

INCAPARINA IN CENTRAL AMERICA

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Incaparina, its laboratory development, and its biological and clinical testing are adequately described in an earlier chapter. Thus, it is sufficient to state that the product is a low-cost vegetable mixture containing 25% or more of proteins, comparable in quality to those of animal origin, which was developed and is sponsored by the Institute of Nutrition of Central America and Panama (INCAP). This chapter will deal with the collaborative efforts of the respective governments, private food industry companies, and INCAP to bring Incaparina from the laboratory to the present position it occupies in the market and in the homes of consumers in Central America.

Laboratory to Consumer: INCAP's Role

It was apparent to INCAP that both the consumer acceptability and the marketability of Incaparina had to be amply demonstrated before it could be offered to responsible food industry companies. The extensive field acceptability trials in several Central American countries and the market testing in Guatemala during 1959-60 have been covered in several previous publications (1-6). These trials provided sound evidence that Incaparina could find a substantial market in Central America and possibly in other areas where a low-cost protein supplement could meet nutritional needs.

INCAP's basic policy that low-cost, protein-rich foods will most effectively contribute to better nutrition if they reach the consumer through regular commercial channels has also been well documented (2,3). This, of course, implies that the product must be produced and distributed by private food industry companies. To do this while at the same time maintaining the desired quality, low consumer price, and ethical standards of promotion, a collaborative effort on the part of the interested governments, the qualified food companies, and INCAP is required. The guidelines for this effort have been well publicized and form the basis for formal arrangements between the food companies and INCAP under which the program has progressed during the last 7 years in Central America and elsewhere. The participating companies are responsible for carrying out all aspects of production and commercial distribution of the product, according to the standards agreed upon with the Institute. It is assumed that they are fully competent to plan and execute any consumer and marketing research studies that would be necessary in addition to all aspects of the product's manufacture and distribution. Of course, INCAP, within its area of competence, does stand ready to assist producers on request, but does not otherwise intervene in the commercialization process. On this basis, the effort to bring the Incaparina concept to reality started with the pioneering efforts described below.

Pioneering Efforts

In addition to the Guatemalan experience, which will be described separately, there were other early efforts to place the product on the market in both Nicaragua and El Salvador. Unfortunately, neither of these ventures was successful but both served to point up some fundamental principles which are worth noting.

I-452 En: Protein-Enriched Cereal Foods for World Needs. Ed. by Dr. Max Milner. Published by the American Association of Cereal Chemists, St. Paul Minnesota, 1969, pp. 320-333.

Nicaragua

INCAP authorized the firm of Alimentos Infantiles of Nicaragua to handle the product in that country in September 1961. This was a newly formed country set up by a group of professional men, mainly physicians, who were interested in having an inexpensive nutritious food on the Nicaraguan market (7).

Assuming that the formulation, packaging, etc., as used in Guatemala, would achieve the same commercial success in Nicaragua, production and distribution started in May 1962. As a newcomer in the food field, this company was not equipped to carry out the necessary product development work, including neither the consumer acceptability nor the market testing. This deficiency soon became apparent when sales did not respond as anticipated. In addition, the lack of food production experience resulted in poor-quality maintenance which may have been another contributing factor. Due to a lack of the required financial resources to continue the project for a sufficiently long period to prove out commercial feasibility, the company decided to abandon the product at the end of 1962. The company was then dissolved with only about 4,000 lb. of Incaparina reaching the market.

In the light of subsequent experience with Incaparina, it is now relatively easy to provide the reasons for this failure. Lack of experience in the food industry on the part of the company's management was probably the principal factor. This is what led to the erroneous assumption that adequate product development work, i.e., consumer and market research, would not be necessary prior to full-scale commercial distribution. Therefore, sufficient financial resources were not made available to sustain the project for the time required to do the development work. We now know that this is necessary for success with a product of this type.

A direct result of this experience was a significant strengthening of INCAP's criteria for evaluating the qualifications of companies desiring to handle Incaparina (8). To some extent, this accounts for the relatively small number of authorizations which INCAP has granted since 1962. Many companies, and groups desiring to form new companies to handle the product, have either been discouraged from applying or have been denied authorization for lack of the qualifications which INCAP considers necessary for success.

