

Implementation, monitoring, and evaluation of the nutrition component of the Mexican Social Programme (PROGRESA)

Juan A. Rivera, Guadalupe Rodríguez, Teresa Shamah, Jorge L. Rosado, Esther Casanueva, Irene Maulén, Georgina Toussaint, and Alberto García-Aranda

Abstract

Mexico has implemented a number of food and nutrition programmes and policies since 1950. However, these initiatives have been largely ineffective. A new social programme targeted to poor families has been implemented. It now covers almost 2 million families and is expected eventually to cover 4.2 million families. The programme facilitates access of beneficiaries to health and education services, and includes monetary transfers and a nutrition component targeted to the critical development period between gestation and the age of two years. Pregnant and lactating women and children under two years of age receive food supplements fortified with key micronutrients. After decades of food and nutrition interventions that were not carefully evaluated, the programme performance and its nutritional impact will be evaluated. A baseline survey was conducted in 1998 on a random sample of communities selected as beneficiaries of the programme and on a sample of similar communities that will participate in the programme after the end of the evaluation. Additional surveys will be conducted in 1999 and 2000. Each survey will include a cross-sectional evaluation of children and women and a cohort of children zero to 12 months of age at baseline who will be followed. Preliminary results from the baseline survey of beneficiaries are presented and discussed.

Introduction

A number of food and nutrition programmes and policies have been implemented in Mexico, including eco-

nomie and food policies at the macro level, social-sector support programmes for human development, and food distribution programmes. Between 1950 and 1980 a mixture of wide-ranging initiatives was implemented, including regulation of food prices, provision of subsidized basic foods through government-owned retail stores, general subsidies on staple foods, school lunch programmes, and the distribution of food baskets to poor families. Since 1990 food and nutrition policies and programmes have been reviewed in terms of their cost-effectiveness. The review concluded that food and nutrition programmes have been ineffective, largely because the services have not been targeted to those in need. A substantial proportion of the subsidies went to groups that were not vulnerable in socio-economic or biological terms. This low effectiveness was in part the motivation behind the Programme for Education, Health, and Food (Programa de Educación, Salud y Alimentación; PROGRESA), which the administration of President Zedillo implemented as its main social programme. There are three main components, as the title of the programme indicates: education, health, and food. PROGRESA also includes several activities aimed at improving the nutritional status of children under five years of age and of pregnant and lactating women.

Description of PROGRESA

PROGRESA was designed as a programme that emphasizes adequate targeting of its beneficiaries. The goal of the programme is to reach the estimated 4.2 million families (about 25 million people) who, according to government estimates, are below the extreme poverty line. The ultimate objective of the programme is to improve human capital among poor families through investments in education, health, and nutrition.

The first stages of the programme, which started in May 1997, were directed at rural areas, and coverage has gradually increased. The beneficiaries up to March 1999 were over 1.9 million families living in 1,750 *municipios* (counties) in about 41,000 communities.

Juan Rivera, Guadalupe Rodríguez, and Teresa Shamah are affiliated with the Instituto Nacional de Salud Pública in Cuernavaca, Morelos, Mexico. Jorge Rosado is affiliated with the Instituto Nacional de la Nutrición Salvador Zubirán, Esther Casanueva with the Instituto Nacional de Perinatología, Irene Maulén with the Instituto Nacional de Pediatría, and Georgina Toussaint and Alberto García-Aranda with the Hospital Infantil de México Federico Gómez—all in Mexico City.

These families were selected through a two-stage process. First, the rural communities with the poorest infrastructure, least education, and fewest economic opportunities were selected. Two other conditions were required for the communities to be included in the programme: a population between 50 and 4,999 and access to health and education services. These two conditions are likely to exclude very poor people from the programme, but were deemed necessary. The lower population limit was set because the cost of delivering services to communities of fewer than 50 people is prohibitive, and access to health and education services is required, given the nature of the programme, which offers its services through the health and education sectors.

