is so small it is simpler to present the data in physical terms. Second, for purposes of inter-program comparisons, what is important is not just total costs--since the programs operate on very different scales, and with different mechanisms--but unit costs. These will be analyzed in section 5.4, and total costs will be discussed in section 5.6.

#### 4.2 Evolution of the PCA

The PCA is a program of the LBA, which answers to the MPAS. Formally speaking it was also part of the PRONAN, but because INAN, nominally the coordinating agency of the PRONAN, does not control it the PCA has not had

TABLE 2

PNS/PSA: POPULATION SERVED AND FOOD DISTRIBUTED  
TOTAL (tons per year) AND PER HEAD (kg per month)  
1976-1984

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Population served (thousands)	1022	1806	2923	2996	2883	2511	2511 4000	4191	4162 4387	3697 4534	4534 8683
Food distributed (tons)											
Rice	6484	30089	34174	30961	33528	36689	36013	51016	50977		87444
Sugar	14143	16005	23141	23109	25538	27637	29776	33120	27741		30400
Beans	*	6432	18610	22203	21968	*	5431	32907	29391		60495
Maize meal	9208	14638	13414	13889	15409	14510	14296	18541	9983		14969
Manioc flour**	188	1113	2985	5607	12310	10582	10988	15552	6640		26414
Powdered milk	3958	5983	6212	1866	1568	3807	3655	5275	6334		11058
Total	33982	74260	98547	97634	110321	93461	100379	156411	123616	22994	245953
Food amounts per beneficiary (kg/mo.)						(1)			(2)	(3)	(4)
Rice	0.53	1.39	0.97	0.86	0.97	1.22	1.24	1.01	1.00		1.06
Sugar	1.15	0.74	0.66	0.64	0.74	0.92	1.02	0.66	0.55		0.37
Beans	*	0.30	0.53	0.62	0.63	*	0.19	0.65	0.58		0.73
Maize meal	0.75	0.68	0.38	0.39	0.45	0.48	0.49	0.37	0.20		0.18
Manioc flour	0.02	0.05	0.09	0.16	0.36	0.35	0.38	0.31	0.13		0.32
Powdered milk	0.32	0.28	0.18	0.05	0.05	0.13	0.13	0.10	0.12		0.13
Total	2.77	3.43	2.81	2.72	3.19	3.11	3.45	3.11	2.43	0.52	2.98

Sources: (INAN, 1979-85 and Unpublished Tables)

\* No distribution.

\*\* Distributed principally in the Northeast, calculated by difference in 1976-77 and 1983.

\*\*\* Includes distribution of 6288 tons of olive oil and 885 tons of pasta.

- (1) Distribution per head calculated on the assumption that those served numbered 2,511,000 for 11 months and 4 million for one month (expansion of 1,489,000 in December 1972).
- (2) Distribution per head calculated on the assumption that those served numbered 4,162,000 for 8 months and 4,387,000 for 4 months (expansion in August/September 1984), giving an average of 4,237,000.
- (3) Distribution per head calculated on the assumption that those served numbered 3,697,000 on average. There are no data on the composition of foods.
- (4) Distribution per head calculated on the assumption that those served numbered 4,537,000 in the first quarter, 6,996,000 in the second, 7,282,000 in the third and 8,683,000 in the fourth, giving an average of 6,874,000.

TABLE 3

PNS, 1980 AND PSA, 1986: POPULATION: TOTAL, TARGETTED AND SERVED (thousands) AND FOOD DISTRIBUTED (tons) BY STATE

PNS, 1980	POPULATION			FOOD DISTRIBUTED					
	TOTAL	TARGET	SERVED	RICE	SUGAR	BEANS	MAIZE MEAL	MANIOC FLOUR	POWDERED MILK
<b>NORTH</b>	4923	886	239	3473	3159	1449	*	*	128
Acre	288	52	19	223	226	85			9
Amapá	174	31	28	230	212	113			12
Amazonas	1252	225	55	910	757	363			32
Pará	2981	537	115	1945	1796	836			70
Rorônia	172	31	16	101	123	27			2
Roraima	56	10	5	64	45	25			3
<b>NORTHEAST</b>	36251	7250	1865	24041	16080	15437	10177	8203	978
Maranhao	3698	740	86	1029	754	782	453	520	55
Piauí	2307	461	189	2162	1621	1540	897	1048	94
Ceará	5891	1178	218	3073	1978	1914	1538	847	111
R.G. Norte	2163	433	86	1212	854	829	491	566	68
Paraíba	2964	593	170	1809	1141	1258	655	777	85
Pernambuco	6607	1321	503	6255	4157	3919	2554	1641	247
Alagoas	2013	403	93	1394	933	891	486	600	82
Sergipe	1094	219	49	656	434	461	216	297	29
Bahia	9515	1903	472	6450	4207	3841	2887	1906	208
<b>CENTER-WEST</b>	7788	1246	145	1367	1343	1052	1101	837	100
Goiás	4134	661	89	763	749	626	632	522	48
Mato Grosso	1089	174	25	355	371	262	298	209	23
Mato Grosso Sul	1400	224	21	149	145	120	110	86	8
Federal District	1165	186	10	100	78	44	62	21	22
<b>SOUTHEAST</b>	51575	7220	346	2386	2531	2051	2172	1580	196
Minas Gerais	13689	1916	79	598	679	591	540	225	29
Espírito Santo	1860	260	49	401	369	322	314	269	30
Rio de Janeiro	12022	1683	127	841	1030	817	845	709	86
Sao Paulo	24004	3361	91	547	454	322	473	377	51
<b>SOUTH</b>	22495	3374	288	2261	2425	979	1958	1690	166
Paraná	10274	1541	129	1094	1166	967	946	842	98
Santa Catarina	3881	582	71	522	548	459	454	404	29
R.G. Sul	8349	1251	88	646	711	553	569	444	39
<b>Total Brazil</b>	123032	19977	2883	33528	25538	20968	15409	12310	1568

Sources: INAN 1979 - 1985 and Unpublished Tables

\* No distribution.

TABLE 3 (continued)

PNS, 1980 AND PSA, 1986: POPULATION: TOTAL, TARGETTED AND SERVED (thousands) AND FOOD DISTRIBUTED (tons) BY STATE

PSA, 1986	POPULATION			FOOD DISTRIBUTED					
	TOTAL	TARGET	SERVED	RICE	SUGAR	BEANS	MAIZE MEAL	MANIOC FLOUR	POWDERED MILK
<b>NORTH</b>	7415	623	692	6985	5261	5827	*	*	1941
Acre	360	30	18	190	121	155			92
Amapá	217	18	18	158	101	120			25
Amazonas	1752	147	165	1235	1258	1140			270
Pará	4238	356	360	4514	3207	3706			1278
Rorônia	744	62	87	820	505	621			260
Roraima	105	9	8	68	69	85			16
<b>NORTHEAST</b>	39431	4456	4290	46320	22438	36022	820	26414	5006
Maranhao	4684	529	436	5343	2329	3640	*	3047	606
Piauí	2454	277	272	3027	1618	2434	*	1724	245
Ceará	5929	670	657	7944	3540	5867	*	4166	769
R.G. Norte	2137	242	237	2900	1528	2309	*	1663	348
Paraíba	3041	344	338	4122	2170	3162	*	2004	*
Pernambuco	6823	771	757	7995	3820	6372	*	5278	946
Alagoas	2254	255	256	3653	1498	2864	820	1398	364
Sergipe	1304	147	144	2140	960	1661	*	1267	73
Bahia	10803	1221	1193	9196	4975	7713	*	5867	1655
<b>CENTER-WEST</b>	9209	709	715	8233	1236	6244	2825	*	1445
Goiás	4485	345	339	3623	534	2994	1103		399
Mato Grosso	1499	115	138	1196	486	885			379
Mato Grosso Sul	1621	125	120	1391	216	1136	336		366
Federal District	1603	123	118	2023	*	1229	1386		301
<b>SOUTHEAST</b>	59771	3228	2038	14513	1463	10491	4190	*	1184
Minas Gerais	14691	793	448	3202	*	3192	1710		569
Espírito Santo	2313	125	125	1299	*	904	735		294
Rio de Janeiro	12848	694	425	3793	*	2543	1745		321
Sao Paulo	29919	1616	1040	6219	1463	4302	*		*
<b>SOUTH</b>	20790	1268	1095	11392	*	9512	7134	*	1463
Paraná	8132	496	491	4760		4189	3299	*	594
Santa Catarina	4122	251	250	3173		2659	1990		257
R.G. Sul	8536	521	354				2664	1845	612
<b>Total Brazil</b>	136615	10283	8829	87444	30400	68495	14969	26414	11058

to follow INAN's rule that only traditional foods should be used; this has remained merely a recommendation that they should be used "whenever possible." In practice, the PCA distributes nothing but three blends. Until the end of 1983 these were a milk substitute, for children less than one year old; a "vitamin" or "milkshake" for children between one and three years; and a soup for pregnant women and nursing mothers. In 1983 the foods were reformulated and since then have consisted of a purée or sweet gruel for all children from six to 36 months, and for women (pregnant or lactating) another gruel and a salted cream soup (LBA Foundation 1985b and c, p. 36). The sweet blends use maize meal, maize and soya, and the salted blend includes beans instead of maize. Two kg are distributed per month per child, and four kg (two kg each of the two products) per adult female. All the products are distributed in powder or dehydrated form. Apart from eligibility ceasing at three years rather than six, the definition of the clientele is identical to that used by the PNS. Beneficiaries must also belong to families with incomes of less than two minimum wages, and are registered individually.

The modus operandi of the PCA is similar to that of the PNS, though with some differences. The food is distributed free once a month using existing premises provided by the community and operated by residents, under the supervision of LBA employees. These community support units, as they are known, can function in churches, social centers, etc. The use of blends and the distribution of specific foods for the three kinds of beneficiaries are consistent with a greater emphasis on nutrition and less on the redistribution of income that the transfer represents. As was noted in Chapter 3, the PCA regards any intra-family dilution as a loss. It is, then, somewhat surprising that the quantity distributed is calculated so as to provide only 20 to 25 percent of calorie and protein needs, as against 40 percent in the PNS. The net effect for any specific beneficiary would be the same, assuming the same degree of substitution of other foods, only if dilution in the PNS was 50 percent plus half of the dilution in the PCA.

The PCA began operations in 1977 in the metropolitan areas of Rio de Janeiro and Belo Horizonte. It was extended in 1978 to the Federal District (Brasília) and Serrinha, Bahia. At first the PCA did not enter the areas in which the PNS was operating, there being a sort of "Treaty of Tordesillas" (Peliano 1984, p. 93) between the two ministries. Later on the PCA expanded its geographical coverage: in 1981 it started in the Salvador metropolitan area, in 1982 in Fortaleza, and in 1983 it spread to the capitals of all the states and territories in the North and Northeast. In 1984 it was also extended to the state of Espírito Santo. The number of clients grew by some 200,000 to 300,000 between 1977 and 1981, and then doubled, as Table 4 shows. However, in 1985-86 the number of people served declined. In terms of beneficiaries, the PCA was about ten percent of the PNS in 1978-79, and 15 percent in 1983. Food distribution reached 9,000 tons in 1980, or eight percent of the total of the six foods distributed by the PNS. If the caloric density of the blends were the same as that of the natural foods, and provided for half of the need met by the latter, this figure ought to be five percent; the discrepancy may partly lie in differences in the regularity of service delivery between the programs. In 1983, 13,000 tons of food were distributed, and in 1984, 21,000 tons, provided through 529 delivery points (see Table 5). On average each client received 2.71 kg per month (two kg for children and

TABLE 4

PCA: POPULATION SERVED, BY TYPE OF BENEFICIARY AND STATE, 1977-1986  
(Thousands of Persons: Average Monthly Number of Clients)

FEDERATIVE UNIT	1977				1978			
	PREGNANT WOMEN	NURSING MOTHERS	CHILDREN	TOTAL	PREGNANT WOMEN	NURSING MOTHERS	CHILDREN	TOTAL
Bahia	(no breakdown)			12.5	1.6	2.2	10.7	14.5
Federal District	-	-	-	-	4.1	10.3	25.9	40.2
Minas Gerais	14.5	30.2	101.3	146.0	11.2	27.4	95.8	134.5
Rio de Janeiro	12.4	16.4	67.3	96.1	10.3	20.8	80.5	111.7
TOTAL	26.9	46.6	168.6	254.5	27.2	60.8	213.0	300.9
	1979				1980			
Bahia	2.0	2.4	12.9	17.4	1.1	1.7	8.6	11.4
Federal District	0.6	13.2	29.5	43.4	2.5	11.0	23.8	37.3
Minas Gerais	10.4	26.4	93.8	130.6	4.8	46.9	96.6	148.3
Rio de Janeiro	9.6	19.5	89.5	118.7	7.1	26.6	70.3	104.0
TOTAL	22.7	61.5	225.8	310.0	15.4	86.2	199.3	300.9
	1981				1982			
Bahia	2.6	7.0	18.7	28.4	3.3	9.8	23.7	36.8
Ceará	-	-	-	-	3.9	6.0	16.1	25.9
Federal District	3.4	11.7	23.4	40.5	3.4	11.0	25.4	39.8
Minas Gerais	9.2	42.5	86.0	137.6	10.9	37.8	89.8	138.6
Rio de Janeiro	4.5	26.5	58.2	89.2	7.4	25.3	59.2	91.9
TOTAL	19.7	87.6	188.3	295.6	28.8	89.9	214.3	333.0
	1983				1984			
Acre	0.5	0.8	1.8	3.0	0.3	1.1	2.3	3.8
Alagoas	2.7	2.1	10.0	14.8	2.1	2.9	10.3	15.3
Amazonas	1.6	1.9	6.4	9.8	1.2	2.5	7.1	10.8
Amapá	0.2	0.4	0.9	1.5	0.2	0.5	1.1	1.7
Bahia	10.6	18.3	54.2	83.0	9.4	20.7	55.1	85.2
Ceará	9.8	12.4	39.5	61.7	9.9	16.9	46.9	73.7
Federal District	3.9	11.0	27.6	42.5	3.6	10.5	26.2	40.3
Expírito Santo	-	-	-	-	0.5	0.8	2.7	4.1
Maranhao	4.1	5.0	15.7	24.7	3.1	6.1	18.3	27.5
Minas Gerais	14.8	34.5	92.8	142.1	12.6	32.7	81.6	126.9
Pará	2.4	3.5	11.9	17.8	1.7	4.3	12.3	18.2
Parafba	3.5	4.0	13.9	21.4	3.5	6.0	16.9	26.4
Pernambuco	3.5	4.9	16.8	25.2	3.9	10.6	28.7	43.1
Plauf	2.9	4.1	12.1	19.1	2.0	5.6	14.0	21.5
Rio de Janeiro	9.9	25.6	66.8	102.3	8.6	24.1	55.3	88.0
Rio Grande do Norte	3.9	4.4	14.7	23.0	4.5	7.9	22.6	34.9
Rondônia	0.2	0.3	0.8	1.2	0.1	0.3	0.7	1.2
Roraima	0.2	0.3	0.8	1.3	0.1	0.3	0.7	1.2
Sergipe	2.3	3.6	8.6	14.6	3.6	6.0	16.5	26.1
TOTAL	76.8	137.1	395.3	609.1	70.9	159.7	419.3	649.9

TABLE 4 (Continued)

PCA: POPULATION SERVED, BY TYPE OF BENEFICIARY AND STATE, 1977-1986  
(Thousands of Persons: Average Monthly Number of Clients)

FEDERATIVE UNIT	1977				1978			
	PREGNANT WOMEN	NURSING MOTHERS	CHILDREN	TOTAL	PREGNANT WOMEN	NURSING MOTHERS	CHILDREN	TOTAL
Acre	0.3	0.7	1.8	2.8	0.2	0.4	1.4	2.0
Alagoas	1.8	2.0	8.1	12.0	0.7	1.2	4.3	6.3
Amazonas	0.9	1.4	4.7	7.0	0.4	0.6	1.9	2.9
Amapá	0.2	0.3	0.8	1.3	0.1	0.2	0.3	0.6
Bahia	8.7	16.1	49.3	74.1	9.2	14.0	46.2	69.3
Ceará	7.5	11.9	37.1	56.5	6.9	9.5	30.0	46.4
Federal District	3.3	6.7	18.9	28.8	3.0	5.8	16.2	25.0
Espírito Santo	0.3	0.3	1.0	1.5	0.2	0.3	0.9	1.3
Goiás	2.1	2.6	10.5	15.2	1.2	2.1	7.0	10.3
Maranhao	2.9	4.3	15.8	23.0	3.1	3.3	13.8	20.2
Minas Gerais	10.4	24.5	61.6	96.6	9.1	18.7	49.2	77.1
Pará	1.5	2.4	9.0	12.9	1.4	1.9	7.2	10.4
Paraíba	3.3	4.7	14.5	22.5	2.5	3.4	10.1	16.0
Pernambuco	4.2	7.2	24.4	35.8	3.1	3.6	13.9	20.5
Piauí	2.0	4.6	13.1	19.7	1.6	3.7	9.7	15.0
Rio de Janeiro	6.5	15.9	39.4	61.9	4.3	9.9	23.3	37.5
Rio Grande do Norte	4.5	7.0	21.7	33.2	4.4	6.5	19.0	29.9
Rondônia	0.2	0.2	0.8	1.1	0.1	0.1	0.3	0.4
Roraima	0.1	0.3	0.3	0.6	0.1	0.1	0.7	0.9
Sergipe	4.6	6.2	21.4	32.2	4.2	5.7	21.3	31.2
TOTAL	65.2	119.5	354.2	538.9	55.6	91.2	276.5	423.3

TABLE 5

PCA: FOOD DISTRIBUTED, BY TYPE OF FOOD AND STATE, 1977-1986  
(tons)

Federative Unit	1977				1978				1979					
	Milk Substitute	Vitamin	Soup	Total	Milk Substitute	Vitamin	Soup	Total	Milk Substitute	Vitamin	Soup	Total		
Bahia	-	42	217	260	-	59	261	320	-	236	540	776		
Distrito Federal	-	-	-	-	434	114	207	756	729	297	332	1357		
Minas Gerais	208	54	92	354	2189	676	911	3777	2125	759	883	3767		
Rio de Janeiro	304	126	180	610	1451	506	594	2551	1725	892	699	3317		
TOTAL	512	222	489	1224	4075	1356	1974	7404	4578	2184	2454	9216		
	1980				1981				1982					
Bahia	52	60	231	343	407	77	182	666	758	117	322	1197		
Ceará	-	-	-	-	-	-	-	-	481	79	214	784		
Federal District	661	207	303	1172	747	150	361	1258	842	109	346	1297		
Minas Gerais	2726	449	1119	4295	2649	435	1239	4322	2035	367	1170	4471		
Rio de Janeiro	1835	640	713	3189	1816	217	744	2777	1901	260	774	2934		
TOTAL	5274	1357	2367	8998	5619	879	2526	9023	6926	932	2825	10683		
	ORIGINAL PRODUCTS 1983				NEW PRODUCTS				1984				1985	
1986	Milk Substitute	Vitamin	Soup		Purée (Children)	Gruel (Adults)	Soup	Total	Purée (Children)	Gruel (Adults)	Soup	Total	Total	Total
Acre	-	-	-		4	2	2	8	40	25	25	89	86	64
Alagoas	-	-	-		40	19	19	78	204	98	98	398	371	180
Amazonas	-	-	-		26	14	14	53	167	88	88	343	245	93
Amapá	-	-	-		4	2	2	9	25	17	17	58	45	21
Bahia	870	140	364		89	44	44	1552	1261	773	773	2744	2328	2229
Ceará	620	79	250		87	50	50	1136	1054	694	694	2373	1812	1510
Federal District	896	118	356		-	-	-	1370	534	395	324	1253	930	810
Espirito Santo	-	-	-		-	-	-	-	2	1	1	3	50	44
Goias	-	-	-		-	-	-	-	-	-	-	-	415	327
Maranhao	-	-	-		63	36	36	135	431	217	217	864	720	640
Minas Gerais	3000	422	1213		-	-	-	4634	1674	1278	1054	4006	3087	2518
Pará	-	-	-		48	24	24	95	282	133	133	548	404	330
Parafba	-	-	-		56	30	30	115	402	216	218	836	723	526
Pernambuco	-	-	-		65	34	34	132	648	317	318	1283	1034	652
Paluf	-	-	-		48	28	28	105	330	177	177	684	578	487
Rio de Janeiro	2132	321	906		-	-	-	3359	1232	876	736	2843	1986	1236
Rio Grande do Norte	-	-	-		59	33	33	125	539	295	295	1129	1186	816
Rondonia	-	-	-		2	1	1	3	21	12	12	44	34	12
Roraima	-	-	-		2	1	1	4	15	9	9	33	29	28
Sergipe	-	-	-		35	24	24	82	387	223	223	833	1030	986
TOTAL	7519	1080	3089		626	342	342	12997	9841	5841	5278	20365	17091	13507

Sources: LBA Foundation 1979, 1985d, 1986a and b.

four kg for women), or 89 grams per day, against approximately 100 grams per PNS client. Given the irregularity of client participation, this difference is not nutritionally significant. In 1985 the distribution fell to 17,000 tons and in 1986 to less than 14,000 tons.

Up to 1980, the PCA merely distributed food and contained no direct health care component. That year marked the beginning of the practice of sending seriously malnourished children to the LBA's Malnutrition Care Centers and referring children for immunization and pregnant women for pre-natal care, along with some attempts at health education, including incentives to breastfeeding for groups of mothers. Currently food distribution is regarded as one of the five health actions in the program (LBA Foundation 1985b). Medical services were reformed in July 1984 in an attempt to integrate them better with the other community activities.

In addition to the PCA, the LBA runs a series of programs designed to raise the living standards of the communities it serves. Among these are nutrition education programs, child care centers for mothers working outside the home, short training courses to facilitate entry into the labor force, centers to treat the seriously malnourished, and basic health programs (LBA Foundation 1985c). These supplementary programs are not part of the PRONAN and have no necessary or direct link with the provision of food, but the LBA regards as them as mutually reinforcing each other.

Finally, it should be noted that the PNS also operates in all the areas in which the PCA functions, although on a smaller scale outside the Northeast. The two programs therefore form a natural experiment suitable for an evaluation that aims to select the best way of achieving the objectives they share. This question will be taken up in Chapter 5.

#### 4.3 A Parenthesis: The PINS Experiment

The three main programs analyzed here were all devised and funded by Brazil; unlike several programs of the period before 1979, they have not depended on foreign food or financing. However, one of them, the PROAB, was partly derived from an experiment financed with external resources. This was the PINS, a component of the agreement signed by the Federal Government and the World Bank in 1975 (Knight 1982, Carvalho da Silva 1982, pp. 41-42; World Bank 1983a). The nutrition project in Brazil included a variety of interventions, including the training of researchers and the strengthening of food and nutrition research in Brazil, but its most costly features were experiments designed to test new forms of increasing the food consumption of poor families or of some of their most vulnerable members (World Bank 1983a, 1985b). One of these experiments gave rise to the PROAPE, a program to provide food and care for pre-schoolers, which will not be discussed here. The other, the PINS, was directed at the entire poor family.

The PINS took up one of the basic procedures of the PNS, namely the individual registration of beneficiary families, as well as the provision of a limited number of basic, traditional foods, in controlled quantities distributed every two weeks (rather than monthly). Instead of distributing fixed amounts of free food it established subsidized prices, thereby enabling

those carrying the cards identifying them as beneficiaries to purchase food at a fraction of the normal price. The food was sold or distributed through a number of COBAL supermarkets (and also by trucks or "mobile markets"); INAN was the coordinating agency and passed on the subsidy, financed by the World Bank, to COBAL.

The experiment was restricted to the city of Recife. Certain poor neighborhoods of the city were surveyed, leading to the selection of a group of 10,071 families, all with an income less than, or very little above, two minimum wages. These families were divided into four groups or models: model A (2,500 families), which received a 60 percent subsidy on four products--rice, beans, maize meal and powdered milk; model B (2,500 families), who received a 45 percent subsidy and were required to take their small children to a health post each month to be measured and weighed; model C (2,563 families), receiving the same subsidy but without the required visit for anthropometric purposes; and model D (2,508 families), who received a 30 percent subsidy. The average income levels of the groups were, initially, inversely related to the amount of the subsidy given, but there were no major differences and all the groups appeared representative of the poor population of Recife. (In the analysis of the anthropometric results of the experiment, in section 6.4 and 6.5 below, evidence will be presented that these income differences were indeed important). The characteristics of the population, together with the program mechanisms, are described in detail in the evaluations of the PINS by the Joaquim Nabuco Foundation (FUNDAJ), (Cavalcanti et al. 1980, 1981 and 1984). There is also an evaluation by Campino (1985a) and another by Nunes da Silva (1985).

The program began with groups A, B and C in November 1977, group D starting in the second quarter of 1978; it concluded at the end of 1980. Table 6 shows, for each model and quarter, the number of families having the right to the subsidy (excluding those who dropped out or lost their membership card), and the number that actually made purchases. As can be seen, there was a drastic reduction in the former group, and an even larger one in the latter; at the end of the experiment 44% of the families had been lost and only 48% were still taking advantage of the subsidy. These losses were inversely related to the amount of the subsidy, being greatest in model D (30 percent) and smallest in model A (60 percent). Furthermore, many more families were lost from model B than from C, given the requirement for anthropometric measurement of the children. This condition was dropped in 1980 before the PINS ended. In the final year, 1980, the most often stated reason for not purchasing the subsidized food was simple lack of money (Cavalcanti et al. 1984, p. 198).

Table 7 shows the quantities of the four foods sold, by model, between October 1978 and the end of 1980. Rice and beans were sold in comparable quantities in all the groups, except that during the first half of 1979 much of the rice supplied was of poor quality and was refused by the consumers. There was also a shortage of powdered milk on some occasions (Cavalcanti et al. 1984 pp. 81 and 168). Powdered milk and maize meal were sold in much smaller amounts than rice and beans. Table 7 also contains estimates of monthly purchases per person in the families who actually continued to buy. These calculations would seem to demonstrate two things. First, the families who did buy did not reduce their purchases over the period despite a general economic deterioration, and, in particular, a rapid increase

TABLE 6

PINS: NUMBER OF FAMILIES ENTITLED TO PURCHASE SUBSIDIZED FOOD ("Participating")  
AND NUMBER OF FAMILIES WHO ACTUALLY BOUGHT, BY SUBSIDY MODEL, 1978-1980

	1978				1979				1980			
	JAN MAR	APR JUN	JUL SEP	OCT DEC	JAN MAR	APR JUN	JUL SEP	OCT DEC	JAN MAR	APR JUN	JUL SEP	OCT DEC
<b>Model A (initially 2,500 families)</b>												
No. participating	2251*	2500	2500	2406	2203	2295	2234	2173	2104	2115	2132	2138
No. buying	1880	2068	2093	1998	1862	1858	1920	1928	1917	1947	2014	1860
<b>Model B (initially 2,500 families)</b>												
No. participating	2488*	2500	2500	1378	1292	1400	1114	1113	1154	1128	1083	1081
No. buying	1497	1351	1234	1135	974	919	942	936	949	951	981	928
<b>Model C (initially 2,563 families)</b>												
No. participating	2266	2563	2563	2085	1894	1909	1786	1638	1710	1562	1619	1619
No. buying	1317	1525	1575	1510	1357	1323	1365	1372	1410	1427	1475	1381
<b>Model D (initially 2,508 families)</b>												
No. participating		1543*	2508	2508	2305	1091	850	878	880	772	781	782
No. buying		630	1271	1512	976	745	740	875	786	661	694	625
<b>Total (initially 10,071 families)</b>												
No. participating	7005*	9106	10071	8377	7694	6695	5984	5802	5848	5577	5615	5620
No. buying	4694	5574	6173	6155	5169	4845	4967	5111	5062	4986	5164	4794

Source: Cavalcanti *et al.* 1984, pp. 169-172

\* During the first period (January-March 1978 for groups A, B and C, and April-June 1978 for group D), not all the families had yet been registered; the total of 10,071 families registered was reached in July-September 1978.

TABLE 7

PINS: PURCHASES OF FOUR SUBSIDIZED FOODS, TOTAL AND PER HEAD, BY SUBSIDY MODEL  
October-December 1978, 1979 and 1980

	RICE		BEANS		POWDERED MILK		MAIZE MEAL		TOTAL, 4 FOODS	
	total tons	per person (kg/mo.)	total tons	per person (kg/mo.)						
OCT-DEC 1978*										
Model A	64.0	2.06	72.0	2.32	18.6	0.60	13.2	2.43	167.8	5.41
B	33.6	1.68	42.7	2.13	11.2	0.56	4.8	0.24	92.3	4.61
C	42.8	1.61	55.0	2.07	14.6	0.55	5.4	0.20	117.8	4.42
D	48.5	1.76	53.5	1.94	13.5	0.49	9.3	0.34	124.8	4.53
TOTAL	188.9	1.79	223.2	2.12	57.9	0.55	32.8	0.31	502.8	4.77
YEAR 1979										
Model A	191.0	1.62	256.4	2.18	65.4	0.56	39.7	0.33	552.5	4.69
B	86.3	1.30	133.6	2.01	33.7	0.51	14.1	0.21	267.7	4.03
C	117.2	1.23	188.4	1.97	47.4	0.50	18.9	0.20	371.9	3.90
D	97.7	1.61	117.1	1.92	28.0	0.46	18.7	0.31	261.5	4.30
TOTAL	492.2	1.44	695.7	2.04	174.5	0.51	91.1	0.27	1453.5	4.26
YEAR 1980										
Model A	264.1	2.19	261.4	2.17	56.6	0.47	34.6	0.29	616.7	5.12
B	147.2	2.19	145.8	2.17	28.7	0.43	15.7	0.23	337.4	5.02
C	208.4	2.07	211.2	2.10	40.9	0.41	21.1	0.21	481.6	4.79
D	93.5	1.85	97.7	1.94	21.7	0.43	10.6	0.21	223.5	4.43
TOTAL	713.1	2.11	716.2	2.12	147.8	0.44	82.0	0.24	1659.1	4.91

Source: Cavalcanti et al. 1984, p. 174 and calculations based on Table 5. The estimates of monthly purchases per head are based on the number of families that purchased and on average family size, by group, calculated from the sample discussed in Cavalcanti et al. 1984, pp. 9-10.

\* The data for January-December 1978 are not broken down by group.

in food prices. Nonetheless, it is possible that these families used part of their right to buy on behalf of their neighbors, being unable on their own to afford all the purchases to which they were entitled. In that case the number of beneficiaries would be larger and average consumption smaller than is indicated in the tables. Second, purchases per head are relatively insensitive to the amount of the subsidy. It would seem that the price-elasticity of these products is low and that the families receiving the larger subsidy in practice used their advantage to purchase other goods, including other foods. However, the physical limits on purchases--the subsidy was not unlimited--may easily invalidate this conclusion. If the beneficiaries who could not afford all the food they were entitled to purchased it and resold it to their neighbors, this would explain the apparent insensitivity of the quantities bought to the price differences between one model and another.

#### 4.4 Evolution of the PROAB

From a simple chronological standpoint, the PINS was used to design new food interventions even before the experiment was concluded. The result was the PROAB, conceived in 1979 and put into full operation in 1980. The new program, which was the result of collaboration between INAN and CNRH, with the assistance of the FUNDAJ, which had begun its evaluation of the PINS in the second half of 1978, was designed to correct the shortcomings revealed up to that point by the experiment in progress. However, since no evaluation of the results of the PINS had yet been made, the deficiencies identified and tackled were necessarily only of a conceptual or operational nature. This view of the origin of the PROAB sees it as a natural derivation of the PINS, although designed before any advantage could be taken of an evaluation of the initial experience of that program. There is, however, another line of thought which maintains that the PROAB would probably have been designed in the same way with or without the PINS experiment, and that the latter was to some extent superfluous. In particular, an expert committee that advised INAN and the Ministry of Agriculture was already insisting in 1977 on the need to intervene in the marketing channels for basic foodstuffs, and suggesting that some form of "horizontal coordination" should be introduced among the small retailers who were the main source of supply for the urban poor (INAN 1977; pp. 17-20). From this standpoint, the PINS was the work of the World Bank and was not integrated into INAN's activities, from which it was clearly separated in both bureaucratic and conceptual terms, and the idea of subsidizing food rather than providing it free existed quite independently of the experimental program. The World Bank itself (1985b, p. 34) recognizes the separation of the program from INAN's regular work, without accepting that the PINS had no influence on the design of the PROAB. Given this disagreement, it does not seem possible to determine how far the PROAB was derived from the PINS. What is important, and is unquestionably due to the World Bank's participation, is that attempts were made to evaluate the results of the PINS, whereas for the PROAB this was only done on a small scale and much later (Oliveira and Medeiros 1985). Therefore the PINS is still a source of much information that is essential to any judgment of the PROAB, especially as regards its nutrition results.

The PROAB retained the basic mechanism of a subsidy, the family-wide benefit with no distinctions among members, and COBAL's role as the supplier, under the supervision of INAN, and--like the PNS--the program was

decentralized to the state ministries of health. Everything else changed. First, as noted in Chapter 3, the identification of individual families was abandoned and replaced by the identification of more or less homogeneous poor neighborhoods, in which all the residents would have access to the subsidy. As a result of this change, both the restrictions on the days on which food could be purchased and the quantitative limit per client were abolished. The latter was replaced by monitoring the purchases of the neighborhood shopkeeper, who became the point of sale instead of COBAL's own premises. In small neighborhoods without retailers COBAL's trucks continued to be used. This change meant that administration was now centered not in the eventual beneficiary but in the intermediary; the number of potential sale points was expanded in order to reduce the distances between them and their customers, and a secondary objective was introduced, namely increasing the incomes of small shopkeepers. It has been a constant concern of the PRONAN to design policies that improve the situation of a given poor group (for example, urban consumers), without reducing the income or worsening the nutritional status of other poor groups, such as shopkeepers or peasants or agricultural workers (INAN 1977, pp. 9-15). Finally, the range of products was expanded to 11, adding to the rice, beans, maize meal and milk of the PINS and the sugar and manioc flour of the PNS, vegetable oil, pasta and three animal products-- eggs, dried meat and dried salt fish. The retailer could also sell any other foods without controls on prices or quantities.

The PROAB mechanism is described in a number of reports and evaluations (Arruda 1982, Coimbra 1985, INAN 1981b), and extensive operational documentation is available (INAN 1984a and b). COBAL buys and stores the food and takes it to the small warehouses or "minicenters" where it is sold to the retailers. The company is responsible for carrying out studies before constructing or remodeling these centers (Maciel Nava 1983, Tavares *et al.*), once INAN and the state secretariat of health have decided on the neighborhoods to be served. The retailers must affiliate with the program in order to purchase subsidized food and must sell the products at the prices fixed, which are reviewed each week. Apart from its own inspections, INAN depends on the clients to denounce any pricing irregularities. The shopkeeper can be eliminated from the program for this reason, for selling wholesale to third parties, or for changing his business into another kind of operation (a bar, for example). INAN transfers to COBAL the difference between the retailer's cost and COBAL's purchase price for the product, plus a margin of 7.4 percent for the company. The selling price to the consumer includes a margin for the retailer that varies between 7 and 13 percent, fluctuating over time and among products. The subsidy also varies from one product to another and over time, according to market conditions and especially inflation. Typically it is 20 percent; the highest level reached is 30 percent, the same as the minimum used in the PINS. These prices and margins are discussed in detail in section 5.5.

The PROAB started on a small scale in 1979 and came into full operation in 1980 in Recife. In 1981 it was extended to four other states in the Northeast, in 1983 to two more and in 1985-86 to another two states, always in the largest city (the capital). Table 8 shows the development of the program in terms of the number and population of the neighborhoods in

which it is operating and the number of retailers involved. It should be noted that since individual beneficiaries are not identified the only estimate of their number is the population that the program is intended to reach. It is not known how many residents of these neighborhoods do not take advantage of the subsidy nor how many non-residents do their shopping in these neighborhoods in order to benefit from it. In the absence of any identification of individual clients, it seems very unlikely that either through ignorance or pride a consumer would refrain from making use of the program when he is entitled to do so, as sometimes happens with programs using food stamps which require this identification (Butler, 1984, Coe 1983). Nonetheless, nothing is known about the way in which the typical beneficiary distributes his purchases among the shopkeepers participating in the PROAB on the one hand and other sources of supply on the other. Starting out with a clientele of 100,000 inhabitants in 1980, the program was serving something over two million people by mid-1984; this was approximately half the number of beneficiaries of the PNS if one includes only the individuals registered with that program, or a smaller fraction if all the members of the families benefiting from that program are included. By mid-1986 the number of PROAB beneficiaries was put at 2.75 million.

Table 9 shows quantities of the eleven subsidized products, by year (1980-1986) and by state. The two most important products are rice and sugar, followed by manioc flour and other products. (The inferior balance between protein and calories compared with the PINS is partly due to the inclusion of sugar, but also to the scarcity and rising price of beans from 1981 onwards.) Table 10 converts these estimates into figures per head per month for 1984 and 1986, on the assumption (not proved) that all the families in the "target population" are making purchases. In Recife and Teresina this calculation produces estimates on a par with those obtained for the PINS (only four products, but a larger subsidy), in other words around five kg per head per month. In the other cities the figures range from 1.0 to 2.6 kg. For some products in some states, the estimates are comparable to the total estimated consumption per head among poor families in the Northeast a decade ago, but these cases are rare. Furthermore, using an average for the region conceals many variations among states in the consumption of certain products.

#### 4.5 SOMAR Network: Semi-Supermarket for the Semi-Poor

Within the PRONAN, the PNS and PCA programs are competitive, using somewhat different procedures to achieve what basically are common objectives, while the PROAB is the only program that works through subsidies rather than providing free food. Outside the scope of the PRONAN, however, there is a program similar to the PROAB but which does not involve a subsidy. This is the SOMAR Network, entirely operated by COBAL. Like the PROAB, it uses retailers who are affiliated with the program and thereby obtain the right to purchase a long list of products directly from COBAL's warehouses, along with the obligation to sell them to the consumer at prices fixed by the company (World Bank 1980). The difference lies in the fact that in a neighborhood served by the PROAB all the shopkeepers have the right to affiliate, while the SOMAR Network only admits certain retailers who can meet minimum requirements as regards their level of sales and their financial and administrative capacity. The result is more a company of supermarkets than the free competition model used by the PROAB. The products marketed include a basic basket of foods that are sold at the lowest possible price, and many other

TABLE 8

NUMBER OF PARTICIPATING NEIGHBORHOODS AND RETAILERS AND ESTIMATES  
OF THE POPULATION SERVED BY THE PROAB, BY STATE, 1980-1986

	RECEFE PERNAMBUCO	TERESINA PIAUI	MACEIO ALAGOAS	JOAO PESSOA PARAIBA	NATAL R.G. NORTE	FORTALEZA CEARA	SAO LUIS MARANHAO	SALVADOR BAHIA	TOTAL
1980: Neighborhoods	2								2
Retailers	121								121
Population (thousands)	100								100
1981: Neighborhoods	2	1	1	1	1*				6*
Retailers	112	398	109	47	50				716
Population (thousands)	160	120	50	601	70				460
1982: Neighborhoods	2	1	1	1	1				6
Retailers	141	509	110	94	180				1034
Population (thousands)	160	120	50	60	70				460
1983: Neighborhoods	3	2	1	2	2	2	3		15
Retailers	231	985	183	291	492	317	132		2631
Population (thousands)	300	200	140	210	270	200	100		1420
1984** : Neighborhoods	6	3	5	2	2	3	3		18
Retailers	331	906	166	285	537	616	20		3081
Population (thousands)	516	325	275	260	340	362	165		2122
1985: Neighborhoods	6	3	5	3	4	4	4		29
Retailers	637	724	347	312	417	627	294		3388
Population (thousands)	672	325	236	321	333	362	265		2514
1986: Neighborhoods	6	3	5	3	6	4	4	2	33
Retailers	770	720	322	102	554	675	394	56	3593
Population (thousands)	696	325	266	183	435	362	259	220	2746

\* The number of neighborhoods is the same as the number of supply mini-centers, except that PROAB operations began in Natal in 1981 without a mini-center yet established. In addition to these fixed supply points, COBAL operates a number of market-trucks, in five states.

