

APPENDIX I

The Case of Thailand

The case of Thailand is instructive for two reasons: It demonstrates how a mix of intervention strategies combining nutrition communication, community action and processed foods can work together successfully. The Thai experience also suggests how different interventions come to play different roles at different moments in the course of a country's socioeconomic development.

In the early 1980s, the early introduction of semi-solid weaning foods was a widespread cause of protein energy malnutrition (PEM) among young Thai children in both rural and urban families, although children in urban families were affected at a younger age due to the early cessation of breast feeding. Over the last fifteen years, however, the level of protein energy malnutrition in Thailand has decreased dramatically. PEM prevalence among Thai children has declined nationwide from 45 percent in 1982, to 25 percent in 1986, to only 12 percent in 1995 (Chavasit and Tontisirin, 1996). Factors associated with this steady decline include more effective nutrition behavior-change strategies focusing on breast feeding (particularly in urban areas) and complementary feeding, the growing availability and use of improved complementary foods, higher incomes for food purchasing, and improved infrastructures in transportation, distribution, electrification, and communications.

Thailand's nutrition program has focused on the production and preparation of complementary foods at three levels; within the household, in the community (for local distribution and sale), and at the industrial or central level. Initially (in the early 1970s), the program placed a significant emphasis on developing centrally-processed complementary food mixtures for government feeding programs (Scrimshaw 1982). Despite the technical feasibility and consumer acceptability of these products, they did not prove very helpful in preventing malnutrition among the rural poor. Government feeding programs relying on packaged foods focused only on more severely malnourished children, giving these packaged products a strong curative bias. And in rural areas, changes in complementary feeding practices were "...made even more difficult by the limited availability of convenient and nutritionally appropriate weaning foods" (Nondasatu 1983).

Consequently, the program emphasis shifted to the community or village level. Seven different formulae for complementary foods based on legumes and rices were developed and tested for consumer acceptability. They could be produced by village cooperatives using relatively simple roasting techniques, manual or electric grinders, and heat-sealed plastic bags (of varying sizes) for packaging. These products were then distributed by village workers free of charge to mothers with severely malnourished children and sold to other mothers whose children did not (yet) show signs of growth faltering. In some projects, food-processing villages sold their product to neighboring villages not able to establish their own complementary feeding cooperatives. In some villages revenues from local product sales were used to set up community funds for investment in improved health and sanitation services; other villages preferred incentive schemes in which sales profits were shared among

cooperative members (primarily women) on a rotating basis.

In many Thai villages, complementary food processing and sales were supplemented with nutrition communications employing a variety of media -- ranging from interpersonal counseling to use of educational videos and films. And these combined interventions (communications plus product distribution) appear to have had a greater nutritional impact than either intervention alone (Scrimshaw 1982).

But the nutrition program in Thailand was never locked into a single intervention strategy -- rather it was committed to assessing the efficiencies and impact of food processing technologies at different levels. Home-prepared foods were tested against cooperatively processed and locally distributed foods, and these community-based approaches were evaluated against packaged foods processed in more centralized production facilities for province-wide distribution.

This experimentation occurred against a backdrop of rapid socioeconomic development which today has linked all but the most remote rural communities into a broader cash-based, market economy. Many rural women in Thailand are now in the wage-labor work force and many others have moved to urban areas in search of employment. With more time spent working (outside the home) and commuting to work, urban and many rural parents have ever less time for child care. As a result, the home preparation of appropriate weaning foods is "...becoming impractical, especially among low and medium income groups;" and with the "...migration of young laborers to the city and thus a reduction in the community manpower necessary to produce supplementary foods," village-based food cooperatives have declined or, in many areas, ceased operations altogether (Chavasit and Tontisirin 1996).

Rather than try to revive these moribund village-based projects, nutritionists at Mahidol University are once again turning to centrally-processed foods.

Through nutrition education, parents should be able to select [raw] materials and prepare a suitable weaning food for their infant at an affordable price. However under Thailand's current socio-economic climate, many Thai parents and other direct child care givers do not have enough time and knowledge for such activities. Consequently, quickly and easily prepared weaning foods are necessary. The industrially-produced complete type is one of the best choices, since it can be inexpensive, conveniently stored and prepared, and provide enough nutrients for the infant's requirements. The cost of weaning foods can be lowered and made more affordable even further if they are domestically produced using locally available raw materials... (Chavasit and Tontisirin 1996).