The identification of communities was followed by the selection of individual families within those communities. On the basis of surveys in which the socio-economic condition of the families was evaluated, those classified as living in extreme poverty were chosen as beneficiaries of the programme. In order to receive benefits, selected families must comply with health-care visits and attend health education sessions, and the children must attend school regularly.

The programme includes the following benefits for participating families:

A monetary transfer for food purchases to all families. Every family receives a fixed monetary transfer regardless of the number of family members and their ages. The purpose of the transfer is to improve the family diet, and it is intended for food purchases. The amount of the transfer in March 1999 was 115 pesos per month (US\$11.50). The amount is adjusted for inflation every six months.

Grants to families whose children attend school. One of the principal obstacles to human capital formation is dropping out of children from primary and secondary school, which often results from the need of parents to increase household income. The cost of education and the opportunity cost of having a child who can generate income at school are factors that stimulate dropping out of school. The objective of this component is to provide incentives to families to keep their children in primary and secondary school.

The participating families receive a grant for each child attending school between the third grade of primary school and the third grade of secondary school. The amount of the grant varies as a function of the grade for primary schoolchildren and as a function of the grade and the child's sex for secondary schoolchildren (table 1). Because girls drop out from secondary school at a higher rate than boys, the amounts granted to girls are larger. The additional amount granted to girls is a function of the difference between boys and girls in the opportunity cost of remaining in school. In addition to these benefits, families receive small amounts of money to cover the cost of school sup-

TABLE 1. Education grants to beneficiaries of PROGRESA whose children attend school

School/grade	Monthly grant (Mexican pesos) ^a	
Primary		
3		75
4		90
5		115
6		150
Secondary	Boys	Girls
1	220	235
2	235	260
3	245	285

a. 1 peso = US\$0.10.

plies. The educational grants are also adjusted for inflation every six months. Benefits are not provided if children do not attend school regularly.

The amount of the combined food and education grants is substantial relative to the incomes of the families, averaging 268 pesos per month (about US\$27), about 30% of monthly income.

Health care for all family members. All members of participating families have access to free health care at government health clinics. A primary health-care package, including basic preventive and curative services, is offered at health clinics serving PROGRESA communities. The infrastructure and equipment of clinics in these communities have been improved substantially through PROGRESA. In addition, personnel attending programme clinics receive special training and supervision. Moreover, physicians attending programme clinics are paid at substantially higher rates than physicians attending clinics in communities not included in PROGRESA.

Participating mothers or child-care providers must also attend health education sessions. At these sessions 25 topics are presented, including nutrition, hygiene, infectious diseases, immunization, chronic diseases, and other topics. Physicians and nurses who are trained in the specific topics conduct these sessions.

Nutrition component of PROGRESA

In addition to the above benefits, food supplements are provided to all children under two years of age, regardless of nutritional status, to all pregnant and lactating women, and to children between two and four years of age with moderate to severe underweight (weight-for-age < -1 Z score of CDC/NCHS/WHO reference population [1]). The supplements were specifically formulated by an advisory committee brought

together by the Secretary of Health that included nutritionists, food scientists, and public health specialists. A detailed description of the products and the process of their development is presented elsewhere [2, 3]

Supplements for children and women contain the following ingredients: whole dry milk, sugar, maltodextrin, vitamins, minerals, and artificial flavours and colours. The supplements are distributed in 240-g packages and are ready to eat after they are hydrated. Once hydrated, the supplement for children has the appearance of a pap or puree (a thick liquid suspension). The product is called *papilla* (Spanish for pap) and is produced in banana, vanilla, and chocolate flavours. A daily ration consists of 44 g of the dry product (69 g after hydration) and supplies 194 kcal of energy, 5.8 g of protein, and approximately the recommended daily allowance (RDA) of vitamins A, E, C, B₁₂, and folic acid, as well as of iron and zinc. The energy and nutrient composition of one ration of pap is presented in table 2.