\*\* Population estimates in April 1985 and corresponding to the end of 1984. The estimates of the number of retailers relate to June 1984.

\*\*\* Estimates at the end of July 1986.

Sources: INAN 1984a and 1986

TABLE 9

## MAIN FOODS MARKETED BY THE PROAB, BY STATE, 1980-1986 (Tons)

		RICE	SUGAR	DRIED MEAT	BEANS	MAIZE MEAL	MANIOC FLOUR	POWDERED MILK	PASTA	SOYA OIL	EGGS	SALT FISH
1980	PERNAMBUCO	1952	2058	503	2227	208	836	94	282	632	415	53
1981	PERNAMBUCO	1722	2485	411	1538	192	814	138	161	673	535	15
	PIAUI	4103	1834		205	336	165	60	67	206	147	14
	ALAGOAS	62	108	13	43	18	20	5	16	34	13	3
	PARAIBA	102	96	23	48	36	22	5	28	34	25	3
	R.G. NORTE	8	16	4	4		7	2	3	8	9	
TOTAL:	5 States	5998	4539	451	1838	582	1028	209	274	954	729	36
1982	PERNAMBUCO	1349	2192	380	1022	179	739	106	201	816	533	46
	PIAUI	6114	3057		315	489	188	106	103	521	339	33
	ALAGOAS	415	1116	167	290	269	129	29	91	319	147	17
	PARAIBA	878	1371	181	665	581	87	30	319	393	358	19
	R.G. NORTE	337	1449	90	351	139	193	48	164	239	322	49
TOTAL:	5 States	9093	9185	818	2644	1658	1335	319	879	2288	1699	164
1983	PERNAMBUCO	2575	4153	924	2580	552	1664	459	521	997	909	173
	PIAUI	17457	5531	*	466	1114	1337	128	304	982	731	16
	ALAGOAS	961	1609	307	936	368	307	131	184	453	287	55
	PARAIBA	2372	2780	554	1636	1227	627	198	837	616	758	156
	R.G. NORTE	1107	3657	259	1102	623	701	173	561	832	932	67
	CEARA	1150	1000	16	199	45	498	85	434	143	56	*
	MARANHAO	473	190	*	10	*	213	18	14	40	27	1
TOTAL:	7 States	26095	18921	2059	6929	3929	5348	1109	2855	4062	3699	467
1984	PERNAMBUCO	3456	9031	1944	2754	1209	4837	466	1153	902	1511	208
	PIAUI	8968	738	*	182	1422	1298	170	389	858	607	5
	ALAGOAS	998	1913	422	441	446	610	124	219	235	345	78
	PARAIBA	1886	3491	696	572	835	572	138	706	288	775	153
	R.G. NORTE	1027	3227	156	473	278	839	154	468	312	533	24
	CEARA	2825	3754	65	351	138	1384	159	591	339	384	95
	MARANHAO	1788	718	*	61	*	1547	64	63	178	163	*
TOTAL:	7 States	20951	29442	3283	4834	4328	11087	1275	3589	3112	4318	563
1985	PERNAMBUCO	2901	7272	1678	1899	1317	2995	376	1673	1303	1418	*
	PIAUI	6489	4616	*	428	661	279	89	269	381	331	*
	ALGOAS	1026	3047	393	586	374	384	60	413	464	522	*
	PARAIBA	1470	1716	347	275	642	162	69	893	360	569	*
	R.G. NORTE	619	2569	26	694	156	221	77	320	369	154	*
	CEARA	3525	4697	8	621	102	500	149	382	426	452	*
	MARANHAO	2605	965	3	145	*	534	39	52	179	223	2
TOTAL:	7 States	18635	24882	2455	4648	3252	5075	859	4002	3482	3669	2
1986	PERNAMBUCO	5788	11684	*	2499	3516	1857	*	1672	210	1613	*
	PIAUI	6637	5127	*	200	328	548	506	92	352	779	3
	ALAGOAS	1212	3748	*	181	536	288	*	418	47	*	*
	PARAIBA	1742	2739	*	255	997	325	*	1233	23	*	*
	R.G. NORTE	2180	3901	*	319	1682	110	17	123	450	505	*
	CEARA	7767	6883	*	1518	1327	50	538	108	717	971	*
	MARANHAO	4525	2568	*	665	*	13	36	71	102	705	*
	BAHIA	742	1498	68	281	323	75	58	30	142	44	2
TOTAL:	8 States	30593	38448	68	5918	8709	3266	1155	3747	2043	4617	5

Source: INAN 1984a, Annex II and INAN 1986. Three products marketed only in some states are excluded: Crackers (Piaui), Tapioca (Piaui, Ceará and Maranhão) and brown sugar (Ceará), generally in smaller amounts.

\* Not sold.

TABLE 10

FOOD DISTRIBUTION BY THE PROAB, BY STATE, IN KILOGRAMS PER HEAD PER MONTH FOR THE POPULATION SERVED  
June 1984 and January-July 1986

	PERNAMBUCO	PIAUI	ALAGOAS	PARAIBA	R.G.	NORTE	CEARA	MARANHÃO	ENTIRE NORTHEAST 1974-75	
									CONSUMPTION PER HEAD BY FAMILY INCOME LEVEL	
									Up to one minimum wage	from 1 to 1.5 minimum wages
<u>June 1984</u>										
Rice	0.57	1.75	0.40	0.27	0.25	0.80	0.09		1.80	2.22
Sugar	1.88	1.78	0.84	1.20	1.31	0.88	*		1.02	1.50
Dried meat	0.40	**	0.19	0.17	0.04	0.01	**		0.33	0.84
Beans	0.06	0.11	0.01	*	*	*		0.03	2.94	2.43
Maize meal	0.18	0.38	0.27	0.33	0.03	0.05	**		1.62	1.20
Manioc flour	1.05	0.31	0.24	0.11	0.13	0.31	0.60		4.56	3.96
Powdered milk	0.09	0.01	0.05	0.05	0.06	0.05	0.06		0.21	2.07
Pasta	0.21	0.05	0.06	0.21	0.09	0.14	0.03		0.03	0.15
Oil	0.08	0.36	*	*	0.05	*	0.09		0.06	0.15
Eggs	0.36	0.16	*	0.23	0.15	0.09	0.11		0.06	0.15
Salt Fish	0.04	*	0.03	0.04	*	**	**		0.21	0.21
TOTAL	4.92	4.91	2.24	2.61	2.11	2.33	1.01		12.84	14.88
<u>January-July 1986**</u>										
Rice	0.61	2.07	0.31	0.62	0.43	2.09	1.26			
Sugar	1.55	1.14	1.07	0.87	0.78	1.54	0.93			
Dried meat	0.38	*	0.12	0.20	0.04	0.02	0.01			
Beans	0.46	0.05	0.23	0.35	0.31	0.28	0.04			
Maize meal	0.23	0.11	0.12	0.30	0.08	0.03	*			
Manioc flour	0.35	0.18	0.06	0.11	0.04	0.38	0.25			
Powdered milk	0.04	0.03	0.02	0.02	0.02	0.02	0.03			
Pasta	0.22	0.10	0.09	0.40	0.10	0.16	0.04			
Oil	0.30	0.20	0.18	0.17	0.09	0.23	0.21			
Eggs	0.17	0.13	0.09	0.15	0.12	0.19	0.15			
Salt Fish	*	*	*	0.01	*	*	0.01			
TOTAL	4.31	4.01	2.29	3.20	2.02	4.95	2.73			

Source: INAN 1984a and 1986; estimates of average consumption in 1974-75 are taken from the ENDEF survey.

\* The product was either completely lacking or less than 0.01 kg per capita per month was distributed.

\*\* Excluding Bahia, where the PROAB started operations during 1986.

less essential products (up to 900 in all); there may be some degree of internal subsidy in this arrangement. COBAL's objective in using this network of private stores is to lower prices and strengthen the retailers. The lower prices are the result of the company's purchasing power and efficiency; support for the retailers--who must operate on a larger scale than those affiliated with the PROAB--includes technical assistance in accounting, advertising and other matters. The initial organization of the SOMAR Network was also partly financed by the World Bank project. The objectives include bringing the benefits of using supermarkets to the poorest families and compensating retailers for the disappearance of the wholesalers with whom they traditionally worked.

Since it does not involve a charge on public funds, this program does not need to be judged in the same way as those that involve public expenditure--it can be justified in the market as long as no subsidies from public funds are required. This is the advantage of the program: consumer prices can be reduced, as under the PROAB, but without a subsidy. From this standpoint, the relevant question regarding the PROAB becomes: what additional price reduction or benefit does it offer over and above what the SOMAR Network can provide? Any comparison between the two programs, to be fair, would have to take into account two potentially important limitations of the SOMAR Network. First, it has to use retailers of a certain size, so it would perhaps not achieve the same results if it included the small shopkeepers affiliated with the PROAB; second, for this or other reasons, it would not be possible to apply the system to the very poor neighborhoods in which the PROAB operates, and where almost all the trade consists of only a few basic products. The question of the relative merits of the two schemes and how they could be combined will be discussed in the final chapter.



## 5. EVALUATION OF THE PROGRAMS: OPERATIONS

The PINS, being explicitly an experiment, was designed to be evaluated; the distinction between the four subsidy models, and the program's operational complexity, had no other justification. The FUNDAJ produced partial evaluations in 1980, during the experiment, issued a long evaluation in 1981, and published a brief summary in 1984 (Cavalcanti *et al.* 1980, 1981 and 1984); there was also an evaluation of the anthropometric results (Nunes de Silva 1985). The other programs were not designed as experiments and did not incorporate evaluations from the beginning, but in all cases attempts have been made to evaluate operational aspects and/or the results achieved. In the case of the PCA there was an early, partial evaluation in the Federal District (Salomón 1978); the data obtained in this study then served for a more detailed analysis of the program with UNICEF participation (LBA Foundation and UNICEF 1982).

Both the PCA and PNS (in addition to other programs, such as the school meals program--PNAE--and the lunches for workers program--PAT) were evaluated in summary fashion by the Institute of Economic and Social Planning (IPEA), at the end of the PRONAN II (IPEA 1981?b). The PNS was examined in a separate document by the same agency (1981?a). INAN, with the assistance of PAHO, evaluated the PNS in 1978 (INAN 1978b), on the basis of anthropometric results obtained in Salvador, Bahia. Rios (1981) provided a more comprehensive evaluation based on a larger number of children and focusing on measurements of their physical growth. (Her evaluation differs from INAN's in not discussing weight at birth or including a control group.) Another assessment of the PNS accompanied the evaluations of the PINS during 1979-81, with the emphasis on program administration in a rural area of Pernambuco (Cavalcanti *et al.* 1980, chapters 3 and 6). A group in the state of Sao Paulo secretariat of health evaluated the PNS from its introduction in that state in March 1980 through April 1982, concentrating on the children's growth (Chavez 1982, Lerner *et al.* 1985a), the reasons for beneficiaries dropping out of the program (Kalil *et al.* 1984a and b) and the administration of the program (Lerner 1985b). And at the end of 1983 an evaluation of the PNS was begun in the state of Santa Catarina (Valente *et al.* 1983) whose findings have not yet been divulged. In 1984 Coimbra (1985) evaluated the operations of both INAN programs, the PNS and the PROAB. In 1984 INAN itself organized a "Meeting to Evaluate the Execution of the PROAB," for which a voluminous documentation (INAN 1984a) was prepared beforehand, while after the meeting a summary analysis and recommendations were disseminated (INAN 1984b). This seminar included participants from the Planning Secretariat in the Office of the President of the Republic (SEPLAN), COBAL and the state secretariats of health, in addition to INAN. An INAN expert, Wilberg (1984), prepared her own evaluation of these and other programs. The seminar was repeated in 1986 (INAN 1986). Finally, the World Bank has prepared or contracted a number of evaluations of the components of its nutrition project in Brazil. These include a report prepared in 1982 by a group at the University of Sao Paulo

(Moldau *et al.* 1982), a preliminary evaluation by Knight (1982), and the Bank's own 1983 and 1985 reports (1983a, 1985b). The 1983 report included a summary description of all the food and nutrition programs then operating in Brazil (Carvalho da Silva 1983a), mentioning the principal findings of certain evaluations. The same author made another survey three years later (Carvalho da Silva 1986).

In short, it is not the case that serious efforts have not been made to evaluate the programs; if many questions remain unanswered, this is due to a lack of specific information, or to methodological limitations of the studies, or to inherent difficulties, especially when there is no way of measuring phenomena that therefore have to be estimated instead. In one case, an attempt to evaluate the implementation of the PROAB in a new neighborhood using a "before-and-after" scheme was frustrated when, after the "before" survey had been carried out, the authorities decided to establish the program in another neighborhood (Oliveira and Madeiros 1985). Nor has there been any lack of concern regarding the data requirements and conceptual framework for an evaluation. A number of papers (Batista Filho 1978, Lopes and Chacel 1978) along these lines were presented to the Seminar on the Economics of Nutrition in 1978 at Recife (UFPE 1978), and a group of specialists from the government and UNICEF set out in 1982 the information requirements for an evaluation of the uses of the resources of FINSOCIAL, established in that year (CNRH *et al.* 1982). The recommendations of these groups have not been implemented in full, but a large quantity of information is available; for the most part the problem is how to interpret it in the face of objectives and assumptions that are at times contradictory.

It would be possible in this chapter to proceed program by program with a view to arriving at a judgment on each one in turn. This seems inefficient if the objective is to compare and contrast them in a number of dimensions. It would be more rewarding to organize the evaluation around these aspects, leaving any summary of each program to the end. This is the procedure adopted in this and the following chapter.

### 5.1 Identification of Beneficiaries

The PROAB uses only one criterion to define its beneficiaries--the general, homogeneous poverty of the neighborhood in which they live. The PNS and the PCA combine a poverty criterion--families with incomes below two minimum wages--with a biological requirement. Before the economic criterion is discussed, three observations should be made about the selection by sex, condition and age. First, this is justified by the notion of "biological vulnerability," and is still valid even when the scope of the assistance is extended to the entire "socially vulnerable" group. Although it may be unfair not to assist families in which no member meets the biological requirements--the elderly poor, for example--it may in the long term be more inequitable not to help a needy child during its formative years. There seems to be no completely fair and acceptable way of getting round the need to help some people and not others, and selection according to biological criteria makes as much sense as any other procedure. Second, this selection is not necessarily dictated by the objective of increasing only the consumption of those registered as beneficiaries. In other words, the "leaking" of food to other family members does not necessarily undermine the criterion used, since

the benefit may still be concentrated among pregnant women, nursing mothers and children, and because these persons may be an easy link to the poor family as a whole, whose other members (adult males and older children) may perhaps be less willing to seek or accept assistance; at any rate, this tendency has been observed in other countries (Butler 1984, Coe 1983). Third, both health care and food and nutrition education will certainly have greater impact when oriented toward mothers and children; to the extent that these objectives are being pursued, the biological group selected is the natural target.

None of the foregoing implies that, in targeting these categories, the PNS or PCA are reaching them in proportions reflecting the real makeup of the poor population. For the PCA, it has been found that the coverage of young children is much more complete than of adult women (LBA Foundation and UNICEF 1982, p. 11). The PNS initially used estimates of the composition of the population based on national averages, and also assumed that the demographic and economic criteria were independent of each other. The result, as Coimbra (1985, pp. 107-111) shows, was that the number of women and children in the target population was underestimated, the children to a relatively greater extent. This distortion was partially corrected later on by adjusting the estimates to actual income distribution in the Northeast (Coimbra 1985, p. 113). Despite this, the PNS established a system of "vacancies" (INAN 1978b) as the basis for calculating the food required; since pregnant women, nursing mothers and children less than a year old are only assisted for six months, but older children for five years, to calculate the "vacancies" in the first group on a half-yearly basis is to reduce the food available for these categories to half what it ought to be. In practice, no account was taken of the fact that when a woman or child leaves the program, its "place" can be taken by another. These complications introduce an inequity into the beneficiary group, as well as raising questions about any calculation of the population actually served; for nutrition purposes, permanence in the program, as opposed to the mere number of clients, may be very important. Neither the PCA nor PNS report on a regular basis on the continuity of their clients and actual transfers of food to them; the limited evidence available comes from anthropometric evaluations based on samples of children, with no control for economic factors (INAN 1978b, Lerner *et al.* 1985a, Rios 1981, LBA Foundation and UNICEF 1982), or from specific studies of women who left the program (Kalil 1984a). It must be admitted, however, that errors in calculating the target population, distributing benefits among classes of individuals and maintaining individual records on them, are secondary problems (Coimbra 1985, p. 113).

As regards the income criterion, two questions can be posed: Is it necessary to use it? And should the cut-off point be twice the minimum wage? It is obvious that for the PROAB the answer to the first question must be yes; the definition of a "poor neighborhood" is based on income, although it could be, and in practice is, arrived at on the basis of other variables that are easier to observe, such as the type of housing construction, sanitary conditions, etc. For the donation programs, the need for the income criterion, which is applied to the family at the time of registration, is not quite so obvious. The PNS, for example, takes as evidence of poverty and nutritional risk the fact that the family visits a health post. There are also indications that families drop out of the PNS when they feel they do not

need the food being distributed, in other words when their economic resources are adequate (Kalil et al. 1983a). What is not clear is whether this voluntary withdrawal only occurs when the family actually achieves an adequate diet, or whether the sense of humiliation at accepting the free food also causes really needy beneficiaries to withdraw as well. Coimbra argues (1985, pp. 107-109) that it would be enough, and much less burdensome administratively, to accept as poor anyone who comes along and asks to be registered. This is all the more reasonable when the areas in which the PNS operates have already been surveyed in order to select poor neighborhoods. That is, the PNS begins with a procedure similar to that of the PROAB, i.e. registering areas, but then goes on to a second and possibly superfluous stage of selecting individuals with low incomes. This could certainly be sensible in very heterogeneous neighborhoods, where the PNS can function but the PROAB cannot. (It is not clear whether the income criterion is similarly open to question in the case of the PCA, which uses a variety of delivery facilities and whose geographical concentration is not described in the evaluations available).

If an economic criterion continues to be regarded as desirable in addition to the biological one, then it must take account, first, of the very unstable incomes of poor families over time (Cavalcanti et al. 1984, Haguette 1982, Motta and Scott 1983), and second, of changes in the real value of any dividing line such as twice the minimum wage. As regards the former, what is needed is an indicator of the "permanent" living standard of the potential client, not necessarily his income at any given moment. For this purpose the zone of residence would very often be sufficient. A functional classification, using occupation and, in rural areas, access to the land, could be even more representative (INAN 1977). As regards the latter, the minimum wage is in theory revised in line with inflation, but such adjustments can be cancelled out by a higher rate of increase for food prices than for other products, or by partial adjustments, as tends to happen. The minimum wage buys much less food than it should, according to the law which established it. If it is desired to retain a real value for the eligibility criterion, the minimum wage multiple probably ought not to be constant. Regional and urban/rural adjustments would also be required to take local price differences into account (INAN 1977), quite apart from the question of whether "poverty" actually begins at twice the minimum wage, or three times, or some other figure.

## 5.2 Selection of Foods

As mentioned in section 3.2, it is the selection of products which basically distinguishes the PCA from the INAN programs. No choice can be made between "natural" or formulated foods in the absence of answers to two basic questions, to be discussed later: What are the relative costs of the two kinds of foods? And which produces better results? i.e. in terms of net additional consumption, child growth, weight at birth, frequency or severity of diseases, or other objectives. The option for one kind of product over another must be based on an analysis of costs and results.

Before we proceed to this, however, three general observations can be made regarding the selection of foods. First, there is no reason why both kinds of food should not be combined within a single program if their respective virtues are evident. This is partly a result of the fact, already

noted, that the distinction between traditional and blended foods is very arbitrary (Castro 1985). If the PNS, for example, includes powdered milk, and if a milk substitute (also distributed in dehydrated form) turns out to contribute more to the growth of small children because its consumption is less diluted among the family, then the blend could also be included. However, there would not be the same justification for including blends that typically are consumed by the entire family (LBA Foundation and UNICEF 1982) if these cost more than the "natural" or less processed products. In other words, the selection must be based on the characteristics of specific products and not on a preference for a certain type of product as a whole.

Second, it is striking how little use has been made of economic criteria, or knowledge of family behavior, in product selection. For the LBA, the family's traditional habits, including that of distributing an increase in consumption among all its members, are a problem to be overcome by using products enjoying only limited acceptance, which in principle reduces their dilution. At the other extreme, INAN emphasizes the acceptability of products; it is also concerned that they be cheap, at least as regards those distributed in the PNS. Nonetheless, the cheapest product is not necessarily the best one to subsidize, even though this is true for an infra-marginal donation, i.e. one that is small in relation to total consumption. The greatest additional consumption resulting from a subsidy is obtained by using those products that are cheap in relation to their price-elasticity (Moldau, 1985), whether or not they are cheap in terms of cost per nutrient. It may be that in the case of the PROAB this criterion justifies the inclusion of relatively expensive foods--meat and fish in particular--because the clients normally consume little of these products, and react by eating more of them when their price is reduced. But to the extent that it is ignored, subsidies to expensive products are very questionable, particularly if the latter are high in protein and the basic problem has been diagnosed as a calorie deficiency. It seems clear that the choice of products to subsidize was based as much on the wishes of the clients, as expressed in the evaluation of the PINS (Cavalcanti *et al.* 1984, p. 203), as on any analytical criterion. However, it must be acknowledged that this is not an easy issue to analyze; we will return to it in section 5.4. As regards the donation programs, it must also be recognized that the theory of the rational consumer assumes that for infra-marginal transfers (and assuming the beneficiary does not sell his ration) there is no difference between a transfer of food and of money (Musgrove 1985a, Timmer *et al.* 1983, p. 37). There is some evidence that in practice consumption increases more through a transfer of food (Kennedy and Pinstруп-Andersen 1983, p. 36), but this applies to very poor people, outside Latin America, or comes from a study of beneficiaries in the United States (Senauer and Young 1986). In these circumstances, the selection of products by the PNS seems very easy to justify, provided that a family does not receive more of any food than it would consume. This conclusion, however, depends on weak evidence and assumptions that are far from being substantiated.

Third, the inclusion of sugar among the products distributed indicates that INAN is not taking its harmful effect on dental health into account. Sugar is the second most important product in the PNS and the first or second in the PROAB. While it is certainly a cheap source of calories--so cheap that it figures in a number of minimum-cost diets calculated by Rosenberg (1976, pp. 91-110) for poor families--the cost advantages can be

cancelled out in health terms by dental caries. From this standpoint the selection of products for the PINS was superior. In rural areas dental consultations represent half of the medical treatments under the INAMPS, for example, and almost all of these involve extractions, without any preventive care (Pinto 1984, pp. 129 and 138). Further, the Food and Nutrition Committee of the Ministry of Health has recognized dental health as a serious problem and proposes to attack it through fluoride salts--but it has not considered a reduction in sugar consumption as a possible preventive measure (MS 1983, p. 6).

### 5.3 Operating Efficiency and Collateral Effects

In conceptual terms, any assistance program can be divided into two phases: up to the moment the food is delivered or sold to the beneficiary, and from that point onward. An efficient operation in the first phase, when the food is still under the control of the public agency, is a necessary but not sufficient condition for the efficient transfer of benefits. It is also much easier to observe what is going on during that phase. It is therefore not surprising that a number of the evaluations of the PCA, PNS and PROAB have only studied the process up to the moment when the food is received (Coimbra 1985, INAN 1984a and b, IPEA 1981a and b, Lerner *et al.* 1985b). The issue of unit costs as an indication of efficiency will be discussed in section 5.4; this section will focus on other operational matters, including the clients' evaluations or views of the programs.

When the PNS was started INAN enjoyed two levels of freedom that it subsequently (from 1979 onwards) lost. One was to pay the state secretariats of health the costs of training and maintaining a team of personnel to supervise the program, store and distribute the food within the state, etc. The other was the ability to buy food directly rather than depending on COBAL to supply the entire program (Coimbra 1985, pp. 113-114). Both options disappeared during a period of severe financial constraints which occurred between the end of the PRONAN II in 1979 and the establishment of FINSOCIAL in 1982. The PROAB, having started operations in 1979, has always depended completely on COBAL for its supplies, and since the company sells directly to the affiliated retailers, the state secretariats of health only participate in decisions on prices, margins and delivery points, and not on the storage and physical distribution of the products.

Given COBAL's central role, the operating efficiency of both the INAN programs depends largely on the operating efficiency of the company. This in turn seems to a great extent to be a function of the financing of the programs; any delay or other problem with the disbursement of funds is quickly reflected in shortages and/or higher prices for food. When COBAL cannot pay its suppliers on delivery, it ends up paying higher prices (INAN 1984a, pp. 3-9; apart from this it may pay more than necessary because of its own internal inefficiency.

A number of observers, both Brazilian and from the World Bank (Pessoa 1986, World Bank 1980 and 1983a), have regarded COBAL as a relatively efficient company, one of the best if not the best in this area in Latin America. They also agree that if COBAL did not exist it would be necessary to invent it, or to transfer its functions to an INAN restructured as a public

company. This was proposed by the Ministry of Health in 1975, but was opposed by other agencies, and INAN was not converted (Coimbra 1985, p. 38). Other observers (INAN 1978a and 1984, Oliveira and Medeiros 1985, Peliano 1984, Wilberg 1984) conclude that COBAL falls short in a number of ways of its objectives, viz. to provide a regular, reliable supply of food at minimum prices. What is unclear is the extent to which these shortcomings are those of the firm itself or are attributable to the BNDES and other institutions responsible for financing the programs. There was a particularly acute crisis in 1984 which involved not only substantial delays in the release of funds but also the installation within COBAL of certain additional directors, for purely political reasons, while a number of company officials were accused of stealing the funds and/or the food intended for the PNS and PROAB. This crisis led to the PROAB evaluation seminar in August 1984 (INAN 1984a), whose recommendations focused on financial and operational issues. This seminar should have taken place earlier, in November 1983 (MS 1983, section V), as part of a wide-ranging training and dissemination program; its postponement may have been due to the financial crisis and/or to the fact that the other activities planned could not be carried out at the same time. During the period of greatest economic difficulty the PROAB was in practice reduced from a program with eleven food products to one with only seven, depending on the state and the moment. Only toward the beginning of 1985 did it resume systematic operations with eight products.

These circumstances complicate any evaluation of the normal or potential efficiency of COBAL, even in general terms. It would seem reasonable to conclude that the company is acceptably efficient, in terms of costs and losses or theft of food, as long as it is not subject to political interference or faced with financial problems for which it is not responsible. This does not mean, however, that for the individual client (or the retailer with whom COBAL deals directly, in the case of the PROAB) the programs function exactly as they should. Leaving aside the question of prices--which only affects the PROAB, and which is discussed in section 5.5 --there have been constant accusations of favoritism or discrimination in the distribution of products, irregular supply, and poor quality.

The detailed criticisms of the clients of the INAN programs, whether consumers or retailers, have principally been analyzed in two evaluations carried out by the FUNDAJ in Recife or in the rural zone near Ribeirao: one study (Oliveira and Medeiros 1985) refers to the PROAB, and the other to the PNS (Cavalcanti et al. 1980). This concentration of evaluations in a single geographical area is a drawback, and when some of the same criticisms are repeated in other reports on the programs, it is not clear whether they are based on any independent evidence relating to other regions of Brazil and/or other moments in time. Nonetheless, in the absence of wider evaluations, it seems legitimate to regard these studies as a fair representation of the problems faced by the programs in their daily operations, and of how they are seen by their beneficiaries and intermediaries. It should be stressed that both evaluations involved monitoring program operations over a period of between five and twelve months; these were not snapshot surveys, which makes their findings more reliable.

One of the advantages of the PROAB, in relation to the PNS, is generally taken to be that it gives the consumer greater freedom, or respects his preferences better; instead of providing fixed quantities of certain foods, it facilitates the purchase, in proportions decided by the consumer, of a larger number of products. The PNS is frequently criticized (along with other donation programs) for being unnecessarily "paternalistic" or "authoritarian," failings from which the PROAB is supposedly immune. There is no doubt that this distinction is partly valid, especially for the final consumer of the food. However, the PROAB does not avoid being authoritarian in relation to its immediate clients, namely the retailers to whom it sells. For one thing, the need to prevent the retailer acting as a wholesaler and reselling what he buys from COBAL to other shopkeepers means that there must be checks of the amounts purchased. Further, retailers complain that COBAL employees allow some shopkeepers to buy as much as they want (even enough to re-sell) while others cannot obtain enough to satisfy their clients. The distribution of sales among retailers is indeed very unequal at times, and this is attributed to corruption on the part of COBAL officials who make deals with certain retailers in exchange for small sums of money or gifts, or for reasons of personal friendship. Retailers have also complained about irregularities in the weighing of products and the difficulty of returning foods that turn out to be of such poor quality that they cannot be sold (Oliveira and Medeiros 1985, pp. 69-80). If the shopkeeper is treated disdainfully or unfairly by the company he usually displays the same attitudes towards his clients, according to the consumers, and almost inevitably puts all the blame on COBAL.

The fact that in the PROAB the consumers are paying 70 percent or more of the price of the product seems to make them more likely to complain about defective goods or poor service. As a rule the PNS clients feel more inhibited in complaining about these shortcomings because they are afraid of losing their status as beneficiaries, or that the entire program may disappear (Cavalcanti *et al.* 1980, p. 61). However, the complaints of the two groups of clients coincide on the issues; a difference in the frequency of the accusations cannot be interpreted to favor one program or the other. The two main faults mentioned are, consistently, the poor quality of the products and the irregularity of their supply (Oliveira and Medeiros 1985, pp. 76-77; Cavalcanti *et al.* 1980, Table 6, p. 184). The poor quality of one or more of the foods (principally beans) was also frequently referred to by a group of PNS beneficiaries in a municipality in Sao Paulo as a reason for leaving that program (Kalil *et al.* 1984a). In this case the complaint may never have reached the program administrators. Unpredictable supplies of one product or another are particularly hard on the rural population served by the PNS, since going to the health posts to collect their rations may entail an expenditure of money that is partly or completely lost when there is no food to distribute. Even when there are no shortages, the cost of going to the health post, in terms of money and time, is perhaps the main reason for abandoning the program (Kalil *et al.* 1984, Table 4). This points up the fact that the food provided is not really free to the client, who incurs costs in order to obtain it. The urban consumer, especially the PROAB client, has greater opportunities to substitute purchases of unsubsidized items for program foods, whether at the same establishment or in another. In doing this he loses only the amount of the subsidy and not the total value of the food.

The food distribution problems noted here in the operation of the PNS and PROAB seem to be attributable either to COBAL or to the way in which the programs are financed, which allows for long delays whose consequences are poor quality and/or shortages. INAN and the state secretariats of health seem to have little influence over PROAB operations. It is not clear to what extent they may be responsible for shortcomings in the PNS when they receive the food from COBAL, since there seem to be no studies that clearly identify where or when delays, losses or poor distribution occur.

It must be emphasized, however, that INAN does not operate any of its programs directly. For the PROAB it depends on COBAL, and for the functioning of the PNS on the state secretariats of health. Furthermore, the latter program aims not only to distribute food but to provide medical care for the participating children. It seems that there have been few attempts to evaluate the effectiveness of the health secretariats in these areas. In a small study carried out in Sao Paulo (Lerner et al. 1985b) it was discovered that the transmittal of basic information--regarding the interpretation of the weight of the child, the importance of vaccination, and the conditions for participating in the PNS--was very limited. The tests of whether the beneficiary mothers understood the instructions they received were also superficial, enabling the authors of the study to conclude that performance was relatively satisfactory, but this judgment is open to question. Perhaps the most interesting finding is that the information was passed on better in a municipality in which health posts already existed than in another in which the PNS had to install itself in improvised premises. Evaluations such as this, despite their shortcomings, have the merit of calling attention to the non-food objectives of the program. The problems revealed improve our understanding both of the low level of integration with health activities and the difficulty of ensuring that the program plays a real educational role. These limitations are just as significant for the health of the population as is ensuring an efficient and equitable distribution of food (Batista Filho and Barbosa 1985, pp. 75-77).

INAN's principal failing, pointed out by many observers (Batista Filho and Barbosa 1985, pp. 75-77; Coimbra 1985, IPEA 1981b, Knight 1982, Peliano et al. 1985, World Bank 1985b), is its political weakness. This is partly the result of its weak legal position--as an institute, it does not have the economic powers of a ministry or a public enterprise and it cannot compete in terms of salaries with more favored agencies. Moreover, INAN does not even control the agencies on which it depends at the state level to operate the PNS. In addition, there has since 1979 been no formally approved PRONAN, and even when it existed INAN never had the power of decision over programs that supposedly were components of the PRONAN, which were under the control of other ministries. It is, however, worth mentioning that this lack of central control can only be regarded as unfortunate if it is concluded that the programs not run by INAN (PCA, PROAPE, PNAE, PAT) are misguided in one major aspect or another. Centralization for its own sake is not a valid objective. More important may be the shortcomings of INAN and the secretariats of health in directing the program (PNS) which they do indeed control without any interference from other federal ministries. The frequently made recommendation, in the evaluations cited, that INAN's status should be upgraded only makes sense insofar as it would entail reforming one

or more of the other programs, and/or correcting or eliminating COBAL's deficiencies. INAN's political weakness may also help to explain the frequent criticisms of its inadequate management (World Bank 1985b).

The available evaluations of the PCA (LBA Foundation 1979 and 1985a, LBA Foundation and UNICEF 1982) do not dwell much on operational matters, except as regards finance. Since it does not depend on COBAL, the PCA has not suffered from by the problems affecting the company and the programs it serves. Its suppliers are private firms, supposedly efficient but possibly oligopolistic and therefore with unnecessarily high costs. The evaluations have taken up this question and have shown that the relative price of the products has fallen. Estimates have also been made of product quantities lost between the producer and the client; the figures for losses are very low (LBA Foundation and UNICEF 1982, p. 4.27). It is suspected, but not confirmed, that the losses of natural products for the PNS and PROAB are somewhat higher. No inquiries have been made into the opinions of clients regarding the quality and quantity of the food distributed, or of the service they receive from the program. On the basis of observation and hearsay, PCA managers believe that many families participate irregularly in the program because they do not like the food provided; they collect their portions when the alternative is going hungry, but when they have any money they avoid using the blended foods. This behavior would be consistent with that observed in the PNS.

The relative efficiency of the various programs can be judged--albeit rather crudely--from their cost structures. It is to be expected that food represents by far the bulk of these costs, although the proportion will vary in line with the three features that distinguish one program from another: the unit cost of the food, the quantity of food per client, and the share of the total cost of the product paid by the program. Furthermore, the programs differ among themselves in the way in which costs are assigned; INAN, for example, does not charge its own administrative costs to the PNS, and the annual reports of the PNS and the PROAB do not break down costs by category or purpose but only by area. It is therefore difficult to compare information between one kind of assistance and another, and appropriately detailed data are not available for the same year in all cases. On this point, the recommendations of the Ministry of Health regarding uniform monitoring of the programs (MS 1983, p. 8) have still not been implemented. Table 11 contains, with these limitations, some data relating to each program.

The high proportion of total costs spent on food is evident; it exceeds 100 percent if the total value of the subsidized products in the PINS is compared to the public funds spent. In this area there are no marked differences between the programs. This is not true of personnel costs, which are systematically higher in the PCA and were very low in the PINS. (The higher figure for Model D reflects the low subsidy and also the low family participation rate, both factors reducing the total value of the subsidy). Unless the administrative costs in the PCA produce other demonstrable benefits, an issue discussed in section 6.6, or represent items which in the INAN programs are contracted to third parties, this comparison would indicate lower efficiency in the PCA. Other, more aggregated calculations for this program (LBA Foundation and UNICEF 1982, p. 4.25), which exclude the cost of

TABLE 11

PNS, PCA, PINS AND PROAB: COST STRUCTURE IN PERCENTAGE TERMS  
(Data for one or more years between 1978 and 1980)

EXPENDITURE ITEM	1979 TOTAL	PNS		PCA, January-June 1980**				PINS, January 1978-December 1980				
		1978-79 Models E,F*		Rio de Janeiro	Belo Horizonte	Federal District	Total, 3 Regions	SUBSIDY MODEL				
		with health	without health					A	B	C	D	Total
Food: Total	86.86	25.16	73.72	84.26	90.11	80.95	86.12	(151.15)	(147.20)	(165.33)	(221.67)	161.84
Subsidy Value								90.69	66.24	83.40	66.50	80.40
Food Transportation and Storage	10.74			1.79	1.22	1.79	1.55					
Personnel		1.39	4.07	10.81	7.01	12.04	9.44	1.58	4.74	2.93	6.27	3.19
Transportation of Personnel				1.89	1.03	4.10	1.91					
Consumption Material		0.17	0.50	0.03	0.06	0.37	0.10	0.07	0.10	0.12	0.27	0.12
Third-Party Services and Other Costs	2.40***	7.40	21.68	1.21	0.57	0.76	0.87	7.67	13.77	13.56	27.03	12.75
Health Activities		65.87							15.07			3.53

Sources: Cavalcanti *et al.* 1984; IPEA 1981?b, Table XII; LBA Foundation and UNICEF 1982, p. 4.23, with corrections to the arithmetic.

\* Two PNS evaluation experiments were included, up to January 1980, in the PINS project (models E and F). The calculations refer to the sum of the models; the "without health" figures show the percentages of total expenditure excluding the 65.87 percent spent on health activities.

\*\* The costs of personnel in the central administration are distributed among the three regions in proportion to the cost of food, which should be proportional to the number of beneficiaries. The costs of transportation of central administrative personnel are distributed between Rio de Janeiro and Belo Horizonte only in proportion to transportation costs in these regions, on the assumption that this item mainly represents travel between one of these regions and the Federal District.

\*\*\* Transfers by INAN to pay the costs of the state secretariats of health; these may be regarded as administrative costs, principally for personnel.

personnel transportation and the transportation and storage of food, show administrative costs as 8.5 percent of total costs in Rio de Janeiro, 2.5 percent in Belo Horizonte, 13 percent in Brasília and 6.3 percent in Bahia. These huge differences between regions are not explained.