El Salvador

During 1961, INCAP authorized the firm of Productos Alimenticios to handle the product in El Salvador. In contrast with the Nicaraguan effort, this company is a major food processing company with considerable experience in the Central American market (8). Using INCAP Formula 9, containing a mixture of uncooked corn and sorghum flour as the grain portion, the product was placed on the market with appropriate commercial promotion and support from the public health authorities. Though little difficulty was experienced in placing the product with retail outlets throughout the country, the consumer demand did not develop as anticipated.

From its own evaluation, the company concluded that the product had poor acceptability with the El Salvador consumers, was not packaged in a sufficiently attractive manner, and had been promoted more as a medicine than as a food (7). Though INCAP did not fully agree with this evaluation, no objection was made to the company's second attempt to introduce a modified Incaparina under the trade name "Campeón." The modified product was a cinnamon-flavored and sweetened mixture which retained the same basic ingredients and nutritional characteristics of the previous product. A slight price increase was granted to cover the added cost of the ingredients (8).

For this second attempt, the company decided to test the market for the modified product in the town of Zacatecoluca in the Pacific Coast region of the country, as a first step. A full-scale publicity program was mounted, including distribution of samples, use of a sound truck, and extensive radio coverage from the local station. After about 6

months of market testing, the company determined that the modified product had insufficient consumer acceptance to justify further participation in the Incaparina program (8). Therefore, by mutual agreement, the INCAP authorization was terminated in January 1964.

From INCAP's point of view, the first attempt at commercialization in El Salvador (unflavored Incaparina) again illustrated the need for both adequate consumer acceptability testing and market testing of sufficient duration prior to full-scale introduction. These two steps, if they had been taken prior to the first attempt, might well have brought out some very different conclusions as to the need for product modification, if any, as well as packaging, promotional approach, etc., to meet the conditions in that market.

The decision of the company to go to a flavored product in its second attempt, without prior adequate consumer research, was probably unwise also. This modification immediately limited the product to use as a beverage only. The flexibility of the unflavored Incaparina for use in a variety of local dishes was, hence, eliminated. This advantage of the bland-type product has now been well demonstrated by the many ways in which it has been incorporated into the diet in those countries where it is now in successful commercial distribution.

Another factor of some importance in the El Salvador experience was the use of crude corn and sorghum flours in the formula. The sorghum flour does affect the taste and this might have had a bearing on the poor acceptance. This could have been determined through adequate acceptability testing prior to marketing. More important is the fact that the flour made from the uncooked grain does not have the stability and shelf life of precooked flour. Though the precooking does add some processing cost, such flours have been specified by INCAP for use in Incaparina since 1963 and have been used since the inception of the program in Guatemala.

Another company, Alimentos Populares, S.A., was also authorized to handle the product in El Salvador at about the same time. This small company was organized by an interested group of businessmen, exclusively for the purpose of producing and distributing Incaparina. This venture followed somewhat the experience of the Nicaraguan project and was also concluded in late 1962. The reasons for the lack of success were similar to those of the Nicaraguan company.

However, there was another factor in this situation that deserves mention. In El Salvador, a relatively small market, two companies attempted to introduce the product at the same time. This experience clearly demonstrated a tendency to hesitance in both companies, particularly in promotional efforts for the product, due to fear of helping the competitor. This was, no doubt, another factor in the failure of either company to achieve commercial success with the product. It now seems obvious that any qualified company desiring to enter a new market with Incaparina should have the protection of exclusivity for the time required to get the product well established. All current INCAP authorizations now contain this type of protection to the producers.