The supplement for pregnant and lactating women is intended to be hydrated and consumed as a beverage. The beverage, *suplemento alimenticio* (food supplement), is available as banana flavour, vanilla flavour, and natural (without flavour). A daily ration is 52 g of the dry product (202 g of the beverage) and contains 250 kcal of energy, 12–15 g of protein, and vitamins E, C, B₁₂, and folic acid, as well as of iron, zinc, and iodine. The energy and nutrient composition of one ration of the beverage for women is presented in table 2.

The supplements are distributed through the health clinics every month. Each family receives a one-month supply of supplements for each participating member. Four of the 25 topics covered in the education programme are designed to encourage supplement consumption and adequate feeding practices: the PROGRESA supplements, diet and health, nutrition during pregnancy and lactation, and breastfeeding.

The topic dealing with the PROGRESA supplements

provides motivational messages that encourage adequate child feeding and the administration of the supplements to the intended beneficiaries and provides practical information about the preparation, administration, and storage of the supplements.

Community study of acceptability and intake

As part of the development of the supplements, spot taste tests were conducted [3]. In addition, the acceptability and consumption of both supplements over two weeks were studied in a semi-rural community in the State of Morelos. The pap was evaluated in a group of 108 children: 81 children under two years of age (58 breastfed and 23 weaned) and 27 moderately underweight children between two and three years of age who were already weaned. The beverage was evaluated in 128 women, of whom 64 were pregnant and 64 were breastfeeding. The composition of the groups reflected that of potential beneficiaries.

The supplements were prepared according to the instructions in the package, using a scale with a precision of 2 g. The acceptability of both supplements was assessed during three consecutive days. The flavours were randomly selected, prepared, and administered to each subject on the three days. Hedonic scales were used to assess the acceptability of the flavours and the consistency of the products. Acceptability was measured by a five-point scale in children and a three-point scale in adults.

Intake was assessed for 14 consecutive days (except Sundays) during which a ration of the favourite flavour was offered to the mothers and children daily at a supplementation centre. In both the acceptability and the intake assessments, the amount served and the leftovers were weighed on an electronic scale with a precision of 2 g. The amount consumed was recorded daily. Some of the results for acceptability and intake have been reported elsewhere [3]; here we present a brief summary of the main findings.

The results of the tests with hedonic scales to assess acceptability of the flavours were satisfactory for the pap and the beverage. The average score for different flavours of pap ranged between 4.0 and 4.1 over a five-point hedonic scale. For the beverage the average was 2.8 over a three-point hedonic scale for all flavours. No significant differences were found between flavours for the pap or the beverage. Similar satisfactory scores (not presented) were found for consistency and for other organoleptic characteristics of the supplements.

During the three-day acceptability tests, the intakes did not differ significantly by flavour for either pap or beverage. On average, 73% of the pap and 96% of the beverage served were consumed. Figure 1 presents daily consumption over the 14 days of the study. The amounts

TABLE 2. Energy and nutrient content of one ration of the PROGRESA supplements^a

Content	Children's pap	Women's beverage
Protein (g)	5.8	12–15
Energy (kcal)	194	250
Iron (mg)	10	15
Zinc (mg)	10	15
Vitamin A (µg)	400	—
Vitamin E (mg)	6	10
Vitamin C (mg)	40	70
Vitamin B ₁₂ (µg)	0.7	2.6
Folic acid (µg)	50	100
Iodine (µg)	—	100

a. One ration (dry weight) consists of 44 g of children's pap or 52 g of women's beverage.

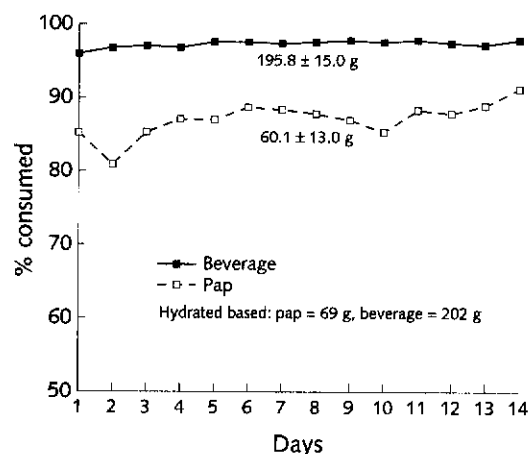


FIG. 1. Average daily consumption of PROGRESA supplements (percentage of ration) over 14 days of study