There is also another estimate of the structure of costs for the PCA, pertaining to 1984 and based on data for three service points in Rio de Janeiro (LBA Foundation 1985?a, p. 11). These figures do not appear to be fully comparable with those contained in Table 11; first, because they depend on certain assumptions, not confirmed by direct observation, regarding the make-up of the clientele, and second, because they show an equipment cost of 13.1 percent, which probably ought to be regarded as investment and not as a current operating cost. Apart from this item, the cost structure is not very different from that calculated in 1980, except that personnel costs are only 4 percent. Food accounts for 81.7 percent of costs and food storage and transportation another 1.2 percent. Costs attributable to LBA's central administration, even including a substantial contribution from UNICEF, only amount to 0.5 percent. It is possible that the apparent reduction in administrative and personnel costs reflects greater program efficiency in 1984 than in 1980, but in the absence of more precise data it is difficult to be certain of this conclusion.

None of the programs spends much on consumption material or makes any significant investments in buildings or durable goods; almost all the expenditure is on food, personnel, and certain administrative needs, such as supervision trips. The low administrative costs of the PINS are particularly striking, given its complicated structure (Cavalcanti *et al.* 1984, pp. 162-166).

Up to this point we have discussed the operating efficiency of a program in terms of its achieving its principal objective, namely to distribute food. It is possible, however, for a program to be efficient in this sense, but at the cost of interfering with other objectives that are also important either for the program itself, the agency executing it or for its clientele. The overall efficiency of the program cannot be assessed without taking possible collateral effects (positive or negative) of this kind into account.

Both the PNS and PCA seek to expand and improve medical care for the population receiving food, which are not objectives of the PROAB. According to the evaluation by Nunes da Silva (1986, pp. 506-507) exactly the opposite occurred in the PNS, at least in the first year of the program. The additional work involved in registering clients and distributing food, added to the task of measuring and weighing the children, meant that over a period of some months no attention could be given to 40 percent of the children visiting the health center for medical consultations not related to the PNS. Nunes da Silva concludes that a health center is not the proper place to distribute food, despite its alleged advantages for combining health and nutrition actions. It should be noted that the health center where this negative side effect was observed could never meet the needs of more than 4,200 beneficiaries, while the PINS, when it was established in the same neighborhood, was able to serve some 56,000 beneficiaries as a result of the participation of the affiliated retailers. The same difficulty of combining

food distribution and medical care is mentioned by Galindo in one of the evaluations by the FUNDAJ (Cavalcanti et al. 1980, pp. 170-173).

The PCA also aims to combine the provision of free food and medical attention, but since it does not as a rule function in health centers and does not employ many medical personnel, its procedure is to refer the client needing health care to a public facility (LBA Foundation, 1985a, pp. 17 and 42). Even so, it is recognized that the program's capacity to provide services beyond the distribution of food is limited and almost totally utilized (LBA Foundation 1984, p. 43).

In general terms, it seems difficult to combine a food donation program with enhanced medical services to clients; either additional personnel or other resources will be needed, thereby increasing administrative costs, or the result will be delays, congestion or an inability to meet existing medical attention needs. This conflict has not been properly studied in any of the programs.

Another potentially negative side effect of these programs is that the beneficiary families reduce their expenditure on food, thereby reducing the incomes of the food retailers. The net impact will be smaller, although there will still be a distributive effect, when the PROAB beneficiaries concentrate their purchases in the establishments affiliated to the program, reducing those from non-affiliated retailers. To some extent, these losses by the sellers are the inevitable consequence of the gains by the buyers, except in the highly improbable case that the consumer does not reduce his purchases but instead increases total food consumption by the same amount as the PNS ration or the income transfer represented by the PROAB subsidy. It is nonetheless worth noting that the losers are also poor people whom it is desired to help, and that at times it is precisely poverty and the lack of capital that prevents shopkeepers from affiliating with the PROAB, even when they are operating in the neighborhoods served and are entitled to do so (Oliveira and Medeiros 1985, pp. 80-83).

#### 5.4 Unit Costs

The only evaluations of programs in which unit costs are adequately broken down are of the PCA and PINS. Unfortunately, the former relates to the year 1980, the final year of the PINS, since which time there has been no adequate study of this matter for any of the programs, although there are some estimates for the PCA for 1984 (LBA Foundation 1985?a, p. 13). In the case of the PROAB, the acquisition costs of food are relatively well itemized (INAN 1984a and b), but there are no estimates of administrative costs (a major part of which are in practice included in the marketing margin paid to COBAL). The documentation for the PNS is less satisfactory: the annual reports generally contain only totals of food distributed and funds spent. It would seem that the administrative costs attributable to INAN itself are very small for any of its programs, but a serious evaluation would have to estimate the administrative load of the state secretariats of health, especially for the PNS.

Table 12 brings together the best available estimates for the PCA and PINS; the former are given in prices of the first half of 1980 and the

TABLE 12.

UNIT COSTS (Cruzeiros per Kg) FOR THE PCA AND PINS  
First Half 1980 or 1978-1980, in constant prices

	PCA, January-June 1980**				PINS, January 1978-December 1980 SUBSIDY MODEL				
	Rio de Janeiro	Belo Horizonte	Federal District	Total, 3 Regions	A	B	C	D	Total
Tons of food (total)	1,513.8	1,962.0	567.7	4,043.5	1,781.2*	939.4*	1,280.0*	830.3*	4,830.9
Cost (Cr\$/kg)									
Purchases of food									
Total Value	73.69	79.34	91.65	86.41	55.32**	57.92**	53.33*	49.46**	54.29
(percentage)	(83.0)	91.3)	(81.8)	(86.6)	(94.2)	(88.7)	(91.8)	86.9	(91.2)
Subsidized Value									
(percentage)					33.19	26.06	24.00	14.84	26.21
(percentage)					(90.7)	(78.0)	(83.4)	(66.5)	(83.3)
Food Transportation and Storage	1.73	0.92	1.92	1.36					
Personnel	10.44	5.46	12.82	9.49	0.58	1.87	0.84	1.40	1.04
Personnel Transportation	1.68	0.71	4.39	1.68					
Materials	1.20	0.47	1.20	0.85	0.03	0.07	0.03	0.05	0.04
Third Party Services***					2.81	5.42	3.90	6.03	4.16
Total Administrative	13.32	6.64	18.41	12.02	3.42	7.36	4.77	7.48	5.24
(Percent Actual Cost)	(15.0)	(7.6)	(16.4)	(12.0)	(9.3)	(22.0)	(16.6)	(33.5)	(16.7)
Total, Actual Cost	88.74	86.90	111.98	99.78	36.60	33.42	28.77	22.32	31.45
Total, Including Total Value of Food					58.74	65.28	58.10	56.94	59.53

Sources: Calvalcanti, *et al.* 1984, pp. 164 and 174; LBA Foundation and UNICEF 1982, pp. 4.23-4.24.

\* The food data were not broken down by model in the first nine months of 1978. They were estimated on the assumption that from January to March, sales in models A, B and C were the same fractions of the total for these three (model D did not yet exist) as in October-December of that year, and that the total for those three months was 9/33 of total sales in the nine months. For April-September, it was assumed that all models were purchasing in the same proportions as in October-December, and that sales in these six months were 24/33 of the total for the nine months.

\*\* Calculated by dividing the actual cost of the subsidy by the fraction subsidized.

\*\*\* Not specified.

latter in prices of the second half. It becomes very difficult to compare the cost estimates for the PCA between 1980 and 1984, not only because of the inflation occurring in the meantime, but because the figures for 1984 are based on only three delivery points and show a rather different cost structure. Since the PINS (like the PROAB) does not finance the entire cost of the food, the unit cost has been calculated including the part paid by the beneficiary. This allows for a fairer comparison with the PCA, and also among PINS models with different subsidy levels. The PINS also has the advantage of having operated in only one location, as against three for the PCA; the latter necessarily had to incur food transportation and storage costs as well as transportation costs for administrative personnel from headquarters, while the PINS did not. Health care costs are omitted from the calculations for Model B.

Three results emerge from these estimates. First, it is obvious that a partial subsidy program can operate with lower costs per kg of food. Second, the PINS costs much less than the PCA even when the full value of the food is assigned to it. Taking mid-year inflation into account for the prices used in Table 12, the conclusion is that the natural food costs only half as much as the blends. Third, the PINS administrative costs were also lower per unit of food--much lower if the "services of third parties" include items pertaining to program evaluation or other costs not relevant to this comparison.

For the PCA, the estimates for a single delivery point in Rio de Janeiro in 1984 show an average cost of Cr\$1,702 per kg of food, this being 81.7 percent of the total expenditure per kg (LBA Foundation, 1985?a p. 13). This suggests that the real cost of the food has declined since 1980; using the Rio de Janeiro consumer price index to compare prices for the two years gives a cost of around Cr\$62 per kg in 1980, still higher than the cost of the natural foods in the PINS but considerably less than the costs of the PCA for that year. However, the methodological weakness of this estimate--it is not a direct measurement--reduces its reliability, and for this reason it was not included in Table 12.

In principle, the unit costs could also be shown on a per client basis rather than for a given quantity of food, but this would make little analytical sense for comparisons among all the programs, for two reasons. First, in the case of the PROAB it is not known how many beneficiaries there really are, and even in the PINS the number of buyers turned out to be much smaller than the number of families registered. So what is the appropriate denominator? This question is complicated even further by the discrepancy between persons registered as clients and the total number of people consuming some of the food. Second, the amount of food provided by the PCA is in theory approximately half that supplied by the PNS (20% instead of 40% of estimated calorie needs).

The comparison would have to be "standardized", but this would falsify the relationship between the actual distribution of food and benefits obtained. Therefore no comparison in these terms will be made. For a single program, however, it does make sense to calculate the cost per client. Unfortunately this cannot be done with the two estimates made in different years for the PCA (LBA Foundation 1985?a, LBA Foundation and UNICEF 1982)

because of methodological errors in the calculations for 1984. When two programs register their clients individually, the first of the two problems mentioned, i.e. the number of beneficiaries, is in theory eliminated. According to unpublished estimates by the CNRH (IPEA 1981?a, p. 102), the cost of assisting a PNS client for one year was Cr\$595 in 1979 as against CR \$1,460 for a PCA beneficiary; in 1983 the estimates were Cr\$24,000 and Cr\$33,600 respectively. This comparison reveals the greater cost of the PCA, even though it provides a smaller quantity of food, but does not relate it to the benefits obtained. In particular, no inferences can be drawn regarding the health status of the beneficiaries in either program or about the share of expenditure attributable to health services. It would seem that the cost differential declined between 1979 and 1983, perhaps partly as a function of the prices of the foods used in the two programs.

As is evident from Table 12, a considerable part of the cost differences per kg between the PCA and PINS is due to the same kind of differences between foods--blends in one case and "natural" in the other. Table 13 shows this kind of comparison for the three blends distributed by the PCA as against four traditional foods distributed by the PNS. Since the calorie and protein density differs from one food to another, costs are also given per hundred calories and ten grams of protein.

It should be noted that these unit costs are not the "shadow prices" of the nutrients, which would reflect their scarcity or marginal value in the diet; they are calculated merely by dividing the cost per kg by the calorie or protein content. 2/

The comparison favors the PNS since it does not include powdered milk, which the program also distributes. Any of the three blends can provide a better balanced combination of amino-acids than any combination of the four traditional foods, without milk. Nonetheless, the cost per gram of protein is so much lower for these foods, especially for beans, that the resulting savings will enable powdered milk to be purchased without necessarily increasing the total cost of the protein intake over that of the blends, at least for adults and children over one year old, who can eat rice and beans. The blends provide cheaper protein only in comparison with milk, and therefore only for infants. This question will be taken up again in section 6.5 in the discussion of the apparent differences in program results according to age of the beneficiary child.

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2/ The shadow-price of a nutrient is zero if there is an excess of it in the diet or if consumption provides more than the minimum requirement. The notion reflects the value of an additional unit of the nutrient and has no relation to its average value in consumption. In a diet lacking in calories, the latter could have a high marginal value and therefore a high shadow-price, although the relative abundance of protein will deprive this kind of nutrient of any marginal value. The calculations presented do not take this interaction into account. In addition, they attribute the total cost either to the calories or to the proteins; they do not allocate the unit cost per kg among these (or other) nutrients.

TABLE 13  
UNIT COSTS AND PROTEIN-CALORIE COMPOSITION OF FOODS DISTRIBUTED  
BY THE PNS AND PCA

March 1980 and November 1983

Program and Food	Content per kg		Unit Costs, in Current Cr\$					
	Calories	Protein (g)	March 1980			November 1983		
			Kg	100 Cal.	10 g. Prot.	Kg	100 Cal.	10 g. Prot.
<b>PNS (Natural)</b>								
Rice	3,640	72	17.00	0.47	2.36	430.00	11.81	59.72
Sugar	3,850	0	13.50	0.35	-	320.00	8.31	-
Beans	3,370	220	27.00	0.80	1.23	650.00	19.29	29.54
Maize Meal	3,540	96	10.00	0.28	1.04	450.00	12.71	46.88
<b>PCA (Formulae)</b>								
Soup	3,800	142	96.70	2.60	6.81	873.00	22.97	61.48
"Milk-Shake"	4,240	81.5	102.50	2.40	12.58	1,283.00	30.26	175.42
Milk substitute	4,450	126	98.00	2.20	7.78	1,285.00	28.88	101.98

Source: Peliano 1984, Table XVII

It is also clear that the cost per calorie is systematically lower for the natural foods. In 1980 the ratio was 3:1 for beans, and up to 8:1 for maize meal. At the end of 1983 these differences had fallen to only 2:1 in relation to rice and less than 4:1 for sugar. The relative decline in the price of the blends seems to be partly due to the very rapid inflation in the prices of traditional foods in the Northeast as compared to slower changes in the Center-South, and partly to changes in the PCA's purchasing policies to ensure lower costs (Castro 1985, p. 182; LBA Foundation 1985b). Relative calorie and protein costs do not systematically diverge in one direction or another, except as regards sugar, which contains no protein.

Comparisons of the kind illustrated in Table 13 suffer from the serious limitation that no family eats only these products. Nor is it very likely that they form the entire diet of any individual family member, although this is possible for an infant. The ration is insufficient to satisfy consumption needs, and even if the quantities were adequate the diet would be monotonous and unappetizing. What the family buys, then, to supplement the food received from the PNS or PCA is all-important; these purchases will certainly not include more blends, but normally will include some kind of animal protein, e.g. fresh meat when possible, or dried meat or eggs; generally this will be the most expensive item. On the typical diet of poor families that are beneficiaries of the PROAB, see Oliveira and Medeiros 1985, pp. 24-28 and 138-151. It includes small quantities, sometimes at high cost, of foods of animal origin, as well as fruit and other higher-priced products. The simple comparison between the blends and the combination of rice, sugar, beans and maize meal would only be appropriate if it could be ascertained that the two groups of beneficiaries spent identical amounts on their other purchases, which in both cases resulted in an adequate diet. In that situation, the greater cost of the blends would be a sufficient reason for not using them. (This conclusion would remain valid if the additional purchases were more expensive for the PCA families and the quality of the diet remained the same in both cases.)

As Castro stresses (1985, pp. 182-191), the cost comparison ought to take account of the role of the blends in the diet of those receiving them. If they replace milk, then they are cheaper, but if they take the place of sugar or maize meal without affecting the consumption of animal products, then they are definitely more expensive. There appears to be no information on this point, partly because the ENDEF survey took place before the programs were introduced and partly because neither INAN nor the LBA has been concerned about that part of food consumption which is purchased rather than received free. Even very poor families often buy small quantities of meat, and larger amounts of milk and eggs, to improve their diet; these products are so much more expensive than basic grains that their total food expenditure is very much influenced by these purchases. The comparison becomes even more complicated if the cost in terms of time and fuel of preparing the food is taken into account, since this cost is typically higher for the natural foods. Bread, however, is an exception, and apart from its relatively low cost and superior image, this may be a crucial reason for the high levels of bread consumption in poor urban families (Campino *et al.* 1984).

Table 14 contains cost comparisons for a wider range of products, including some "natural" foods not distributed by the PNS, though they are subsidized by the PROAB (eggs, bread and pasta). Unit costs are also

TABLE 14

 UNIT COSTS AND PROTEIN/CALORIE COMPOSITION OF VARIOUS NATURAL FOODS  
 AND BLENDS, ALONE AND IN COMBINATION, SEPTEMBER-NOVEMBER 1983

	Content per kg (grams)			Unit Costs (Current Cr\$)				
	Calories	Proteins	NDp Cal.	Kg.	Unadjusted		Adjusted	
					100 Cal.	10g.Prot.	100 Cal.	10g. Prot.
Skimmed milk	655	331	14.1	227	34.7	6.7	34.7	12.1
Powdered milk	3,495	360	28.8	1,475	42.2	41.0	42.2	147.7
Eggs	1,509	123	40.9	690	45.7	56.1	45.7	286.4
Bread	2,690	93	6.9	360	13.4	38.7	15.5	38.7
Pasta	3,440	149	8.7	295	8.6	19.8	8.6	21.4
Maize meal	3,446	78	4.5	190	5.5	24.4	9.8	24.4
Rice	2,939	71	4.6	222	7.6	31.3	13.2	31.3
Rice, beans and eggs	3,500	80	9.6	290	8.3	36.3	8.3	43.6
Pasta, eggs and soy (meat substitute)	2,735	72	10.5	205	7.5	28.5	7.5	37.5
Milk, maize meal, sugar	369	15	10.8	616	166.9	403.9	166.9	543.3
Salt blend	4,100	130	8	973	23.7	74.8	23.7	74.8
Sweet blend (milk substitute)	4,200	130	8	2,440	58.1	187.7	58.1	187.7

Source: Castro 1985, pp. 188-189.

Note: NDpCal is a measure of the relative abundances of protein and calories in a food, used to adjust the cost per unit of protein or of calories in a way that roughly reflects which element is scarce. A value of 8 for NDpCal is taken as the dividing line between having more protein than is needed (so that calories are relatively expensive) and having too little protein (so that protein is relatively expensive). When NDpCal = 8, the adjusted cost of protein is (NDp Cal/8) times the unadjusted cost. When NDpCal = 8, the adjusted cost of calories is (8/NDpCal) times the unadjusted cost. When NDpCal = 8, there is no adjustment.

calculated for three combinations--a mixture of milk, maize meal and sugar frequently given to infants, a combination of rice and small amounts of beans and eggs, and a mixture of pasta and eggs to which a small amount of artificial meat made from soya was added. The comparisons generally confirm that the natural products are cheaper, but the differences with respect to the blends are not always very large and are therefore sensitive to the consumption of more expensive products such as meat and fruit. The table also shows adjusted calculations taking the composition of the protein into account. Foods with more than eight percent of the amino-acids that cannot be substituted by plant sources are costly sources of protein, since much of their content could be replaced by cheaper grains. Conversely, foods with less than this eight percent, such as maize meal, would be expensive sources of calories if they were not supplemented with products of animal origin. Perhaps the most interesting result is the low cost of a good combination of natural products, which could be reduced even further with the use of soy-based formulated foods. It is also clear that it is very expensive to use milk as a vehicle for the cheaper calories in maize meal and sugar; the blends are clearly superior to this combination.

#### 5.5 Prices and Margins

For a subsidy program there is a further criterion of operating efficiency, which applies only partially to a donation program. This is the price of the subsidized product as compared to the price the beneficiary would otherwise have to pay, and the impact of the entire range of subsidies on the prices actually paid by the client (Campino 1985a). This has been a constant concern of INAN in relation to the administration of the PROAB, and it is therefore amply documented (INAN 1984a and b, and unpublished tables). Since the PNS obtains its foods in the same way as the PROAB--purchased from COBAL--the first part of the criterion is also relevant for the PNS.

INAN has adopted as a reference point the price of an item of food in a supermarket in the same city. It is acknowledged that the typical poor consumer may pay more for his food (INAN 1984a, p. 4) by purchasing from the local shopkeeper, who provides credit or will sell in very small quantities, but it is also assumed that he nonetheless has the opportunity of buying in the supermarket, where the lowest prices are generally assumed to be found. Furthermore, supermarket prices are collected regularly for purposes of constructing the retail price index. If COBAL is to be efficient, it must be able to sell as a wholesaler at prices lower than those in the supermarket. Two other factors intervene between COBAL's selling price and price paid in due course by the PROAB client: the subsidy, and the marketing margin fixed for the shopkeeper, both controlled by INAN and the state secretariats of health, not by COBAL.

Table 15 shows, for the city of Recife (the same data exist for the other cities served), and at approximately half-yearly intervals from 1980 to 1986, the subsidy and the shopkeeper's margin, plus the differences between the supermarket price on the one hand and COBAL's selling price, the final price to the client, and the unsubsidized price on the other. A considerably more detailed analysis of this kind forms part of the evaluation of the PROAB coordinated by Oliveira and Medeiros (1985, pp. 83-101), for the period March-August 1984. Table 15 covers a longer period but in less detail, and

TABLE 15

RECIFE (JIQUIA), PERNAMBUCO: RETAILERS' MARGIN AND SUBSIDY LEVEL AND COMPARISON OF PROAB PRICES  
(COBAL SELLING PRICE, AND CONSUMER PRICE WITH AND WITHOUT SUBSIDY)

June 1980 - July 1986 (percentages), Six Products

		Difference in Relation to				Difference in Relation to					
		Supermarket Price of		Margin		Supermarket price of		Margin			
		COBAL	Consumer price	Retailer	Subsidy	COBAL	Consumer price	Retailer	Subsidy		
		selling	without	with		selling	without	with			
		price	subsidy	subsidy		price	subsidy	subsidy			
RICE											
1980	JUN	-38.3	-28.2	-42.4	12.8	20	12.0	-5.1	-14.4	7.2	10
	NOV	-9.6	+4.8	-16.3	12.8	20	-5.8	-1.7	-8.5	7.2	10
1981	JUN	-21.3	-9.6	-27.7	12.0	20	-0.9	-7.0	-3.4	7.2	10
	NOV	-21.8	-10.1	-27.7	12.0	20	-0.9	-7.0	-3.4	7.2	10
1982	JUN	-18.6	-6.4	-20.6	12.8	15	-6.6	+0.9	-9.2	9.0	10
	NOV	-14.0	-1.1	-16.3	12.8	15	-5.9	+3.5	-11.9	8.5	15
1983	JUN	-6.7	+7.5	-25.0	10.5	30	-4.4	+5.0	-15.7	8.0	20
	NOV	-3.3	+11.2	-16.7	11.3	25	7.6	+1.6	-23.9	7.5	25
1984	JUN	-3.3	+11.2	-16.5	11.3	25	-4.2	+5.4	-20.9	7.5	25
1985	JAN	13.4	-2.1	-21.7	13.0	20	-0.9	+9.0	-12.9	10.0	20
	JUN	-3.5	+7.1	-14.3	11.0	20	**	**	**	10.0	20
1986	JAN	-12.2	-2.4	-21.9	11.0	20	-2.9	+7.1	-14.3	10.0	20
	JUL	-18.4	-9.1	-27.3	11.0	20	-6.7	+2.6	-17.9	10.0	20
BEANS											
1980	JUN	-16.0	-1.8	-21.5	13.6	20	-6.3	+10.6	-11.5	14.4	20
	NOV	-7.3	+6.6	-18.0	11.6	23	-14.5	+1.0	-14.2	15.3	15
1981	JUN	-0.9	+13.0	-12.8	11.6	23	-13.6	-0.7	-20.8	12.0	20
	NOV	-11.2	-0.1	-22.1	10.8	23	-10.4	+3.1	-18.1	12.0	20
1982	JUN	-7.2	+5.5	-15.6	11.2	20	-14.5	-1.5	-22.1	12.0	20
	NOV	-13.5	-3.1	-15.7	10.4	13	-5.7	+8.4	-12.7	12.0	20
1983	JUN	19.6	-8.4	-26.5	12.6	10	-23.9	-12.9	-34.9	11.3	25
	NOV	-12.0	-1.4	-31.1	8.4	30	-3.7	+10.7	-22.6	10.5	30
1984	JUN	-1.6	+10.2	-22.8	8.4	30	-6.1	+8.0	-24.4	10.5	30
1985	JAN	*	*	*	*	*	*	*	*	*	*
	JUN	4.4	+7.1	-14.3	12.0	20	-6.1	+3.3	-17.4	10.0	20
1986	JAN	-1.6	+10.3	-11.8	12.0	20	-1.6	+8.1	-13.5	10.0	20
	JUL	-46.5	-40.0	-52.0	12.0	20	-18.6	-10.8	-28.6	10.0	20
POWDERED MILK											
1980	JUN	-25.5	-16.8	-28.5	11.1	15	-11.8	-1.3	-11.0	10.0	17
	NOV	-7.4	+4.7	-13.2	10.8	17	-1.6	+10.2	-5.2	9.6	20
1981	JUN	-3.4	+8.3	-13.9	9.6	20	-4.7	+6.7	-14.4	9.6	20
	NOV	-1.3	+10.6	-11.8	9.6	20	-4.3	+7.1	-19.5	9.0	25
1982	JUN	-9.9	+0.9	-14.6	10.2	15	-17.3	-7.4	-26.2	9.6	20
	NOV	-6.3	+5.0	-10.7	10.2	15	-7.4	+3.7	-16.9	9.6	20
1983	JUN	-2.2	+9.7	-23.4	8.4	30	-1.6	+10.3	-23.0	8.4	30
	NOV	+1.3	+13.5	-15.8	9.0	25	-0.6	+9.4	-23.5	7.0	30
1984	JUN	-4.7	+6.7	-19.9	9.0	25	-1.0	+8.9	-23.8	7.0	30
1985	JAN	*	*	*	*	*	*	*	*	*	*
	JUN	-10.8	-0.1	-20.1	12.0	20	-1.3	+8.6	-13.1	10.0	20
1986	JAN	-6.1	+5.1	-15.9	12.0	20	-12.2	-3.4	-22.7	10.0	20
	JUL	-**	**	**	12.0	20	-10.7	-1.9	-21.5	10.0	20
SOYA OIL											
1980	JUN	-25.5	-16.8	-28.5	11.1	15	-11.8	-1.3	-11.0	10.0	17
	NOV	-7.4	+4.7	-13.2	10.8	17	-1.6	+10.2	-5.2	9.6	20
1981	JUN	-3.4	+8.3	-13.9	9.6	20	-4.7	+6.7	-14.4	9.6	20
	NOV	-1.3	+10.6	-11.8	9.6	20	-4.3	+7.1	-19.5	9.0	25
1982	JUN	-9.9	+0.9	-14.6	10.2	15	-17.3	-7.4	-26.2	9.6	20
	NOV	-6.3	+5.0	-10.7	10.2	15	-7.4	+3.7	-16.9	9.6	20
1983	JUN	-2.2	+9.7	-23.4	8.4	30	-1.6	+10.3	-23.0	8.4	30
	NOV	+1.3	+13.5	-15.8	9.0	25	-0.6	+9.4	-23.5	7.0	30
1984	JUN	-4.7	+6.7	-19.9	9.0	25	-1.0	+8.9	-23.8	7.0	30
1985	JAN	*	*	*	*	*	*	*	*	*	*
	JUN	-10.8	-0.1	-20.1	12.0	20	-1.3	+8.6	-13.1	10.0	20
1986	JAN	-6.1	+5.1	-15.9	12.0	20	-12.2	-3.4	-22.7	10.0	20
	JUL	-**	**	**	12.0	20	-10.7	-1.9	-21.5	10.0	20

Source: INAN, 1984a, Annex IIIb; INAN, 1986, pp. 82, 86-87, 89-90, 92, 94.

\* Product not sold by the PROAB

\*\* Product unavailable in the supermarkets; there is no information on prices.

the calculations are limited to six main products; the results would not be systematically different if more of the the eleven foods were included. Three general trends emerge from these figures.

First, COBAL's selling price, at which the program acquires the food, rose in relation to market prices up to 1984 and then fell somewhat. This is more apparent for rice, sugar and oil than for beans, milk and manioc flour, where the trends are less consistent. This seems to indicate a relative loss of efficiency by the company, probably due in part to the payment delays and constraints noted in section 5.3. The deterioration is disturbing (INAN 1984b, Wilberg 1984) since it raises the final prices in the program. There was a certain recovery in this respect in 1985-86.

Second, in most cases the unsubsidized price--including the shopkeeper's margin--would be higher than the supermarket price. For rice and sugar, the two main products in the program, this relationship was in fact deteriorating, up to 1984 in the case of rice, and up to 1986 for sugar. This means that, with some exceptions, the subsidized price is not lower than the supermarket price by the amount of the subsidy. Put another way, not all the subsidy is being passed on to the client, at least in relation to the supermarket. Even if it cannot be said that the program must always be capable of passing on the full subsidy, there is cause for concern over any reduction in the portion of the subsidy actually passed on, or any transfer significantly less than 100 percent.

The degree to which the subsidy is actually transferred to the consumer depends on the price used as a benchmark or purchasing alternative. Oliveira and Medeiros (1985, pp. 86 and 90) made this kind of analysis for Recife, using both the minimum and the average price found in the supermarkets. A summary of the results is shown in Table 16. It is apparent that even in comparison with the average price, there were times over the 23 weeks studied when the transfer was negative; in other words, the PROAB price with the subsidy was higher than the reference price. This reflects not just internal inefficiencies inside COBAL but the problem of delayed financial transfers, which raised the purchase price of food to the company. Although these examples are few, it was quite common for only half or less of the subsidy to be passed on to the consumer in the form of prices lower than any others he could find. When the comparison is with the minimum price observed during the week, the situation is necessarily worse; it is rare for three quarters of the subsidy to be passed on, and the frequency of negative transfers or loss of any actual subsidy increases.

The incomplete transfer of the subsidy to the client cannot have been entirely due to inflation and its consequences for the financing of the PROAB, since it continued in the first half of 1986, during which time the rate of price increases slowed considerably, while COBAL had already introduced financial and organizational reforms designed to make it more responsive and efficient. During this half-year, the subsidy was consistently 20 percent on almost all the products in the eight states served. The effective transfer, however (measured in relation to the average supermarket price), varied a great deal and at times was negative. Increasingly often the

TABLE 16

DISTRIBUTION OF THE ACTUAL TRANSFER OF THE PROAB SUBSIDY TO THE CONSUMER,  
IN RELATION TO MINIMARKET PRICES, RECIFE  
MARCH-AUGUST 1984: NUMBER OF WEEKS PER TRANSFER INTERVAL

Percentage of Subsidy Transferred	Rice	Sugar	Dried Meat	Beans	Maize Meal	Manioc Flour	Powdered Milk	Pasta	Soya Oil	Eggs
<b>I. In Relation to the Minimum Price During the Week</b>										
100 and more	0	0	1	3	2	0	2	0	0	2
75 to 99.9	3	2	0	1	5	1	6	1	1	7
50 to 74.9	5	6	9	3	0	10	5	6	5	7
25 to 49.9	3	13	6	3	8	12	1	3	9	4
0 to 24.9	9	1	2	3	4	0	4	6	6	1
Negative	3	1	5	10	4	0	5	7	0	2
<b>II. In Relation to the Average Price During the Week</b>										
100 and more	4	6	1	12	7	0	9	1	0	3
75 to 99.9	6	2	3	5	2	6	6	5	4	7
50 to 74.9	7	12	8	1	3	9	4	10	5	6
25 to 49.9	1	2	7	3	7	8	3	5	11	4
0 to 24.9	4	0	3	0	3	0	1	0	1	3
Negative	1	1	1	2	1	0	0	2	0	0

Note: Prices were obtained over 23 weeks for all the products except soya oil (21 weeks).

A "minimarket" is a small supermarket with a limited range of foods; those requiring refrigeration are not sold. Prices in such an establishment will normally be no higher than those in a full supermarket.

Source: Oliveira and Medeiros 1985, Tables 7 and 10, pp. 86 and 90.

COBAL selling price was higher than the supermarket price, part of the subsidy being absorbed just to equal the market price. The problem of irregular supplies (INAN 1984b, pp. 86-95 and 98-194) also persisted, even before the excessive demand created by the introduction of the Cruzado Plan in March.

Third, even the somewhat discouraging results shown in Table 15 were only achieved as a result of increasing the subsidy and/or reducing the shopkeeper's margin, up to 1984. The former increases the cost of the program and the latter reduces the benefit to the shopkeeper, who is also a client that the program wants to help. This does not mean that any of these adjustments were mistaken, because the subsidies were at times so small that one may wonder anyway about their impact, and because it is possible that at the start of the program the margins paid were unnecessarily large. What is a matter for concern is that in some cases (rice and beans) the changes did not result in lower prices in relation to the market. For sugar, manioc flour and oil the price differentials widened. The high subsidies in effect in 1984 were subsequently reduced and stabilized at 20 percent, with little change over time or among products.

Decisions on subsidies and margins and their consequences for the consumer were complicated by the rapid inflation up to 1986. This is particularly true because the impact of a sudden price increase can be temporarily counteracted by increasing the subsidy, and then reducing it later when the relative price falls again. Apart from this mechanism--risky to use, since it means guessing what is going to happen to relative prices--a subsidy does not protect the consumer against inflation. The beneficiary experiences the same rate of change in prices as any consumer, being merely partially protected as regards their level. In practice, the subsidy enables the beneficiary to buy at the prices prevailing some months earlier, the interval being longer when inflation is slower. In such circumstances, the consumer typically does not distinguish between inflation and any other factor eroding his real income; it is striking how often families participating in the PINS identified inflation as the main problem (Cavalcanti *et al.* 1984, pp. 175-187 and *passim*). The same is true of the PROAB clients; interviewed about program problems or shortcomings, 20 percent referred to "the constant rise in prices," the only complaint heard more frequently being about the poor quality of the products (Oliveira and Medeiros 1985, p. 76). Finally, it is obvious that inflation compounds the consequences of any delays in the release of funds, reducing the quantities of food that can be obtained. This factor had a particular impact on PROAB performance in 1984, leading to frequent shortages of one or more products, either for months at a time or more irregularly (INAN 1984a, pp. 171-175).

Table 17 shows price changes for the 11 products over the same periods used in Table 15, also in Recife. For rice, the PROAB price rose much more than the supermarket price from 1981 onwards, but this deterioration is largely the result of using June 1980 as the starting point; from the end of 1981 onwards the rate of increase is almost identical. There was a relative deflation for maize meal, manioc flour, olive oil and fish as a result of the increase in subsidies noted above. In all, inflation for the 11 products was almost identical in the PROAB and the supermarkets. There was also a good deal of differential inflation or price dispersion, which affected the program

TABLE 17

CHANGES IN NOMINAL SUPERMARKET AND PROAB (SUBSIDIZED) PRICES  
FOR STAPLE FOODS IN RECIPES, AND INDIVIDUAL AND COMBINED FOOD PRICE INDICES, 1980-1986  
(June 1980 = 100)

MONTH AND YEAR	RICE		SUGAR		DRIED MEAT		BEANS		MAIZE MEAL	
	SUPERMARKET	PROAB	SUPERMARKET	PROAB	SUPERMARKET	PROAB	SUPERMARKET	PROAB	SUPERMARKET	PROAB
1980 NOV	122	176	118	126	149	169	294	308	149	167
1981 JUN	159	200	186	210	138	162	326	362	290	305
NOV	173	216	255	246	194	228	375	372	290	305
1982 JUN	329	453	333	353	289	314	348	374	456	425
NOV	332	482	559	575	339	354	190	204	553	552
1983 JUN	814	1,059	815	802	600	677	747	699	1,058	1,057
NOV	1,220	1,765	1,615	1,436	1,564	1,513	1,223	1,073	5,592	5,294
1984 JUN	2,376	3,443	2,462	2,272	2,571	2,640	6,005	5,902	6,796	5,870
NOV	2,847	4,353	4,410	4,407	4,036	4,550	4,212	4,619	4,515	4,770
1985 JUN	8,305	12,353	*	*	5,214	5,444	9,103	9,934	12,864	12,759
NOV	13,390	19,353	12,974	13,114	15,714	17,261	13,043	12,457	23,107	24,126
1986 JUN	23,390	29,412	20,000	17,365	21,250	22,432	20,652	13,772	51,650	52,759
NOV	23,390	29,412	20,000	19,162	*	*	24,456	24,533	51,456	52,759
MONTH AND YEAR	MANIOC FLOUR		PASTA		POWDERED MILK		EGGS		SOYA OIL	
	SUPERMARKET	PROAB	SUPERMARKET	PROAB	SUPERMARKET	PROAB	SUPERMARKET	PROAB	SUPERMARKET	PROAB
1980 NOV	96	93	166	145	103	125	97	133	134	143
1981 JUN	223	200	268	302	170	205	175	185	192	185
NOV	175	162	313	345	215	265	207	222	263	238
1982 JUN	253	223	666	500	347	414	371	385	489	406
NOV	234	231	694	759	451	563	355	412	446	417
1983 JUN	405	298	1,190	1,207	717	769	629	667	927	803
NOV	1,004	879	2,408	2,510	1,153	1,358	1,286	1,344	2,732	2,346
1984 JUN	3,123	2,667	4,674	4,828	2,213	2,482	2,429	2,771	5,313	4,549
NOV	3,086	3,109	6,941	7,069	*	*	3,829	4,444	*	*
1985 JUN	4,275	3,992	18,343	19,310	17,333	18,060	5,571	6,296	12,406	12,113
NOV	4,981	4,307	33,428	34,138	27,200	30,403	9,314	8,889	16,917	15,789
1986 JUN	8,550	7,437	77,904	69,483	10,400	113,880	20,000	22,963	21,629	21,126
NOV	10,409	9,328	77,904	77,759	*	*	20,286	22,593	23,960	21,126
MONTH AND YEAR	SALT FISH		INDEX FOR 11 PRODUCTS**							
	SUPERMARKET	PROAB	SUPERMARKET	PROAB						
1980 NOV	144	101	163	182						
1981 JUN	*	*	209	231						
NOV	228	212	250	261						
1982 JUN	*	*	346	366						
NOV	459	371	349	382						
1983 JUN	924	764	726	754						
NOV	1,793	1,508	1,538	1,502						
1984 JUN	3,696	2,967	3,661	3,678						
NOV	4,620	4,512	4,022	4,541						
1985 JUN	*	*	7,990	8,966						
NOV	*	*	13,662	14,637						
1986 JUN	*	*	21,538	20,402						
NOV	*	*	22,547	23,141						

Source: INAN 1984a and 1986.

\* The product was not sold by PROAB.

\*\* Weighted by the amounts sold by PROAB in 1980 at June 1980 prices for the products sold in that month.

and the market almost equally. Insofar as the poor consumers ate mostly these products and managed to keep their nominal income rising at the same rate as the general price index, their food purchasing power would not have deteriorated; their difficulty probably lay more in lags in their incomes in relation to general inflation. In that situation, the subsidy merely delayed slightly the impoverishment of program clients (Cavalcanti et al. 1980, p. 109).

Returning to the assumption mentioned at the beginning of this section--that prices are probably lower in the supermarkets, but that poor consumers go on buying from local shopkeepers for various reasons of convenience--another question arises regarding the PROAB subsidies: how large are they compared to the price differences among the various kinds of establishments selling food? Price differences can also be analyzed in relation to many other factors: the size of the population center, its geographical location, the kind of client served, the extension (or not) of credit to the client, and the amount bought. Since consumer price indices are calculated only in the state capitals, a survey was conducted in 19 population centers in the Northeast in June 1985 to obtain some information about the influence of these variables (Galindo 1985). The effects of inflation were eliminated by limiting the survey to a period of 15 days. The relatively small number of observations does not permit simultaneous classification for more than two variables, and even when two are studied one of them typically has to be limited to the most numerous class.