Chavasit and Tontisirin [the Director and Deputy Director, respectively, of the Institute of Nutrition at Mahidol University] go on to recommend instant, cereal-based foods -- widely available in the Thai

market -- as a good option for many parents (*ibid.*). These products include milk powder and soybean powder (for protein), vegetable oils (for fat), and are micronutrient-fortified. They are industrially-processed using drum driers or cooker extruder technologies, and are packaged in either metal cans or aluminum bags. Although a single transnational corporation accounts for the major share of market sales, at least three factories in Thailand and a government nutrition research institute also produce these instant, cereal-based products.

APPENDIX II

A Sampling of Projects

The following brief cases illustrate how different projects, at different levels of market organization, have grappled with the twin concerns of sustainability and nutritional impact. Cases have been chosen based on the availability of project documentation as well as on how well they represent a diverse set of approaches. With the exception of *Superamine*, they all suggest approaches which are working. (*Superamine* is included as an example of the early generation of centrally managed projects that came to be the object of such widespread and often vitriolic criticism).

Central, Industrial Scale	Regional, Intermediate Scale	Local, Small Scale
<i>Incaparina</i> (Guatemala)	<i>Musalac</i> (Burundi)	<i>Misola</i> (Burkina Faso)
<i>Thripasha</i> (Sri Lanka)	<i>Superfarine</i> (Benin)	<i>Vitafort</i> (Congo)
<i>Superamine</i> (Algeria)		

***Incaparina* (Guatemala)**

Incaparina was developed by INCAP (a Guatemala-based research institute serving Central America and Panama) in the late 1950's. Originally it was not a specific weaning food formula but a concept for combining any well-processed oil seed and a cereal in a ratio of 1:2, fortified with vitamins and minerals. The product concept, established in the early R & D phase of the project was that the food should take the form of a flour, it must be compatible with local tastes (and was to have a corn-like flavor) and dietary practices, and was to have a protein content and quality on a par with animal proteins. The product was to be stable and have an acceptable shelf life -- about four months under tropical conditions -- and had to be cooked before consumption. This product concept has since served as a model followed by nutrition programs in other countries in developing their own commercially or centrally processed complementary foods with locally available oilseed meal and cereals.

The resulting formula and the brand name were licensed by INCAP to a large brewery corporation,

which then manufactured and distributed the packaged product to retail outlets through its fleet of beer trucks. Now, over four decades later, *Incaparina* is still on the Guatemalan market, and market sales have slowly if steadily increased over the years.

A 1969 survey of *Incaparina* consumers indicates that *Incaparina* was purchased by a significant proportion of low income families.

**GUATEMALAN FAMILIES CONSUMING INCAPARINA
BY INCOME GROUP**

Monthly income	Estimated number of families	Percentage of income group
\$20 or less	75,000	29%
\$21 to \$100	205,000	61%
\$101 or more	65,000	76%

Source: Icaza 1969, in Jensen 1979 (see also Heimendinger, Zeitlin, and Austin, 1981)

Two things are worth noting about this data. First, it has been used to argue that commercially distributed complementary foods -- even such a flagship brand as *Incaparina* -- fail to reach low income groups. Yet a 29 percent penetration of this low-income market segment would be considered quite a success by managers of social marketing programs in other health sectors (i.e., family planning).

Today *Incaparina* retails for U.S. \$0.50 a pound, up from \$0.26 per pound in the '60s and '70s when this consumer survey was conducted (Bressani 1996). INCAP views this price increase as problematic, noting that it reflects increases in the costs of ingredients, packaging materials, labor, energy and distribution. Nevertheless, it would appear that a doubling of price over a period of twenty-years plus is simply the result of broader inflationary pressures -- pressures which would have a similar affect on the operational costs of any nutritional program operating in Guatemala over the same time span.

Nevertheless, consumer demand appears to be growing. The company that produces and distributes *Incaparina* has recently launched two other complementary feeding products -- *Vitatol* and *Innovarina*. Although we have little information (at this writing) on promotional activities carried out in support of *Incaparina* or these newer products, they appear to be fairly modest, largely limited to point of purchase advertising

Thripasha (Sri Lanka)

Thripasha, a complementary food developed and marketed in Sri Lanka, illustrates how performance benefits, packaging, and other added values combine to create a distinctive brand.