of pap and beverage offered were 69 and 202 g, respectively. The average intakes (\pm SD) over the 14 days were 196 ± 15 g for the beverage (97% of the ration) and 60 ± 13 g (87% of the ration) for the pap. These intakes are equivalent to 244 kcal for the beverage and 168 kcal for the pap. The intakes were relatively constant over the 14 days (fig. 1). Although the follow-up period was short and longer-term evaluations are advised, the amounts consumed during the study period were satisfactory and, if continued for a longer period of time, would have a positive impact on the nutritional status of children and women.

Process and impact evaluation

The advisory committee in charge of the design of the supplement developed a proposal for evaluating the process and the impact of the programme on the nutritional status of children and women.

Process evaluation

The objective of the process evaluation is to assess the performance of the programme. This will be done by contrasting the norms, procedures, and goals of the project as stated in the programme plan with the way the programme actually works. This will enable us to determine the degree to which the goals of the programme are met. Two sources of data will be used: information produced on a routine basis in health units and information obtained through surveys conducted in health units and at homes in communities where the programme is in progress.

Routine information is generated and analysed periodically by the Secretary of Health. A number of variables are already part of a surveillance system. In order

to reduce the need for special information, some variables that are currently produced by the system will be used. These variables include changes in prevalence of low weight-for-age, percentage of children recovering from malnutrition, and mortality due to nutritional deficiencies.

The following variables, not currently included in the system, will also be obtained: participation in key health-care programmes, coverage of nutrition education programmes, and distribution of supplements.

All the information will be obtained for children under five years of age and for two subgroups: children under two years of age and those between two and four years of age.

Information will be obtained by surveys conducted in health units and in selected homes. Households will be selected centrally from a list of beneficiaries. In the health units, questionnaires will be given to physicians and nurses. In addition, inspection of stored supplements and examination of records will be made. During the home visits, a questionnaire will be completed for families included in the programme.

The areas that will be assessed are delivery of supplements to units, status of stored supplements, selection of beneficiaries, delivery of supplements to beneficiaries, participation in nutrition education sessions, acceptance of supplements by children, sharing supplements with other family members, and satisfaction of beneficiaries.

Impact evaluation

The purpose of the impact evaluation is to assess the benefits of the programme to the nutritional status of children. Two study strategies will be used: a cross-sectional design to estimate the impact on the prevalence of malnutrition and micronutrient deficiencies, and a longitudinal design to assess the impact on growth and micronutrient status. For both types of strategies, a design with intervention and control communities will be used.

As mentioned earlier, since May 1997 the programme has increased its coverage gradually over different recruitment phases. Since the protocol for the evaluation of PROGRESA was completed after the programme began, beneficiaries included in the evaluation were selected from communities that joined the programme during the fourth recruitment phase, which started in September 1998.

Cross-sectional design strategy

Table 3 illustrates the cross-sectional design strategy. Three cross-sectional surveys will be conducted over two years. Each survey will use an independent random sample of children residing in 224 communities that were randomly selected from communities that joined PROGRESA during the fourth recruitment phase

TABLE 3. Cross-sectional design

Groups	Baseline survey, August 1998	Follow-up	
		August 1999	August 2000
PROGRESA <i>n</i> = 224 <i>n</i> = 2,240	Anthropometry Haemoglobin Blood sample Dietary intake Supplement intake	Same as for baseline	Same as for baseline
Control <i>n</i> = 224 <i>n</i> = 2,240	Anthropometry Haemoglobin Blood sample Dietary intake Supplement intake	Same as for baseline	Same as for baseline

in six states. The numbers of communities and of children within communities that were sampled were determined on the basis of the expected impact of the programme on the prevalence of undernutrition and of micronutrient deficiencies. Control communities were selected among eligible communities that were not selected to participate in the first four phases of the programme. Once a community had been selected as a control, entrance to the programme was postponed until completion of the last evaluation survey (by the end of the year 2000). The control communities were selected individually to match each PROGRESA community in population, indicators of community infrastructure, wealth, and geographic location. The control communities had to be in the same *municipio* as the matched PROGRESA community. As will be explained in detail later, since not enough communities were found to match each PROGRESA community, the number of control communities did not reach the intended number of 224.