A selection of the results obtained (Galindo and Musgrove 1986) appears in Table 18. For each of up to 12 staple items the comparison shows the ratio between two price averages; each average was calculated on the basis of not less than ten observations (ten different vendors of the product). The table also indicates whether the difference between the two averages is statistically significant, given the number of observations in the two cases, at a 95% confidence level. Comparisons relating to unit prices for quantities smaller than the standard unit (for example, 100 grams of rice instead of a one-kg packet) are limited to rice, sugar, beans and manioc flour, the only products studied on this basis in the sample.

In general terms perhaps the most striking finding is the great similarity of prices. Only 34 of the 142 comparisons show a difference of ten percent or more, and of these only 26 are statistically reliable. These differences are concentrated in rice, beans, maize meal and manioc flour; they do not occur at all for sugar, pasta, soya oil, eggs or sardines. Thus it would seem that the PROAB subsidies are relatively substantial compared with price variations in the region. This is less true for manioc flour, powdered milk, and bread, where at times the differences are 20 percent or greater.

The question nonetheless arises as to whether the subsidies tend to widen or counteract the "natural" differences in prices. The first three rows of Table 18 suggest that they work to narrow differences according to city size: the PROAB functions only in the three large cities surveyed--Recife, Fortaleza and Teresina--and prices are generally higher there than in the medium-sized or smaller cities, just as they are higher in medium-sized than small towns. This trend is statistically significant for rice, beans, maize meal and bread. It should be noted that the comparison is limited to

TABLE 18

COMPARISONS OF AVERAGE PRICES ACCORDING TO GEOGRAPHICAL LOCATION, TYPE OF ESTABLISHMENT  
AND OTHER FACTORS, FOR 12 STAPLE FOODS IN THE NORTHEAST, JUNE 1985

COMPARISON OF AVERAGE PRICES: NUMERATOR/ DENOMINATOR	Rice	Sugar	Dried Meat	Beans	Maize Meal	Manioc Flour	Powdered Milk	Pasta	Soya Oil (125 g)	Eggs	Tinned Sardines	Bread 100 g
1. Retailers (not affiliated with the PROAB) by city:												
Large/Medium	1.05	1.01	0.97	1.07	1.02	1.35*	0.99	1.01	1.03	1.00	0.97	1.29*
Large/Small	1.12*	1.01	1.13	1.50*	1.16	1.60	0.99	1.00	1.02	0.97	1.00	1.35*
Medium/Small	1.07*	1.00	1.17*	1.40*	1.14*	1.18*	1.00	0.98	0.99	0.97	1.03	1.05
2. By Establishment Size:												
Small/Medium	0.97	1.03	1.01	0.99	1.00	1.15*	0.69*	1.05*	1.02	1.04	1.00	-
Small/Large	0.86*	1.01	0.99	0.89	1.05	0.92	0.96	-	1.03	1.01	0.91	-
Medium/Large	0.88*	0.98	0.98	0.90	1.05	0.80*	1.38*	-	1.01	0.97	0.91	-
3. Large Cities (3):												
Small shop/Supermarket	1.01	1.03	-	0.96	1.12*	1.07	0.97	1.06	1.02	0.98	-	-
Small shop/Minimarket	1.00	0.93	-	1.04	0.87*	1.06	1.00	0.93	0.96	0.98	0.97	-
4. Medium-sized Cities (6)												
Small shop/Supermarket	0.96	1.07	1.01	1.27*	1.10	0.84	-	1.09	1.06	1.00	-	-
Small shop/Minimarket	0.96	1.04	1.09	0.89	1.12*	0.94	1.01	1.09*	1.02	1.05	-	-
5. Small shops, by Type of Sale:												
Cash/Credit	1.12*	0.97	1.03	1.30*	1.00	1.19*	1.00	0.97	0.99	0.98	-	-
6. Quantity Sold, Small shop (not affiliated with PROAB)												
a) Large Cities (3)												
Kg/100 g	0.97	1.07	-	0.85*	-	1.06	-	-	-	-	-	-
Kg/250 g	1.14*	1.01	-	1.21*	-	1.07	-	-	-	-	-	-
Kg/500 g	1.05	0.97	-	-	-	1.01	-	-	-	-	-	-
(b) Medium Cities (6)												
Kg/100 g	0.97	0.97	-	0.94	-	0.85	-	-	-	-	-	-
Kg/250 g	1.01	0.95	-	-	-	-	-	-	-	-	-	-
Kg/500	1.02	1.00	-	1.09	-	0.95	-	-	-	-	-	-
(c) Small Cities (10)												
Kg/100 g	-	-	-	-	-	-	-	-	-	-	-	-
Kg/250 g	1.00	0.95	-	-	-	-	-	-	-	-	-	-
Kg/500 g	1.02	0.99	-	1.21	-	0.94	-	-	-	-	-	-

## Notes:

(\*) Statistically significant difference, at 95 percent confidence.

(-) Not included because observations are either missing or number less than 10.

Source: Galindo and Musgrove 1986 (Table 7).

shopkeepers not participating in the PROAB; hence it is not influenced either by the inclusion of participating establishments or by the presence of other kinds of establishments, such as supermarkets.

A direct comparison of the prices charged by shopkeepers not participating in the PROAB with supermarket prices shows that in the large cities the only significant differences involve maize meal; in the six medium-sized cities, the greatest differences are for beans. It does not appear that the small shop is a systematically more expensive source of staple foods than other outlets. Nor is there any clear evidence that the consumer pays more for using credit (his purchases are recorded in a book and he pays later when he has cash), or for buying in small quantities. It was not possible to calculate the implicit interest rate associated with buying on credit, but it can at least be said that the shopkeepers who accept this form of payment are not systematically raising their prices to cover the associated risks. As regards purchases in small quantities, the unit price is relatively constant, which means that a small amount does not cost more per kg than the standard amount, except for soya oil (Musgrove and Galindo, 1988, Table 7). This evidence does not mean that the possibility of buying on credit and/or in small amounts is unimportant for the shopkeepers' customers, but rather that these practices are not raising across the board the prices they pay for staple foods.

The fact that food prices are now relatively homogeneous, even in the interior of the Northeast, appears to reflect two basic changes in food marketing over the last decade. First, public investments in roads, storage facilities and marketing centers have rationalized the market and led to greater competition between producers at different levels and in different regions of Brazil. The price differences previously attributable to transportation and storage difficulties have declined markedly. This process, which a more detailed examination of prices in small communities in the interior (Galindo 1985) has shown to be still incomplete, has not always had the distributive effects anticipated (Pessoa 1986), but in overall terms it has been a success. Second, the spread of supermarkets has forced the traditional shopkeepers to face greater competition, reducing their prices and taking away their customers. Where this process has gone furthest poor urban consumers are now buying most of their food in supermarkets and are relying on the small shopkeepers for certain products only (IPARDES 1985a, pp. 45-54). These two changes have greatly undermined the assumptions built into the PRONAN ideology and discussed in section 3.4, namely the inefficiency of the market for food and the almost complete dependence of poor consumers on the traditional shopkeepers, despite their higher prices. At the same time, there is a tendency for these shopkeepers no longer to offer the traditional credit to their clients; the market seems to be becoming more homogenous, not only with regard to prices but also in terms of the conditions on which products are sold.

When these inferences are added to the general evidence that the PROAB subsidy is not small in relation to the price differences prevailing outside the program, it seems reasonable to conclude that the PROAB should be capable of providing the client with prices that are generally lower than or equal to any price that he would find outside the affiliated shops. When the

program does not achieve this, it would seem to be clear evidence of some internal inefficiency rather than the result of the costs inherent in working with shopkeepers in the large cities.

#### 5.6 Cumulative Total Cost of the Programs

It is in theory possible to estimate the total accumulated cost of any of the food programs by adding yearly budgets together and adjusting the figures for inflation. This would express the resources spent in constant prices to provide a measure of the financial effort that these programs have represented for Brazil. However, this procedure runs into serious difficulties. First, inflation has been so rapid that the results very largely depend on the index used to adjust current costs. Again for this reason, it might seem that there was no clear relationship between the total money amount and the physical distribution of food. This difficulty would merely be compounded by the periodic shortages of one product or another, by sharp changes in their relative prices, or by delays in financing the programs, which have led to price increases at certain times. There is also the problem, noted in section 4, that the financial reports of the various programs are very dissimilar as regards their treatment of costs, apart from the acquisition of food; in particular, there is no uniform treatment of administrative costs.

For these reasons, it seems appropriate before making any calculation in money terms to try to find out by other means how much the main food subsidy or donation programs have cost. The calculations in this section begin with the physical distribution of food by the PNS/PSA, PROAB and PCA. (The PINS is excluded because it was a short-term experiment of limited geographical scope, which in less than three years distributed less than 2,000 tons of the four subsidized foodstuffs.) Food distribution is aggregated for all the years in which a program operated, beginning in 1976 for the PNS, 1980 for the PROAB and 1977 for the PCA, and ending with the year 1986. As shown in Part (1) of Table 19, this produces a total of 1.672 million tons of food, of which 1.155 million, or 69 percent, was channeled through the PNS/PSA. The PROAB distributed 24 percent, and the PCA the remaining 6.7 percent. These proportions reflect the different ages of the programs and not just the differences in scale prevailing in 1986.

To these physical quantities of food are applied unit values for June 1984 (or the average for the year, in the case of the PCA). For the INAN programs, the most appropriate value would seem to be the price at which COBAL would sell the products to the shopkeepers participating in the PROAB were it not for the subsidy; this is the price to which the INAN subsidy is applied, and it already includes the retail margin paid by INAN to COBAL to cover its transportation, storage and administration costs. (It excludes the margin that the shopkeeper receives on selling the product to the consumer.) This price relates only to sales in the large cities of the Northeast in which the PROAB functions, while the PNS/PSA also operates in small municipalities in that region and other parts of Brazil. Nonetheless, the shop prices do not differ very much between large and small cities, as Table 18 shows; while on the other hand the distribution by the PNS/PSA to the small population centers may add some additional cost that cancels out these differences. Applying the

TABLE 19

AGGREGATE ESTIMATES FOR PHYSICAL DISTRIBUTION OF FOODS, TOTAL COST AND TOTAL PUBLIC EXPENDITURE AT CONSTANT JUNE 1984 PRICES, FOR THE PNS, PROAB AND PCA FROM THE BEGINNING OF EACH PROGRAM THROUGH THE END OF 1986

	(1) Physical Distribution (tons)			Unit Value (Cr\$/KG June 1984)	(2) Total Cost, Cr\$ Million June 1984					(3) US\$ Million 1986	
	PNS 1976-86	PROAB 1980-86	Total		PNS Total Cost	PROAB Total Cost Subsidy		Total 2 or 3 Programs Public Cost Expenditure		Total Cost	Public Expenditure
<b>I. Natural Products</b>											
Rice	405,550	120,657	526,207	586	237,652	70,705	16,956	308,357	254,608	188	156
Sugar	243,452	131,723	385,175	569	144,214	74,950	16,837	219,165	161,051	134	98
Dried meat	-	9,813	9,813	3,196	-	31,362	7,414	31,362	7,414	19	5
Beans	203,093	29,671	232,764	1,118	227,058	35,172	8,654	260,230	235,712	159	144
Maize meal	140,256	23,218	163,474	614	86,117	14,256	3,228	100,373	89,345	61	55
Cassava meal	94,848	30,103	124,951	709	67,247	21,343	5,551	88,590	72,798	54	44
Powdered milk	50,750	5,565	56,315	3,942	200,057	21,937	4,657	221,994	204,714	136	125
Pasta	885	16,283	17,168	655	580	10,665	2,141	11,245	2,721	7	2
Soya oil	6,288	16,829	23,117	2,440	15,343	41,063	10,795	56,406	26,138	34	16
Eggs	-	20,347	20,347	1,845	-	37,540	8,245	37,540	8,245	23	5
Salt fish	-	1,448	1,448	2,978	-	4,312	1,291	4,312	1,291	3	1
<b>Total</b>	<b>1,155,122</b>	<b>405,657</b>	<b>1,560,779</b>	<b>-</b>	<b>978,268</b>	<b>363,305</b>	<b>85,769</b>	<b>1,341,573</b>	<b>1,064,037</b>	<b>819</b>	<b>650</b>
<b>11 Products</b>											
Unit cost (Cr\$/Kg or US\$/Kg)					(821)	(939)	(245)	(854)	(701)	(0.52)	(0.43)
<b>II. PCA Blends, 1977-86</b>			111,105	1702 (US\$1.05)				189,101	189,101	116	116
<b>III. All Products</b>			1,671,884					1,530,674	1,253,138	935	765

Source: Quantities distributed (INAN 1984a) and Tables 2, 5, 7 and 9; PROAB unit costs and subsidies for June 1984 (INAN 1984a, p. 179); unit cost of blends (LBA Foundation 1985b).

unit value thus defined to the total physical quantity gives the total cost of the food distributed if it had been purchased throughout at the June 1984 prices. This total amount is shown in Part (2) of Table 19, which also calculates, in the case of the PROAB, the amount of the subsidy or the portion representing a public cost. The subsidy rates by product in the period 1980-84 are the averages for the program in all seven states in which it operated, also for June 1984; as discussed in section 5.5, these are typically somewhat larger than the average over time since the subsidies on certain products increased after the program was established. For the last two years (1985-86) a uniform 20 percent subsidy is applied since the subsidy varied very little between products or cities during that time.

This calculation results in an estimated accumulated cost for the food distributed by the three programs of approximately Cr\$ (June 1984) 1,531 billion of which Cr\$1,253 billion was public expenditure, the remainder being the contribution of the PROAB beneficiaries to buying subsidized products. In comparison with the physical distribution of products, the PNS share of the total cost is somewhat less (64%), because it distributes the cheapest food, with a unit cost of only Cr\$821 per kg. The inclusion of dried meat, fish, oil and eggs in the PROAB raises the unit cost of its products to Cr\$939 per kg, while the blends cost exactly twice as much as the natural products (Cr\$1,702 versus Cr\$854). In terms of total public expenditure only, including as regards the PROAB only the subsidy paid by INAN, the PNS share naturally rises, reaching 78 percent. The unit public cost falls to Cr\$701 per kg for the natural products, since the average cost of transferring one kg of food through the PROAB is no more than Cr\$245.

Using the free market cruzeiro/dollar exchange rate for June 1984, (Cr\$1,728 = US\$1), and then adjusting for inflation in the United States between 1984 and 1986 (5.55 percent), part (3) of the table shows that the total cost of the food transferred by the three programs was US\$ (1986) 935 million, of which US\$765 million was public expenditures and US\$170 million the contribution of the PROAB beneficiaries. (The unit cost was a little over US\$1 per kg for the blends and about US\$0.50 for the natural products). These totals are about 0.4 percent of Brazil's GDP; in 1984 the programs would have accounted for perhaps 0.1 percent of GDP, a figure which then increased with the expansion of the PNS/PSA and the introduction of the PNLCC.

The corresponding financial estimates, based on the cost of the programs, are shown in Table 20. The estimates are not comparable with those in Table 19, for a series of reasons: they exclude the initial years of the PNS, include administrative costs and other non-food related costs, and--most important--use for inter-year comparisons a general price index rather than the prices of the specific foods. Despite these differences, the totals are very similar in the two calculations; the total costs of the PNS/PSA, PCA and PROAB are estimated at US\$ (1986) 953 million, versus US\$935 million in Table 19. Table 20 also indicates that this amount is less than half of total federal expenditure on food/nutrition programs, given the great weight of the school meals programs and certain other costs. It also indicates the rapid growth of this type of expenditure which more than tripled between 1984 and 1986.

TABLE 20  
 TOTAL EXPENDITURE ON FOOD AND NUTRITION PROGRAMS BY PROGRAM, 1978 - 1986  
 (Cruzados millions and Dollars, 1986)

PROGRAM	1978	1979	1980	1981	1982	1983	1984	1985	Total 1986	Total 1978-1986	IUS\$ 1986
PNS/PSA	673.9	502.0	759.7	601.9	811.9	1,074.8	1,163.9	2,227.2	2,382.1	10,198.4	749.6
PCA	155.9	212.0	236.5	231.3	211.5	158.9	121.5	112.3	456.0	1,895.8	139.3
PNLCC	-	-	-	-	-	-	-	-	656.3	656.3	48.2
Total, Distribution	829.8	714.0	996.2	833.2	1,023.4	1,233.7	1,285.4	2,339.4	3,494.4	12,750.5	937.2
PROAB	-	-	-	44.1	55.7	205.9	182.6	200.6	180.3	869.2	63.9
PAP	-	-	-	-	-	-	-	1.2	350.0	351.2	25.8
PROCAB	320.5	196.7	135.2	71.4	52.1	25.8	10.6	7.4	27.6	847.3	62.3
Total, Subsidy and Marketing	320.5	196.7	135.2	115.5	107.8	231.7	193.2	209.3	557.9	2,067.7	152.0
Total, Programs Listed	1,150.3	910.7	1,131.4	948.7	1,131.2	1,465.4	1,478.6	2,548.7	4,052.3	14,818.2	1,089.2
Total, All Food/ Nutrition Programs	1,654.9	1,763.7	1,915.3	2,001.5	2,515.5	2,794.5	3,026.2	5,550.8	9,122.2	30,344.6	2,230.4

Source: McGreevey (1988, Table 12A), estimates in cruzados; converted into dollars at Cz\$13.61 = US\$1.

## 6. EVALUATION OF THE PROGRAMS: RESULTS

All the evaluations reviewed in the preceding chapter referred to what happens up to the moment when the food is passed from the program to the client. Until that moment, the only certainty is that an income transfer has taken place, which can easily be calculated in terms of the savings to the consumer--provided that we assume that he would have bought the same quantity at market prices if he had not had access to the program (Calvalcanti *et al.* p. 190), which on the whole is not a reliable assumption. In this chapter the focus is on the results that this transfer produces for the beneficiaries. Do they eat more food, whether specific items or in general? What happens to the food provided, and who eats it? Can any changes be observed in nutritional status, as measured by anthropometry? Are there any other benefits not directly food-related, involving health or other aspects of life? These issues are discussed below.

### 6.1 Increase in Family Food Consumption

If the only objective of a program were to transfer income, then to calculate the benefit it would only be necessary work out the value of the donated food, or the subsidized portion of the cost of subsidized purchases. If the objective is to stimulate consumption and thereby reduce calorie and protein deficits, the reaction of the family must taken into account, including the substitution of food bought outside the program and the possible increase in purchases as a result of a subsidy (Moldau 1982 and 1985, Timmer *et al.* 1983, pp. 36ff). This kind of analysis is based on the assumption of a rational consumer, i.e. one who knows his tastes or preferences--which may or may not coincide with his biological needs--and who tries to maximize his satisfaction through the consumption of various goods and services, including food. The constraints he faces on increasing his satisfaction or utility are the prices of the items he wishes to consume and his purchasing power, which includes the acquisition of goods by other means than purchases in the market, such as production for household consumption or the receipt of free goods.

Consumers may react in different ways to a change in purchasing power and/or one or more prices. The theoretical framework can indicate the kinds of reaction that may occur and the direction of a particular effect, but cannot predict their magnitude, for which empirical measurement is required. This means either measuring the consumption of families with and without the program--either that of participating families compared with non-participants, or the same families before and after they register for the program--or estimating relations between consumption and income, food prices, and perhaps other factors that affect consumption. Generally these estimations are made through a horizontal cut of the population, although in some cases variations over time are studied using aggregate data. Comparisons between two different moments in time allow certain inferences to be drawn regarding the reasons for changes in consumption (Campino *et al.* 1984), but it can be difficult to attribute effects to any particular cause.

As regards the increase in consumption that could be expected as a result of an implicit income transfer deriving from a subsidy or donation, section 2.2 above discussed the variety of estimates available and some of their limitations. On the consumption increases that should result from a decline in the price of a given food, Campino (1986b) records several estimates for certain basic products. Unfortunately the few available estimates never refer to the Northeast of Brazil, do not allow the price-elasticity to vary with income level, and typically are based on aggregated time series. Some of the coefficients obtained are reasonable--for example, the price-elasticity of beans varies from -0.12 to -0.21--but others are very dubious for a poor population, such as the almost complete inelasticity of demand for rice. No reliable basis results for estimating the effects of a subsidy in terms of increased consumption. Data referring specifically to the Northeast (Ferraz de Lucena et al. 1984) show positive elasticities for all nutrients in relation to the amount of land worked by the family, but the lack of direct measurement of income makes any calculations of this kind impossible. Nor in this case is there any information on prices.

The most complete estimation of consumption functions in Brazil before this study was that made by Gray (1982), using ENDEF data aggregated by region and level of total expenditure (used as an approximation for income). It gives results for nine foods or groups of foods, relating calorie consumption to income and the prices both of the food in question and of other products--i.e. own and cross price-elasticities respectively. These are given for two groups of calorie-poor consumers, who roughly correspond to the population served by the PCA, PNS and PROAB.

A number of the elasticities calculated are reasonable (in particular the income-elasticities for rice, sugar, milk, eggs, legumes or beans, and fats and oils) but there is one group of results that is difficult or even impossible to trust. According to Gray, a ten percent increase in the income of the poorest group entails a reduction of almost 30 percent in the consumption of manioc flour. The replacement of the latter by rice is unquestionably responsible for the very low income-elasticity of calories in general; calorie consumption would rise only two percent. The four price-elasticities for rice and manioc are even more extraordinary: they indicate that if the price of rice increases ten percent, for example, consumption declines by 55 percent and that of manioc increases by 40 percent. It is possible that these results are due to the use of regional aggregates, since the relative proportions of rice and manioc consumption vary from one region to another. The estimates may also be weakened by the omission of family size as a determinant of consumption.

When these estimates are used to calculate the effects of a 20 percent subsidy and a donation of 40 percent of calorie needs, the result is a reduction in manioc flour consumption (particularly unlikely in the case of a donation) and, partly as a result, a very small increase in total calorie consumption. At the extreme, the 20 percent subsidy leads to consumption increases of 98 percent for rice, 57 percent for sugar and 35 percent for oil, but only 4.4 percent more calories in all (Gray 1982, Tables 40 and 41). For this to happen the diet before the subsidy would have to consist very largely of manioc flour.

This exercise leads one to suspect that the much-discussed tendency of poor Brazilian families not to translate transfers into higher food consumption has no very solid empirical basis. It is at least possible that the impact of the PNS or PROAB was much greater than this. As regards the difference between a subsidy and a donation, at these levels (20 percent and 40 percent respectively) the subsidy seems to be more effective in bringing about an increase in consumption. Nonetheless, this result, which assumes a money income sufficient to pay the nonsubsidized 80 percent of the price, depends on the very low income-elasticity. When the two transfers are compared foodstuff by foodstuff, the donation seems clearly superior in stimulating milk consumption, which is why it could have a significant impact on infant diets.

If the above-mentioned questionable results are a consequence of using aggregate data, more reliable estimates can be obtained from the original ENDEF observations at the family level (Musgrove 1988). In order to rule out any effect resulting from regional differences in consumption patterns in Brazil, this estimate was based on data relating to one region only, in this case the Northeast. It is also possible to study only the target population of the PROAB, by restricting the analysis to metropolitan areas. Finally, we have used a more flexible consumption function which gave good results in the analysis of an income and expenditure survey in the Dominican Republic (Musgrove 1985b). The function depends on family size, family income (or total expenditure) and the price of the good; each elasticity depends on all these three variables. The prices of other foods can also be introduced into the determination of consumption of a given food. In particular, given the importance of rice and beans as sources of protein and calories, the prices of these two items have been included in the equations for various products. We have also tested the existence of relationships between the various cheap sources of calories (manioc flour, maize meal, and sugar) and between some protein-rich foods (beef, eggs and milk).

Since the elasticities vary according to expenditure and family size, they have to be calculated by establishing values for these variables. Gray's study (1982) enables a number of "poverty lines" to be defined that correspond to different definitions of the absolute or relative inadequacy of expenditure per head. These estimates are shown in Table 21, in terms of Cr\$ of August 1974, per person or per family, and distinguishing between urban or metropolitan and rural areas. On this basis it was decided to make calculations for a family of six, approximately the average size found in the ENDEF survey, and three levels of total expenditure, viz. Cr\$ 3,000, 6,000 and 12,000, corresponding to expenditure of Cr\$500, 1,000 and 2,000 per head respectively. As is apparent, at the lowest of these levels a rural Northeastern family could only have satisfied its calorie needs if it spent all its income on rice and beans. At the highest of the three levels it would have had to spend only a quarter of its total income, or a little more than a third in the case of a metropolitan family.

The income- or expenditure- and price-elasticities corresponding to these levels of poverty are shown in Table 22, for 15 foods. The income-elasticity results show that maize meal and manioc flour are inferior products

TABLE 21

INDIVIDUAL AND FAMILY POVERTY LINES, ALL OF BRAZIL AND THE NORTHEAST,  
URBAN AND RURAL, BASED ON ENDEF DATA, 1974-75

<u>Poverty Level</u>	<u>Level (in Cr\$ of August 1974) per head or per family, according to location</u>			
	1. All of Brazil			
	Urban		Rural	
	<u>Person</u>	<u>Family</u>	<u>Person</u>	<u>Family</u>
Income: Poorest 30%	1,712	7,685	1,151	5,609
<u>Calory Consumption Relative to Needs</u>				
Poorest 15%	1,860	8,751	742	2,473
Poorest 30%	2,322	11,322	898	3,794
	2. Northeast Only			
	Recife and Salvador		Rural Area	
<u>Purchasing power to obtain 2,000 calories a day per person eating only rice and beans:</u>	<u>Person</u>	<u>Family</u> (6 pers.)	<u>Person</u>	<u>Family</u> (6 pers.)
Using 100% of expenditure	696	4,176	508	3,048
Using 50% of expenditure	1,391	8,346	1,017	6,102
Using 25% of expenditure	2,782	16,692	2,034	12,204

Sources: Gray, Tables 13 and 14, and original calculations, based on the average cost per 100 calories per day of various foods, in Gray 1982, Tables 15 and 16.

that are replaced in the diet as family purchasing power increases, except at very low levels of total expenditure. It is apparent that there is a tendency for poor families to replace proteins of plant origin by animal proteins when their total expenditure rises.

As regards price-elasticities, no exaggerated estimates are found for rice and manioc flour. Almost all the price effects show elasticities between zero and -1.0, and many of them are sufficiently large to suggest that a subsidy would have an appreciable impact on consumption. These elasticities decline rapidly in absolute terms as income or expenditure per head rises. The estimates of cross price-elasticities (consumption of one food against the price of another) show that most are not significant. See Table 23 which illustrates most of the results obtained:

- when the price of rice rises, consumption of manioc flour increases while that of maize meal falls, without affecting the other diet components;
- the price of beans affects rice consumption (which increases when beans are more expensive because the beans/rice ratio falls when the more expensive item becomes even more costly), but does not affect consumption of the other foods;
- consumption of rice also increases when sugar becomes more expensive, but falls when the same occurs with manioc flour;
- there is a detectable but quite small effect between manioc flour and sugar, both being cheap sources of calories;
- with one exception, there are no cross effects between the various foods of animal origin, nor between them and beans. The exception is that consumption of fresh milk seems to be very sensitive to the price of eggs (these estimates do not appear in the table); and
- oil and margarine are substitutes, but the effects of the price of either on consumption are small and of little statistical significance.

The elasticities presented in Tables 22 and 23 make it possible in theory to estimate the degree to which the consumption of one food would be affected if its price were subsidized or if the family received a transfer or donation of foods (which might or might not include the food in question). However, the calculation of this effect--i.e. estimating the additional consumption brought about by the subsidy or transfer--depends on a series of other factors as well. In the case of a subsidy, the result may depend on whether it is applied only to the food in question or whether a group of foods is subsidized, as under the PROAB. The more products are subsidized the greater may be the income effect of the assistance, and cross effects between the consumption of one food and the price of another are more likely. Where a donation is concerned, its value to the beneficiary must be calculated and then regarded as if it were a transfer of income or purchasing power. As already mentioned, this equivalence depends on the assumption that the

TABLE 22  
ESTIMATED ELASTICITIES FOR PURCHASES OF 15 FOODS IN THE NORTHEAST, BY  
LOCALITY AND LEVEL OF EXPENDITURE PER HEAD, FOR A FAMILY OF SIX

Food and Locality	Income-Elasticity Expenditure per Head			Price-Elasticity (in Cr\$ of August 1974)		
	Cr\$500	1,000	2,000	Cr\$500	1,000	2,000
<b>Rice</b>						
Northeast	0.926	0.524	0.323	-1.776	-1.374	-1.173
Metropolitan Area	0.867	0.507	0.327	-1.545	1.185	-1.005
Rural Area	0.960	0.587	0.401	-1.799	-1.426	-1.240
<b>Maize meal</b>						
Northeast	0.240	-0.088	-0.251	-1.144	-0.815	-0.653
Metropolitan	0.362	0.012	-0.163	-1.092	-0.742	-0.567
Rural	0.466	0.163	0.011	-0.942	-0.639	-0.487
<b>Mantoc flour</b>						
Northeast	0.008	-0.260	-0.394	-0.741	-0.473	-0.339
Metropolitan	0.254	-0.127	-0.317	-0.941	-0.560	-0.370
Rural	0.143	0.013	-0.052	-0.433	-0.303	-0.238
<b>Pasta</b>						
Northeast	0.988	0.518	0.283	-1.413	-0.943	-0.708
Metropolitan	1.294	0.631	0.299	-1.751	-1.088	-0.756
Rural	*	*	*	*	*	*
<b>Sugar</b>						
Northeast	1.155	0.632	0.371	-1.514	-0.991	-0.730
Metropolitan	0.843	0.460	0.269	-1.039	-0.656	-0.465
Rural	0.719	0.542	0.453	-1.263	-1.086	-0.997
<b>Beans</b>						
Northeast	0.518	0.189	0.025	-0.806	-0.477	-0.313
Metropolitan	0.999	0.415	0.124	-1.080	-0.496	-0.205
Rural	0.331	0.214	0.156	-0.658	-0.541	-0.483
<b>Meat with cheese</b>						
Northeast	1.079	0.502	0.240	-1.142	-0.583	-0.303
Metropolitan	1.424	0.680	0.308	-1.566	-0.823	-0.451
Rural	0.698	0.502	0.403	-0.370	-0.174	-0.075
<b>Dried meat</b>						
Northeast	0.811	-0.297	0.039	-1.275	-0.761	-0.503
Metropolitan	1.029	0.443	0.149	-1.237	-0.651	-0.357
Rural	0.974	0.574	0.374	-0.956	-0.556	-0.356
<b>Salt fish</b>						
Northeast	0.126	0.107	0.098	-0.270	-0.251	-0.242
Metropolitan	0.371	0.312	0.282	-0.322	-0.263	-0.233
Rural	0.438	0.300	0.231	-0.445	-0.307	-0.238
<b>Eggs</b>						
Northeast	1.054	0.641	0.434	-1.059	-0.646	-0.439
Metropolitan	0.972	0.585	0.392	-0.954	0.567	-0.374
Rural	0.395	0.361	0.344	0.487	0.453	0.436

(Table 22, pg. 2)

Food and Locality	Income-Elasticity Cost per Person			Price-Elasticity (in Cr\$ of August 1974)		
	Cr\$500	1,000	2,000	Cr\$500	1,000	2,000
Fresh milk						
Northeast	0.445	0.222	0.110	-1.130	-0.907	-0.795
Metropolitan	0.745	0.238	-0.015	-1.904	1.397	-1.144
Rural	0.314	0.245	0.210	-0.801	-0.732	-0.697
Pasturized milk						
Northeast	0.772	0.486	0.344	*	*	*
Metropolitan	0.585	0.397	0.303	*	*	*
Rural	0.408	0.134	0.267	-0.303	-0.209	-0.162
Soya Oil						
Northeast	0.851	0.629	0.517	-0.502	-0.280	-0.168
Metropolitan	1.847	1.118	0.753	-1.287	0.558	-0.193
Rural	0.954	0.724	0.608	-0.571	-0.341	0.225
Margerine						
Northeast	1.450	0.773	0.434	-1.362	-0.685	-0.346
Metropolitan	1.497	0.871	0.424	-1.441	-0.725	-0.368
Rural	1.025	0.525	0.275	*	*	*
Coffee						
Northeast	0.809	0.529	0.389	-0.939	-0.659	-0.519
Metropolitan	0.831	0.517	0.360	-1.206	-0.892	0.735
Rural	0.704	0.528	0.441	-0.574	-0.398	-0.311

Source: Musgrove 1988, Table 3

\* The sign of the coefficient is opposite to that expected, so the estimates cannot be regarded as trustworthy.

TABLE 23  
 INCOME- AND PRICE-ELASTICITIES, OWN- AND CROSS-, AMONG SIX FOODS  
 (PRINCIPALLY CALORIE SOURCES) IN THE NORTHEAST (TOTAL URBAN AND RURAL)  
 ACCORDING TO EXPENDITURE PER HEAD

Elasticity with respect to:	Income			Price			Prices of other foods			
	Expenditure per Head (Cr\$ of August 1974)			Expenditure per Head			Rice	Cassava	Sugar	Beans
	Cr\$500	Cr\$1,000	Cr\$2,000	Cr\$500	Cr\$1,000	Cr\$2,000				
Rice	1.357	0.814	0.543	-1.499	-0.956	-0.685	-.-	-0.114	0.265	-0.225
Maize meal	0.519	0.056	-0.175	-1.282	-0.819	-0.588	-0.178	-.-	-.-	-.-
Manioc flour	0.023	-0.239	-0.370	-0.712	-0.450	-0.319	0.405	-.-	-.-	-.-
Pasta	1.085	0.566	0.306	-1.463	-0.944	-0.684	-.-	0.041*	-.-	-.-
Sugar	0.773	0.435	0.266	-1.023	-0.685	-0.516	0.011*	0.088	-.-	-0.078
Beans	0.683	0.265	0.056	-0.941	-0.523	-0.314	0.035*	-.-	0.087	-.-

\* Not different from zero, with 90 percent confidence.  
 Source: Musgrove 1988, Table 4.

quantity donated of a given food does not exceed what the beneficiary would have bought if he had received a cash transfer, and this may not always be the case. Furthermore, even when this quantity remains within that amount, the donation of food may not be regarded by the recipient just as though it were money (Senauer and Young 1986), because it includes some educational or psychological element. In this situation the assumption of equivalence--the only one consistent with the theory of the rational consumer, if no other evidence of his behavior is available--would result in an underestimate of the additional consumption resulting from a donation.

To apply the estimated elasticities obtained, the following assumptions have been made:

- the value of a donation of foods that provide 40 percent of calorie needs is equivalent to 40 percent of the cost of providing these calories through rice and beans only. Hence the value would be Cr\$1,200 (at August 1974 prices) for a rural family of six and Cr\$1,670 for a metropolitan family, according to the lowest poverty line calculated in Table 20. At this level of poverty the value of the food donated would be equivalent to 40 percent of the rural family's total expenditure or income, and 56 percent for a family in a major metropolitan area. At a level of Cr\$6,000 (Cr\$1,000 per person), the effect would be to increase income by 20% for the rural beneficiary, and 28 percent for the urban client. It should be noted that this calculation is equivalent to assuming that the donated food meets 40 percent of the calorie needs of all family members. The effect of a donation on total family consumption would necessarily be less if the transfer was targeted at some family members only, as is typically the case. In this sense it is a relatively generous donation whose effect is being calculated. It is also worth pointing out that the lack of information on the intrafamily distribution of food makes any calculations regarding the additional consumption of a given family member, which may be the object of the transfer, impossible.
- the subsidy may be applied to a single food if the calculation is based on consumption functions that do not take the effects of the prices of other foods into account (Table 22). In this case, if two or more foods are subsidized, the individual effects are added, without interactions. When the calculation is based on functions that do include cross effects (Table 23), the group of subsidized foods must be specified. For the present exercise it is assumed that rice, maize meal, manioc flour, sugar and beans are subsidized simultaneously so that the price of all of them is reduced by 20 percent; and that if oil is subsidized, then so is margarine, and vice versa.

The calculations resulting from these assumptions are contained in Table 24, for metropolitan areas and the Northeast as a whole, at two levels of expenditure per person. In general terms, they suggest that a subsidy is effective in stimulating consumption, even if prices are reduced by only 20 percent. At least, this appears true for certain staple foods: rice,

TABLE 24

ESTIMATES OF ADDITIONAL CONSUMPTION (PERCENTAGES) OF 15 STAPLE FOODS:  
EFFECTS OF A 20 PERCENT PRICE SUBSIDY (PROAB) AND A 40 PERCENT DONATION OF CALORIE NEEDS (PNS)

Location Expenditure per head (Cr\$ of 8.74)	Metropolitan Area				Rural Area				Total Northeast				Total Northeast (Including Cross Effects)				
	Cr\$1,000		Cr\$2,000		Cr\$1,000		Cr\$2,000		Cr\$1,000		Cr\$2,000		Cr\$1,000		Cr\$1,000		
Type of Assistance	Subsidy	Donation	Subsidy	Donation	Subsidy	Donation	Subsidy	Donation	Subsidy	Donation	Subsidy	Donation	Subsidy	Donation	Subsidy	Donation	
<b>Foods</b>																	
Rice	29	12	25	4.3	36	10	31	3.8	35	11	29	3.6	12	18	6.5	6.2	
Maize meal	17	-0.7	13	-2.2	15	3.0	11	0.2	19	-2.6	12	-4.6	24	0.2	18	-2.01	
Manioc Flour	12	-4.1	8.1	-4.2	6.6	0	5.3	-0.5	10	-6.0	7.5	-4.5	0.4	-5.6	-2.2	-4.2	
Sugar	15	11	10	3.4	27	10	25	4.4	23	13	17	4.1	15	9.0	11	3.0	
Noodles	25	15	18	3.7	*	*	*	*	22	11	17	3.1	**	**	**	**	
Beans	10	8.9	4.0	1.4	13	3.8	11	1.5	*	*	*	*	8.2	4.8	3.8	0.5	
Meat w/ cheese	18	16	9.6	3.8	2.2	8.1	0.8	3.6	12	11	6.3	2.6	**	**	**	**	
Dried meat	14	9.7	7.6	1.7	12	3.5	7.8	0.2	17	5.4	11	0.3	**	**	**	**	
Salt fish	5.9	7.8	5.3	3.7	6.7	5.4	5.3	2.2	5.7	2.3	5.5	1.1	**	**	**	**	
Eggs	12	14	8.2	5.1	11	6.7	10	3.3	14	14	9.8	4.9	**	**	**	**	
Fresh milk	35	4.6	28	-0.7	18	4.4	17	2.0	21	3.8	19	1.1	**	**	**	**	
Pasteurized milk	*	*	*	*	4.5	5.7	3.6	2.6	*	*	*	*	**	**	**	**	
Soya oil	*	*	*	*	7.3	14	4.9	5.9	5.9	14	3.6	6.0	14	32	2.2	9.6	
Margarine	16	19	7.6	5.4	*	*	*	*	15	16	7.2	4.8	15	21	4.1	5.4	
Coffee	21	31	17	4.7	8.8	9.8	6.9	4.2	15	11	12	4.4	**	**	**	**	

\* The signs for one or more coefficients are the opposite of the expected, and do not permit trustworthy calculations.