As stated in the Protein Paradox (8), in speaking of the initial experiences in Nicaragua and El Salvador, "...the person who hears of these failures without knowing any of the causes or having an explanation tends to believe that the concept of Incaparina has failed." In fact, this reaction did occur. The El Salvador experience, in particular, was cited in some of the popular literature as an indication of the failure of the concept (9). Fortunately for the protein food program in general, the success of Incaparina in Guatemala and elsewhere has been sufficient to overcome the adverse impression of these early failures. In spite of the losses incurred by the dedicated individuals involved, these early efforts with Incaparina can be considered as worthwhile contributions to the accumulating knowledge of protein foods and how they should be produced and marketed.

Guatemala - The Commercial Breakthrough

The company finally selected to handle Incaparina in Guatemala entered the program in a more favorable position than the other Central American companies interested in the product. As stated above, the consumer acceptability testing had already been carried out in Guatemala by INCAP. The market testing had also been conducted by a commercial firm that collaborated with INCAP during this phase². In spite of these advantages, it was not easy to find a suitably qualified and interested company to take on the product. At that time, there were very few food processing companies of stature in the country, though several have been established in recent years to serve Guatemala and the other Central American countries.

Following extensive explorations with the limited number of candidates interested in the product, a decision was made to grant the authorization to Cerveceria Centroamericana, S.A., the principal Guatemalan brewer and soft drink producer. The management of this company had expressed an interest in diversifying into the food field. In addition, they were well equipped in the area of quality control, had their own distributing organization, and adequate financing to carry out the project. The company was also willing to agree to the pricing which previous studies had shown would provide a reasonable return when adequate volume was achieved. The INCAP authorization was granted in December 1960 on an exclusive basis for a 5-year period and has since been extended for an additional 10 years.

Pilot production

The initial production of Incaparina was secured by the company under a contract with the Central American Research Institute of Industry (ICAITI), the same organization that had made Incaparina in its pilot plant for the consumer and market testing. Therefore, Cerveceria Centroamericana was only required to package the product for retail distribution, pending the installation of its own production facilities. This arrangement made it possible to begin full commercial distribution in May 1961 (see Fig. 1).