Three cross-sectional surveys were planned for both PROGRESA and control communities. A baseline survey was carried out between August and September 1998, one follow-up survey took place in August and September 1999, and another will take place in August and September 2000.

In each PROGRESA community, 10 families with children under five years of age that were selected to participate in the programme were randomly chosen for participation in the survey. In each survey, an independent sample was to be obtained. The questionnaire used in PROGRESA communities for the selection of beneficiaries was also used in control communities and was administered by the personnel who conducted the survey regularly. Families from the control communities that would qualify as beneficiaries of the programme were the group from which families were selected for participation in the survey. Therefore, families selected for the survey in control communities were similar in

socio-economic status to those selected for the survey in PROGRESA communities.

The following information and measurements were obtained for children and their families: age; anthropometric measurements (weight and length or height); haemoglobin (using a portable photometer); dietary intake (using a 24-hour recall questionnaire); and vitamins A, E, C, and B₂, as well as zinc and iron, from a venous blood sample.

The principal outcome variables of the cross-sectional design are the prevalences of malnutrition, anaemia, and micronutrient deficiencies. For the prevalences of wasting, stunting, and underweight, -2 standard deviations of the NCHS/WHO norm [1] were used as cut-off points. For anaemia, a cut-off of 110 g/L, adjusted for altitude, was used. The cut-off points for micronutrient deficiencies were plasma ferritin concentrations below 12 µg/L for iron, serum retinol concentrations below 0.7 mmol/L for vitamin A, and plasma concentrations below 10.7 mmol/L for zinc. Other variables that were used as covariates were socio-economic conditions, satisfaction with the programme, and intake of the supplements.

Longitudinal design strategy

Table 4 illustrates the longitudinal design strategy. The group of children who were between zero and six months of age studied at baseline will be followed one and two years apart to assess the impact of the programme on growth and micronutrient status. The children will be between 12 and 18 months old at the second follow-up and between 24 and 30 months old at the third follow-up. The information and measurements obtained will be the same as those in the cross-sectional surveys. However, the outcome variable will be the change in nutritional status over time. The principal outcomes will be linear growth and changes in length-for-age Z score, weight gain and changes in weight-for-age Z score, changes in weight-for-length Z score, changes in the mean values of haemoglobin and micronutrient status (vitamins A, E, C, and B₂, as well as zinc and iron), and changes in the prevalence of wasting, stunting, underweight, anaemia, and micronutrient deficiencies.

TABLE 4. Longitudinal design

Groups	Baseline survey, August 1998	Longitudinal follow-up	
		August 1999	August 2000
PROGRESA	0-6 mo	12-18 mo	24-30 mo
Control	0-6 mo	12-18 mo	24-30 mo

Data analyses

The prevalences of malnutrition, anaemia, and micronutrient deficiencies will be compared between the type of community (PROGRESA and control) at baseline and at the two cross-sectional follow-up surveys. Unadjusted comparisons will be made first (using chi-square tests), followed by adjusted comparisons using logistic regression models, with the prevalences as dependent variables, and the type of community, an indicator variable for time of follow-up, and a number of covariates and potential confounding factors as independent variables. An interaction term between type of community and time of follow-up will be tested to assess the impact of the programme.

To identify subgroups with larger impact, a number of statistical interactions between type of community and potential effect modifiers will be tested. In addition to the comparison of prevalences, differences in mean or median values between groups will be studied using the cross-sectional data. Analysis of the longitudinal data will use two approaches. In the first approach, multiple linear regression models will be used, with the indicators of nutritional status *Z* scores at the last survey as dependent variables, and the *Z* scores at baseline, an indicator variable for type of community, and a number of covariates and effect modifiers as independent variables. In the second approach, generalized estimating equation techniques will be used to take advantage of the longitudinal nature of the data. The structure of the equations and variables used in generalized estimating equations will be similar to those used in the multiple linear regression models. As in the case of prevalences, interactions will be tested. Similar analysis will be conducted with anaemia and with the indicators of micronutrient status.