\*\* Not calculated with cross effects (See Table 23)

Sources: Musgrove 1988, Table 1 and original calculations.

maize meal, pasta (noodles), beans, eggs, and even beef. Other foods such as fats and oils, and coffee, also seem relatively sensitive to price changes. With some exceptions, a donation, which produces an income-effect but no substitution effect due to changes in relative prices, would have a smaller impact. However, when the interactions between the consumption of one food and the price of another are incorporated (in the last columns in the table), the superiority of the subsidy is less evident for rice, oil and margarine. Furthermore, the results obtained leave it unclear what is going on with milk consumption. The assistance programs almost always provide or subsidize powdered milk, but the ENDEF information only refers to fresh or pasteurized milk, and demand seems to be very different for these two products. Only the PNLCC donates fresh milk.)

The alterations in consumption illustrated here do not show nutritional consequences directly, in terms of calories or proteins, because they indicate changes in the intake of individual foods; they could nevertheless be used to estimate beneficial nutritional effects in terms of the composition of the client's diet. Nor do they indicate the cost of either method of stimulating consumption. To show that a subsidy or donation is effective in increasing this intake does not mean that either measure is justified if the cost per additional unit of consumption is very high.

If the objective of a subsidy is to bring about the largest possible increase in consumption per unit of expenditure on the subsidy, then the criterion for selecting the foods must be the maximum ratio between the price-elasticity and price of the food (Moldau 1982, Musgrove 1988). Estimates of this ratio are given in Table 25. According to this criterion, and using the 1984 prices given in Table 19, the product most worth subsidizing, for poor consumers in Brazil, is undoubtedly rice. This is followed by sugar, with an almost equal value, and then maize meal and pasta. Manioc flour is not such a good candidate, since it is an inferior product, with the result that the income-effect of the subsidy tends to cancel out its good price-effect. Foods with greater protein value cost more and therefore are less worth subsidizing; among these the best candidate would be beans, followed by eggs and dried meat. This analysis is repeated for metropolitan and rural areas separately, using June 1985 prices, also in Table 25. The foods most worth subsidizing continue to be rice and sugar; the subsidy for beans is more effective in rural areas than in the cities.

As discussed in section 2.3, income per head in a family also varies as a function of the number of family members, so that variations in this number affect food consumption and nutritional status. From this standpoint, family planning and health care programs that affect the survival of children have nutritional consequences as well. The same consumption functions provided by the income- and price-elasticities just discussed enable food consumption to be related to family size (Musgrove 1986b). The results are contained in Table 26, which shows relative consumption per head, using a family of four as a benchmark, and calculating variations in average intake according to whether the family contains five, six, seven or eight members.

With the single exception of brown sugar, a very cheap source of calories, consumption per head always declines as the number of family members increases. At low income levels, the reduction is striking for all the products considered, but is still significant at income levels four times

TABLE 25

RELATIONSHIP BETWEEN ADDITIONAL CONSUMPTION AND COST OF A SUBSIDY FOR TEN FOODS IN THE NORTHEAST,  
BY LOCALITY AND LEVEL OF EXPENDITURE PER HEAD

Food	Metropolitan Area (3 Cities) Consumption/Relative Expenditure		Rural Area (10 Municipalities) Consumption/Relative Expenditure		Entire Northeast Consumption/Relative Expenditure				
	Price/kg (Cr\$ of 6/85)	Expenditure per head (Cr\$ of 8/74)	Price/kg (Cr\$ of 6/85)	Expenditure per head (Cr\$ of 8/74)	Price/kg (Cr\$ of 6/74)	Expenditure per head (Cr\$ of 8/74)			
	1,000	2,000	1,000	2,000	1,000	2,000			
Rice (own price)	2,366	0.653	0.424	2,233	0.639	0.555	586	2.345	2.002
(Including effects of other prices)		0.404	0.290	-	0.428	0.307		1.631	1.169
Maize meal	2,586	0.287	0.219	1,990	0.321	0.245	614	1.327	1.064
Manioc flour	1,351	0.415	0.274	906	0.334	0.263	709	0.667	0.478
Pasta	2,832	0.384	0.267	2,948	***	***	655	1.440	1.081
Sugar	1,598	0.411	0.291	1,592	0.682	0.626	569	1.742	1.283
Beans	2,343	0.212	0.087	1,628	0.332	0.297	1,186	0.402	0.264
Eggs*	4,257	0.133	0.088	4,493	0.101	0.097	1,845	0.350	0.238
Soya oil**	6,137	0.091	0.031	6,302	0.054	0.036	2,440	0.115	0.069
Margarine	8,056	0.090	0.046	7,924	***	***	-	-	-
Coffee	18,116	0.049	0.041	17,756	0.022	0.018	-	-	-
Dried meat	-	-	-	-	-	-	3,196	0.238	0.157
Salt fish	-	-	-	-	-	-	2,978	0.084	0.081

\* A dozen eggs weighs 600 g., and their price was Cr\$2,554 (metropolitan area) or Cr\$2,696 (rural area).

\*\* A 900 ml. bottle weighs 831 g., its price being Cr\$5,100 (metropolitan area) or Cr\$5,237 (rural area).

\*\*\* No trustworthy elasticity can be estimated; see Table 21.

- Food not included in the relevant price study.

Source: Elasticities, Tables 22 and 23; 1985 prices, Galindo and Musgrove 1986, Table 2; 1984 prices, Table 19.

TABLE 26

CONSUMPTION PER HEAD OF 16 FOODS IN THE NORTHEAST, FOR FAMILY OF 5, 6, 7 AND 8 MEMBERS  
(RELATIVE QUANTITY = 1.000 FOR 4 MEMBERS) AT DIFFERENT LEVELS OF TOTAL EXPENDITURE

Food and Total Expenditure (Cr\$ of 8/74)	Metropolitan Area Number of Members				Rural Area Number of Members			
	5	6	7	8	5	6	7	8
<b>Rice</b>								
Cr\$ 3,000	0.825	0.689	0.581	0.492	0.788	0.634	0.518	0.428
6,000	0.877	0.779	0.698	0.630	0.837	0.716	0.621	0.545
12,000	0.905	0.829	0.766	0.712	0.863	0.761	0.680	0.615
<b>Maize meal</b>								
Cr\$ 3,000	0.861	0.746	0.648	0.566	0.849	0.729	0.631	0.550
6,000	0.913	0.839	0.774	0.716	0.893	0.807	0.735	0.673
12,000	0.940	0.889	0.844	0.804	0.916	0.849	0.793	0.744
<b>Manioc flour</b>								
Cr\$ 3,000	0.914	0.829	0.749	0.674	0.896	0.813	0.744	0.684
6,000	0.973	0.941	0.906	0.869	0.916	0.849	0.793	0.746
12,000	1.005	1.003	0.977	0.987	0.925	0.867	0.819	0.779
<b>Noodles*</b>								
Cr\$ 3,000	0.741	0.557	0.423	0.323	0.873	0.791	0.737	0.700
6,000	0.828	0.695	0.589	0.503	0.840	0.734	0.659	0.603
12,000	0.875	0.776	0.695	0.628	0.825	0.707	0.623	0.559
<b>Sugar</b>								
Cr\$ 3,000	0.861	0.744	0.644	0.560	0.834	0.712	0.617	0.541
6,000	0.918	0.845	0.781	0.723	0.859	0.755	0.674	0.608
12,000	0.947	0.901	0.860	0.822	0.872	0.778	0.704	0.645
<b>Brown sugar</b>								
Cr\$ 3,000	1.046	1.100	1.160	1.226	0.871	0.779	0.710	0.656
6,000	1.010	1.024	1.042	1.064	0.867	0.772	0.701	0.644
12,000	0.992	0.989	0.988	0.911	0.865	0.769	0.696	0.639
<b>Beans</b>								
Cr\$ 3,000	0.811	0.659	0.537	0.438	0.872	0.775	0.697	0.632
6,000	0.893	0.800	0.718	0.646	0.890	0.806	0.739	0.683
12,000	0.938	0.882	0.831	0.788	0.898	0.821	0.760	0.710
<b>Meat with cheese</b>								
Cr\$ 3,000	0.711	0.515	0.377	0.278	0.790	0.643	0.535	0.453
6,000	0.805	0.660	0.546	0.457	0.816	0.687	0.591	0.516
12,000	0.857	0.747	0.658	0.585	0.830	0.710	0.621	0.552

(Table 26, pg.2)

Food and Total Expenditure (Cr\$ of 8/74)	Metropolitan Area Number of Members				s	Rural Area Number of Members			
	5	6	7	8		5	6	7	8
<b>Dried meat</b>									
Cr\$ 3,000	0.750	0.572	0.442	0.344		0.760	0.592	0.470	0.378
6,000	0.828	0.696	0.593	0.509		0.812	0.676	0.574	0.493
12,000	0.869	0.768	0.687	0.619		0.839	0.723	0.634	0.563
<b>Salt fish</b>									
Cr\$ 3,000	0.830	0.711	0.621	0.551		0.834	0.713	0.621	0.547
6,000	0.839	0.725	0.640	0.574		0.854	0.747	0.665	0.599
12,000	0.845	0.736	0.655	0.591		0.863	0.764	0.688	0.627
<b>Eggs</b>									
Cr\$ 3,000	0.879	0.773	0.679	0.597		0.812	0.683	0.589	0.518
6,000	0.938	0.879	0.824	0.773		0.816	0.691	0.599	0.529
12,000	0.968	0.938	0.908	0.879		0.818	0.694	0.604	0.535
<b>Fresh milk</b>									
Cr\$ 3,000	0.825	0.684	0.569	0.474		0.800	0.664	0.565	0.490
6,000	0.898	0.810	0.733	0.664		0.809	0.679	0.585	0.513
12,000	0.937	0.881	0.832	0.786		0.814	0.687	0.595	0.525
<b>Pasteurized milk</b>									
Cr\$ 3,000	0.825	0.697	0.599	0.521		0.807	0.673	0.575	0.499
6,000	0.852	0.743	0.658	0.591		0.819	0.694	0.602	0.531
12,000	0.865	0.766	0.690	0.628		0.826	0.705	0.616	0.548
<b>Soya oil</b>									
Cr\$ 3,000	0.689	0.486	0.348	0.253		0.856	0.764	0.702	0.660
6,000	0.778	0.620	0.502	0.411		0.823	0.707	0.626	0.566
12,000	0.827	0.700	0.602	0.524		0.806	0.681	0.591	0.524
<b>Margarine</b>									
Cr\$ 3,000	0.724	0.532	0.395	0.296		0.748	0.572	0.445	0.349
6,000	0.815	0.675	0.565	0.476		0.813	0.676	0.571	0.488
12,000	0.865	0.760	0.675	0.604		0.848	0.735	0.647	0.577
<b>Coffee</b>									
Cr\$ 3,000	0.824	0.690	0.585	0.499		0.814	0.680	0.580	0.500
6,000	0.869	0.767	0.684	0.616		0.838	0.721	0.632	0.562
12,000	0.892	0.808	0.741	0.684		0.850	0.742	0.660	0.596

\* The calculations for rural areas are based on an estimated parameter whose sign is the opposite of that expected, but not significantly different from zero, and which therefore does not rule out the estimation.

Source: Musgrove 1986b, Table 3.

higher. It is evident that the poor family cannot absorb the impoverishment caused by family growth, and that it adjusts by reducing the consumption of each member. This adjustment is more noticeable for high-protein foods; the diet therefore suffers not only quantitatively but qualitatively too. Although the high-calorie foods are relatively less affected, the main deficiency in the diet of poor families is still the lack of calories; nonetheless, the deficit would be even greater without the sacrifice of quality and variety that these findings indicate.

As regards the other procedure for estimating the size of food consumption increases as a result of participation in an assistance program, namely a direct survey of families with and without, or before and after, the program, only fragmentary and dubious data are available in Brazil. The LBA-UNICEF evaluation of the PCA (1985, pp. 6.5-6.7 and 6.14) notes that a survey was made in the Federal District in March 1978 before the introduction of the program, and another in September of that year when the PCA had been in full operation for six months. On both occasions the families were asked about their expenditure on food in the preceding month and their consumption (diet) the preceding day; in the second interview they were also asked if they had reduced their purchases of specific foods after becoming participants in the program. Unfortunately the data from the second interviews do not seem very trustworthy. In general terms, and making some heroic assumptions about intervening developments as regards food prices and the average real income of the population, it was calculated that real expenditure on food rose about 8 percent (LBA Foundation and UNICEF 1982, p. 6.6). The estimate is very crude but suggests that the donation liberated funds that were spent on larger purchases of food. However, it tells us nothing about the composition of these purchases and it is even doubtful whether they really did increase. Asked if they had reduced their purchases of the foods replaced by the donated blends, the families said yes; in particular they said that they had bought less milk. This information, however, was purely qualitative and no calculations were made regarding quantities.

The frankly experimental nature of the PINS provided an opportunity to measure changes in the consumption of the beneficiary families directly and to relate these to participation in the program and to simultaneous changes in family incomes and food prices. The evaluation of the experiment carefully studied the purchases of subsidized foods (Cavalcanti *et al.* 1984, pp. 168-175), but did not investigate the other foods bought by the families. In any case, the rapid inflation of 1978-1980 would have made it very difficult to assign any impact to the program. One of the authors of the evaluation may well be right in saying that the program only managed to limit the reduction in consumption of its beneficiaries (Cavalcanti *et al.* 1980, p. 175), which is still a positive effect.

As regards the PROAB, the evaluation carried out by FUNDAJ was designed to study the beneficiary population before and after introduction of the program, to detect changes in food consumption patterns. The evaluation as executed contains much information about the diet of the population (Oliveira and Medeiros 1985, pp. 132-151), but does not enable any inferences to be drawn about the effects of the subsidy. The same is true of the evaluation of the PNS, also carried out by FUNDAJ in parallel with its study of the PINS (Cavalcanti *et al.* 1984, pp. 45-56).

In brief, attempts to measure the effect on consumption directly either have not been made, or have been frustrated, or resulted in estimates that may be reasonable but are extremely fragile. In these circumstances indirect estimates, unfortunately, seem necessary if we are to obtain any idea of the impact of the programs. It is regrettable, therefore, that there are still no disaggregated estimates, based on the wealth of ENDEF data, that would enable this question to be resolved more convincingly. Approximations provided by non-Brazilian data suggest that the impact of the PROAB subsidy could be relatively large, and that the total calorie impact of any of the programs is probably greater than might be supposed on the basis of the calculations available in Brazil; but they are no substitute for better knowledge of the behavior of poor families in Brazil.

## 6.2 Intrafamily Dilution and Distribution

The programs that target the food consumption of specific members of the family (unlike the PROAB, which treats the family as a unit) are almost automatically concerned with intrafamily "dilution," or the extent to which foods provided for particular family members are consumed by others. Given the specificity of these foods, which the family may or may not regard as "appropriate" for some member(s) rather than others, nothing can be inferred on this question from the pattern of total family consumption. (The information obtained in the ENDEF survey included total food consumption by the entire family for a day, but no information was sought regarding intrafamily distribution or individual consumption.) Therefore the only way of estimating dilution is by clinical observation or by surveying the beneficiary families.

With one exception the evaluations of the PNS (IPEA 1981a and b, Rios 1981) have not dealt with this issue. Dilution has, however, been estimated for the PCA. This is not surprising, given that the LBA insists to a much greater extent than INAN on targeted assistance, and that the three blends are differentiated according to the family member who is supposed to consume them. In the PNS, the ration varies for different family members, but the products are the same--except for milk, which initially was included in everybody's ration but which by 1978 was restricted to infants only (Coimbra 1985, p. 80).

The available estimates for the PCA were obtained by asking the mother: How many family members regularly consume the product? In quantitative terms, this procedure can only give very approximate results; at best it serves to distinguish between products but does not provide any useful estimate of what portion of the donation is consumed by other family members. Dilution was estimated at 15 percent for the milk substitute, 39 percent for the vitamin supplement and 43 percent for the soup. Given the imprecision of the calculations, no distinction can be made between the vitamin and the soup, but the milk substitute does seem to be highly specific; in 73 percent of families, only the infant (less than one year old) consumed it (LBA Foundation and UNICEF 1982, p. 6.7), as a substitute for the milk that the family previously bought. Such statements may be very unreliable, reflecting more what the directors of a donation program want to hear than the real behavior of the family. Ferriani and collaborators (1985) discovered that a donation

of powdered milk, given to poor families in Ribeirao Preto and intended to be consumed only by children under two, may not have been consumed by all the children but was indeed consumed by all family members between the ages of 7 and 21. However, the mothers or other responsible persons always declared that only the young children had consumed the milk, presumably because they did they not want to lose the supplement. No reliable inferences can be drawn from this experiment regarding the real level of dilution of blends intended for children under two. The incentives to conceal the dilution would be just the same as those at work in the case of powdered milk, but it is possible that the product would be less appetizing for the older family members. Ferriani mentions evidence that acidified milk is still accepted by the infants but is less attractive to the older children, because of its taste. The same could happen in the case of the blends, depending on their exact composition. For the PNS (INAN 1975, p. 17), the calculation of the ration assumes dilution of each product ranging from 10 percent to 30 percent, the higher figure applying to rice and beans. However, these rates were neither measured nor estimated but are arbitrarily established, as the authors of the evaluation acknowledge. Until more reliable evidence is available it would not seem possible to tell if the "success" with the low dilution of infant formula is real, whether it is different from the dilution of milk or other "natural" products, or whether it could be increased by preparing products with even more specific "images," as the LBA-UNICEF evaluation suggests.

It is not necessary to adopt the extreme position of the PROAB, i.e. assisting the entire family without being concerned about specific members, to reach the conclusion that this emphasis on dilution is quite simply a mistake. There are three reasons for saying this. First, the implicit criterion of zero dilution runs completely counter to the way in which the family as a social unit normally functions. All the statistical and anecdotal evidence indicates that the family will distribute any marginal benefit among its members in the same way as it distributes hardship when sufficient food is not available. To say this is not to assert that the "natural" intrafamily distribution is optimal, or that it should not be changed through educational efforts, if for example it is observed that the small children tend to be poorly fed. But it is simply unreal to adopt as a benchmark a situation in which none of the benefit at all goes to family members not designated as "vulnerable."

Second, and even more important, the objective is that the entire family should eat better, whether or not this involves a special focus on certain members. To ask whether some other family member has consumed the donated food is misguided; the right question is: what was the net additional consumption of the designated family member, or of the family in general? It does not make much sense to be concerned about the distribution of a small part of total consumption--in the PCA, only 20 percent of needs, and probably not more than 25 or 30 percent of the total intake--without knowing what is going on as regards the family's food purchases. Here the only difference between using blends and traditional foods lies in the perhaps better composition of the blends--but this only means that the focus should not be on the number of grams of food consumed but on the specific nutrients going to each family member.

Finally, if the ultimate objective of the program is better health for its beneficiaries, it would be more worthwhile to measure this directly. If health is not very closely associated even with total food consumption (because of poor hygiene and diarrheas and other diseases), it is even less associated with the marginal consumption provided by an assistance program. To focus on dilution is a very inefficient way of drawing inferences about health, and it has the additional disadvantage of excluding from consideration the possible non-food-related determinants of malnutrition discussed in section 2.3. Nonetheless, when it is observed that a particular child (or pregnant woman or nursing mother) participating in the program has a health problem (for example, is losing or no longer gaining weight), it would be worth investigating the intrafamily distribution of the supplement as one of the possible causes. This approach is obviously valid even for a family not participating in a program targeted at specific members.

### 6.3 Anthropometric Results: Weight at Birth

It is much easier to measure the height of a child, or to weigh it, than to estimate the quantity and variety of the food it consumes. The results are also more directly related to its state of health at the time of measurement, or to the cumulative impact of its health in the past. It is therefore natural that great efforts have been made, via anthropometry, to evaluate the results of the food assistance programs. These efforts have taken two forms: measuring the impact on the infant's weight at birth when the mother received a food supplement during pregnancy, which is discussed in this section; and studying the effects on the physical growth of the children after birth, which is discussed in section 6.4.

As regards weight at birth, an evaluation was made of the PNS relating to 1976-1978 (INAN 1978b) and one of the PCA for 1984 (LBA Foundation 1985a). The former studied a total of 1,763 births in the city of Salvador, and the latter 36,105 births in the states of Ceará and Rio de Janeiro. The differences in time and in the populations studied make any direct comparison between the two evaluations difficult, since neither recorded any information about family income or composition, medical history or other possibly pertinent factors. In qualitative terms both studies indicated improvements in the weight distribution of the newborn infants, but in numerical terms the results are rather dissimilar.

Table 27 contains the findings for the PNS. A study was made of 859 births by mothers who had received food under the program during their pregnancy, of which 658 had been beneficiaries for three months or more. A control group was used consisting of 904 mothers whose children had been born in 1974-1975, before the PNS was introduced in Bahia. Thus the two groups of births do not coincide in time, but the assumption made by the authors of the evaluation, namely that these first 904 births were representative of the population subsequently served by the program, seems reasonable. (It might have been more difficult to find a proper control group in 1976-1978, because the program was aiming to reach the entire eligible population of Salvador).

TABLE 27

WEIGHTS OF LIVE BIRTHS TO A GROUP OF 904 MOTHERS NOT BENEFICIARIES OF  
THE PNS AND A GROUP OF 859 PROGRAM BENEFICIARIES, 658 OF WHOM PARTICIPATED  
FOR MORE THAN THREE MONTHS: SALVADOR, 1974-75 AND 1976-78

Weight at birth (g)	Number of Births	Total	Percentage distribution by age of mother in years				
			under 20	20-24	25-29	30-34	35 and older
2,500 or less							
Nonbeneficiaries	136	15	18	15	12	16	13
Beneficiaries: Total	129	15	18	9	16	21	10
For 3 months or longer	72	11	17	8	13	13	8
2,501 - 3,000							
Nonbeneficiaries	316	35	47	33	30	33	26
Beneficiaries: Total	223	26	38	33	20	21	26
For 3 months or longer	112	17	27	26	15	14	12
3,001 - 3,500							
Nonbeneficiaries	316	35	28	38	38	26	40
Beneficiaries: Total	309	36	31	39	39	33	35
For 3 months or longer	257	39	39	42	37	37	40
Over 3,500							
Nonbeneficiaries	136	15	7	14	20	25	21
Beneficiaries: Total	198	23	13	19	25	25	29
For 3 months or longer	217	33	17	24	35	36	40
Total Births							
Nonbeneficiaries	904		208	307	199	99	91
Beneficiaries: Total	859		69	223	215	215	137
For 3 months or longer	658		*	*	*	*	*

Source: INAN 1978b, Tables 2A and 10-13.

\* Data incomplete in the source.

The most useful comparison in the table is that between the nonbeneficiaries as a whole and the number of women who received food for three months or more, since the total number of beneficiaries may include some who participated for a few weeks only, on whom the program could not be expected to have much impact. The proportion of babies born weighing 2,500 grams or less fell from 15 percent to 11 percent, and there was a reduction from 35 percent to 17 percent in birth weights between 2,500 and 3,000 grams. At the other extreme, the proportion of babies weighing 3,500 grams or more at birth rose from 15 percent to 33 percent. Two aspects of these results deserve special attention. First, the overall change in the distribution is relatively large: no less than 22 percent of the births seem to have moved from below 3,000 grams to more than that figure. Second, the reduction in the frequency of low weight at birth is concentrated--both in terms of absolute percentages or relative to the percentage in the control group--in the 2,500 to 3,000 grams band. It seems easier to improve this part of the range than to affect the seriously underweight births of less than 2,500 grams, which are the most disturbing ones. This difference between the results in these two weight bands is particularly striking for mothers who were less than 20 years old when giving birth. However, when the mothers are differentiated by age the samples become too small for reliable comparisons, especially at either end of the age range.

In surveying births, the study in Bahia did not include pregnant women who abandoned the program before giving birth. Even with this limitation, only 77 percent of the mothers studied participated in the PNS for three months or more; if the dropouts are included this figure would certainly be lower. An almost contemporaneous study in Sao Paulo (Kalil *et al.* 1984b) found that of 3,992 pregnant women enrolled in a powdered milk distribution program prior to the establishment of the PNS, 1,300 left because they gave birth, had an abortion or proved not to be pregnant--and no fewer than 518 women simply abandoned the program. In other words, they did not show up to receive the supplement for two consecutive months. The study also confirmed that the women tended to register relatively late in their pregnancy, and that even when they enrolled at a fairly early stage they often missed the distribution for one or more months. The reasons for the low participation were not investigated.

The results of the PCA evaluation in the states of Rio de Janeiro and Ceará are given in Table 28. In this case the samples are much larger, and the control group (nonbeneficiaries under the program) was contemporaneous with the study group. The beneficiaries were not differentiated according to the length of their participation, so that in theory they are comparable with the total of beneficiaries in the PNS evaluation.

In contrast to the PNS evaluation, the total change in distribution of weight at birth is relatively small, but it is concentrated in the band of 2,500 grams or less. Overall, the PCA seems to reduce the frequency of very inadequate birth weight by 1.6 percent, and to increase the frequency of birth weights over 3,000 grams by 2.2 percent, with a reduction of only 0.6 percent in the middle band. Some of the distinguishing features of the PCA in relation to the PNS may possibly influence this difference--in particular, the portions of food distributed are small but better balanced in micro-nutrients,

TABLE 28

WEIGHT AT BIRTH OF INFANTS ASSISTED BY THE PCA, ACCORDING TO WHETHER THEIR MOTHERS PARTICIPATED IN THE PROGRAM DURING THEIR PREGNANCY, RIO DE JANEIRO AND CEARÁ, 1984

Weight at Birth (g)	Rio de Janeiro		Ceará		Total, Both States	
	Number	Percentage	Number	Percentage	Number	Percentage
2,500 and lower						
Nonbeneficiaries	1,467	10.3	850	11.1	2,317	10.6
Beneficiaries	624	8.3	647	9.8	1,271	9.0
2,500-3,000						
Nonbeneficiaries	3,878	27.1	1,701	22.2	5,579	25.4
Beneficiaries	1,997	26.5	1,513	22.8	3,510	24.8
Over 3,000						
Nonbeneficiaries	8,941	62.6	5,119	66.7	14,060	64.0
Beneficiaries	4,904	65.2	4,464	67.4	9,368	66.2
Total						
Nonbeneficiaries	14,286	100	7,670	100	21,956	100
Beneficiaries	7,525	100	6,624	100	14,149	100

Source: LBA Foundation 1985a, Tables 24 and 25.

and the food supplement seems to better integrated with medical care. Both factors could have accounted for the fact that the improvement in birth weight is concentrated at the lower extreme and not in the 2,500 to 3,000 grams band. However, any impact caused by the differences between the two programs could easily be outweighed by differences in the population in the locations studied, the economic situation of 1976-78 as against that of 1984, or the distribution by age of the beneficiary mothers. The possible significance of changes in the economic situation is suggested by Zisman (1987), who found a tendency for low birth weights to increase in Recife between 1976 and 1984; the proportion of babies in the low-income group who weighed 2,500 grams or less at birth rose from 7.8 percent to 14.8 percent during that time. No data were obtained regarding the participation of the mothers in food supplement programs or on the economic situation of their families.

#### 6.4 Anthropometric Results: Physical Growth

Even more attention has been given to measuring the physical growth of children, generally those more than six months old, than to the attempts to estimate the effects of food assistance on weight at birth. Unlike the analysis made of births, no control groups have been used in this kind of evaluation because it was not regarded as right to monitor the growth of the poor child without providing any food supplement. Evaluations have been made of the PNS, PCA and PINS. The LBA carried out an anthropometric analysis of 1,086 children in the Federal District (LBA Foundation 1979), and these data were re-analyzed as part of the evaluation of the PCA (LBA Foundation and UNICEF 1982). Salomón (1978) also analyzed PCA data in the Federal District, but his report does not explain the size, composition or selection of the sample, and almost all the results are provided in aggregate and graphic form. A large number of pregnant women were also studied, but the physical data--weight at birth--were not measured directly but requested from the mother, making the information rather unreliable. The PNS was the subject of a very extensive anthropometric analysis by Rios (1981) using data on 4,041 children (or a subsample of these) assisted by the program in Bahia in 1976-80. In this case no information was obtained on pregnant women and births, but stature as well as weight at birth was measured for 1,989 children. There are also anthropometric analyses covering a shorter period (1976-78) relating to 1,738 four-year-olds (INAN 1978b), who presumably are among the children studied by Rios, and therefore are not included here. Finally, a study was made of the growth of 7,040 children assisted by the PNS during the first two years of the program (1980-82) in the state of Sao Paulo (Lerner *et al.* 1985a). Some 2,540 of these children were studied during the first six months of the program (Chaves 1984).

There is no anthropometric analysis of the effects of the PROAB, but it should be possible to assess its results through those of the PINS, which was studied in detail. The general evaluation report on the PINS (Cavalcanti *et al.* 1980, Chapter 5) contains data on only 29 children, too small a number on which to base any judgment. This occurred because the analysis of the large mass of measurements obtained in the project was interrupted from 1982 to 1985; some early tables of results were consulted for purposes of drawing preliminary conclusions (Knight 1982, p. 6), but the author was only able to complete his report later (Nunes da Silva 1985). The data relate to 8,452 children weighed at the start of the experiment, 7,914 after one year and

7,364 at the end of the second year. However, only 6,920 children were measured twice with an interval of 12 months, and only 5,329 with an interval of 24 months. The discrepancies are explained by children whose families abandoned the program before they were one (or two) year(s) old, and by the children born during the interval to the participating families.

The fact that the PINS registers the family and not the individual child means that among its beneficiaries are infants under six months old, which is the minimum age for beneficiaries of the donation programs. The tables pertaining to the PINS unfortunately do not distinguish between infants under six months and those between six and twelve months. There are other differences in the programs and among the methods of their evaluators, all of which complicate the comparison of their results. First, the analysis of the PINS includes children up to six years old, while the studies of the PCA and PNS were limited to children who were under three at the time of entering the program. In the analysis of the PINS it is not always possible to separate those who were three years old or less. Second, the PCA beneficiaries were studied for only six months, those of the PINS for twelve and/or 24 months, and those of the PNS (in Bahia) for varying intervals, grouped by Rios (1981) into six to 24 months and 24 to 48 months, while the Sao Paulo studies covered periods of 6 months (Chaves 1984) and 24 months (Lerner *et al.* 1985a). Third, the PCA data do not differentiate the children by age; the PINS data distinguish them by age at the initial moment and the two final moments; and the PNS data discriminate by initial age, but--given the variable period of assistance--not by final age. Lastly, the PCA and PNS studies always involve a constant number of children, while the PINS data are partly of this type and partly refer to a non-constant sample, owing to births, death and withdrawals.

All these evaluations contain information on weight for age, this being the only datum available in the case of the PCA. The information system recently established for this program (LBA Foundation 1985?b) will in future permit longitudinal analysis of the children benefited, but up to now the only available data relate to their status on entering the program (LBA Foundation 1985a). For the PNS and PINS there is some additional information on the stature of a subsample of the children; this was analyzed further in the case of the PNS. The report on the PINS breaks down the results according to the four subsidy models, which ought to make it possible to relate the level of subsidy (and the inclusion or otherwise of health care) to the anthropometrical results. Unfortunately, the families included in the various models do not seem to have been representative of the entire population studied; those in model A, for example, were the poorest, in addition to receiving the largest subsidy. This probably explains the strange result obtained by Nunes da Silva (1985), namely that the largest subsidy is associated with the poorest results in terms of the weight and stature of the children. For this reason the analysis here is limited to the ensemble of four models. It should be noted that for purposes of measuring results in terms of physical growth, none of the programs was analyzed through comparisons with a non-participating control group, unlike the evaluation of weight at birth discussed in section 6.3. Rios (1981, Chapter 4) did compare beneficiary children with their own brothers, but in this case the children were necessarily of different ages. Furthermore, the distribution of food within the family largely wipes out the distinction between a beneficiary and nonbeneficiary child.

Table 29 shows the nutritional status (weight for age) of the 1,086 children studied in the PCA, the 4,041 studied in the PNS in Bahia, and the 4,117 beneficiaries of the PINS under three years old (the older ones being excluded), at two or three moments in the program. The data on the PNS in Sao Paulo are excluded because they do not discriminate by age. All three programs seem to have managed to reduce the prevalence of moderate and severe malnutrition (grades II and III). This reduction is striking for the donation programs--from 5.2 percent to 2.8 percent for the PCA and from more than 20 percent to less than 12 percent for the PNS. On the other hand, the PINS only reduced these same categories from 13.4 percent to 11 percent. This relative success also emerges from a comparison of the changes in the proportion of children of normal weight for their age. This rose from 60 percent to 71 percent for the PCA, and from 37 percent to 45 percent or 42 percent for the PNS; it hardly changed for the PINS beneficiaries, rising from 50 percent to 51.6 percent in the first year and then falling to 48.7 percent.

This comparison suggests that a donation program is more effective than a subsidy in reducing malnutrition among small children. If correct, this conclusion does not appear to be the result of initial differences in the distribution of the nutritional status of the children served by one type of program or another. It is true that the group assisted by the PCA included very few cases of serious malnutrition, and 60 percent of normal children; but the worst initial status distribution occurred not in the subsidy program but in the PNS, another donation program. However, the comparison presented in Table 29 refers to all children initially under three years old, and a closer analysis by ages suggests that the differences--and the difficulties of improving nutritional status in any program--are concentrated among infants less than twelve months old. This question will be discussed in more detail in section 6.5. There may be a reflection of this in the table, since both for the PNS and PINS the proportion of normal children is somewhat lower when the participation period is longer. The group of children assisted for more than 24 months by the PNS necessarily includes the youngest ones because a child could not stay in the program after reaching the age of six. Something similar happened with the PINS, because in the two-year period more children were born than in the first year.

Table 29 shows the total number of children in each nutritional category at different moments in time; if one child's status improves while that of another deteriorates, the net effect is zero. Table 30 corrects this limitation by presenting the matrix of individual transitions between one nutritional status and another. The PCA and PNS data describe the same 1,086 and 4,041 children, respectively, already referred to. By contrast, the PINS data relate to all the children under six (not just those under three) who remained beneficiaries for an entire year (4,853 cases) or for two years (3,353 cases). For the PNS only, the table also indicates the results for a subsample of 1,989 children whose stature was also measured, thus enabling weight to be related to height and height to age. Most of these children participated for less than two years, being in most cases older than the total group of 4,041 children. The analysis by Nunes da Silva (1985, pp. 18-22) of the PINS also includes the comparisons of height with weight and age, but it does not record the individual transitions or differentiate by age group.

TABLE 29

NUMBER OF CHILDREN INITIALLY AGED UNDER THREE, ACCORDING TO INITIAL  
AND FINAL NUTRITIONAL STATUS (WEIGHT FOR AGE), BY PROGRAM  
AND DURATION OF PARTICIPATION

1976-1980

	Normal	Degree of Malnutrition			Total
		I	II	III	
PCA, Brasilia, 1978: beginning	651	378	57	-	1,086
6 months	771	285	30	-	1,086
PNS, Salvador, 1976-80: beginning	1,512	1,698	678	153	4,041
6-24 months	912	860	218	22	2,012
24-48 months	844	951	219	15	2,029
PINS, Recife, 1978-80: beginning	2,058	1,507	478	74	4,117
12 months	1,900	1,379	357	46	3,682
24 months	1,598	1,316	328	37	3,279

Sources: LBA Foundation and UNICEF 1982, p. 7.25; Rios 1981, Tables 2, 47 and 48; Nunes da Silva 1985, p.17.

Table 30

CHANGES OBSERVED IN CHILDREN PARTICIPATING IN THE PCA, PNS OR PINS,  
ACCORDING TO ANTHROPOMETRIC MEASUREMENTS AND DURATION OF PARTICIPATION,  
1976-1980

NUTRITIONAL STATUS BEFORE	NUTRITIONAL STATUS AFTER				CHANGE OF STATUS		
	Normal	Degree of malnutrition			None	Improved	Worsened
I		II & III	Total				
<u>1. Weight for age (Gomez Classification)</u>							
PCA (6 months)							
Normal	589	56	6	651	589	-	62
Malnourished I	170	196	12	378	196	170	12
II & III	12	33	12	57	12	45	-
Total	771	285	30	1,086	797	215	74
PNS (6-24 months)							
Normal	693	203	7	903	693	-	210
Malnourished I	198	509	66	773	509	198	66
II & III	21	148	167	336	135	197	4
Total	912	860	240	2,012	1,337	395	280
PNS (24-48 months)							
Normal	480	121	8	609	480	-	129
Malnourished I	296	558	71	925	558	296	71
II & III	68	272	155	495	113	376	6
Total	844	951	234	2,029	1,151	672	206
PINS (12 months)							
Normal	2,261	849	48	3,158	2,261	-	897
Malnourished I	477	2,141	248	2,866	2,141	477	248
II & III	36	350	510	896	451	426	19
Total	2,774	3,340	806	6,920	4,853	963	1,164
PINS (24 months)							
Normal	1,636	843	65	2,544	1,636	-	908
Malnourished I	467	1,456	224	2,087	1,456	407	224
II & III	55	333	310	698	261	426	11
Total	2,098	2,632	599	5,329	3,353	833	1,143
<u>2. Weight for height</u>							
PNS (6-24 months)							
Normal	985	63	6	1,054	985	-	69
Malnourished I	145	34	9	188	34	145	9
II & III	31	20	13	64	7	56	1
Total	1,161	117	28	1,306	1,026	201	79

(Table 30, pg. 2)

NUTRITIONAL STATUS AFTER	NUTRITIONAL STATUS BEFORE				CHANGE OF STATUS		
	Normal	Degree of malnutrition		Total	None	Improve	Worsened
		I	II & III				
PNS (24-28 months)							
Normal	450	32	6	488	450	-	38
Malnourished I	128	26	2	156	26	128	2
II & III	35	4	-	39	-	39	-
Total	613	62	8	683	476	167	40
3. <u>Height by age</u>							
PNS (6-24 months)							
Normal	303	210	72	585	303	-	282
Malnourished I	58	209	146	413	209	58	146
II & III	18	65	225	308	152	114	42
Total	379	484	643	1,306	664	172	470
PNS (24-28 months)							
Normal	125	89	17	231	125	-	106
Malnourished I	70	110	44	224	110	70	44
II & III	30	64	134	228	91	118	19
Total	225	263	195	683	326	188	169
<u>Programs</u>	<u>Location</u>	<u>Dates</u>	<u>Initial age limit</u>	<u>Sources</u>			
PCA	Brasília	1978	3 years	LBA Foundation and UNICEF 1982, p. 7.25			
PNS	Salvador	1976-80	3 years	Rios 1981, Tables 47, 48, 51, 52, 53 & 54			
PINS	Recife	1978-80	6 years	Nunes da Silva 1985, pp. 23 & 25			

As can be seen, in the PCA more than half the children started with a normal weight for their age, and almost all of them remained normal, with 62 deteriorating over the 6-months period, six seriously. Of the 435 initially underweight children, 208 stayed in that category, 215 improved (almost all them moving from first-grade malnutrition to normal) and only 12 worsened. The total number of seriously malnourished children fell by almost half, this being the largest relative change; but the transition from slightly malnourished to normal is the most frequent change in absolute terms. In all, almost three times as many children improved as deteriorated.

Among the children assisted by the PNS for a period not exceeding two years the incidence of loss of normal status was higher, and the proportion of initially malnourished children whose weight for age improved was smaller. Nonetheless, those who improved outnumbered those whose status worsened. The results were a great deal better for children participating over a longer period (between two and four years), these generally being younger when they entered the program. For this group, the improved/deteriorated ratio was the same as for the PCA, or 3:1. It should also be noted that the improved/unchanged ratio was the same as for the PCA for the first group (6-24 months), and better--almost double--for the second group (24-48 months). The major difference between the two analyses, therefore, is the number of children whose nutritional status deteriorated.