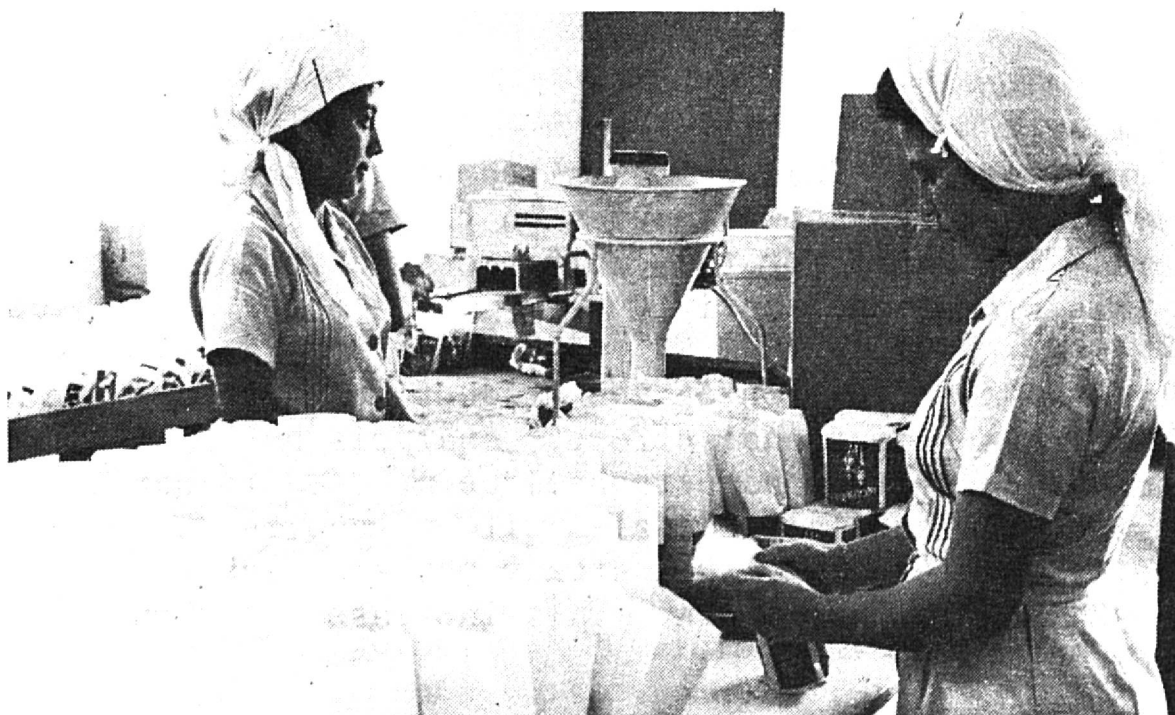


Fig. 1. Manual filling of 1-lb. packages of Incaparina in the Guatemalan factory.

²The Guatemalan affiliate of W. R. Grace & Co. was the company which handled the market testing with INCAP under a temporary arrangement. INCAP, following the Guatemalan market test, offered a long-term exclusive authorization to the company. However, the parent organization decided it did not wish to make the estimated investment which INCAP believed would be required to adequately supply the Guatemalan market. This decision led INCAP to seek another producer.

In recognition of the limited production facilities available from the ICAITI pilot plant, the initial publicity was kept to a minimum at introduction. Nevertheless, supplies during the first few weeks did not keep up with the demand. As the pipeline filled, sales during the balance of 1961 averaged about 20,000 lb. per month. Later on, with the establishment of his own facilities for mixing and packaging, the producer was in a better position to adjust production to sales. During this phase of the program, the producer purchased the precooked corn flour from a local milling company which further simplified production and kept his capital investment low. It was his desire to operate in this way until sufficient experience could be obtained with the product to determine the most desirable size and type of complete manufacturing facilities to establish. This relatively small operation was set up within a wing of the brewery, and thus any need for new construction was avoided.

Marketing

Commercial advertising was limited but the producer did put a mobile promotion unit in operation during 1962 (Fig. 2). This was found to be a very effective method,



Fig. 2. Sound truck used for the promotion and delivery of Incaparina in Guatemala and Honduras.

particularly in the rural areas. This unit visited all the health centers in the country, gave demonstrations, and showed movies on the product and nutrition in most of the population centers. The staff for this unit received training at INCAP and was given other assistance in this promotional activity.

Unfortunately, the distribution of the product, particularly in the rural areas, did not keep abreast of this promotional effort. Analysis by INCAP and the producer showed that the distribution system and personnel being used to handle his other products were not equipped to make the specialized sales effort required by a product such as Incaparina. Nevertheless, sales did show a steady but slow increase during the following year, averaging about 24,000 lb. per month. This increased to about 30,000 lb. a month by mid-1964.

In May 1964 INCAP reviewed the first three years' experience with the producer. During these discussions, INCAP presented evidence that the product was not being adequately distributed to meet the evident demand. This was well illustrated by repeated reports that many stores were selling Incaparina at premium prices due to an obvious scarcity in many localities. From these discussions came the decision that the producer would make the product available to any food wholesaler at a sliding price scale based on the volume of the purchase instead of attempting to handle all distribution through his own distributing company. It was further agreed that a stepped-up advertising and promotional campaign would accompany this change in marketing policy.

The effect of these changes was immediate and dramatic, as shown on the sales chart for 1964 (Fig. 3). The wholesale price schedule was made effective during the

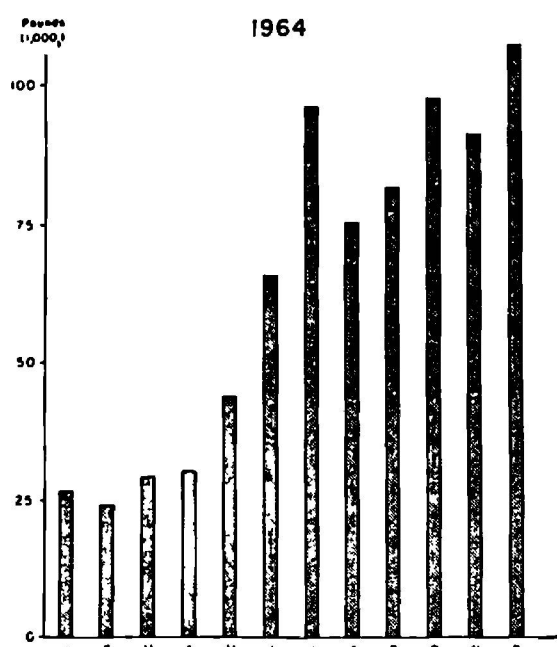


Fig. 3. Incaparina sales in Guatemala.