Results of baseline survey

The baseline survey was conducted during August and September 1998, with 222 PROGRESA communities and 146 control communities finally selected for the evaluation. The intended number of PROGRESA and control communities was 224 of each. Because of coding errors in the selection process, two of the PROGRESA communities were not included in the final set. The reason for the substantially smaller number of control communities was that not enough communities, among those that qualified as potential controls, were found to match the selected PROGRESA communities. Given the smaller number of control communities, in order to reach the required sample size of 4,480 children and 416 pregnant women, the number of children randomly selected within communities was set to be larger in control than in PROGRESA communities.

Data analyses have not been completed; however, preliminary results for children under five years of age

indicated high coverage rates (about 94%) and a high prevalence of malnutrition and anaemia. The overall prevalences of malnutrition were 36% for stunting (length/height-for-age *Z* score < -2), 22% for underweight (weight-for-age *Z* score < -2), and 5% for wasting (weight-for-length/height *Z* score < -2). The prevalence of anaemia (haemoglobin < 110 g/L) was 25%, and that of severe anaemia (haemoglobin < 100 g/L) was 12%. No differences were found in the prevalences of malnutrition or anaemia between children in the PROGRESA and control communities. These results indicated that children in PROGRESA communities may benefit from the programme, given their high prevalences of malnutrition and anaemia. In addition, the similar nutrition status in the two study groups indicated that the control communities were adequate to be used for comparisons in the two subsequent surveys.

Conclusions

The principal features of PROGRESA are its emphasis on targeting the benefits of the programme to poor, vulnerable families and the importance given to investing in human capital formation by facilitating access of beneficiaries to health and education services of high quality and through improvements in nutrition during the critical period between gestation and the age of two years. In order to accomplish its goals, PROGRESA requires the coordination of three key government sectors—Education, Health, and Social Development—that are working in a specific intervention in which the role of each sector has been clearly defined.

The recognition of nutrition as a key component of PROGRESA is an important feature of the programme. Moreover, for the first time in Mexico, a nutrition intervention has been targeted to the critical development period between gestation and the age of two years. The rationale for this is the evidence in the literature that the largest effects of dietary improvements occur during this crucial period [4, 5]. Another important feature of the project was the decision to add key micronutrients to the supplements. The micronutrient mixture added to the supplement was defined on the basis of evidence about micronutrient deficiencies in Mexico [6–8].

Finally, after decades of food and nutrition interventions that were not carefully evaluated, the performance and the nutritional impact of the programme will be evaluated. The projected cost of the nutrition component (about two million dollars) is very small relative to the total investment in the programme. Its results will allow measurement of the magnitude of the nutritional impact and will also provide answers if the programme is less effective than expected. The performance evaluation will allow lessons to be learned from mistakes.

The programme started in May 1997. Since then, coverage has increased substantially. The fact that almost two million families were beneficiaries of PROGRESA as of March 1999 reflects the political support for the programme. Ironically, this support may be the principal drawback to the sustainability of the programme. President Zedillo's administration will end in the year 2000. In Mexico large-scale programmes such as PROGRESA are usually not sustained after the end of a presidential term. Since PROGRESA is envisioned as the social programme of President Zedillo's administration, it is likely that the next administration will not continue with the programme as such, regardless of what political party wins the presidential election. However, certain components of the programme, particularly those that are most appreciated by the beneficiaries,

may persist, even if the name and certain components of the programme change. That is probably the case for the money transfers, which are highly valued by beneficiaries. At this point it is difficult to judge the degree to which the public appreciates the nutrition component of the programme.

Since the performance evaluation has not yet been conducted, we do not know at this point how the programme is being implemented. If indeed the nutrition component is implemented as planned, its most important benefits will probably be observed in the long run, when children who benefited from the different components of the project reach their productive age. The expected benefits will be better physical and mental performance that may improve the chances of the beneficiaries to lead healthy and productive lives.