In the PNS, those who deteriorated generally started out slightly malnourished (grade I), but in the PCA there was little deterioration in this group, and larger losses among those initially normal. In all, those who deteriorated were seven percent in the PCA and 12 percent in the PNS (14 percent among the short-period beneficiaries and ten percent among those participating for more than 2 years).

It is worth pointing out that the PCA results were obtained from a smaller donation of food than that provided by the PNS, although the latter was not the full 40 percent of needs that it should have been but closer to one third (Rios 1981, p. 60). This suggests either that in the PCA the focus on the children studied was more intense, or that the assistance was more regular, or perhaps merely that 20 percent of calorie requirements was sufficient to change the nutritional status of the typical beneficiary child assisted because its calorie deficit was not very large. If this last factor was significant it may be due to a better family income situation in the Federal District than in Bahia, where a similar nominal income (in terms of the minimum wage multiples, corrected for general inflation) in practice means a smaller food purchasing power.

The results for the subsidy program, the PINS, are consistently worse. First, the cases in which nutritional status deteriorated were more numerous than those in which it improved, over any assistance period. Second, this was due not only to the fact that losses were more numerous, but also to a smaller proportion of gains. Finally, it is noticeable how many initially normal children ended up slightly malnourished. It should, however, be noted that all these comparisons refer only to weight for age, without taking into account the child's height; a child who is underweight for his age may nonetheless be of normal weight for his height, if this is also below normal for his age. Regarding these two measurements (parts II and III of the table), individual information is only available for the PNS.

Although the PNS was able to improve weight for age, and weight for stature, there was no net positive effect as regards height for age. Cases of low weight in relation to height almost disappeared while the program operated, especially as regards serious malnutrition, but the number of children small for their age increased, especially among those who spent less time in the program because they were already older when they entered. Even when it started earlier, the diet supplement was not enough to bring about more cases of improvement than deterioration; and among the late starters the program could do little to combat chronic malnutrition. Its main impact, and the same can be expected to be true of the PCA, is on acute malnutrition measured by weight. The overall results for the PINS, shown in Table 31, are consistent with part of the picture observed for the PNS but not all of it. While the incidence of low weight for height greatly declined in the first year, its frequency then more than doubled for grades II and III, and increased 57 percent for slight malnutrition. In terms of proper weight for height, there was a sharp reduction in serious cases (grades II and III), more than offset by a significant increase in the number of cases of mild malnutrition.

Unfortunately, none of the evaluations controlled for family income--or its fluctuations, which may have been considerable over a period of two years or more--or for diseases affecting the children studied. Apart from differences in the general income level of the target populations, mentioned earlier in comparing Brasflia with Salvador, there is the problem of the deterioration in income in the period 1976-80. This could have particularly affected the population of Recife, studied in the PINS, and may explain the worsening of various indicators during the second year of the experiment. If no similar deterioration over time is recorded for the PNS, this may be due to the fact that the data are broken down by duration of participation in the program and not by the calendar date; the children assisted by the PNS entered and left the program according to their ages, which was not the case with the PINS.

These borrowings from the analysis by Rios (1981) do not do justice to the depth of her evaluation; they merely present some basic results that can be compared, with limitations, to those of the other programs. The lack of basic information on the PCA has been partly offset by an imaginative exercise that uses the data to explain weight gains in terms of the characteristics of the child, the family and program attendance (LBA Foundation and UNICEF 1982, pp. 7.5-7.7). As a dependent variable in a linear regression a binary variable was used that distinguishes between normal or above-normal weight gain and sub-normal gain, separate equations being calculated by age group. As one would expect, the initial weight relative to the normal has a large impact on subsequent gains. Also exercising an effect, although not with much statistical precision, are age, sex, diseases and vaccinations and the total number of children in the family. The results are not very decisive as regards program-related effects but suggest a positive impact for participation in the PCA and a negative impact for intra-family dilution of the vitamin compound, the blend specifically designed for children from one to three years of age. It was not possible to incorporate family income, total family food consumption, or the net additional consumption resulting from the program. Perhaps the most interesting result is the demonstration of the great importance of diseases, which strengthens Shrimpton's (1984) argument regarding their role in malnutrition.

TABLE 31

NUMBER OF CHILDREN INITIALLY AGED UNDER SIX PARTICIPATING IN THE PINS,  
 ACCORDING TO INITIAL AND FINAL NUTRITIONAL STATUS, BY ANTHROPOMETRIC  
 CRITERIA AND DURATION OF PARTICIPATION, 1978-80

	Normal	Degree of Malnutrition			Total
		I	II	III	
<b>Weight for age</b>					
Start	3,658	3,545	1,027	122	8,452
12 months	3,547	3,473	813	81	7,914
24 months	3,212	3,340	755	57	7,364
<b>Weight for height</b>					
Start	6,788	1,380	202	77	8,447
12 months	6,600	1,228	149	37	8,014
24 months	4,967	1,930	389	78	7,354
<b>Height for age</b>					
Start	5,312	1,286	1,411	341	8,350
12 months	5,412	1,131	1,187	275	8,005
24 months	4,516	2,166	447	226	7,355

Source: Nunes da Silva, 1985, pp. 16, 18 and 20.

On the basis of these results, the evaluation of the PCA calculates the typical cost of ensuring that a child gains weight normally, when this would not have happened had the program not existed. The calculation (LBA Foundation and UNICEF 1982, p. 7.24)--much influenced, right from the start, by the large number of normal children in the sample--puts the total cost of maintaining normal weight gain for six months at Cr\$8,000 (1980) and for a full year at Cr\$21,000; the second figure is more than twice the first because it includes the interval between seven and 12 months in which delays in gaining weight are most frequent. To ensure improved nutritional status for a child assisted for six months costs, according to similar calculations, Cr\$14,300. These amounts correspond (refer again to Table 11) to 70, 186 and 128 kg, respectively, of food distributed by the program.

In light of such high costs, the evaluators recommend restrictions on the distribution of food and propose that an anthropometrical criterion be introduced to govern entry into the program. There is no doubt that this would increase the number of cases of improvement, because in programs of this kind the most notable benefits are typically obtained by the entrants with the worst nutritional status. This has been observed in the PNS and has been quantified for a very similar program which assists pregnant women, mothers and young children in the United States (Kotelchuck *et al.* 1984). This suggests that a program should be evaluated not merely in terms of its average results, but that special attention should also be paid to what happened to the neediest cases. However, to convert this idea into the exclusion of the not-yet-malnourished would be to go from an essentially preventive and non-clinical program to one with a frankly curative emphasis. This does not seem to have been the intention of any of the programs under consideration.

The analyses contained in Tables 30 and 31 classify the children according to the duration of the assistance, i.e. the number of months for which a child was registered in a program (or his family, in the case of the PINS). For the PNS and PCA this variable is linked with the number of times that the mother obtained the food supplement. However, it does not measure this frequency directly, because the mother may have missed on a number of occasions over a period of a year or two without being excluded from the program. It is therefore worth investigating whether there is any link between the actual frequency of benefits obtained and changes in nutritional status.

The study of the PNS in Sao Paulo (Lerner *et al.* 1985a) observed a group of 7,040 children over a fixed period of two years, starting with the introduction of the program in that state, and classified them according to the number of times the supplement was collected. The combined results for two municipalities and all age groups are shown in Table 32. As in Table 30, the individual transitions are shown. At first sight, there seems to have been no effect associated with frequency; the distribution among stable, improved and worsened for each initial nutritional status seems to be independent of the number of visits.

If the children are classified down by their initial nutritional status, there is for both the normal and slightly malnourished children some statistically significant association between the frequency of visits and the final nutritional status. However, it is not unidirectional--the distribution

TABLE 32

CHANGES OBSERVED IN CHILDREN PARTICIPATING IN THE PNS IN TWO MUNICIPALITIES  
IN SAO PAULO, MARCH 1980-APRIL 1982, ACCORDING TO FREQUENCY OF VISITS TO RECEIVE FOOD  
(NUTRITIONAL STATUS MEASURED AS WEIGHT FOR AGE, GOMEZ CLASSIFICATION)

NUTRITIONAL STATUS BEFORE	NUTRITIONAL STATUS AFTER Grade of Malnutrition			CHANGE OF STATUS			
	Normal	I	II & III	Total	None	Improved	Worsened
<b>Fewer than 6 visits</b>							
Normal	271	114	9	394	271	-	123
Malnourished I	84	199	57	340	199	84	57
II & III	20	56	83	159	76	79	4
Total	375	369	149	893	546	163	184
<b>6 to 11 visits</b>							
Normal	1,188	342	30	1,560	1,188	-	372
Malnourished I	184	641	143	968	641	184	143
II & III	22	119	132	273	117	149	7
Total	1,394	1,102	305	2,801	1,946	333	522
<b>12 to 17 visits</b>							
Normal	713	261	31	1,005	713	-	292
Malnourished I	170	473	105	748	473	170	105
II & III	29	99	100	228	87	137	4
Total	912	833	236	1,981	1,273	307	401
<b>18 or more visits</b>							
Normal	506	166	21	693	506	-	187
Malnourished I	131	327	62	520	327	131	62
II & III	20	60	69	149	61	84	4
Total	657	553	152	1,362	894	215	253

Source: Lerner et al. Tables 1-4.

of final status does not always improve with more visits--and it is very weak. Among the slightly malnourished, the ratio of improvements to deteriorations does improve in line with more regular food supplements, when six or more visits were made during the two years. There is no relationship for the moderately and severely malnourished, which is rather surprising in view of the tendency of the programs to be more successful in curing these levels of malnutrition.

There was a marked difference between the two municipalities studied in the distribution of the ages of the children. In view of the tendency for nutritional deterioration to appear during the second year of the child's life, one might have expected that a differentiation between the municipalities would have revealed a clearer association in at least one of them; but this does not happen--there is no significant association.

If all the beneficiary families were equally needy and if their circumstances did not change during the period of assistance, it would be very strange not to find any association between the amount of the food supplement received and changes in nutritional status. Part of the explanation for the lack of any such association may lie in the differential abandonment of the program; the mothers who stopped receiving the supplement frequently gave as their reason that they did not need the food (Kalil 1984a). If the less poor families, or those whose economic situation improved, made less frequent visits this would be enough to explain the result obtained.

As Table 32 shows, there was a small but general deterioration in the nutritional status of the children during the two years, with more cases of decline than of improvement. This was not the case during the first six months of the PNS in Sao Paulo; observation of 1,046 children in four municipalities--including the two studied for two years--showed an increase in the number of normal children in three municipalities and a decline in all grades of malnutrition (Chaves 1984, Table IV). However, the fourth municipality showed a deterioration from normal to slight malnutrition, and this municipality was responsible for almost 60 percent of the cases studied. The general economic deterioration between 1980 and 1982 may also have had an effect; during this period Brazil began to feel the effects of adjustment to the economic crisis. Neither the possible influence of economic changes nor that of diseases was taken into account in the study.

To sum up, the two donation programs have shown they are capable of improving the weight of children who are underweight for their age or height, and hence of improving their nutritional status. The main limitations on this achievement are three:

- the large number of normal children, which is a problem in terms of the cost per child improved. It must be stressed, however, that the programs may be responsible for keeping some of these children in a normal condition and that therefore their achievement is greater than the mere number of positive changes.

- the small or zero impact on the stature of the children assisted. This is not a failing if a "small but healthy" child is regarded as an acceptable result for the program, but it does seem to indicate that the additional quantity of food consumed and/or the duration of the assistance are inadequate to produce more profound changes.
- the deterioration in the condition of some children. Insofar as this is due to a deterioration in the family's economic or social situation--a very frequent occurrence given the beneficiaries' unstable circumstances--it is beyond the scope of a food assistance program (although the LBA does target part of its activities at these problems). But to the extent that the deterioration reflects health problems not directly related to nutrition--diarrhea, respiratory infections, diseases preventable by vaccination--this result seems to indicate clearly that the integration of food assistance and health care activities, which is part of the ideology of both programs, has been insufficient. Likewise, if the deterioration is the result of poor intra-family distribution of food, the programs have failed in their education component.

It should be noted that the evaluations of the donation programs do not permit a clear verdict on whether the natural foods or the blends produce the best results, because the groups studied differed as regards their initial nutritional status and income, the amount of food donated and the regularity of their participation. A controlled comparison between soya "milk" and cows' milk with sugar (to provide the same calorie content) shows that there are no significant differences in the resulting growth (Costa *et al.* 1985) when all children start out normal, consume the ration under supervision, in order to eliminate intra-family dilution, and participate regularly. However, this comparison may be controlling precisely those factors which in practice would produce differences between the results of one program and another.

If the estimates that suggest that a subsidy produces a larger total food consumption are to be trusted, then it must be supposed that the PROAB would have very similar effects to the PNS and PCA. There may, nonetheless, be two distinctions favoring the donation programs as regards the anthropometric improvement of children. One is the total absence of health care activities in the PROAB. The other is that the milk substitute is supposedly the least "diluted" food in the PCA, and it can be assumed that the same is true of the powdered milk in the PNS. The fixed rations of these foods may perhaps--no direct measurements have been made on this point--favor the small child in comparison with the unrestricted purchases of food in the PROAB. Clearly, the net effect depends not only on the food provided but also on what happens to family purchases of food and their intra-family distribution.

The anthropometric evaluation of the PINS carried out by Nunes da Silva (1985) is the only source of information of that kind that enables inferences to be drawn about the effects of the PROAB. As in the case of Rios's work (1981), the analysis is much more detailed than the information used here would imply. Its results would suggest that a subsidy program is in fact somewhat less effective in producing satisfactory growth in a small child. As noted above, this conclusion is rather tentative in view of the

differences in the economic situation of the families studied and--probably more important--the methodological differences between one evaluation and another.

Nunes da Silva's analysis also includes an interesting hypothetical exercise to evaluate the PINS in the absence of a control group (1985, pp. 33-37). It uses the distribution of the children's nutritional status at the beginning of the program to define a specific "expected" pattern for each age group, in the absence of the program. Then, after 12 and 24 months of participation, it compares the observed weight for age distribution with the expected distribution by age group. The degree to which the observed distribution is better than the expected--more normal children and fewer malnourished ones--is interpreted as a measure of program impact as compared to what would have happened in its absence. The comparison reveals a clear but small reduction in moderate and serious malnutrition (from 16.6 percent to 11.7 percent in one year, and from 14.5 percent to 11.3 percent in two years), and an increase of two or three percent in the proportion of normal children. According to this calculation there are no losses or deteriorations other than a one percent increase in slight malnutrition; but the number of cases of improvement is surprisingly small. For this reason Nunes da Silva observes that although the program is intended to be essentially preventive, its greatest impact seems to have been curative, through the reduction in the incidence of moderate and severe malnutrition (1985, p. 41).

#### 6.5 Infants Under One Year: A Special Case

In both the PNS and PINS, the relatively poor anthropometric results seem to a significant extent to be due to the outcome in respect of children less than one year old. Table 33 presents the overall findings (without the changes in individual nutrition status) of the evaluation of the PNS in Bahia, for the three criteria and the two assistance periods shown. Taking the children as a whole, 20 percent improved in terms of weight for age up to two years' participation and 14 percent deteriorated. However, of the children entering the program aged between six and twelve months, 14.6 percent improved and 20 percent worsened--an outcome almost exactly opposite to the overall results. Of those participating in the program for more than two years, the global result showed 33 percent of children improving and ten percent deteriorating, as against 25 percent and 15.5 percent for the youngest age group.

The discrepancies are not very significant as regards weight for height, but are striking in relation to stature for age. Of the total number of children participating for less than two years, 13 percent improved and 36 percent deteriorated, but for those under one year old the figures were 5.7 percent and 50 percent respectively. The differences are smaller for children receiving assistance for two years or more, but the proportion of deteriorations increased from 25 percent to 30 percent, while those who improved fell from 27.5 percent to less than 20 percent. Summarizing her results, Rios (1981 p. 3) observed that there is a significant deterioration in both weight and stature in relation to age for the youngest age group. Children who were at least a year old on entering the program improved

TABLE 33

CHANGES OBSERVED IN CHILDREN PARTICIPATING IN THE PNS, INITIALLY BETWEEN  
6 and 12 MONTHS OLD, ACCORDING TO ANTHROPOMETRIC CRITERIA AND  
DURATION OF THEIR PARTICIPATION, 1976-1980

	Weight for Age	Weight for Stature	Stature for Age
Initial Distribution: Normal	822	734	521
Malnourished I	567	142	266
Malnourished II	205	43	108
Malnourished III	50	16	40
Total	1,644	935	935
Changes with 6-24 months participation: Total	992	644	644
None	651	504	285
Improved	145	101	37
Worsened	196	39	322
Changes with 24-48 months participation: Total	652	240	240
None	388	170	107
Improved	163	50	47
Worsened	101	20	86

Source: Rios 1981, Tables 2, 9, 12, 60, 62 and 63.

significantly in terms of weight for age and weight for stature, irrespective of the length of their participation. However, stature for age, an indication of chronic malnutrition, tends to deteriorate rather than improve among children less than two years old on entering the program.

The PINS results summarized in Table 34 relate only to weight for age, there being no breakdown by age group for indicators including stature. They show a relatively even worse situation for children under one year old. The proportion of deteriorations is 38 percent for one year's participation and 44 percent for two years, as against 16.8 percent and 21.4 percent, respectively, for all the children together. The differences are so large that they significantly affect the proportion of children maintaining their nutritional status unchanged: this falls by 16 or 17 percent if only the youngest children are considered. According to Kennedy and Alderman (1985, p. v), it is to be expected that a subsidy program, while it may be successful in protecting the total calorie consumption of the family as a whole, will not be a good vehicle for dealing with severely malnourished children. However, the PINS results suggest that it is not even a good way of maintaining the children's nutritional status, especially for the youngest group. The free food program, which identifies the individual client and provides foods supposedly earmarked for the child alone, seems more successful in this respect; but the large difference between infants and older children, and the relatively poor overall performance, is still surprising.

How can this disappointing result be explained? It must be noted, first, that the nutritional status of a child less than one year old is more likely to deteriorate than that of an older child, simply because he is more likely to enter the program with a normal weight for his age. Among the children studied in the PNS, half of those under a year old initially were of normal weight, as shown in Table 33, but this proportion fell to less than 30 percent for children between one and three years old. The prevalence of each level of initial malnutrition increased. The pattern among children participating in the PINS is partially similar--the proportion of normal children falls as the initial age rises, but goes on falling between two and three years of age until it reaches, for the older children, the 30 percent typical of the PNS. The other difference is that the proportion of serious malnutrition (grade III) does not rise, but instead falls a little.

This initial distortion in nutritional status can be allowed for if the analysis is limited to the children that were initially normal or to those initially underweight. In the former case, a comparison of Table 29 and Table 33 shows that during the first year of PINS participation, 79 percent of the children over one year remained normal. By contrast, of those less than one year old with the proper weight on entry, only 54 percent remained normal. Taking the first two years' participation in the program, the proportions are 74 percent for the older children and only 44 percent for those less than a year old.

The PNS data are not presented in such a way as to allow a comparison by age group of the initially normal children, but they do permit such comparisons for the other children, i.e. those who were initially suffering from some degree of malnutrition. The PINS data are also presented

TABLE 34

CHANGES IN WEIGHT FOR AGE OBSERVED IN CHILDREN INITIALLY UNDER  
TWELVE MONTHS, PARTICIPATING IN THE PINS, ACCORDING TO  
DURATION OF PARTICIPATION, 1978-1980

NUTRITIONAL STATUS BEFORE	NUTRITIONAL STATUS AFTER				None	CHANGE OF STATUS	
	NORMAL	I	II and III	TOTAL		Improved	Worsened
<b>One Year of Participation:</b>							
Normal	501	383	36	920	501	-	419
Malnourished I	46	173	84	303	173	46	84
II and III	8	47	56	111	56	55	-
Total	555	603	176	1,334	730	101	503
<b>Two Years Participation:</b>							
Normal	357	411	47	815	357	-	458
Malnourished I	50	169	75	294	169	50	75
II and III	14	56	34	104	24	78	2
Total	421	636	156	1,213	550	128	535

Source: Nunes da Silva 1985, pp. 23-26.

in this way: the results of the comparison are shown in Table 35. The probability that nutritional status will improve is always lower for the younger children in the PNS, but always slightly greater in the PINS; the difference is of the order of five percent or less. The two programs are totally consistent as regards the likelihood of deterioration when a child starts out underweight; this probability is greater if the child is initially less than a year old. Another significant comparison between the two programs involves the probability of this happening to the younger children, which is only some eight to nine percent for PNS clients, but around 20 percent among children whose families were participating in the PINS.

All these results lead clearly to two conclusions. First, in any kind of program, children less than a year old do not benefit, in terms of physical growth, as much as the older children. One is therefore quite justified in focusing on their situation as a special case, rather than assuming that the benefits will have the same anthropometric consequences regardless of age. Second, the donation program is more effective than the subsidy in providing benefits for the youngest children. Since this is true of a program which, like the PINS or the PROAB, uses natural foods, the result cannot be attributed simply to the use of blends specifically prepared for infants. However, the PNS uses a "natural" product--powdered milk--and as noted in section 6.1 this seems to be a product for which a subsidy does very little to stimulate consumption, but which is sensitive to direct transfers or increases in income. (The problem of the great dilution of powdered milk, referred to in section 6.2, may arise in both a donation and a subsidy program.) If this is the explanation, it would be very worthwhile to repeat the analysis made here of the PNS for the PCA, in order to determine whether, in comparison with the PINS, this program also benefits those under 12 months to a relatively greater extent. In that case, the price of the blend provided to the infants should be compared not with the prices of the other basic foods but with the price of milk, so as to determine which product is cheaper for the younger children.

Another possible explanation is that the crucial difference between the programs lies not in the transfer mechanism but in the presence or absence of medical care. This would be consistent with the evidence, discussed in section 2.3 above, that infant malnutrition is largely due to diseases, and that this factor is especially important in the second year of the child's life. The incidence of diarrhea and respiratory diseases is systematically higher in that year; after the second year the sickness rates all decline, to a greater extent for diarrhea than for the respiratory diseases (McAuliffe et al. 1985). The experience of the PINS could in theory help to evaluate this explanation, since two of its subsidy models (B and C) had the same subsidy but differed as regards the requirement for frequency of medical consultations for the children. The experiment also included a comparison of two PNS models (E and F) with the subsidy models. This part of the analysis could not be completed because of the cost of investigating the rural model of the PNS. Meanwhile the results obtained by Nunes da Silva (1985, pp. 24-25) suggest that model B (more frequent medical consultations) produced better results than model C in terms of the incidence of deterioration of nutritional status among infants under a year old. However, the interpretation of this finding is complicated by the higher dropout rate among families registered in

TABLE 35  
 CHANGES IN WEIGHT FOR AGE IN INITIALLY UNDERWEIGHT  
 CHILDREN PARTICIPATING IN THE PNS OR PINS, BY PROGRAM,  
 INITIAL AGE AND DURATION OF PARTICIPATION

	Normally	Improved Partially	Total Improved	No Change	Deteriorated	Total
<b>PNS, Participation 6 to 24 months</b>						
Age 6-12 months	82	63	145	263	41	449
12-36 months	137	113	250	381	29	660
<b>PNS, Participation 24 to 48 months</b>						
Age 6-12 months	81	82	163	179	31	373
12-36 months	283	226	509	492	46	1,047
<b>PINS, Participation 12 months</b>						
Ages 0-12 months	54	58	112	214	88	414
12-72 months	459	332	791	2,378	179	3,348
<b>PINS Participation 24 months</b>						
Age 0-12 months	64	64	128	193	77	398
12-72 months	398	307	705	1,524	158	2,387

Source: Rios 1981, Table 66; Nunes da Silva 1985, pp. 23-26.

model B, as mentioned in section 4.3 above. It is possible that two initially comparable samples ceased to be so because of this difference in the dropout rate.

Finally, the most important factor may simply be that small children are especially vulnerable family members, requiring additional care and food. The regular tendency for nutritional status to deteriorate between 6 and 24 months may be the result of ignorance as to how much food and of what type a child needs. This explanation emphasizes the educational effects of a donation program, which are entirely absent from a subsidy program. Since both this ignorance and the education to overcome it are highly specific to the case of the younger child, it is irrelevant whether the Brazilian diet in general is either adequate or rational. What works from a certain age upwards does not permit any inferences to be drawn as to whether the population assisted by donation or subsidy programs is equally educated and careful when it comes to the nutrition of the youngest children.

#### 6.6 Other Benefits for the Client

In principle, food donation or subsidy programs are capable of generating a number of benefits in addition to, or in place of, those of greater food consumption. These benefits may include additional non-food consumption, as a result of the income effect of the transfer; better health, as a result of more frequent medical care and regardless of whether the client eats more or not; and, as a consequence of these factors and/or the absence of hunger, more rapid mental and psychomotor development, better school performance, etc. The first of these benefits is generally regarded as a program defect by those who put special emphasis on the food benefit. There is good reason for this view as regards families who begin to enjoy the benefit in a non-food form while one or more family members are still suffering nutrition deficits. But once this deficit is made up, there is no reason not to receive part of the benefit in the form of consumption of other goods and services; this may even be necessary in order to take advantage of the effects on the child's health or development. It is also obvious that the use of anthropometric criteria, while appropriate for malnourished children at the start of their participation in the program, ignores the potential benefits for a normal child in terms of weight, stature or other physical measurements.

This being so, it is really extraordinary that until 1986 none of the evaluations of the PCA, PNS, PINS or PROAB had measured one or more of these potential additional benefits. The study by Salomón (1978) is a partial exception: it seems to have found that the PCA had a positive effect on the duration of maternal breastfeeding, but the evidence is very fragmentary. While it is true that the other effects are more difficult to measure than a change of weight or stature, they are no less accessible to observation than additional consumption of food. The lack of any direct estimate of collateral benefits seems to be due not to any intrinsic difficulties but to three other factors.

The first of these is ideological, in the sense discussed in Chapter 3 above. The LBA puts so much emphasis on the consumption of a specific food by a specific family member that it tends to belittle any other kind of

positive result. This virtual obsession is evident in the stress on intra-family "dilution," the importance attributed to the "image" of different foods, and in the effort, praiseworthy in itself, to quantify the cost of bringing about a change in nutritional status or of ensuring normal weight increases. What is notable about the PCA is that its ideology also insists on the importance of health care; the evaluation (LBA Foundation and UNICEF 1982, p. 7.23) indicates the real impact of diseases on weight increases--yet before 1984 no effort had been made to measure the effect of the program in terms of more frequent health consultations, lower incidence of diseases, or other health-related indicators.

For its part, INAN seems to be content if its programs achieve income transfers and does not concern itself much with estimating the effect of this transfer in terms of food consumption. This does not mean that malnutrition is unimportant in INAN's ideology; it merely underlines that the PNS and PROAB are largely regarded as elements in the fight against poverty, one of whose many manifestations is malnutrition. Since INAN belongs to the Ministry of Health, and the PNS operates through health posts, it is really remarkable that there has been no serious attempt to measure the medical results of the program. Perhaps this is partly due, as Coimbra (1985, pp. 102-103) suggests, to the fact that the PNS (and even less the PROAB) is not regarded by the Ministry as essentially a health program, in view of its more economic orientation and the participation of the CNRH in establishing it. Contributing no doubt to this attitude is the fact that the mandatory health consultations were, subsequently, the reason for the low participation and dissatisfaction of the families registered in model B of the PNS (Cavalcanti *et al.* pp. 166-168). Meanwhile, Ministry of Health officials tend to regard the PNS/PSA not as an essential part of their task of providing health care but as a program competing with these efforts, reducing the resources available for health in the medical sense, and complicating the task of health workers (Musgrove 1987).

The second factor is not as clear, but there seems to be in both institutions, INAN and the LBA, a conviction that the other potential benefits will occur more or less automatically. In the case of the PCA, the evaluation cited (LBA Foundation and UNICEF 1982, pp. 3.17-3.21) summarizes the literature on associated benefits observed or inferred in supplementation programs in other parts of the world, without any concern as to whether there are good grounds for expecting similar results to occur in Brazil. As regards the PNS, one must have reservations about the repeatedly expressed confidence that the rationality and common sense of the participating families will lead them to take maximum advantage of the benefits that the food assistance is making available to them. If a family already knows what foods it ought to eat and merely lacks sufficient income to adjust its consumption to this knowledge--the basic ideology of INAN, especially as regards its preference for traditional foods--why should it not also know how to take advantage of the other benefits permitted by an income transfer? In none of the institutions is there any sign of this rather ill-defined optimism being squared with the belief that the family must be taught how to use certain products (PCA), or about breastfeeding and using the medical system (PCA and PNS). This confidence emerges even more strongly in the new Milk Program, which is discussed in section 7.3. The idea of the "rational consumer" is almost essential to any analysis of observed behavior, since otherwise it is

difficult or even impossible to interpret what is observed (Timmer *et al.* 1983, pp. 35-36); but this does not make assumptions a good substitute for observation and evaluation. Furthermore, the consumer may be rational for certain purposes but not for others, as Rosenberg (1976) shows in relation to the consumer who is "efficient" in purchasing the nutrients he acquires, but not totally "sensible" in terms of which products to buy. Something rather similar may be occurring among the food and non-food benefits.

Third, it is notable that almost all the available evaluations have been made by nutritionists, whose professional interest is focused on physical growth and the nutritional status of beneficiaries. There has been little participation by other disciplines in these studies, especially those dealing with the PNS. This is merely another example of the extent to which, despite their ideology, the food and nutrition programs have tended to be isolated from the health care system and even more so from other public services such as education. The location of INAN within the Ministry of Health and the official participation of the Ministry of Education and Culture in the PRONAN have not been sufficient to overcome this limitation.

The evaluation of the PCA through the Integrated Child Assistance Project (Projeto Integrado de Atendimento à Criança-PIAC), begun in 1984, has entailed the collection of information on collateral benefits. The results for weight at birth were discussed in section 6.3; up to now no information is available on another possible effect of the program, namely the encouragement of exclusive breastfeeding for infants under six months old. The PIAC has also estimated the frequency with which the younger clients of the PCA are "absorbed" in other levels of health care, and has shown a significant increase in consultations (LBA Foundation 1985a, pp. 33, 39 and 77). It should be noted that this evaluation only counts the number of cases in which a child received attention as the result of its need for medical attention being detected through its participation in the program. The evaluation also noted an increase in the use of oral rehydration salts for domestic treatment of diarrhea. The number of cases of medical needs not being met is not known, nor is there any general evaluation of the children's health status. These limitations may be overcome in the future if the greater quantity of information generated under the program is combined with some sort of sampling of the population served.

#### 6.7 Production Incentives

According to the approach adopted here, the donation and subsidy programs are good or bad insofar as they succeed in improving the health of their clients through net increases in food consumption and direct health interventions. For those who designed the PNS and PROAB, however, there is the secondary but important objective of stimulating production and increasing the incomes of small producers of basic foodstuffs, especially in the North and Northeast of Brazil. This strategy of "closing the circle" between producer and consumer is, according to its proponents, one of INAN's most worthwhile innovations (Arruda 1980, INAN 1979-84), in that it combines an element of income redistribution with increases in the supply of farm products, thereby reducing relative food prices. (As noted in section 3.2, the PCA also aims to stimulate production, but in this case, given the focus on the formulated foods industry, there is no separate justification in terms of supply or income distribution.)

It is not the purpose of this study to evaluate the PROCAB, the mechanism by which food is purchased from the participating small producers and cooperatives. Two observations, one theoretical and the other empirical, will suffice. First, although the PNS and PROAB provide a market for these purchases, and the association between them and the PROCAB is useful, this link is neither necessary nor sufficient for the success of the PROCAB. Even if the assistance programs did not exist it could still be good agricultural-food policy to favor the small producer, using for this purpose the COBAL supermarket network and the small shopkeepers affiliated to the SOMAR Network. For their part, the PNS and PROAB must be justified or not by their direct results.

The empirical observation, summarized in Table 36, is that the PROCAB has not been able systematically to supply the needs of the assistance programs; it has been more successful for certain products typically produced by small farmers (beans, manioc) than for others (rice, sugar, maize), and the drought in the early years of this decade seriously affected total output in the Northeast. Nonetheless, for certain products, in one year or another, the PROCAB has been able to meet a large proportion of PNS and PROAB demand. The evaluation of the net benefit that this represents would require a separate study.

#### 6.8 Evaluation of the Evaluations

Among the many sources of pertinent information on the PNS, PCA and PROAB only a very small number can be regarded as evaluations in the sense that they are concerned to measure the consequences of the operation of a program or its results for its clients and supposed beneficiaries. A number of studies (Coimbra 1985, LBA Foundation 1985?a, INAN 1984a and b, INAN 1978b, IPEA 1981?a, Oliveira and Medeiros 1985, Nunes da Silva 1986) confine themselves to evaluating operational aspects, without going into an analysis of results. Others (Cavalcanti *et al.* 1981, Chaves *et al.* 1984, LBA Foundation 1979, Kalil *et al.* 1984a and b, Lerner *et al.* 1985a and b, Moldau *et al.* 1982, Rios 1981, Salomón 1978, LBA Foundation and UNICEF 1982, Nunes da Silva 1985), while they may deal with operational aspects, focus on estimating different impacts on the target population.

The evaluations referred to above vary greatly as regards the populations studied, the questions asked, and the methods used to answer them. Nonetheless, an examination of these investigations as a whole reveals a series of limitations affecting some or at times all of them. It seems worth summarizing these shortcomings and difficulties, with a view to improving future evaluations and ensuring that they have greater impact on the design and operation of and support for assistance programs. In any reference to the shortcomings of these evaluations, it is only fair to point out that some of them have been very serious and complex exercises. The most obvious example is undoubtedly the study designed to evaluate the PINS (Cavalcanti *et al.* 1981 and 1984, Nunes da Silva 1985), but the comprehensive and careful studies of the PNS (Rios 1981) and the PCA (LBA Foundation 1985a, LBA Foundation and UNICEF 1982) should also be mentioned, as should the large quantity of evaluation data available on the PROAB (INAN and 1984a and b, INAN 1986, Oliveira and Medeiros 1985).

TABLE 36

CAPACITY OF THE PROCAB TO SUPPLY PNS AND PROAB NEEDS IN THE NORTH AND NORTHEAST FOR FOUR BASIC PRODUCTS  
1978-1984 (Tons)

	1978	1979	1980	1981	1982	1983*	1984*
<b>RICE: DISTRIBUTION</b>							
PNS and PROAB	34,174	21,936	35,480	56,140	45,106	77,111	79,268
Acquisition by PROCAB	-	713	4,747	3,025	1,354	418	334
Percent	-	3.3	13.4	5.4	3.0	0.5	0.4
<b>BEANS: DISTRIBUTION</b>							
PNS and PROAB	18,610	17,575	24,195	1,678**	8,075	39,836	34,858
Acquisition by PROCAB	7,088	17,029	1,963	313	7,962	290	6,648
Percent	38.1	96.9	8.1	18.7	98.6	0.7	19.1
<b>MAIZE MEAL: DISTRIBUTION</b>							
PNS and PROAB	13,414	13,526	15,617	17,230	15,954	22,470	14,863
Acquisition by PROCAB	15	4,301	980	293	1,215	1,708	-
Percent	0.1	31.8	6.3	1.7	7.6	7.6	-
<b>MANIOC FOUR: DISTRIBUTION</b>							
PNS and PROAB	2,985	5,799	13,146	6,865	12,323	20,900	19,855
Acquisition BY PROCAB	1,855	3,187	3,772	4,900	5,704	1,087	9,200
Percent	62.1	55.0	28.7	71.4	46.3	5.2	46.3
<b>POWDERED MILK: DISTRIBUTION</b>							
PNS and PROAB	6,212	1,866	1,662	4,016	3,974	6,465	8,073
Acquisition by PROCAB	-	-	-	-	-	550	1,900
Percent	-	-	-	-	-	8.5	23.5

Sources: INAN 1979-1984, 1979-1985.

\* Purchases up to September 30 (all or virtually all the purchases for the year).

\*\* Maize in the husk equivalent to maize meal (1.48 tons of husk per ton of meal).

\*\*\* PROAB only: the PNS did not distribute beans in 1981.

What are the commonest or most serious limitations of these evaluations? They can be reduced to nine, with a certain amount of overlapping, as follows:

- (1) Excessive dependence on ideological attitudes, sometimes explicit but more frequently only implicit (Musgrove 1985a). There is no question that some kind of theoretical or ideological orientation can be useful and even necessary in embarking on an investigation of complex phenomena having many component factors; attention must be focused on some of these, while the rest are relegated to a secondary position. However, this may result in an important factor being ignored, for example the beneficiary's education, because the program ideology insists almost exclusively that malnutrition is an economic problem rather than one of culture or knowledge. This emphasis was discussed in Chapter 2 and its incorporation in program ideologies in Chapter 3.
- (2) Lack of a clear hypothesis regarding the result that the program is seeking to achieve. Put another way, no clear idea is presented of what the beneficiaries' situation would be in the absence of the program, which greatly complicates the interpretation of the apparent results (Mason and Habicht 1984). In the specific case of anthropometry, for example, is it right to assume that if a child's nutritional status does not change, the program has had no effect? How should the numerous cases of deterioration in anthropometric indicators be interpreted? Among the evaluations summarized here, only that of Nunes da Silva (1985) tried to formulate a hypothesis about what the situation might have been without the program.
- (3) Lack of a control group with which to compare the beneficiary group, although it must be acknowledged that this lack is not universal. The division of PINS beneficiaries into four distinct categories allowed for partial controls (Nunes da Silva 1985), and in the evaluation of the effect of the PCA on weight at birth a control group was used that did not receive assistance (LBA Foundation 1985a). It must also be admitted that there is a certain ethical problem in disturbing a group of potential beneficiaries in order to study them, without offering participation in the program or benefits of other kinds (Townsend et al. 1982, p. 61). This problem, however, can in principle be overcome by using a before-and-after analysis. In any event, given the lack of sufficient resources to help all those entitled to be assisted, the relatively low cost of studying the nonbeneficiaries must be set against the potential improvements in a program that would be derived from a more rigorous evaluation (Hollister 1982; Miller and Sahn 1978, p. 269).
- (4) Use of unreliable information: for example, the statements by mothers regarding intra-family dilution of donated foods (Ferriani et al. 1985). There is a place for information obtained through questions to beneficiaries, and their answers may be important even when they are wrong. This is particularly true as regards the perceptions of clients about the way a program is operated (Kalil et

al. 1984a, Oliveira and Medeiros 1985), which may affect their participation. But one must be careful not to accept uncritically client opinions concerning final benefits, and even less statements about their own behavior changes.