latter part of May. Sales that month reached 44,000 lb. in comparison with the previous month's total of 30,500. In June sales again climbed to 60,000 lb. and reached 100,000 lb. by December of that year. It was obvious from this experience that the demand had not been previously met, largely owing to an inadequate distribution to the retail outlets. The independent food wholesalers were aware of this and were eager to handle the product, giving it much wider distribution.

Sales of this magnitude quickly brought the producer well above the break-even point, and encouraged him to give the product more substantial marketing support. This first took the form of a reorganization of his own distributing organization, providing for a separate corps of Incaparina salesmen, equipped with their own delivery trucks and assigned to specific territories. Again, INCAP assisted with a certain amount of basic training, on the product and its salient features, for the special Incaparina sales organization. These changes, plus the stepped-up advertising campaign, based primarily on radio with some TV and newspaper coverage, became fully effective during 1965. Sales that year averaged 115,000 lb. per month. With this volume, it became possible to reduce the retail price of the 1-lb. bag from (U.S.) 24¢ to its present 20¢. The price-cut was made in November and further improved sales.

Not to be overlooked is the wholehearted support that Incaparina has received, since its introduction, from the Guatemalan public health workers and the medical profession in general. While some of this support may stem from INCAP's many years of work in the nutrition field in Guatemala, this is not the full story. The producer has been encouraged to direct promotion to public health workers and others concerned with nutrition, using the health centers as a focal point. This has obviously paid off to the point where Incaparina has now become a routine prescription to mothers who bring their malnourished children to the centers for consultation. Physicians in private practice have also been strong supporters of the product since its introduction.

Another factor is the favorable image which has been created for Incaparina. It has not been advertised as a product for the low-income groups. In fact, advertising material, TV and radio presentation, etc., have studiously avoided such a connotation. Sales through retail outlets serving the middle and upper income groups have been consistently good. This, of course, has been of assistance in reaching the lower income groups who, definitely, constitute the larger market.

Naturally, there has been emphasis on child feeding, particularly in the promotion

carried out through the health centers. However, Incaparina is also advertised as a good food for the entire family and is used in this way in many homes.

Improved presentation and product

Some product changes have been made as both the producer and INCAP have gained experience. Packaging has gone through an evolution; from cellophane envelopes, then to polyethylene, and later to a kraft and glassine 1-lb. package, to the present use of a laminated paper-polyethylene material for both retail size packages (Fig. 4). The changes



Fig. 4. Incaparina packaged for distribution in Central America and Panama. in packaging materials have been accompanied by improved label wording and design, resulting in better product protection as well as improved presentation.

Production techniques, including a slight heat treatment of the basic raw materials prior to mixing, have further improved stability. Finer grinding and better sifting techniques have also upgraded the product. Nutritionally, the most outstanding modification was the addition of synthetic L-lysine to the Guatemalan Incaparina early in 1967. This brought the protein quality up to that of casein. This was probably the first time that such enrichment had been attempted in a commercial, low-cost protein food. Though the desirability of this additive had been known to INCAP for some time, it only became economically feasible when the price of synthetic lysine reached a sufficiently low point. This slightly increased the raw material costs, but nevertheless, the producer was able to make this improvement without any additional cost to the consumer.

Acceptability in Guatemala

What are the indications of Incaparina's acceptability in Guatemala other than the steady increase in sales volume? Fortunately, there are some objective data on the knowledge and use of Incaparina by various population groups, and additional comprehensive studies are being made.