Walk down a street in Colombo and ask any man or woman if they have heard of CARE or the United States Agency for International Development (USAID) and you will probably be met with a blank stare. Ask if they know what Thripasha is and the chances are excellent that a smile of recognition will follow. Thripasha is a household word to virtually all Sri Lankans. Its name is synonymous with good nutrition and its value as a food for children is well understood (Hornstein 1986: 1)

In 1972, *Thripasha* was first introduced as a specially packaged, take-home weaning food for use in Sri Lanka's public sector feeding programs. In 1980 it was successfully relaunched as a commercial product distributed through retail channels (by Lever Brothers). Its success as a commercial product is largely attributed to its long standing acceptance and use by Sri Lankan consumers. And much of this acceptance rested on early investments in creating a positive brand image, primarily through packaging. "[The packaging] provides value and dignity to the recipient and also relieves the already overworked medical and clerical staff at the clinics of the burden of having to measure and handle an unpacked commodity" (*ibid*: 7). Consumers also saw *Thripasha* as a labor saving, nutritious food that was especially "good for children" (but could also be used as a pre-cooked base for preparing *aggala*, a traditional family snack).

A distinctive name, well designed, attractive packaging (to shield *Thripasha* from the stigma of a "poor man's food"), and many years of widespread public-sector distribution established *Thripasha* as a distinctive brand enjoying a dominant position in the Sri Lankan market. Consequently, Lever Brothers could relaunch *Thripasha* with a minimum of promotional support; advertising was limited to point of purchase displays, posters, and leaflets.

Thripasha also illustrates a more general argument: Added values arise primarily from consumers' experience with the brand, and to some (usually lesser extent) from packaging, advertising, and other forms of marketing communications. Old and successful brands, like *Thripasha* in the 80's, build up added value in the good will of their users. Manufacturers of a new brand cannot call upon this stock of consumer good will, and new products must rely almost solely on functional characteristics for initial survival. Advertising, or sampling programs, can give a short-term boost to new products by stimulating consumer trial. But then the brand must function as promised.

Because added value stems from the use of the product plus packaging and advertising, building this value takes not only time but money. But the consumer price of products has to be reckoned in terms of

relative costs and benefits -- what the consumer gives up in exchange for the benefits, functional and subjective, of a product.

Pricing decisions and cost management determine the ease with which a product can be obtained and used by consumers. With commercial weaning foods, the conventional wisdom is that the added costs of quality control, packaging, promotion, and distribution -- costs which must be (largely) covered by retail sales revenues -- create pricing barriers which poorer consumers often cannot overcome. In one early assessment of commercially processed weaning products this retail price (in a small sample of products) appeared to vary from 1.8 to 4.4 times the average price of the basic commodities (Orr 1972, in Jensen 1979: 236.) And much of this markup is attributed to processing and packaging costs.

It is difficult to know quite what to make of these numbers, however. For instance, a more detailed breakdown of product costs from the *Thripasha* project, estimated the cost of a two week ration -- one 750-gram packet -- at U.S. \$0.35 (in 1981). This included the cost of:

- raw materials, \$0.30;
- packaging, \$0.02; and,
- processing, \$0.03.

Thus packaging added about seven percent to the cost of the basic ingredients, and processing added another 10 percent. Subsequently, Lever Brothers relaunched *Thripasha* as a commercial product. Lever Brothers initially subsidized the costs of distribution itself, and then incrementally increased the retail price to cover distribution and its additional (albeit modest) promotional support.

Available data on *Thripasha*'s customers suggest that a significant proportion were from the lowest income groups. At a time when *Thripasha* was selling for 5.5 rupees (45 cents) per pound, 40 percent of rural households purchasing *Thripasha* had an estimated monthly cash income of 750 rupees (about \$37.50 in 1980 dollars), and an additional 19 percent of purchasers had an income of 500 rupees or below. The eligibility requirement for government food stamps in Sri Lanka at that point was 400 rupees per month. (An interesting footnote to this is that 38 percent of rural purchasers also continued to receive *Thripasha* free of charge through the public sector take-home feeding program.)