- (5) Lack of information concerning the incomes or economic situation of beneficiaries. The PINS was an exception, at least as regards the initial situation of the families enrolled, but the data obtained were never analyzed (Cavalcanti et al. 1981). It would seem that information is generally not sought on this point because it is assumed that the selection of beneficiaries will have produced a more or less homogeneously poor group. But even if this were true as regards long periods or major changes in economic wellbeing, in the short term there may be major fluctuations in the position of the poor (Haguette 1982, Motta and Scott 1983) that may determine the regularity with which they seek assistance or participate in a program (Kalil et al. 1985a), with important consequences for its eventual results (Lerner et al. 1985a). On the other hand, if there is a general tendency for the beneficiary group to become richer or poorer, as is believed to have occurred with the PINS (Cavalcanti et al. 1981), this must be taken into consideration (Miller and Sahn 1978, p. 266). Finally, it should be noted that in the evaluations being discussed no attention was given to changes in family size and composition, which may have a major impact on food consumption (Musgrove 1985b). Even less was any attempt made to learn whether participation in a program affected the composition of the family nucleus, although it is possible that this may have occurred (Scrimshaw and Pelto 1982).
- (6) Lack of information about the regularity of client participation, with the already-mentioned exception of the study of the PNS (Kalil et al. 1984b, Lerner et al. 1985a). In the absence of this information there is a tendency to use the time that has elapsed since a beneficiary enrolled in the program in order to estimate the total assistance received (Rios 1981, Nunes de Silva 1985), but this does not produce a very exact approximation. It probably goes a long way to explaining the generally weak relationship observed between the period during which benefits are received and the result for the client.
- (7) Excessive dependence on anthropometry to measure benefits. This emphasis has the advantage of being relatively objective and of indicating a direct relationship with nutritional status and health. Nonetheless, the fact that this kind of evaluation is the almost exclusive province of nutritionists reduces the attention given to other benefits, viz. greater consumption of other goods that contribute to the beneficiaries' well being, better health, more regular school attendance, etc. Moreover, there is a striking lack of multivariate or multidisciplinary analysis in this area.

- (8) Lack of other information regarding health status than the beneficiary's anthropometric data. Attacks of diseases may have a strong cumulative effect on the child's growth and eventual nutritional status. It is this relationship that justifies the desire to combine the provision of food with medical care, which makes the PNS and PCA health as well as nutrition programs. But when the health history of a beneficiary is not recorded during his period of participation in a program, or this information is not analyzed, it is impossible to know whether the apparent successes and failures are due to the transfers of food per se or to differences in the frequency and severity of episodes of illness, and in the health care which cures or prevents these episodes. The absence of this information on health makes it particularly difficult to evaluate the impact of donations of food on infants under 12 months, who typically exhibit the most frequent nutritional deterioration (Nunes da Silva 1985). Given the potential conflict between supplying food and providing medical care in a program which uses health establishments to distribute food (Nunes da Silva 1986), it would be especially valuable to measure the relative contributions of the two activities, but no evaluation has done so. It must be admitted that this is an inherent limitation in a program that does not identify individual clients; but it is not inevitable when the beneficiary is identified and, in theory, is treated by a health service. In this case, however, information must be obtained directly from the family, not just from the service, if the significance of the illness is to be assessed.
- (9) Lack of adequate statistical analysis (Habicht and Butz 1982). In some cases, conclusions are derived from a very small number of beneficiaries (Cavalcanti et al. 1980, Oliveira and Medeiros 1985), but in general the statistical problem is not that samples are too small. Some evaluations used about a thousand cases (Chaves 1984, INAN 1978b, Kalil et al. 1984a and b, Lerner et al. 1985a and b, Rios 1981, LBA Foundation and UNICEF 1982), and others up to ten thousand (Nunes da Silva 1985) or more (LBA Foundation 1985a). The limitation they share is the failure to apply even the simplest statistical tests to the information obtained--for example, to discover whether two averages differ (Galindo 1985) or whether two variables are reliably associated (Rios 1981, Nunes da Silva 1985). Application of the appropriate statistical test might, in these cases, show that a major part of an apparent finding is not reliable enough to make an explanation worth seeking (Galindo and Musgrove 1986).

This limitation is clearly linked to the lack of explicit assumptions, mentioned above; if no effect is postulated, there is no way of determining whether it exists or not. The analytical deficiencies that are a feature of most of the investigations in this field consist, in varying proportions, of an insufficiently precise description of what is being sought--points 1 and 2 above--and the use of inappropriate techniques to answer the questions posed. This does not mean that any investigation, to be useful for evaluation purposes, must be quantitative and mathematical; there

is a place for more individualized and even poetical forms of research, which can create sympathy, indignation or understanding (Cavalcanti et al. 1984, Oliveira and Medeiros 1985, Scheper-Hughes 1984). But such investigations help to define the problems, rather than to evaluate attempts to solve them.

These shortcomings in the evaluation of food and nutrition programs in Brazil have also occurred in other countries and in other kinds of programs. Given this experience, there is already a useful secondary literature on how to undertake and execute evaluations (Klein et al. 1982, Sahn et al. 1984) covering a large number of issues, from specific techniques for measuring variables (Sahn et al. 1984, Chapters 3-11), to ethical and conceptual problems (Cook and MacAnamy 1982, Habicht et al. 1984). The lessons of this experience must be the starting point for any future evaluation activities in Brazil, so that the significant efforts to obtain information are justified by the precision and reliability of the resulting conclusions.



## 7. THE PROGRAM OF SOCIAL PRIORITIES, 1985 AND AFTER

The six preceding chapters have discussed programs that existed at the end of 1984 (PNS, PCA, PROAB) or which terminated before that date (PINS). This chapter summarizes the changes in the food and nutrition programs introduced by the new civil government that took office on May 15, 1985. It is still too soon to know what impact the new or modified programs will have; with few exceptions, it is only possible at the present time to describe these programs and speculate about their probable virtues and defects on the basis of the information presented in earlier chapters. While there are as yet few evaluations of these actions, in general terms three important points should be stressed. First, the proposed food and nutrition interventions are supposedly part of a broader program to respond to Brazil's social problems. Second, although these actions will include some new elements, what is more striking is their continuity with the programs and assumptions of the recent past. They do not represent a rejection of this experience or a radical change, despite the political tendency to describe them as if they constituted a break with the food policy of the previous government. Finally, an explicit part of the new public program is the monitoring and evaluation of the activities of which it will consist. If this intention is systemically carried out it will provide timely knowledge of the successes and failures of each component, as well as a more uniform and reliable basis for comparison between them than has been available previously. One element in this focus on evaluation, which in practice preceded the new regime, is the establishment of a system of surveillance of the nutritional status of children treated at the health posts (Castro and Odísio 1986). This system came into operation in January 1985 in Recife (INAN, SIVAN Bulletin), the intention being to extend it to other capital cities. However, this still had not occurred four years later.

### 7.1 General Priorities

The Program of Social Priorities announced in May 1985 (SEPLAN 1985) identified as top priorities the programs specifically designed to combat hunger, poverty and unemployment. Since it suffers more from these problems than any other region, the Northeast was singled out as the priority region. The Program stressed three factors, namely:

- food for the people, including under this heading a new program discussed in section 7.4 below, plus the expansion of or changes in four existing programs, including the PNS. (The PROAB remained unchanged under this plan, while the PCA was not mentioned.)
- employment generation and attention to basic social needs. This component includes the health and primary education programs, in addition to the objective of creating employment through construction and other programs.

- assistance to small food producers in the Northeast, with this component absorbing a number of existing assistance programs in agriculture, education, health and sanitation, together with assistance to small non-agricultural businesses in rural areas.

For purposes of this study it should be pointed out that the problem of inadequate food consumption and malnutrition can be tackled through all three components. The aim is to increase the production of staple foods, reduce their prices to the consumer, generate higher incomes for poor families, and provide more and better health care. This last aspect is linked not to an inadequate intake of food but to malnutrition, and its integration with food programs may greatly affect the impact of these on the beneficiary population.

## 7.2 The Existing Food Programs

As mentioned above, the Program of Social Priorities proposed no change in the PROAB's operating methods and only a small expansion of its coverage. The decision to maintain the subsidy program at more or less its current size seems to have been based on two factors. First, the PROAB is conceived as assisting the states in the North and Northeast, which contain the greatest concentration of urban poverty in Brazil. Since it requires a considerable number of small shopkeepers, it is basically limited to the large (and possibly medium-sized) urban centers. Given these limitations there is not much room for expanding its coverage except to other regions of the country, while an increase in the subsidy rate would probably lead to dilution of benefits among families not as poor as those it is desired to help. Second, the new Program to Supply the People (Programa de Abastecimento Popular-PAP), discussed in section 7.4, was designed to generate a similar benefit to that of the PROAB--a reduction in the price to the consumer--but without any fiscal subsidy, which would make it an alternative to the PROAB in other parts of the country. It was also intended to introduce the PAP in medium-sized cities in the interior of the Northeast where the PROAB has never functioned (COBAL 1985b, pp. 3-5).

Nor were any changes proposed in the PAT, despite the fact that this program has been strongly criticized for its high cost and lack of focus on the poorest groups (IPEA 1981b; Knight 1982; Wilberg 1984, p. 51). Substantial expansion was proposed of two other programs that provide meals (rather than food to be prepared and cooked at home). These are the PNAE and the LBA program which provides lunches for pre-schoolers. The former will serve 20 million children for 180 days each year, while the second will benefit 1.3 million children throughout the year.

The decision to expand the LBA program but not to enlarge the PCA seems to represent a clear victory for the proponents of natural foods and a corresponding defeat for the advocates of the blends. In cost terms there is little doubt that this is the correct decision; as Table 19 showed, the blends are significantly more expensive than traditional foods when the latter are freely combined by the poor consumer, who is the typical client of the PROAB. The only justification for using the blends would be a greater impact on the nutrition of small children. The evidence on this point examined in sections 6.4 and 6.5 does not rule out the possibility that the blends are

more effective per kilogram of donated food, but it has not been possible to establish any clear superiority. In any event, the decision neither to eliminate nor expand the PCA--it was already greatly expanded during 1983-1984--is a reflection of the need to decide on how to use the program's human and institutional resources even if the blends were discontinued. The evidence against formulated foods is in no way a negative assessment of the administrative capacity or efficiency of the program. On the contrary, the evaluations of the PCA and the integration of its food and health services (LBA Foundation 1985a and 1985?b) suggest that it has probably been as or more effective than PNS operations.

In July 1986, the LBA began a pilot project to distribute "natural" and traditional foods in ten of its 66 service units in Salvador, Bahia. The products adopted for this basket--rice, beans, manioc flour, maize meal, powdered milk and soya oil--are the same as those distributed by the PSA, except for the absence of sugar; and the justification for using natural foods and these products in particular (LBA Foundation 1986b) is almost identical to the arguments in their favor always employed by INAN. The experiment was extended to 20 other units in November-December 1986 and to the other 36 units in February-March 1987, by which point the blends had been eliminated completely in the PCA in Salvador. The foods were acquired from COBAL without any supply problems except as regards the packaging of the products. It should be noted that the traditional foods do not merely replace the blends in terms of providing a given transfer of calories and proteins. The "natural" products provide a larger proportion of nutritional needs, especially for children, who receive double (or more) the calories and proteins contained in the ration of blends.

Given this increase in the nutritional value of the supplement, along with the change in the beneficiaries' typical diet, it is not surprising that the evaluations of the pilot project (LBA Foundation 1987a and b) showed positive results. On the one hand absenteeism, or the failure to collect the food, fell from 16.5 percent with the blends to 6 percent or less. On the other, there was a large increase (from 1,333 to more than 2,400) in the number of children receiving health and weight checks. There is as yet no evaluation of the impact on nutritional status.

Adoption of this scheme of traditional foods throughout the PCA would effectively eliminate any differences of ideology or mechanism between that program and the PNS; the only remaining differences would be in administrative efficiency and the link with other activities--including health care--associated with either program.

For the PNS itself, the Program of Social Priorities proposed a substantial expansion and the reorganization of certain features. To emphasize the differences with the former PNS and to minimize the appearance of continuity, the program's name was changed to the PSA. (It would seem that the new name was chosen to cause the greatest possible confusion with that of the rival program, the PCA; but this is not the first time that different programs have had names that are easily confused, as the PNS and the PINS were, or the PROAB and PROCAB are.)

The main change is a great geographical expansion of the program from the 4.2 million beneficiaries assisted in 1985 to the entire population entitled to participate, estimated at 10 million (INAN 1985) or even 11.6 million (SEPLAN 1985). Given the administrative and budgetary impossibility of immediately expanding throughout the country, it was proposed to give priority to the Northeast and particularly to the states relatively little covered by the PNS--Maranhao, Ceará, Paraíba and Bahia (INAN 1985, p. 7). Before the end of 1985, however, the program was already being introduced in states with lower priority, such as Paraná. Furthermore, it was decided to proceed cautiously so as not to generate expectations that could not possibly be satisfied; one of the explicit objectives of the reorganization was to restore confidence in the program and the government. Nonetheless, as noted in section 5.3, little was done to overcome the program's financial and operating problems, which have again been compounded by irregularities and shortages and by theft or diversion of food (Musgrove 1987). This failure to fulfill the original purpose of the program is largely due to the creation of another, more favored program which competes with existing programs; this will be discussed in the following section 7.3.

The beneficiary selection criteria remained essentially the same as before: pregnant women or nursing mothers and small children in households with an income of less than two minimum wages. This last criterion, however, will only be used to select the geographical areas in which the PSA will function and to calculate the quantity of food to be distributed by state, in somewhat the same way as the PROAB works. Identification of individual beneficiaries will still depend on local criteria and information, it being recognized that individual income cannot be determined and treated as though it were stable. This process of "democratic" selection is discussed in INAN's proposal (1985, pp. 8-9) but it is not clear how it will work. It still seems to leave room for the same favoritism or discrimination at the local level that is supposed to be eliminated through the universalization of the program. It should be noted that some economic criterion, in addition to the biological parameter, is required if the aim is to limit the benefit to the really needy population groups, estimated at 70 percent of the total population of pregnant women, nursing mothers and small children.

The biological parameter has also been modified. In order to focus attention on a child's early years, when it is most vulnerable, and hence to be able to use the same amount of resources to reach a larger number of children, it was decided to reduce the maximum age for program participation from six years to three (INAN 1985, p. 2); initially consideration was given to reducing this limit in the Program of Social Priorities even further, to only two years (SEPLAN 1985, p. 10). To obtain a greater impact on the nutritional status and health of these children, assisted during the period of maximum vulnerability to diseases (McAuliffe *et al.* 1985), it is proposed to combine the PSA with the Integrated Assistance Program for Mother and Child Health (Programa de Assistência Integral à Saúde da Mulher e da Criança) which is also INAN's responsibility. If this integration can actually be achieved it may correct one of the principal apparent deficiencies in the food programs, and lead to a reduction in the marked tendency for nutritional status to deteriorate during the child's second year, as discussed in

section 6.5. As Gomes Pinto (1984) points out, the provision of medical care to poor rural groups through the Ministry of Health has encountered many operational difficulties despite the Ministry's basically correct intentions.

Since a larger number of children will participate for a shorter time each, the composition of the clientele will change in the sense that at any one time it will include fewer children and more adult women. The rations provided are not very different in terms of total quantities as between women and children, so that the physical distribution of food must expand at almost the same rate as the enrolled population. It was anticipated that raising the number of beneficiaries from 4.39 million to 10.04 million (a factor of 2.29), would increase the quantity of food from 18,600 tons to 48,200 tons per month (a factor of 2.59; INAN 1983, p. 13). The composition of the basket of food donated shows no essential changes, consisting of the three products, viz. rice, beans and powdered milk, throughout the country. To these are added manioc flour in the Northeast, sugar in the North, and maize meal in the other regions--a distinction designed to respect local food preferences, but which is very artificial in view of the importance of these three products throughout the country. In any event, a policy of concentrating purchases on products offering the best price and supply conditions might do away with regional distinctions. It should be noted that in all these reforms no criteria have been introduced for micro-nutrients or the use of fortified foods; the program continues to be a response to protein and calorie deficiencies only. The specific iodine, iron and vitamin A deficiencies must be tackled through specific programs (Batista Filho and Barbosa 1985).

The decision to expand the donation program to such an extent, despite its high cost in comparison with a partial subsidy, seems to depend on three assumptions. One is that the families to be benefited by the PSA are too poor to take full advantage of the subsidy even in areas where this is feasible. Another is that a program like the PROAB cannot function in the small municipalities and rural areas that also contain a great deal of poverty, and where there is no alternative to a donation program. The third is that donations, with their identification of specific family members as vulnerable, are more effective than the subsidy in preventing infant malnutrition and in stimulating health care. Although intrafamily dilution of the food is high, and despite the evidence that the donations are insufficient to prevent a deterioration in nutritional status during the second year of the child's life, the evidence summarized in Chapter 6 offers some support for this hypothesis; it will be more convincing if the proposed integration with the health services takes place, as noted above. The other two assumptions regarding the economic and operational non-viability of the PROAB outside the cities are also reasonable, if not entirely confirmed.

### 7.3 The Milk Program for Needy Children

This program, introduced at the end of January 1986, is intended to ensure one liter of free fresh milk per day for each child under seven that lives in a family with a total income not exceeding two minimum wages. It started in three state capitals and was extended first to all the other state capitals in August 1986, and then in principle throughout the country (SEAC 1986?a). The target population includes the children entitled to participate in the PSA or PCA, and also all poor children of pre-school age. It excludes pregnant women or nursing mothers, who are served by these two programs.

Unlike all the other Federal Government food and nutrition programs, the Milk Program uses coupons or stamps, which are each worth one liter of milk. The same system has been used for the distribution of milk by the state government of Sao Paulo for a number of years, and to some extent this served as a model for the new federal program (Carvalho da Silva, 1983a and 1986). The coupons are distributed monthly to beneficiaries; one booklet contains stamps for the entire month, and each participating family receives as many booklets as there are eligible children. The milk is obtained from shopkeepers affiliated with the program, who in turn receive the corresponding cash amounts. In using this commercial network the system is similar to the PROAB, although there are two important differences. The retailer does not have to buy the milk directly from the program, but uses his normal source of supply; and any kind of retailer may become affiliated, including supermarkets. In these respects the program is identical to the food stamp program in the United States, the difference being that it is limited to one product only.

With a view to eliminating bureaucratic inefficiency (SEAC 1986?a, p. 4) the program operates through "community agencies" which register the beneficiaries and distribute the booklets to them monthly. Neither the Ministry of Health nor the Social Security System nor COBAL participates. The community agencies in their turn are registered and supervised by the Special Secretariat for Community Action (Secretaria Especial de Acao Comunitária-SEAC), which is responsible to SEPLAN. In using a variety of institutions to administer the program, the scheme is similar to that of the PCA. The community agencies do not have to have any connection with health, and the program provides no health services of any kind. A nutrition or hygiene education component can be included as part of the monthly meetings at which the booklets are distributed, but the agenda for these meetings is decided by the agency and not by SEAC, which for its part promotes all kinds of community actions, with no emphasis on health or nutrition. SEAC obtains copies of the family registration forms from the participating agencies, along with a monthly statistical report on the beneficiaries served and, in theory, a description of the meetings held (SEAC 1986?b). This material provides the only basis for supervision; it does not include any information on the nutritional status or health of the beneficiaries.

By December 1987 the PNLCC had expanded to 338 municipalities throughout the states and territories. A total of more than six million children were benefiting from the program through 18,859 community agencies, with plans for eventual expansion to reach nine million children in 1988 and ten million in 1989. Table 37 shows the expansion and geographical coverage of the program since its introduction. From this it can be seen that the typical coupon distributing agency serves 320 children, operating on a scale similar to that of a health post or other unit distributing food in the PSA or the PCA. There is the same possibility of multiple registration in either kind of program; in no case is any adequate information available on this point. The figures also show that on average there are 2.7 children registered for each beneficiary family.

Until some kind of evaluation of the program was made, which initially was not a priority for the SEAC, its virtues and defects could only be assessed on a theoretical level. The only firm statement that could be

TABLE 37

NATIONAL MILK PROGRAM FOR NEEDY CHILDREN (PNLCC): MUNICIPALITIES AND BENEFICIARIES SERVED,  
AND PARTICIPATING COMMUNITY AGENCIES, BY STATE, 1986-87

STATE OR TERRITORY	FEBRUARY 1986			MUNICI- PALITIES	DECEMBER 1986			MUNICI- PALITIES	DECEMBER 1987			MUNICI- PALITIES
	BENEFICIARIES				BENEFICIARIES				BENEFICIARIES			
	CHILDREN	FAMILIES	AGENCIES	CHILDREN	FAMILIES	AGENCIES	CHILDREN	FAMILIES	AGENCIES			
Acre				12,000	4,500	53	1	27,600	10,350	69	5	
Alagoas				72,200	27,000	179	7	141,600	53,100	441	15	
Amazonas				-	-	-	-	74,400	27,900	308	3	
Amapá				-	-	-	-	13,200	4,950	43	1	
Bahia				108,000	40,500	351	3	315,840	118,440	1,511	17	
Ceará				139,200	52,200	453	6	295,200	110,700	754	14	
Federal District	43,200	16,200	127	108,120	40,545	208	5	148,800	55,800	318	5	
Espírito Santo				108,000	40,500	367	5	208,800	78,300	846	14	
Goiás				120,000	45,000	341	4	223,200	83,700	540	13	
Maranhão				41,760	15,600	17	3	283,200	106,200	610	17	
Minas Gerais				265,560	99,585	804	14	650,880	244,080	2,437	35	
Mato Grosso Sul				24,000	9,000	112	3	52,320	19,620	222	8	
Mato Grosso				28,800	10,800	137	2	62,400	23,400	236	6	
Pará				-	-	-	-	91,200	34,200	361	5	
Parafba	29,520	11,070	110	67,200	25,200	210	7	158,400	59,400	310	11	
Pernambuco				156,000	58,500	395	10	300,000	112,500	574	16	
Piauí				55,200	20,700	137	2	149,280	55,980	370	16	
Paraná				36,000	13,500	100	1	76,800	28,800	290	8	
Rio de Janeiro				533,520	200,070	1,241	5	912,000	342,000	3,152	23	
Rio Grande Norte	30,480	11,430	137	90,720	34,020	246	1	153,600	57,600	441	11	
Rio Grande Sul				72,000	27,000	181	1	476,160	178,560	914	20	
Rondonia				14,400	5,400	35	1	44,400	16,650	137	7	
Roraima				4,800	1,800	19	1	9,600	3,600	23	2	
Santa Catarina				28,800	10,800	109	4	84,000	31,500	293	7	
Sergipe				48,000	18,000	114	3	108,000	40,500	259	14	
Sao Paulo				480,000	180,000	1,741	32	959,520	359,820	3,400	45	
TOTAL	103,200	38,700	374	3	2,614,080	980,280	7,635	121	6,020,400	2,257,650	18,859	338

Source: Unpublished SEAC tables.

made was that the introduction of the program increased the demand for milk during 1986 and thereby contributed to the general shortage of that product during the final months of the year. Supply could not keep up with demand, and the Milk Program ended up by competing for milk with the programs that distribute powdered milk. The problem would to some extent have existed anyway even without the new program because it resulted from the increase in total wages and the freezing of prices that accompanied the Cruzado Plan.

To evaluate the nutritional impact of the program a study was made of a sample of 1,270 children from various communities on the outskirts of Belo Horizonte served by 33 community agencies; they were measured (weight for age) before the distribution of milk began, and again after 13 months of program operation. A subsample of 500 children received a clinical examination of nutritional status every three months, and an independent subsample of 130 children was given a biochemical examination at the start of the program and again after 13 months (Araújo *et al.* 1987). A comparison was also made between 2,754 children at the beginning of the program with a group of 2,741 after 13 months, but these were not all the same children; it is assumed that the group of 1,270 studied longitudinally is a subgroup of the large initial group. The distribution of whole milk reduced the prevalence of serious vitamin A deficiency in the small sample which was biochemically examined. (The absolute number of such cases fell from 51 to 22.) It is not surprising that there was no significant change in the prevalence of anemia.

The data in Table 38 indicate that, when the children in the sample who were present at both moments are mixed with those who left the program before the end of the period and with others who entered during those 13 months, there was no significant change in the distribution of the anthropometric status of the beneficiaries. This is not a surprising result because there was no control according to the beneficiary's initial status, and the participation period of the children varied. However, when the comparison is confined to the same cohort of 1,271 beneficiaries, there is a statistically significant change in distribution: the frequency of moderate malnutrition increases and that of the other three levels declines. This result raises the same questions for the PNLCC as occur with regard to the other two programs examined, namely: first, why could not all the initially normal children remain so? In other words, why is it so difficult to prevent deterioration, whether from normal to slight malnutrition, or from slight to moderate? Secondly, if the program is capable of improving the status of a severely malnourished child, at least to the moderate level, should efforts be concentrated on finding and saving these children? Or in other words, is it not inefficient to distribute food to so many beneficiaries when only some of them benefit in this rapid and visible way? An analysis of the kind made as part of the evaluation of the PCA (LBA Foundation and UNICEF 1982) would, in this case too, show a very high cost per improved child, or per kilo of weight gained. Finally, it should be noted that the individual transitions were not recorded, only the total initial and final distributions.

Toward the end of 1987 the evaluation of the PNLCC was extended on an experimental basis to Brasília, Vitória and Recife, as a collaborative effort between SEAC, UNICEF and the Ministry of Health (SEAC, 1987). This "Let the Child Grow" program is designed to provide continuous monitoring of

TABLE 38

NUTRITIONAL STATUS (WEIGHT FOR AGE) BEFORE AND AFTER  
13 MONTHS OF PNLCC OPERATION, IN BELO HORIZONTE:  
COMPARISON OF COHORT AND NON-COHORT SAMPLES

NUTRITIONAL STATUS	COHORT: : SAME CHILDREN		NON-COHORT: SAME OR DIFFERENT CHILDREN	
	INITIAL	FINAL	INITIAL	FINAL
Normal	642	627	1,431	1,402
Malnourished I	489	484	1,050	1,055
II	115	142	236	257
III	24	17	37	27
TOTAL	1,270	1,270	2,754	2,741

Source: Araújo et al. 1987, Tables 2 and 3.

the nutritional status (weight for age) of the children served by the program; it will not study the beneficiaries of other programs or those not receiving assistance.

The concentration on a single food creates no problems as regards the nutritional quality of the product, for most of the beneficiaries. But many Brazilian children cannot tolerate lactose, and for them the benefit is very questionable; the program provides no information on this point. There are two other potential dangers in milk distribution, especially if it is not accompanied by effective nutrition education. On the one hand, it may discourage breastfeeding; this is why both the PCA and the PSA establish a minimum age of six months for their beneficiaries. On the other, the intrafamily distribution of milk, even supposing it is not consumed by the adults, may favor the older children to the detriment of the vulnerable younger ones aged between six months and two years. This effect is not taken into account in the estimate that only a very small proportion (less than five percent) of the coupons are being "abused" (Araújo et al. 1987).

Given the assortment of participating community organizations, considerable variation is to be expected in the results, according to their competence and honesty. The program ideology relies to an exaggerated extent on the capacity of the participating agencies to choose "from among the needy children in the community those who needs are greatest" (SEAC 1986?a, p. 5). and to control abuses in the distribution and use of the coupons. The retailers, for their part, promise not to take the coupons in exchange for purchases of other foods or goods. Supervision of both the community organizations and the retailers of milk requires surveillance--and a bureaucracy--by SEAC, which faces similar tasks and difficulties to those confronting INAN, the LBA and COBAL in the supervision of the programs for which they are responsible. It will be necessary to study program costs and results carefully, in comparison with the more traditional programs, in order to find out how far this experiment is working. To the extent that it achieves the desired large-scale participation of volunteers, it should be able to operate with lower costs; but, as was emphasized in section 5.4, reliable estimates of administrative costs are not available for any of the programs, with the partial exception of the PCA. In any event, minimization of these costs is not a sufficient criterion of efficiency, even though it may contribute to it.

#### 7.4 The Program to Supply the People

The largest, highest-priority food-related component of the Program of Social Priorities could be described either as a cross between the PROAB and the SOMAR network, or as a PROAB without the subsidy. This is the new Program to Supply the People (Programa de Abastecimento Popular-PAP), directed by COBAL, and designed to lower the prices of basic foods for low-income groups by reducing acquisition and marketing costs (COBAL 1985a, SEPLAN 1985, Teixeira Filho 1985). The system used is essentially that of the PROAB; COBAL purchases the products and subsequently sells them to retailers affiliated to the program, who in turn sell them to their customers. The sales to retailers are for cash (no credit), and they are obliged to sell at the prices established by COBAL; prices must remain stable for one month (instead of one week as in the PROAB). There are no checks on the quantities sold by the

retailers or on their terms of sale to the consumer (on credit, in small quantities, etc.), other than the control of prices. The program is geographically confined to areas in which typical family income is six minimum wages or less, as against (in theory) two minimum wages for the subsidy or donation programs. The products selected are the same as those in the PROAB, with the addition of coffee and--possibly--other kinds of meat and fish than dried meat and salt fish.

The PAP is like the SOMAR network in three ways. First, it is designed to operate without a subsidy, by lowering prices through its greater purchasing power at harvest time and greater efficiency in marketing as compared with the current supply chain. Second, as already mentioned, it extends to areas less poor than those served by the PROAB and therefore reaches a larger proportion of the total population. Third, it is a COBAL program exclusively, without any participation by INAN or other agencies involved in health care. In brief, the PAP could be described as an expanded SOMAR network, with a limited selection of products. The description of the program provided by COBAL, however, does not refer to the SOMAR network but calls it identical to the PROAB, except for the absence of any subsidy (COBAL 1985b, p. 3).

The PAP was aiming to reach 13.3 million consumers in 1985, marketing some 3.3 million tons of food (COBAL 1985a, Annex I). Of this amount, powdered milk was the most important component (809,000 tons), followed by rice (650,000 tons), sugar (358,000 tons), meat and beans (318,000 tons each). This breakdown of sales does not correspond, be it noted, to the relative importance of the products subsidized by the PROAB as indicated in Table 19. Over the following three years it was hoped to expand the program to sell around 11.3 tons of food to some 66.3 million consumers by 1988. To avoid the problems of late payment, high prices and inadequate supply that have characterized COBAL's operations in recent years, it was proposed to finance the program through a revolving fund; this only required a contribution from public funds to establish the fund, with real additional contributions in line with the expansion of the PAP (and monetary adjustment to compensate for inflation). Emphasis is also put on using stocks of food that have built up under the minimum prices programs for agriculture. COBAL expects to acquire part of the products it will need through direct purchases from small producers or their cooperatives, for rice, beans, milk, manioc flour, maize products and fish (COBAL 1985?a, p. 5); this essentially is the PROCAB, although the program does not appear under that name either in COBAL's proposal or in the description of the Program of Social Priorities.

The PAP was launched in Brasilia in September 1985 and was extended during October to the cities of Goiânia, Porto Alegre, Belo Horizonte, Sao Paulo, Vitória, Florianópolis and Curitiba. Before the end of the year it was also established in Rio de Janeiro, Manaus, Belém, Campo Grande, Culabá, Porto Velho, Rio Branco and Macapá. The more or less simultaneous expansion of the PROAB to Salvador and Aracajú (the only capitals in the Northeast in which it did not operate) ensured that all the state capitals in Brazil were served by one program or another (COBAL 1985?b). Having expanded to the larger cities, the PAP was then due to reach out to smaller towns containing an adequate network of retailers, as soon as COBAL's operating capacity permitted.

It is clear that if the PAP manages systematically to reduce the prices of staple foods even to a small extent, the resulting benefit will be large in relation to the costs involved, since the cost of establishing and operating the program would only be a small fraction of the value of the food thus marketed; and the aim is to keep this cost lower than market costs would otherwise be, without the program. No major price reductions are needed to justify the PAP, since it can operate at almost no cost to public funds; a reduction of the order of 5 or 10 percent would be sufficient. The resulting increase in food consumption would always be less than this. However, there are no firm grounds for believing that this kind of reduction can be achieved and maintained. The PAP is a wager that COBAL will be sufficiently alert and efficient, once the administrative and financial problems that affected it in 1984 are put right, to bring about this result. In other words, it is a wager that the current marketing of basic foods in Brazil is still so inefficient, because of monopolies, an excess of intermediaries, inadequate storage and transportation infrastructure, or other reasons, that COBAL can demonstrate that it is more effective than the private market.

There is little evidence on this point. The SOMAR network provided an opportunity to judge COBAL's potential in this sense, and some simple efforts to evaluate this program suggest that it may have been able to reduce prices by 20 to 25 percent (World Bank 1985b, p. 25), some years ago. Unfortunately, the evaluation designed to test this hypothesis was never completed (World Bank 1980), so that the optimistic estimates could easily be exaggerated. Even if significant reductions were obtained some years ago, it is possible that the food market is more competitive nowadays, leaving less scope for interventions to reduce costs even further. The distribution of prices shown in Table 18 appears to indicate this; neither among geographical locations nor different kinds of establishment do average prices usually vary by more than 10 percent. Furthermore, although some more detailed studies of food marketing do exist, this is, as Campino (1986a) and Carvalho da Silva and Iunes (1981, Chapter 6 and p. 188) point out, a little-known subject which requires further study to establish whether major inefficiencies really exist that could be corrected without the need for large-scale investments and/or structural changes in agriculture and marketing circuits. For at least some products there seems to be neither a long chain of intermediaries nor high margins, but the situation differs considerably from one product to the next.

In its first weeks of operation the PAP sold (to the final consumer) at prices that were generally some 15 percent below "market" prices (COBAL 1985?b, last tables in Annexes III to VIII), the difference fluctuating between 10 and 22 percent. Initially the program did not sell powdered milk, dried meat or sardines--nor for a short time sugar--since the market prices of these products were high (COBAL 1985?b, pp. 17-18). The program's apparently good initial performance, therefore, could be reflecting decisions about which products to market, concentrating on those of which COBAL had large stocks, acquired at lower prices, rather than any systematic efficiency. (Unfortunately, the possibility of such stratagems in the management of a program always has to be considered, especially in relation to recently introduced programs.)

In the longer term, the PAP may have the beneficial effect of regulating and reducing all market prices as a result of its competitive impact, thereby providing benefits even for consumers who do not purchase from the retailers affiliated to the program. The opposite danger, however, also exists, namely that COBAL purchases will raise prices because they represent a net addition to demand while supply remains inelastic. Both possibilities are acknowledged by COBAL (1985?b, p. 17), but it is not clear which will predominate, nor how it will be possible to discern the net impact of the program on prices. If COBAL's purchases reach the point of being a substantial proportion of all purchases of a particular product at a given time and place, the "market price" of reference will disappear and the company will end up determining the price. This monopsonic power may bring significant benefits, but would make it almost impossible to determine what the price would have been without these official purchases. It would seem that the purchases involved in supplying the PNS and PROAB never became a dominant part of demand, but this could happen with the PAP as a result of the very large scale of the program.

Finally, it is clear that the nature of the PAP facilitates the introduction of subsidies if it is decided to incur greater costs in order to reduce prices further. Likewise, it would permit the future absorption of the PROAB through a reduction of the subsidy, if economic conditions permitted. Its relationship with existing agricultural programs for stabilizing prices, building stocks and stimulating small producers also give it a great deal of flexibility. What remains to be seen is whether COBAL can manage the program with the necessary efficiency. In other words, on the basis of the comparisons made in Tables 15 through 17, the company will have to operate more efficiently than it did up to 1986 in running the PROAB. There seems to be no reason to suppose that COBAL is more efficient in managing its "own" program (PAP) than the program it shares with INAN (PROAB), unless the company discriminates against the PROAB, using gains in that program to finance lower prices in the PAP, for which there would be no justification.

There is a danger that the PAP may end up using subsidies but that these would be implicit and difficult to calculate in financial terms, rather than being explicit, as in the PROAB. This possibility exists to the extent that COBAL can speculate with, or invest, the funds available to it, using financial gains to cover trading losses, as many critics of the company believe occurred in 1984-85. The de-indexing of Brazil's economy that accompanied the introduction of the Cruzado Plan in March 1986 greatly reduced the scope for that strategy, but little is known about the situation after prices were liberalized. Furthermore, any delays in payments to suppliers will also allow the company to generate an implicit subsidy and to pass on its cost, in the first instance, to food producers and traders. It should also be noted that it is not enough to reduce prices in relation to what they would otherwise be in the small shops where the program operates, since the consumers that it is desired to benefit do not make all their purchases there. The benchmark must be the supermarket, where the private market functions more efficiently and where the poor consumer is buying a large and growing proportion of his food (IPARDES 1985a).

The evaluations of the PAP made thus far (COBAL 1985?b, Fletcher and Peliano 1987) have enabled its results to be measured in terms of lower prices, thus making it possible to estimate the implications for greater food consumption, using for the purpose the consumption functions shown in section 6.1. They have not provided any evidence regarding improvements in nutritional status nor have they even managed to establish how the price reductions achieved were financed. We therefore have an idea of the potential impact of the program without yet being able to judge its efficiency or the extent to which it may be depending on its initial stocks, invisible subsidies, or other short-term factors.

## 8. CONCLUSIONS AND RECOMMENDATIONS

The objective of this final chapter is to draw some relevant conclusions for the modification or improvement of food and nutrition programs in Brazil, based on the evaluations made or summarized in the preceding chapters. The conclusions set out below suffer from three limitations which must be kept clearly in mind. First, they do not refer, except tangentially, to programs not studied in this report (PNAE, PROAPE, PAT, etc.), although a consistent, comprehensive policy in this area ought to include them. Second, the aim is not to draw conclusions from Brazil's experience that are universally valid for other countries, although there are grounds for believing that much of what has been said here would be true in other countries. Finally, this is not an overall analysis of Brazil's entire economic policy, so that the references to the management of the economy in general and agriculture in particular are very broad in nature, the latter area being relevant insofar as it relates to nutrition policies. This limitation is consistent with the summary treatment of these matters in sections 1.3 and 1.4.

What follows is a parallel discussion of the principal conclusions of the study and certain recommendations that can be drawn from these findings. These conclusions are organized around the following topics: research that still needs to be done, the selection of foods, the identification of beneficiaries, the kind of mechanism to use, the operation and financing of the programs, and the integration of food and nutrition activities with health care. The chapter concludes with some reflections on the future of the programs in the event that the transformations in Brazilian society sought by the Program of Social Priorities actually occur.

### 8.1 Directions for Research

In any evaluation of social programs, it is standard practice to lament the lack of information of one kind or another, and to point to the need for research to provide it. This is particularly true of food and nutrition programs, where many basic issues either have not been studied or have yielded only ambiguous and fragmentary results (Campino 1986a, Hollister 1982, Kennedy and Alderman 1985, Keusch *et al.* 1986, Carvalho da Silva 1983b). This should not, however, be taken to mean that no judgments can be made until further research has been carried out. Nor does it mean that all kinds of research would be equally useful. In what follows, priority is given only to those investigations that would lead to a firmer grasp of the problems surrounding the operation and evaluation of the programs. Excluded therefore is any kind of more "basic" or less operational research that could also be justified, but which would contribute little to improving the current programs or to their replacement by better ones.

In particular, it does not seem very useful to dwell further on the categorization or classification of the poor, as the World Bank proposed (1979, p. 1), and also INAN (1977, pp. 1-3 and 25-26), or on the production of more "specific" foods to deal with the problem of intrafamily dilution, as suggested by the LBA (LBA Foundation and UNICEF 1982, p. 6.7). The first of these issues makes little sense given the precarious situation of the target population and the administrative costs of more sophisticated identification and classification of clients. In practice, the originality of the Brazilian programs has lain in their reliance on simpler criteria, especially that of geography. Furthermore, very detailed descriptions of who are the poor are useless if they cannot be reached with tailor-made programs, and superfluous to the extent that the groups thus identified share similar needs and behavior. Probably the only important distinction is that between the rural and urban population, or more specifically between producers and consumers. This distinction is already incorporated in the relationship between the PROCAB, which is designed to boost production, and the PSA and PROAB, which are intended to stimulate consumption, in each case by poor families. The only exception to this suggestion that no further attention need be given to categorizing the poor is that it would be worth investigating who will benefit from Brazil's economic growth and who will not. On this issue see section 8.7 and also point 10 below.