The first such study was conducted during the Guatemalan portion of the Central American Nutrition Survey in 1965 (10). During this study, information on Incaparina was obtained from 389 families located in 39 of the total sample of 40 communities throughout Guatemala on which the Nutrition Survey was based. It was found that 67% of the families interviewed were familiar with Incaparina. Forty-five percent of the families were then consuming Incaparina. Among these consumers, 79% stated that they were serving Incaparina to all members of the family. A few of the families, 12% of the consuming groups, were

only serving it to their children. Hence, it would appear that, shortly after the expansion of distribution in 1964, Incaparina was already reaching a significant proportion of Guatemalan families. The Nutrition Survey was, of course, representative of the Guatemalan population generally and, therefore, the sample contained a large majority of low-income families, mostly in rural communities.

A somewhat similar study of five representative Guatemalan communities was made in early 1968 by a professional anthropologist working with the "Programa Interamericano de Información Popular" of the American International Association for Economic and Social Development. This study went into considerably greater detail with regard to the motivations of both consumers and nonconsumers of Incaparina and was a follow-up on a study made in the same villages in 1962. The 1968 study revealed that 92% of the families interviewed were familiar with Incaparina. While only 16% of the families were using the product in 1962, 37% reported using it regularly in 1968 and another 29% reported occasional use. By 1968, the group who had never tried Incaparina constituted only 16%. Another 14% who had tried it were not then using it. In questioning the nonconsumers it appeared that other factors, rather than the product itself, were the basis for nonuse. In fact, the majority of the nonusers gave a favorable opinion on the various aspects of the product, such as its price, method of preparation, commercial availability.

This survey also secured data on those within the family who were receiving the supplement. Here it was found that 64% of the consumer families were feeding it to children under 1 year of age, 89% to children 1 to 2 years, and 91% to the 2- to 5-year age group. This would indicate that the families using Incaparina are serving it to the critical preschool-age child as the type of supplement that the product is intended to be.

Lactating mothers as well as pregnant women and the other adults in the families were also being served Incaparina in more than 75% of the families using the product.

Though the surveys made to date do indicate a relatively low consumption per family, this seems to be due to other factors, principally low purchasing power, rather than to the product itself. Nevertheless, Incaparina would appear to be reaching the nutritionally most vulnerable groups, for which it was intended, among the significant number of families who are purchasing it regularly. Furthermore, it is apparent that the present form of the product, as a bland flour requiring cooking and the addition of flavoring in the home, has found wide acceptance in Guatemala.

Institutional market

It is significant to point out that the majority of sales of Incaparina in Guatemala have always been through regular retail outlets for use in the home. While there has been some institutional use, mostly by private organizations, the proportion of total sales has remained quite low. This has occurred in spite of a special reduced price which is granted to governmental and private organizations for institutional programs. The product is obviously well suited for this purpose and could be widely used in the government's school lunch programs, for hospital feeding, etc. The principal factor which has impeded the government's use of Incaparina in this way in Guatemala has been the ready availability of imported donated foods through the U.S. Government's Food for Peace program. Nevertheless, advantages of serving Incaparina, particularly in the school lunch program, have been generally recognized by those concerned with nutrition. It is pointed out that Incaparina, a readily available local product of recognized acceptability and low cost, would be a much better means to achieve the desired long-term effect on the nutrition education aspects of the school lunch programs. Certainly there would be a desirable carry-over and presumably, greater home use. This cannot be said for most of the donated products, including the more recently introduced FFP vegetable mixtures. These products are not generally available through commercial channels in Guatemala. When they are, the price is usually beyond the reach of most Guatemalans and some of the donated products are not as well adjusted to the local dietary patterns as Incaparina.

The sales volume continued to increase during 1966 and averaged 140,000 lb. per month for the year. During 1967, sales showed some tendency to level off from the previous year's relatively steep climb, but did exceed 150,000 lb. per month.