Superamine (Algeria)

Superamine was on the Algerian market for 15 years -- a good run for any brand. Nevertheless it illustrates some classic mistakes in marketing management. It also shows how the various elements of the marketing mix (product, price, distribution, packaging and promotion) are closely intertwined. A failure to address difficulties in one area of the mix (cost, in this case) resulted in a cascade of unmanageable problems in distribution, quality control, and poor market performance.

First developed in 1963 for use in a nutritional rehabilitation center, an Algerian pasta factory began

producing this high-protein mixture (21% of total weight) in 1969 for commercial distribution. Primary ingredients were hard wheat meal (28%), lentils meal (18%) chick pea meal (38%), skim milk (10%), saccharose (5%) with Vitamins A, D3, B2 and calcium carbonate. Instructions for both exclusive use and for complementary feeding were provided for children at different ages.

In the first project year, annual production was 800 tons. By the mid-1970s, with the addition of another production line, product volume reached 3,000 tons a year. *Superamine* was discontinued in 1984 for a variety of reasons.

- *Increases in the cost of raw ingredients.* Legume production stagnated, then declined, and the project was forced to rely on more expensive imports for the bulk of product ingredients. The same problem occurred with hard wheat, and also for skim milk after World Food Programme provisions were cut in 1980.
- *Unrealistic pricing.* Government insistence on low retail pricing -- the sale price per packet (.80 DA) was significantly lower than the production cost (2.4 DA) -- led to losses for the manufacturer, who diverted *Superamine* production lines to the processing of profitable products such as pasta and couscous.
- *Poor quality control systems* and a shortage of specialized personnel led to Salmonella contamination of certain lots, contributing to frequent breakdowns in the distribution system.
- *Competition from attractively packaged, imported, instant cereal products* (with normal protein levels), led to brand switching and a steady erosion in *Superamine's* customer base. *Superamine's* price competitiveness was not sufficient to stave off foreign competition, and (artificially) low prices and unsophisticated packaging probably contributed to the growing consumer perception of poor product quality.

In retrospect, *Superamine* was a victim of several interlocking problems. The product formulation was not based on a consistent supply of locally available ingredients, and thus was hostage to global inflationary pressures. Financial sustainability never appears to have been much of a priority (at least of government), and pricing decisions were made by bureaucratic fiat, with little understanding of market conditions or consumers' willingness to pay. Product packaging was not competitive and consumers came to question product quality. Though willing to set limits on *Superamine's* retail price, the government was not willing to shelter the product from foreign competition. We can understand, consequently, why the project's private- sector partner would rather be making pasta/couscous.

Regional, intermediate scale projects

Superfarine (Benin)

Superfarine evolved out of early work (in the 1970s) on weaning-food recipes for community level interventions in Ouando (Benin). Two formulas were developed, one for 3-6 month-olds (corn, sorghum, rice and sugar) and one for older infants over 6 months (with 2 different recipes - corn, sorghum, beans, peanuts and sugar or corn, sorghum, soy and sugar - probably depending on availability/price constraints) using locally available foods and simple preparation methods. Initially the approach was to popularize these early home-prepared weaning foods through community outreach and nutrition education.

An artisanal production unit was established at Ouando to produce a more convenient, pre-processed food, for employed women who did not have time to prepare these recipes for their children. This production also served to provide packaged foods to rehabilitative feeding programs. Improvements in processing technologies, permitting greater production volumes, followed from increased demand. Semi-industrial equipment was donated to the project by the Netherlands, and annual production increased to about 100 tons by 1984.

A project evaluation and feasibility study led to the installation of a *Superfarine* factory in Ouando, financed by the Italian government through an Italian NGO. This facility follows the same basic formula but uses a processing technology based on extrusion. Production rose to 150 about tons/year.

Project managers attributed the steady increase in demand for *Superfarine* to several factors. First, development of the manufacturing process was guided by local food preferences and habits; for example, roasting of raw ingredients is not only to improve hygiene, but to create taste and aromas well known to consumers. Second, is ease of product use. *Superfarine* products are easy to prepare, following methods almost identical to the preparation of traditional *bouillies*. Third, product distribution has been supported by local promotional activities. At the beginning, mothers thought *Superfarine* was a medicine for malnourished children, but this perception was countered through education, discussions, and health worker counseling.