As regards intrafamily dilution it was already explained in section 6.2 why this emphasis appears exaggerated. The focus should not be on the "dilution" of the food supplied, but on total consumption by the younger children; when this is inadequate despite the fact that there is sufficient food in the home, putting matters right will depend more on altering habits and attitudes than on changes in the foods provided. Intrafamily distribution is unquestionably important, but it should not be regarded as a question of "diluting" certain foods and forgetting the rest.

Among the areas of research that would be of particular value are the following:

- (1) Given the principal objective of providing basic foods at low cost, it would make sense to study actual prices and consider the extent to which they are influenced by geographical location, type of establishment, and selling conditions (quantities, use of credit, etc.). A study of this kind has already been carried out in the Northeast (Galindo, 1985, Galindo and Musgrove 1986) and provided useful information; this investigation should be repeated in other parts of Brazil. The information thus obtained, in addition to providing a better understanding of price variations among localities and consumers, would be an important input for the evaluation of cost reduction, subsidy or donation programs.
- (2) Apart from measuring prices and relating them to the factors mentioned, it would be useful to have a better understanding of price formation--marketing margins at the various stages, the importance of the scale of operations, etc. (Campino 1986a). Such studies would make it easier to assess the real possibilities of

reducing food prices without the need to apply subsidies; this has obvious implications for the optimum balance between programs with an explicit subsidy element (PROAB) and those which in principle do not make any call on public funds (PAP).

- (3) Following this line of thought, it would seem highly desirable to carry out an empirical study of the effects of the SOMAR network on prices, including the indirect competitive effects. Only on the basis of this information will it be possible to estimate the additional benefits provided by the PROAB in relation to the additional cost of the explicit subsidy. A study (World Bank 1980) was already designed; it would only be a matter of carrying it out, not in relation to the SOMAR network but to the new Program to Supply the People (PAP), discussed in Chapter 7. This line of investigation has only begun; it should be the subject of continuous evaluation.
- (4) As regards the PROAB itself, a direct analysis of its impact in terms of additional consumption and on nutritional status would be well worthwhile. Given the considerable differences between the current program and the experimental PINS in which it had its origin, inferences derived from the latter alone should not be relied upon, especially as the evaluation of the PINS (Cavalcanti et al. 1984) was incomplete in certain respects. The best way of evaluating the PROAB would be a thorough before/after study that would monitor an expansion of the program, but failing that a comparison could be made between a group of beneficiaries and a control group, following and improving on the PINS evaluation model.
- (5) Given the generally acknowledged difficulty of interpreting anthropometric data in terms of health, there would not seem to be much justification for embarking on studies to obtain new individual data of this kind, unless they also included information on health status. What would be worthwhile would be to make better use of the PINS data, partially analyzed by Nunes da Silva (1985) but still worth closer study. As Knight (1982, pp. 32-33) points out, these data could be used to obtain a better understanding of the importance of family income; the absence of information on this point greatly complicates the interpretation of the anthropometric results obtained for the PCA and PNS, as noted in sections 6.4 and 6.5. In addition, they might perhaps throw some further light on the cases where a participating child's nutritional status deteriorates; this kind of transition occurred more frequently in the PNS, but the reasons are not known.
- (6) In contrast to research using individual anthropometric data, it would be very useful for studies to be undertaken at the group level as part of the system of food and nutrition surveillance. For one thing, the SIVAN can provide anthropometric data on a relatively large number of children each month, making it possible in theory to detect changes in the pattern of nutritional status according to age and sex. For another, the reports are prepared with the assistance of statistical and socio-economic research institutions, which are

responsible for producing indicators such as the consumer price index, unemployment rate, etc. However, the system bulletin (INAN's SIVAN bulletin) merely presents these two kinds of information without any interpretation or analysis of how socio-economic conditions are affecting nutritional status. It would not be difficult to carry out a study, although it would be necessary to take into account the lag between economic changes and their possible nutritional impact.

- (7) The investigations by Leslie (1982) and Shrimpton (1984), among others, suggest that control of diarrheas and parasites would make a larger contribution to the health of young children than a small, across-the-board increase in food consumption. On the other hand, the experience of PINS model B clearly shows that the participating families, although benefiting from a 45 percent subsidy, found the requirement for regular medical/anthropometric consultations very tiresome, this being the reason for their low participation. As noted in section 6.6, there is not much information available about these consultations, now voluntary, among the clients of the PCA and the PNS or PSA. This conjunction of observations suggests that it would be most useful for research to be undertaken into the perceptions and behavior of poor families regarding the connection between certain diseases and their medical control, and nutritional status. The information obtained could contribute to better integration of health care into food programs. As already noted in section 6.8, the evaluations of these programs have adopted an excessively anthropometric approach; what is needed is a more interdisciplinary focus, so as to make use of the links between health and nutrition.
- (8) The major impact of operational difficulties in the programs (problems that are very largely independent of the ideological or conceptual basis for their activities), suggests that it would be useful to carry out detailed operational studies. Besides knowing whether a program is working or not, we need to know the reasons for its relative success or failure: what are the scarce factors? Where are the bottlenecks? What assumptions are not being borne out in practice? It is worth pointing out that investigations of this kind have been few and far between (LBA Foundation 1985?a, INAN 1984a and b, Kalil *et al.* 1984a, Lerner *et al.* 1985b, Oliveira and Medeiros 1985, Nunes da Silva 1986) and typically remained incomplete, as compared to studies that only evaluate results or discuss the design of the programs. They are, however, of indisputable importance.
- (9) In Brazil large amounts of funds are channeled--or significant amounts of taxation remitted--on behalf of programs that are not targeted at really needy groups. This is true of the school meals programs (PNAE), to the extent that the lunches are provided indiscriminately; and it is very much more the case as regards the PAT, which only operates in relatively "formal" companies whose work force therefore does not suffer from severe poverty (IPEA 1981?b). If the expenditure on these two programs were even partially

reallocated to efforts focussed on the poor it would perhaps have a significant impact on malnutrition. Studies that examine the cost and benefits of the PNAE and PAT and the probable results of such a reorientation should therefore be given high priority. To say this is only to ask that these two programs should be subject to the same evaluation criteria as the more explicitly "social" programs, instead of occupying a relatively privileged position. Whatever the deficiencies in the evaluations of the programs studied here, up to 1985 they were far more serious and complete than the reviews of the other programs that were also formal components of the PRONAN.

- (10) Finally, there is a lack of studies that would make it possible to estimate the extent to which nutrition problems in Brazil might be solved by other methods than programs to provide food. There is a plethora of studies blaming much of the problem on the kind of economic policy followed for more than 20 years, particularly as regards agricultural development and income distribution (Alves (no date), Campino et al. 1984, INAN 1977, Knight 1982, Martine and Garcia 1984, Homem de Melo 1983, Peliano 1984, Pessoa 1986, Timmer et al. 1983). But since the publication of World Bank estimates (1979) showing that an enormous redistribution of income would be necessary to eliminate calorie malnutrition, there do not seem to have been any studies inquiring into the effects of reversing or refocusing some aspects of Brazil's economic and agricultural policies. What would the consequences be for food consumption and the nutritional status of the poor of generating a feasible quantity of new jobs? Of raising the real minimum wage to the legally established level (in terms of food purchasing power) and compressing the distribution of wages? Of reorienting agricultural policy toward basic foods (which might require unfavorable adjustments in food prices)? Of carrying out a serious agrarian reform? These questions seem important enough to justify greater attention to the relationship between the food programs and economic performance, an issue discussed in section 8.7.

## 8.2 Selection of Foods

As regards the choice of foods to include in an assistance program, the evidence in Chapters 5 and 6 would seem to justify the use of traditional, little-processed foods. The blends have not demonstrated such superior results as to systematically justify their high cost per kilogram. In particular, there is no evidence that the greater "specificity" of the blends is reflected in greater additional consumption by the family members they are designed to benefit. Even if dilution is lower for the blends, this advantage may be completely offset by the intrafamily distribution of the other foods consumed. Nonetheless, the verdict in favor of the traditional foods must be qualified in two important respects. First, it does not justify the distribution of highly expensive food, since the main argument against blends is exactly their high cost. Second, micro-nutrient deficiencies require a solution that cannot necessarily be provided by the beneficiaries' traditional diet. The blends provide one possible answer, but fortifying one or more traditional foods may cost less or be simpler to achieve. Or the solution may

involve an intervention not related to food intake, such as the distribution of Vitamin A capsules. There is still no consensus or definitive answer to this issue in Brazil except as regards endemic goiter, which is being eliminated through the iodization of salt.

If this argument is accepted, then the justification no longer exists for retaining the PCA as a parallel program to the PSA, distinguished from the latter principally by its use of blended foods. This does not mean that the other LBA programs are affected, including its program to help seriously malnourished children. It may even be that for these cases, which necessarily are more expensive to treat than the mere supplementation of family consumption, the blends are appropriate; this is really more of a clinical issue. Curiously enough, the idea that the PCA might disappear as a competitor of the PSA is not in sharp contradiction with the defense of the program put forward by the LBA and UNICEF (1982). Among their own recommendations was a proposal to reduce the number of persons receiving the food supplement, thereby focusing attention on poor families through the complementary programs operated by the LBA (education and income generation programs, etc.). On the other hand, if the PCA were to go over to using traditional foods, the competition between it and the PSA would become a matter of relative efficiency, and there would be no reason to terminate either program unless systematic differences became apparent in this regard. More than this, this competition would call attention to the operational differences between the two programs and would indicate which of them functioned better, rather than having the debate focus around the kind of food donated.

What should be done in the particular case of milk? It is relatively expensive and consumption seems to change little in response to price changes; on the other hand, it has excellent nutritional value, while total family consumption does indeed appear to respond to free milk, through the income effect. In practice all the donation programs include milk (or a blended substitute), so that the relevant question is whether it makes sense to distribute milk separately--as is done in the Milk Program--or whether it should be one of the foods donated, as in the PSA. There is no definite evidence on this question, but there does not seem to be much reason to give out milk on its own. Given the family behavior encountered, it would be difficult to ensure that milk was consumed in sufficient quantities to replace a basket of four products. Milk is good for children, and tends to be consumed by them--but not necessarily by the youngest children in the family (Ferriani et al. 1985). Furthermore, a focus on milk could prejudice breastfeeding; there is no information on this likelihood.

The question of what foods to use does not end with a decision to prefer traditional foods and eliminate processed foods or blends, because the traditional foods themselves also include many that are processed and/or expensive. Should these be included among the foods subsidized by the PROAB? At the seminar on this program in 1984 (INAN 1984b), the COBAL representatives defended the idea of extending the PROAB subsidy to a much wider range of products, thus converting the program into a kind of subsidized SOMAR network. This proposal was turned down by INAN. Indeed, a correct decision on whether to include a particular food or not must depend on the effect of

its inclusion on family or individual consumption as a whole, taking the product's price- and income-elasticities into account, and no study exists that enables an appropriate list of products to be identified with complete confidence. We do know, however, that where a subsidy is concerned the most beneficial and cost-effective products are those providing cheap sources of calories; not only because calorie deficiency is as severe or more severe than protein deficiency, but because the price-elasticities of such foods are high in relation to their prices or acquisition costs, as discussed in section 6.1. Therefore any subsidy must be focussed on such products, and the inclusion of meat and fish is highly questionable. There is even less justification for including products of little or no nutritional value, such as coffee.

In this situation INAN's position is more correct, since it concentrates its financial and administrative resources on a small number of indisputably basic foods. The pressure to expand the list of products comes partly from the wishes expressed by the beneficiaries (Cavalcanti *et al.* 1984, Oliveira and Medeiros 1985), who would prefer a subsidy on all their food purchases. To give in to such pressure, however, quite apart from the logistical difficulties involved, reduces the food or nutritional impact of a program, making it more like an income transfer arrangement and losing the opportunity to take advantage of the potential relative price effect in order to increase consumption and improve diet quality. To allow the consumer to decide how much of each food to purchase once its price has been adjusted goes far enough toward respecting his tastes; not all his preferences have to be accepted as policy guides. It is therefore recommended that any subsidy be restricted to a very short list of products. Furthermore, the greater the focus on basic, cheap foods, the larger the subsidy can be without leading to a leakage of benefits towards families with greater resources. The latter's desire to buy in the subsidized shops would depend on the variety of products available there; the incentive to do so will be less if the benefit is only applied to a small fraction of their consumption.

If a food marketing program contained no subsidy at all, then in theory this argument would not apply. Any reduction in prices that results from greater efficiency is welcome. It might therefore seem that the PAP could operate with as many products as COBAL can provide. This is not advisable, however, and it seems right to apply the same restriction to this program as already mentioned with regard to the PROAB. This view basically derives from the suspicion that the PAP will not be able to lower prices systematically, without recourse to subsidies. Even if COBAL demonstrates its ability to operate as or more efficiently than the private market, it seems reasonable to suppose that administrative considerations will increase its efficiency if it is limited to a small number of products. For these two programs there is no problem if the list of foods varies between one state and another, in accordance with local consumption habits. Nor need these be rigid and separate as between one region and another.

Perhaps all these considerations can be summarized by saying that there is no single magic food or panacea. What exist are certain criteria--of traditional consumption, nutritional value, cost, sensitivity to prices and incomes--which enable a limited group of products to be chosen with some confidence that this will bring about significant increased consumption at tolerable cost.

### 8.3 Identification of Beneficiaries

The cost reduction programs (PROAB and PAP) do not identify individual beneficiaries, but poor areas in which sales are organized through shopkeepers. The implicit criterion is therefore a mixture of geographic (initially at the municipal and then the neighborhood level) and economic parameters. No biological criterion, or of age, sex or nutritional status, is used. The donation programs (PSA, PCA and the Milk Program), on the other hand, use not only the geographic criterion but parameters pertaining to the family, i.e. its income level and the inclusion of one or more "vulnerable" members in terms of age or the condition of pregnant woman or nursing mother.

The principal advantage of not identifying individual beneficiaries is the consequent reduction in administrative costs. The principal drawback is that the flow of benefits is not channeled to the most needy--there is an unknown but potentially large dilution of benefits among the population. Even though the selection of geographical areas and the foods distributed prevents any significant diversion of benefits to non-poor families, the food intended for the very poor may easily reach the not-so-poor. And although there may be no large differences in income among the poor, there may be considerable variations in their nutritional status and need for medical care and education.

Regrettably, no study has attempted to estimate the cost of registering and monitoring individual beneficiaries, so there is no way of comparing this cost with the greater benefit which this identification potentially provides. The little information available on unit costs, discussed in section 5.4, suggests that administrative costs are not very high in comparison with the cost of registering and monitoring the retailers participating in the commercial programs. If this is true, then there is no good argument, based on cost and benefits, in favor of not registering individuals as opposed to benefiting an entire population group indiscriminately. This conclusion is reinforced to the extent that the identification of biologically vulnerable individuals makes sense, because in order to focus attention on them their families must be identified (this may not be a sufficient criterion as regards poor intra-family distribution, but it is still necessary). It should also be noted that there is no necessary connection between the identification (or not) of beneficiaries and the way in which food is distributed (commercial channel or government donation). In this sense, the milk program is a hybrid; it identifies individuals who should receive milk, but the physical distribution is made through commercial retailers. It is obvious that this system could be extended to a range of basic foods. The only hybrid scheme that could not function would be to identify the individual beneficiaries of a subsidy but still allow them to purchase any quantity of the subsidized foods, since this would certainly lead to purchases for resale. In this sense the nonidentification of PROAB or PAT beneficiaries is a necessary consequence of the policy of not placing quantitative limits on purchases.

Another advantage sometimes claimed for the nonidentification of beneficiaries is that nobody then has to feel humiliated, ashamed or picked out; the poor are not made to feel worse for having to acknowledge their poverty. In light of the total absence of empirical information on this

point--no study has ever been made even of what beneficiaries who are identified feel as compared to those who are not, and much less has anyone attempted to estimate what this alleged indignity is "worth"--this can only be regarded as an ideological statement. The only pertinent evidence is that the PROAB clients are apparently more disposed to criticize the program than the beneficiaries of the PNS, perhaps because the latter are afraid of losing their benefits (Oliveira and Medeiros 1985). But if there is a problem of fear, or a problem of the acceptance of ill-treatment, it could in principle be solved through better conduct of the program and closer monitoring of its operations.

In brief, it seems that the only reliable argument in favor of not identifying individual beneficiaries of a food and nutrition program is that it enables a subsidy to be used without quantitative restrictions. This means that the correct decision regarding beneficiaries is not independent of the selection of mechanisms; this issue is discussed in the next section.

The decision to register individual beneficiaries having been taken, there remains the question of what criteria to use. The combination of an economic and a biological criterion, adopted in all the donation programs, is a perfectly reasonable approach. One might consider adding anthropometric parameters, but in general terms this would be superfluous; basically, any child who is malnourished according to anthropometric criteria is also poor. It would be an unjustified error to impose a certain level of malnutrition as a necessary condition for participating in a program designed to prevent malnutrition, but there would be no problem in making this a sufficient condition for admission.

In principle, one could forego the economic criterion and simply admit as beneficiaries any family that meets the biological requirements and asks to enroll; in other words, let them say that they are poor, and take their word for it. In practice, this is how things must frequently happen, since the income of poor families is notoriously unstable and very difficult to determine. The only important consequence of abolishing any formal economic criterion is that the program benefits would have to be quite unattractive to non-poor families. This would strengthen the argument for distributing only basic, cheap foods. With the exception of milk, this is already the approach used in all the donation programs.

#### 8.4 Evaluation of Mechanisms

As is clear from the discussion in the two previous sections, the decision on what mechanism to use in a food and nutrition program cannot be separated from decisions on the selection of foods and of beneficiaries. Even when these interactions are taken into account, the evidence examined in Chapters 5 and 6 does not allow any firm conclusion to be reached in favor of one mechanism--e.g. donations versus subsidies or price reductions--over another. In practice there seems to be room for both kinds of program, since neither one demonstrates any clear superiority over the other.

Donation programs are traditional in the Brazilian context, while price reduction programs are relatively recent. Apart from this distinction, which is politically important because there is a tendency to suppose that a

new program will be more successful than an old one in tackling the same problems, a subsidy program offers a number of theoretical advantages which contributed greatly to the decision to implement the PROAB and test it as an alternative to the PNS. Among these advantages are:

- the existence of a price-effect that stimulates food consumption, in addition to the income-effect. The empirical evidence, reviewed in section 6.1, suggests that for the poor, and for basic calorie sources, this price effect is substantial.
- not paying the entire cost of the food means that subsidy can operate with lower costs per kilo of food passed on--which does not necessarily mean that the costs per additional kilo consumed will be lower.
- not registering individual beneficiaries reduces the number of clients to be monitored, and therefore in theory reduces administrative costs per beneficiary.
- working with shopkeepers means that the existing infrastructure and the efficiency of the private market can be exploited, reducing other administrative costs.
- finally, the subsidy mechanism is more flexible; the benefit and the cost of the program can be varied through changes in the amount of the subsidy for all or merely some foods, while to achieve the same for the PSA or PCA one would have to alter the number of clients and/or the size of the ration. This argument applies to a possible eventual integration of the PROAB and the PAP.

Have these theoretical advantages been realized in practice? The evidence is scarce, and such as it is does not confirm any superiority in terms of benefit obtained per unit of cost. The PROAB has suffered from serious supply problems, and in general terms has not succeeded in passing on the full value of the subsidy to the client. Furthermore, the nutritional results of the program (measured anthropometrically) can only be inferred from the study of the PINS (Nunes da Silva 1985), which showed very limited gains. It is true that the first of these problems may be attributable to COBAL's inefficiencies and to the slow and complicated machinery for financing the program, especially during periods of rapid inflation. The second problem--the meager nutritional results--may be due to the fall in family income during the period of the PINS experiment. In this sense, the theoretical advantages of a subsidy may not perhaps have been achieved, but it should not be concluded that they are unachievable. But even assuming a stable economic environment and an efficient system of supply, there are two reasons for concluding that unrestricted subsidy programs cannot entirely replace the traditional donation programs.

The first reason is economic: many beneficiaries of the donation programs are so poor that a subsidy on basic foods would still not enable them to eat properly. The recipient of the subsidy still has to pay 75 or 80 percent of the cost of the food; the subsidy enables him to feed himself

only if his income is sufficient to buy that proportion of a satisfactory diet. As long as unrestricted quantities can be purchased, and individual beneficiaries are not identified, the subsidy cannot exceed 20 or 30 percent; a greater price reduction would attract too many non-poor clients, either directly or through resale of the food. Hence it is not feasible to help the very poor through a subsidy program, and there is still a justification for direct transfers on the basis of prior identification of beneficiaries. The poor are not a homogeneous group, and a heterogeneous range of programs is merely a sensible response to this situation.

The second reason relates to the non-economic determinants of malnutrition, in other words cultural and health factors. In theory it is possible to target health and nutrition education programs at the beneficiaries of subsidy programs--the fact that the PROAB does not include such components does not matter if other programs exist that can help educate and provide health care for the same population. In practice, however, there is no evidence that these programs are working, and the theoretical expectation remains that education and/or health programs must be more effective in association with the donation component of a nutrition program. At the least, it is to be expected that such efforts will be more productive when directed at identified beneficiaries. This is not an argument for distributing food through a school or a health post; it merely strengthens the case in favor of identifying the audience for certain education or health activities in light of their current or potential nutritional status. The Milk Program could well have this kind of educational impact even when the milk is distributed through retailers.

This argument is strengthened if the same people who are too poor to obtain much advantage from a subsidy are also those in most urgent need of health or nutrition education. In such a situation a donation program can focus on the neediest groups, in various senses, while price reduction programs meet the needs of those who are less poor and better served in terms of education and health. This distinction between different levels of poverty is also important for a consideration of the future of the poor in Brazil and of the program modifications that would be appropriate to meet their needs. This issue is considered in section 8.7, after a discussion of other aspects of the experience accumulated up to now with these programs.

In sum, just as there is no single magic food, even less is there any magic or universally appropriate mechanism. Where the beneficiary's only problem is that his income hardly allows him to eat properly, a subsidy may be a good answer. But this supposes that his poverty is not of the extreme kind, that he already has access to health care, and that he does not require nutrition education. At the moment when he ceases to meet any one of these conditions--either because he is very poor, or because he needs specific nutrition education, or because his malnutrition is more a health problem than a question of income--a direct transfer is justified, along with individual identification of beneficiaries and quantitative restrictions on foods.

At this point other questions arise, viz. how should the direct transfer be made? Through a public or charitable institution? Or through a network of retailers? On the issue of whether it is better to give out the

food itself (as in the PSA and PCA) or whether it is just as or more effective to provide stamps or coupons (as in the Milk Program) there is still not a single comparative evaluation.

#### 8.5 Operational, Financial, and Institutional Aspects

Taken overall, the problem with programs such as the PCA, PNS-PSA or PROAB can be expressed as follows: that they do not show very significant results in terms of greater net food consumption, improved nutritional status, reduced incidence of diseases or other benefits which in theory are their justification. From the point of view of those who administer the programs, however, these deficiencies are remote and insubstantial. For them, the principal problems are typically financial and operational. It is true that a concern for the immediate problems is partly the result of a bias against research on INAN's part until recently (Knight 1982, pp. 14-15; World Bank 1985b), and of a conviction that if the programs succeed in transferring income everything else is secondary, as noted in sections 6.1 and 6.6. It is nonetheless undeniable that stable operation is a necessary condition for generating any medium or long-term benefit, and for achieving results at the minimum feasible cost. For these reasons, and given the history of the PNS and PROAB since their respective beginnings, it seems absolutely justified to regard their operating problems and needs as of great importance. It is not clear whether the PCA has suffered from any similar financial and operating instability; both its sources of financing and its cost structure are different from those of the INAN programs. The limited evidence available suggests that any instability in the operation of a program--particularly a donation program--leads to a corresponding instability, or even withdrawal, on the part of the beneficiaries (Kalil *et al.* 1984a and b). At best, the latter tend to use the program as a last resort, owing to the fact that participation can be irksome or the quality of the food poor. Consequently, more regular participation, with its more obvious and predictable benefits, depends on ensuring that the program operates reliably.

For the PSA and PROAB, and now for the PAP as well, the criteria for satisfactory operation include an uninterrupted supply of products, obtained at the lowest possible cost. This leads to two basic recommendations: first, whatever the financing mechanism adopted, there should be no delays in disbursing the necessary funds for timely food purchases; and second, that sufficient stocks of food should be held to ensure a stable supply. There is nothing original in these recommendations; they require no new policy, merely that reasonable financial and physical conditions be established, in line with the original concept for the programs. These two requirements--stable financing and buffer stocks--were fully discussed in 1984 at the seminar on the execution of the PROAB (INAN 1984b), but they apply with the same force to the PSA. This question is normally discussed in terms of maintaining a sufficient stock for 30 days of normal operation within the individual states, which in turn are supplied from COBAL's central stocks or by purchases within that state when this does not increase costs. Put this way, the recommendation has an obvious political component, given the participation of the state secretariats of health in program administration; linking local stocks with local purchases is obviously designed to strengthen the PROCAB and prevent purchases from being concentrated in the south of Brazil. Given the PSA's

concentration on the Northeast and the exclusively Northeastern focus of the PROAB, this criterion also has its element of regional policy. This should not disguise the fact that stable supply arrangements, eliminating shortages or sudden price changes, depend on a system of stocks; the only question is where to establish them and in what quantities. Quite rightly, COBAL regarded this issue as of fundamental importance in the establishment of the PAP.

Then there is the question of which agency or company should buy and manage the food stocks. The PAP maintains the tradition of giving COBAL a monopoly of these tasks, which seems natural for a program that is entirely COBAL's, with no participation by INAN. The situation is different for the programs in which INAN intervenes, namely the PROAB and PSA, where COBAL's control has contributed to shortages, poor food quality, and unnecessarily high prices (INAN 1984a and b). When the company's monopoly was broken in 1986 supplies could be improved, to the point where the problems briefly became those of a surplus rather than a shortage of food (oral communication, INAN, December 1986). Allowing INAN to carry out these functions instead of depending on COBAL produces gains, but requires certain conditions if the arrangement is to work. COBAL would always have to be one possible source of supply, subject to checks to ensure that it was not secretly subsidizing its sales. For its part, INAN would need to have the administrative capacity to carry out these functions, which it has not always displayed in the past.

As regards financing, any mechanism may be suitable in principle, provided that the funds it accumulates are disbursed promptly. One obvious solution for the financing of the PSA and PROAB would seem to be to channel budget allocations directly to INAN, thereby enabling the Institute to pay COBAL immediately for what the company buys from its suppliers or to buy directly from other sources for cash, in the search for the lowest possible prices. What should at all costs be avoided is COBAL paying more than necessary, either because it cannot take advantage of favorable circumstances (harvest periods, for example) through lack of money or because it has to buy on credit. It should be noted that the fact that INAN pays only about 20 percent of the cost of the food marketed by the PROAB--as against 100 percent in the PSA--provides no protection against the problems of delayed or irregular financing. Purchasing food at minimum prices is a necessary condition for a program to operate at minimum total cost. Where a subsidy is involved, if the purchase price is greater than that paid by the retailers, only part of the subsidy will be passed on to the beneficiary, as has happened in the PROAB. Nonetheless, it would be a mistake to take the minimizing of the total cost per unit of food supplied as a measure of the overall efficiency of the operation of a program. In practice, optimum operation means minimizing the cost in relation to the benefit obtained by the client, which we do not know how to quantify. What we do know is that the effective transfer of benefits depends on good administration and oversight of the program, and these activities are not cost-free. The evidence obtained from a comparison of the results of the PNS and PCA suggests that the former may have spent too little on these matters. Unfortunately, the information on unit costs summarized in section 5.4 does not allow us to determine the optimum level or structure of costs, but it does indicate the need to balance the non-food costs against the improvements that can be obtained in program effectiveness as a result of better oversight and evaluation of its operations.

A familiar theme in the evaluation of food and nutrition programs in Brazil has been the lack of any central oversight or coordination, even when the PRONAN formally existed. Specifically, INAN has not been able to guide programs as important as the PNAE and PAT, or to insist that the PCA follow its decision to use natural foods. The combination of political and technical weakness from which INAN has suffered since it was established tends to give rise to one of two reactions: either it is recommended that all the decision-making power on any program included in the PRONAN be centralized in (INAN 1981a), the relative "weakness" of the programs being attributed to the lack of this power; or it is urged that no new initiative be entrusted to INAN, and even that a number of its functions be distributed among other agencies (Knight, 1982, pp. 13-16 and 25).

In practice both positions seem exaggerated. The former implicitly assumes that programs such as the PNS-PSA or PROAB suffer because other agencies are managing programs with different objectives or procedures. It may be that the PSA and PROAB have fewer resources because the PNLCC or PNAE, for example, are not under INAN's control--but this says nothing about the results achieved with the funds available, or the efficiency with which they are used. The second position, expressed by the World Bank and to some extent by the CNRH, seems to reflect frustrations with a difficult situation, not all of which is INAN's fault.

In practice the optimal institutional or administrative relationship is bound up with the decisions on the foods to distribute, the population to be served, and the distribution mechanism. Moreover, the variety of programs in Brazil is not merely a waste of effort; rather it has been a complex natural experiment without which we would know even less than we do about how to define and attack malnutrition. Finally, centralized control is not necessarily a benefit, while a monopoly makes it difficult to correct program deficiencies.

Once these matters are settled, the question of INAN's position perhaps becomes a secondary issue. It would only be necessary for it to have significantly greater power if it were given relatively direct control over programs not run by the Ministry of Health; for this purpose it would be advisable, and perhaps necessary, for INAN's connection with the Ministry to be cut, which would run counter to the idea of linking nutrition and health programs more closely in Brazil.

## 8.6 Integration with Health Care

It was noted in section 6.6 that the link between any or all of these assistance programs and their clients' health is much weaker than might be expected. This seems to be due, among other factors, to inadequate integration of the programs with any knowledge about the health of their beneficiaries and the health activities of the institutions administering them. It is therefore recommended that this integration be strengthened so as not to waste the food assistance and to exploit the many other ways of benefiting the participants' health. This seems to be of particular importance in relation to parasitic diseases and diarrheas, and hence for the health of children under three. It cannot, however, be achieved through a mere requirement to go to a health post, especially when this is regarded as a

tiresome and unnecessary imposition. Furthermore, even when the aim of making the client appear at the health post is achieved, there seems to be a serious problem regarding the system's capacity to perform the two tasks of distributing food and providing health care. In theory the two processes are complementary, but they can easily end up being competitive in practice (Nunes da Silva 1986). The implicit assumption behind the decision to distribute food through the health facilities seems to be that there has been significant spare capacity which could be used for this additional task; but experience suggests that this spare capacity does not exist. There may indeed be inefficiency, but this is another matter. Additional resources may therefore be necessary to achieve this integration of nutrition and health. This would have obvious consequences for the total cost of the food programs, but as pointed out in section 8.5, a higher total cost is not necessarily a bad thing if it produces greater benefits. This conclusion is reinforced to the extent that the beneficiaries of a food donation program need nutrition and health education as well, which also uses skilled human resources and entails greater total costs.

Direct integration is in principle indicated for a program that identifies individual clients and provides health care in the same location as the food is distributed. The situation is different for the programs that only affect food prices and have no direct connection with health services. In this case information is needed about the health and nutritional status of the beneficiary population, to allow for the optimal provision of health care activities. The implicit hypothesis is that the health services are meeting the target population's needs, so that it does not matter that they are operating independently of the food programs. But insofar as this assumption is not being borne out, food is being unnecessarily wasted in relation to the benefits obtained, and so there is scope for intensifying the impact of the food program through the activities of the health services.

Also important is a correct understanding of the associations between the different food and health activities, and their consequences in either direction. For example, controlling diarrheas leads to better nutritional status, but the food supplements seem to reduce neither the frequency nor even the severity of diarrheas (Feachem 1985). Proper evaluation of integrated actions requires specifying the direction of the effects that are to be studied and promoted. As regards nutritional status, the most important achievements of a health service, even when operating in relatively difficult conditions, may be to promote pre-natal checks on pregnant women and wider vaccination coverage (Galvao and Sampaio 1981). What in fact is being recommended is that the food donation or subsidy programs should not be regarded merely as a politically acceptable way of redistributing income, but that instead the association between nutrition and health, which provides their primary justification, be taken seriously. This emphasis will be even more important to the extent that efforts are concentrated on the malnourished and the sick, rather than on using the programs as a response to poverty in general.

#### 8.7 Social Changes and the Future of the Programs

All the programs studied here were designed to be of an "emergency and temporary" nature (IPEA 1981?b, p. 6), their objective being to protect a vulnerable population group while more profound social transformations began

to reduce poverty and with it the need for food and nutrition assistance. These changes, it is assumed, would affect relations within the economy in general and the structure of employment, production and income in rural areas in particular.

It is widely recognized both outside Brazil (Timmer *et al.* 1983, Chapter 5) and within it that the food consumption and nutritional status of poor families may depend much more on the country's macroeconomic and agricultural policies than on any specific activities targeted at the provision of food. In this sense it is absolutely right for the Program of Social Priorities to stress employment generation and a more equitable distribution of income. There is, however, a danger in this insistence; as happens with regard to other components of the food and nutrition ideology, a partial truth may conceal rather than illuminate reality. No matter how successful the government's program and general economic management, it is unlikely that it will totally eliminate poverty, even for several decades. It would be a triumph if it only managed to give each employable adult male a job that enabled him to feed his family properly, without having to resort to any public assistance program. But then there would still be a large poor population, concentrated in family units headed by women who because of the presence of young children and their lack of working experience would find it difficult to obtain employment through the labor market, not to mention a large number of elderly and/or incapacitated persons.

Even in countries much richer than Brazil it has been necessary to maintain specific nutrition and health programs for these groups (Kotelchuck *et al.* 1984), although they may be on a smaller scale than the general subsidy or assistance programs. In the specific case of Brazil a general reduction in poverty, which would not eliminate the problem of malnutrition among poor women and children, would seem to have some implications that social policy ought to anticipate. First, the incorporation of women into the labor market, which would enable the assistance provided through programs like the PSA to be reduced, may depend on the availability of other programs, such as those of the LBA, to take care of small children. Second, as general poverty is reduced, programs like the PROAB or the PAP may become less important, while specific assistance such as that provided by the PSA or PCA will, relatively speaking, become more important. This is not to say that the PROAB cannot function in the circumstances for which it was designed--generalized but not very severe poverty--but only to point out that success in alleviating poverty by expanding employment and income tilts the balance of needs towards individual programs, such as those providing free food. This would be even more true if the poverty that does not respond to a general economic improvement were more associated with health problems; such problems are much better treated through the PSA or PCA than by a program which only lowers food prices.

This has two implications for the future of the programs that run counter to the current trend embodied in the Program of Social Priorities. First, the programs would have to be more rather than less intensive in skilled manpower in order to provide the proper health and educational assistance required. The way of the future would not be that represented by COBAL, which maximizes the amount of food passed through the system and

minimizes these individual contacts with the program. Second, to the extent that general poverty is reduced, there will be greater scope and urgency for reducing the number of clients and increasing the assistance given to each one. A given amount of resources would have far greater nutritional impact if it were focused on giving more food to fewer people, i.e. those most in need. Unfortunately this approach means putting a brake on the political desire to maximize the number of beneficiaries, even at the cost of minimizing the benefit. It is also clear that in these circumstances the proper selection of beneficiaries would be even more important than it is at present.

## 8.8 Final Reflections

Brazil's experience with food and nutrition programs is so long and varied, on the one hand, and so inadequately evaluated on the other, that no simple answers can be put forward as regards what should be done to reduce hunger and malnutrition. Such conclusions as can be drawn on a number of specific issues have already been discussed in previous sections of this chapter. The purpose of this final section is to offer three more general reflections deriving from the study.

First, food adequacy and nutrition, no matter how closely related, are not the same thing. The problem of food adequacy may or may not reveal itself as a nutrition problem; and a nutrition problem may or may not be the result of an inadequate supply of food. Part of the evident lack of success of Brazil's programs in this area derives from this fact, because the kind of intervention that corrects one sort of problem is not necessarily useful for the other.

A great deal of the debate, and of what we have called the ideology of malnutrition, involves an over-simplification of this question. The complex reality probably requires numerous, complex interventions, whether economic, or pertaining to education and health, separately or together. What at times seems to be a confusion of competing and even contradictory programs is not, therefore, necessarily an error or merely an unfortunate result of the proliferation of competing and uncoordinated public agencies. Certainly there must be greater consistency among the various policy components--or, to put it better, there must be a consistent public policy in the area of food and nutrition. Attempts have been made to define a consistent global program in this sense (Souza et al. 1986), but it is still too early to say whether such a policy exists or will produce results. In any event, consistency does not have to entail any monopoly or uniformity of approach to the related but different problems of food adequacy and nutrition in Brazil.

Partly as a result of this multi-faceted situation, but even more for other reasons, the main problems for public intervention can be defined as operational rather than conceptual. While clear ideas and well-designed programs are certainly important, even the best concepts will achieve little if food is lacking, if prices are too high, if the administration of the food results in less or worse medical care, if the need for educational efforts is not met, or if the clients only benefit from the program on an emergency or intermittent basis. Brazil's experience, assessed as a whole, seems to show that if a program is efficient, adequately supervised and equipped with the necessary resources, it may reduce malnutrition; there are a number of

different ways of achieving this objective. But the same experience also indicates that no program has had the impact that was expected of it--at times the nutritional impact has been very small, and in general terms the potential results have not been well measured--and it appears that the principal reason for this is internal inefficiency, lack of resources, and inadequate supervision. In other words, the need is not so much to redesign programs, and still less to devise new ones, but rather to improve the internal administration of existing ones so that they produce something closer to their potential yield.

Third, the entire food and nutrition program functions (or ceases to function) in a given context, and thus depends on other programs or systems to function too. The program depends on the proper operation of the private market for food, or, if it refuses to rely on that, on a public supply system. It depends on the health services working as they should, and it even assumes that they operate with sufficient spare capacity to absorb new responsibilities without new resources. And any program depends, generally without explicitly recognizing the fact, on what happens to employment and incomes, on the people's knowledge of nutrition, and on the education systems that change that knowledge, for better or worse.

All the assistance programs recognize that they are not going to correct the defects of the economic system or the education system; they aim to compensate for these shortcomings while reforms are undertaken or until the necessary development occurs that makes food assistance superfluous. This does not mean that there is no need to identify the bottlenecks and obstacles that prevent the food and nutrition programs from operating efficiently. At times, the main problems will be beyond the scope of these programs, requiring changes not in order to put an end to hunger in some remote future, but so that the fight against hunger can continue today.

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Telex: WUI 64145 WORLDBANK  
RCA 248423 WORLDBK

Cable Address: INTBAFRAD  
WASHINGTONDC

### **European Office**

66, avenue d'Iéna  
75116 Paris, France

Telephone: (1) 40.69.30.00

Facsimile: (1) 47.20.19.66

Telex: 842-620628

### **Tokyo Office**

Kokusai Building  
1-1 Marunouchi 3-chome  
Chiyoda-ku, Tokyo 100, Japan

Telephone: (3) 214-5001

Facsimile: (3) 214-3657

Telex: 781-26838