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Summary of discussion of articles by Rosado et al. and Rivera et al.

Cost. Originally, a single sachet cost US\$0.12 to produce and package. The cost has been reduced to US\$0.08 per ration by packaging five rations. Each ration weighs 44 g. This cost only covers production and packaging and does not include transportation and distribution. Packaging constitutes 30% of the total cost.

The food supplement is a small part of the overall costs of the PROGRESA Programme, which has many other more costly components to reduce poverty. The processed complementary food is also intended to replace other programmes subsidized by the Government of Mexico. Currently, the Government is spending about US\$2 million per day in food programmes. One objective of this programme is to replace these other programmes with a more targeted programme. Therefore,

a beneficiary of PROGRESA is not permitted to participate in other programmes. The price of PROGRESA and the processed complementary food may be high, but it is less expensive and better targeted than the programmes it replaces.

Public- versus private-sector production. A risk of sole dependence on the government for production is the possible loss of support and the disappearance of the supplement if the government changes. The government company now responsible for production cannot adequately meet the demand, and the private sector has expressed interest in becoming involved. The programme will be open to bidding by the private sector, and there are many private companies interested in

making the product. If the private sector becomes involved, the government will purchase the product and distribute it; however, the logistics of how this would occur have not yet been established. There is interest on the part of the private sector in the commercial sale of the product, but a mechanism for doing this has not yet been established.

Clinical tests. In the past it was recommended that a processed complementary food be tested clinically among malnourished children in a tightly controlled setting to ensure that the food met the nutritional needs of the target population. Although clinical tests were not conducted for the PROGRESA product, its development drew upon the collective experience of scientists with other products with similar characteristics. Clinical tests are important for products that have new and untested formulations, but they are less important for products with formulations that are similar to those previously tested.

Effectiveness trial. The need for an effectiveness trial is recognized and a proposal is available, but no funding has yet been received. Political considerations resulted in the product being launched immediately.

Target population. All children between the ages of four months and two years and all malnourished children (-1 SD weight-for-age) between two and five years of age.

Product composition. Ferrous sulphate and zinc oxide are added to the processed complementary food. The reasons for the high percentage of milk in the product instead of a higher cereal content are the unacceptable taste of a corn and oil product that was tested and the availability of inexpensive imported milk. Some of the participants voiced doubts about the sustainability of a product that is so dependent on imported milk powder. The market cost of milk powder in Guatemala appears to be twice that in Mexico.

Volume of ration. The total cooked weight is about 80 g, and the dry weight is 44 g.

Sharing of supplements and leakage. There are anecdotal reports that the processed complementary food is being used to make desserts and beverages for the entire family. The issue of leakage to the private sector is an open question, which the International Food Policy Research Institute will be doing research on in the context of a broader evaluation of PROGRESA.

Pap versus beverage for children. Because pap is more viscous and cannot be served in a bottle, it was selected as the supplement rather than a beverage. A more concentrated product also has a higher energy density.

Ecuador experience. Cost is important, because the lower the cost, the more children can benefit at a constant budget. Ecuador has a lot of experience in school feeding programmes. The food product is designed by the government but manufactured and distributed by the private sector. The mean estimated cost for production, packaging, transportation, and distribution to the schools is US\$1.20/kg. The programme is largely focused on schools in rural areas where transportation is difficult. The cost is US\$0.13 for each ration, which consists of a beverage and fortified cookie and provides 400 kcal.

Addition of water. The label on the Mexican product recommends that the "best water" be used. Water quality has improved in Mexico in recent years. Although there is concern about the use of contaminated water, a greater concern is the possibility that the food will be prepared only once a day if boiled water is required for preparation and that contaminated leftover pap will be served to children.

Ration. Families receive a one-month supply of the processed complementary food at a time.

Quality control. One plant is being used for production. The Ministry of Health is doing some monitoring. A manual was prepared to guide quality control of production.