Initially, project personnel, water and energy costs were subsidized by the government. There has been, however, a gradual evolution towards retail prices which should permit the enterprise to become financially self-sufficient and, in the long-term, profitable.

At the beginning, distribution systems reached only into market areas nearest to production centers, but additional distribution points have been progressively added in other departments. As of 1995, there were about 200 distribution points, 120 in Cotonou alone. Distribution channels include:

- Medical and paramedical outlets, (10% of total distribution). These were the only distribution points originally.
- Pharmacies and pharmaceutical depots, (40% of total distribution). These points of distribution appear to have improved the image of *Superfarine* products and helped to diminish the importation of infant weaning products.
- Supermarkets, kiosks, grocery stores, door-to-door sales (50% of total distribution)

Product sales are primarily to urban markets, with 71 percent in Atlantique province, home of the capital city. Although actions have been taken to keep the price to consumers low, the purchase power of the rural populace is so weak that it is difficult for many rural families to purchase these products. Consequently, the project took 3 actions to improve the situation:

- progressively creating points of sale in all regions of the country for those with means to purchase the product;
- began to publicize the recipe for *Superfarine* and to allow mothers to prepare it themselves from raw staples, and;
- intensified nutrition communication activities to assist families to use available resources to improve feeding.

Musalac (Burundi)

Musaga is a zone of Bujumbura (the capital of Burundi) with about 60,000 inhabitants. In 1985, responding to popular demand, the Musaga health council began implementation of a nutrition project involving development of a pre-formulated complementary food (a *bouillie* or porridge), named *Musalac*. The product was intended to rehabilitate malnourished children and was also meant to be more widely marketed in order to prevent malnutrition more generally.

Musalac is composed of corn (48%), sorghum (22%), soy (20%), sugar (8%), and skim milk (2%). The chemical composition is: water (7%), proteins (14%), fat (8%), fibers (2%) and ash (2%). Energy content is 417 Kcal. per 100 grams and the proteins have a digestibility of 71 percent with a chemical index of 90. For reasons of digestibility, it is only recommended for children over 6 months.

In addition to the production unit in Musaga, five satellite production units have been established (as of 1994) in other regions, linked to the project through franchise contracts. Two additional units were scheduled for start up in 1995. Production units in the interior are managed by associations, such as hospitals, cooperatives or organizations serving the handicapped. Surplus sales revenues are used to subsidize primary health care services in local communities.

The processing and packaging of *Musalac* involves simple, known technologies, that allow for rapid start up and permit local management and quality control. Capital costs are also relatively modest. The original production unit started during very difficult economic times, and for the first for three to four

years relied on bank loans to purchase raw materials and pay for routine maintenance and repairs. Since then, however, production has continued to climb, from an artisanal level (40kg/month) in the beginning (January 1985), to over 40 tons of product per month (as of 1995). Production units are financially self-sufficient, breaking even or generating surpluses.

The project employs a multi-channel distribution system that include retails shops, pharmacies, local markets, and health centers. The project operates *Musalac* kiosks, located next to health centers, offering free product samples (a cup of *bouillie*) to all children visiting the center. In addition to this kind of sales promotion, the project works closely with health care providers in conducting a variety of nutrition education activities. [In 1990 the *Musalac* project received the WHO Liguria Prize of Rome for health education within primary health care.]

The project has had a national impact: In 1986 Burundi imported infant foods at an annual cost of about 30 million Fbu, but imports decreased to less than 10 million in 1988. The retail price of *Musalac* is 150 Fbu/kg, 12 times less expensive than similar imported products. Cost savings and low consumer prices are possible through use of a simple production process and direct purchasing of raw ingredients from local farmers.

One of the most intriguing aspects of the *Musalac*-project approach is the creation of backward economic linkages -- most evident in the creation of a market demand for soy beans that has stimulated upstream agricultural activity (cultivation of soy in the country was quite low until 1989). In addition, construction materials, processing equipment, and labor are all drawn from local communities.

Local, small scale projects

Both of the examples provided here, as with *Musalac* in Burundi, have developed a multidisplinary management system including the health system and other players. Also, like *Musalac*, there are multiple units. But with these 2 projects, the units are locally-managed and independent, while *Musalac* uses a franchise approach. Both of these projects also use their main unit as a facility to train those who **will** become the managers of new units elsewhere.

***Vitafort* (Congo)**

The *Vitafort* project was initiated in 1990, in a collaboration involving the Ministry of Health, Orstom and others. The focus has been on manufacturing infant cereals from local agricultural commodities with balanced nutrients that can be prepared in the form of energy dense *bouillies*. Initial assessments recommended developing a model production unit which could be rapidly replicated. A pilot unit was established following marketing research conducted in 1992 which determined the name and logo of a chubby baby. Given the weaning practices prevalent in the Congo, it was determined that the *bouillie* prepared from *Vitafort* should have sufficient energy density and contain enough essential nutrients so

that two feedings per day, together with breast milk, would meet the nutritional needs of children four to nine months old.

Within a year of production, the initial product was enriched with minerals and vitamins. In addition, the new formula was changed in response to feedback from urban mothers that the manioc flavor was too pronounced and bitter. (The original manioc flavor was preserved in the product formula for the rural areas.)

Formulas:	Rural	Urban
Manioc flour:	43%	-
Corn flour:	30%	74.0%
Soy flour:	19%	14.0%
Sugar:	8%	11.0%
BAN 800 MG:	28 units/100g	30 units/100g
Complement min.	0.9%	0.9%
Complement vit.	0.1%	0.1%

Nutrient content, per 100g of dry product:

Water	< 8g
Fibers	< 3g
Saccharose	<12g
Fats	> 4g
Linoleique acid	> 1.2g
Raw protein	>10.5g and < 16g
Amino acids	> 2988mg

If the product is prepared as instructed the energy density should be close to 120Kcal/100 ml while still having a sufficiently fluid consistency to be well accepted by children.

During processing, each type of grain is prepared and roasted separately, then combined in proper proportions with other ingredients and placed in transparent sachets of polyethylene. The package consists of two identical sachets, one inside the other, with two inserts in between (containing the product name and logo, as well as information on the production unit, product characteristics, and preparation instructions). Each sachet weighs 250 grams which represents 3 to 5 days of use. The retail price in 1995 was quite reasonable at 275 Fcfa (180 before devaluation).

Each *Vitafort* production unit can be operated by three to four people. Five units were opened and

operating in 1995, and three more operator/owners (“entrepreneurs”) were in training. The central project, with its own production unit, functions as a kind of on-the-job training center. Each batch of “entrepreneur” candidates, after selection and orientation to the technical aspects of production, learns the *Vitafort* production process over a period of several weeks, and then are given responsibility for running the unit (including choice of staff and paying a regular “rent” corresponding to loan payments) for next four to six months. Following this apprenticeship, the project then helps each entrepreneur to obtain credit and open his own production unit or workshop.

The total cost of equipment and installation for each production unit appears comparable to start up costs and debt levels for a small Congolese business. Variable costs (in 1993) include the cost of raw materials (70%), sachets and labels (24%), temporary labor (4%), and energy consumption (2%). Variable costs represented about 73 percent of total costs. Fixed costs, including equipment, the workshop facility proper, and labor, represent 27 percent of total costs; a quite reasonable ratio given the financial security of the activity. [Since the enterprise is structured as a family business, the reimbursement to the owner is not included in the personnel costs.]

Monthly production is typically 8000 sachets of 250 grams, **at a wholesale price** of 225 Fcfa, which meets the needs of about 800 children aged 4 to 9 months consuming *Vitafort bouillies* as the only complement to breast milk.

During 1993, the manufacturer’s margin was 20 percent of the retail sale price. Monthly income for *Vitafort* entrepreneurs, after covering both variable and most fixed costs, was 214,000 Fcfa; which is partly remuneration for the entrepreneur and partly savings for reinvestment/renovation.

Products are sold through distribution channels such as small shops and kiosks as well as through health centers.

Vitafort management suggests that the project differs from other “weaning food” production units in Africa in that it is overseen by an intersectoral committee that includes health service managers, development organizations, and researchers. This blend of organizations and capabilities has three consequences: first, products are endorsed and (in theory) promoted throughout the public health system; second, the project is able to draw on the resources of participating NGOs to provide comprehensive training to entrepreneurs; and third, decisions to improve and diversify products are informed by supporting pilot research.

The project is confronting problems in two areas. First, it relies heavily on health centers for product sampling and promotion, but health centers have been slow to implement these activities for a variety of reasons beyond the control of *Vitafort* entrepreneurs. The second barrier is price competition. *Vitafort* is competing with local weaning cereals, and because they are not fortified or processed they are less expensive. Project management, however, does not see profitability as an end in itself, but as an indispensable condition to pursue the primary objective: making a nutritious complementary food

available to the largest number of children possible.

***Misola* (Burkina Faso)**

Misola has been manufactured since 1982 from millet, soy and peanuts. The *Misola* project was begun when international aid to the Nutritional Rehabilitation and Educational Center (CREN) of the hospital of Fada N' gourma ended, leading the hospital's pediatric team to find an alternative.

The project remains modest; as of 1991 production volumes ran at about 1 ton/month total for all four production units. The product is available in packages of 220g and 500g. The retail price is 225 Fcfa for the 500g package, compared to a price of 400 Fcfa for a 400g package of imported children's foods such as Cerelac.

The *Misola* family of products is based on three formulae with the following compositions per 100 grams of meal:

	<i>Misola Misopa</i>		<i>Den-Mugu</i>	
millet	60g	58g	60g	
soy	20g	23g	-	
peanuts	10g	-	-	
bean	-	-	10g	
powdered milk	-	30g	-	
sugar	9g	5g	-	
monkey bread	-	3g	-	
salt	-	1g	-	
iron sulfate	-	-	100mg	
zinc sulfate	-	-	60mg	

For all products, the energy level is in the 400-436 Kcal/100g range. Protein content varies from 13-16%, fats 8-14%, glucides 62-68%, minerals 2-3%, and water 6-8%.

The *Misola* product line exists in three forms. First, processed and packaged products are produced in autonomous production units for retail sale. Second, *Misola* products are prepared communally in health centers by mothers using traditional kitchen equipment and materials; each of the participating mothers takes a supply of *Misola* home for her child until the next health center visit. Third, *Misola* recipes are taught as part of nutrition education activities at the community level.

The primary benefits of *Misola* meals are their reasonable price, ease of preparation and their well-accepted taste. They can also be enriched after preparation with juices, monkey bread flour, fish or meat.

The production units that manufacture *Misola* for sale are decentralized and autonomous. Each local unit is: supervised by the local medical authorities who manage malnutrition programs; operated as an income generation project by a women's association (who are also in charge of marketing) and; is supported and financed by an NGO. Community-based production functions along the same lines, but more flexibly.

Misola production units receive support from the formal health system, women's groups and local NGOs. Links with health centers has two advantages; offering fairly direct access to target groups and creating opportunities for health personnel to develop a better understanding of the importance of child nutrition to health and survival. The integration of *Misola* production and distribution into the activities of health facilities also reinforces consumers' perceptions of the health benefits of the product.

Collaboration with women's groups and local NGOs also has a number of benefits. It permits the privatization of production, offers access to local markets (beyond the formal health system), and brings women's direct knowledge of local conditions into management decision making. NGO partnerships also serve as vehicles for attracting other resources, such as financing for micro credits and management skills, to the project.

In addition to product processing and packaging, the central production unit at Fada N' gourma:

- serves as a national training center for production of *Misola*. In its role as a national training center, the central unit trains teams for other production units in Burkina Faso as well as in neighboring countries;
- manages local distribution and sales to the commune; while also
- distributing product to 30 health facilities in three provinces and pharmacies in Ouagadougou (the capital).

The *Misola* approach relies heavily on local technologies, locally available ingredients and materials, and fairly traditional forms of labor organization. *Misola* products are based on raw ingredients whose supply is generally consistent throughout most of the year. Women from the production units are responsible for local purchasing of agricultural inputs. Processing techniques are inspired by traditional methods, and are adapted for efficiency. Since processing equipment is simple, there are few breakdowns and maintenance is seldom a major problem. Production units are generally close both to sources of raw ingredients as well as to sales outlets, reducing both the costs of inputs and product distribution.

In organizing production units to be financially self-sustainable, the project's financial objective is to

cover operating costs and generate capital for reinvestment and growth. Rigorous accounting procedures are necessary, but ordinary day-to-day accounting can be undertaken by a woman's group. Locating the production unit in a health center also permits cost-sharing (energy, building, etc.) while allowing the center to offer more tangible nutrition assistance to its clients.