The Regional Marketing Concept

As experience was gained with the product, it became apparent that the markets in most of Central American countries were not sufficiently large to support fully integrated individual country operations. However, Guatemala, the largest of the countries with a population of about 4.5 million, has demonstrated that it is a market of sufficient size. Economic studies, made as early as 1964, tended to show that a total market population of about 4 million was apparently required to secure a sufficiently large and early sales volume for an economically viable operation at the desired low price to the consumer. With none of the countries except Guatemala having a population in excess of 3 million and some of them below 2 million, an alternative solution to supply them was clearly indicated.

The alternative arrived at was to group the countries around two producers. Incaparina, as well as the necessary locally produced raw materials, can pass freely within the provisions of the Central American Common Market, so that no payment of customs duties is involved in this arrangement. A previously authorized local company in Honduras, in recognition of the small market there, agreed to withdraw before starting operations. As the previous producers in Nicaragua and El Salvador had also withdrawn from the program, the field was clear for this approach.

The regional plan was discussed fully with the governments involved and the interested potential producers during the latter part of 1965 and into 1966. Agreement was reached that this approach would be more feasible economically than individual country projects and that it was in the best interest of the INCAP objectives for the product.

Negotiations with interested producers and studies of consumer acceptability in the countries other than Guatemala proceeded during 1966. This activity resulted in the present arrangement, under which the Guatemala, Honduras, and El Salvador markets are the responsibility of the Guatemalan producer. The remaining two countries of the Central American Common Market (Costa Rica and Nicaragua) are the responsibility of Quaker de Centroamérica, S.A., a Quaker Oats Company subsidiary, with production facilities in Managua, Nicaragua. This leaves the southeastern portion of Central America in the hands of a company with considerable previous experience with Incaparina in South America, as described in another chapter. The balance of the area, therefore, is being served as an extension of the Guatemalan market within a unified geographical area. This provides for the application of the successful experience in Guatemala to the other two neighboring countries. Totally new manufacturing facilities have been completed near Guatemala City to meet the expanded demand of this three-country market.

The necessary preparations for the introduction of Incaparina in both Honduras and El Salvador were completed during the latter part of 1967. Commercial distribution, through exclusive distributorships in the two separate marketing areas of Honduras, was begun in October. A similar arrangement is being established to handle Incaparina in El Salvador.

Quaker de Centroamerica conducted extensive consumer research in both Costa Rica and Nicaragua, in preparation for its marketing program. The producer decided that these studies, which included consumer acceptability testing, did not indicate a need to modify the existing Incaparina formulations. However, both the package size and design, as well as the basic trade name for the product, were changed from previous patterns as a result of this consumer research in the two countries. These preparatory studies also served as the basis for a somewhat different emphasis and approach in this promotional program.

Market testing was started early this year in the city of Chinandega. A full-scale promotion effort, including the use of a mobile unit, demonstrations, etc., was mounted as part of the test. Arrangements for national distribution in Nicaragua, under the trade name "Nutrimas," will depend on the outcome of the market test. A similar program of market testing has been planned for Costa Rica.

Panama: An Alternative Approach for the Smaller Market

Panama is not, as yet, a member of the Central American Common Market but it is an INCAP-member country and, in many ways, is an integral part of the region.

Nonaffiliation with CACM and the total population of less than 1.5 million presented special problems in making the product commercially available there. Nevertheless, the government and a local company engaged in a variety of commercial activities including rice processing, related agricultural concerns, and the retail food business, manifested a keen interest in producing Incaparina. As a result, an INCAP authorization was granted to that company, Central Agrícola, in 1962.

Early efforts to set up and operate a fully integrated plant operation for the production of Incaparina for the Panama market were found to be both costly and inefficient in view of the relatively small volume required. Neither cotton nor soybeans is grown or processed in Panama. This requires the importation of the protein concentrate. Facilities for the economic production of precooked corn flour depend on a large volume of production, considerably beyond the requirements of the Panama Incaparina market. An attempt to use a crude corn flour as a more economic alternative resulted in stability problems, bringing the initial market testing to a halt in 1965.

Continued interest on the part of the company and the public health authorities led to a search for some solution to the apparent impasse. Reduction of the capital investment required for corn flour preparation equipment was found through the use of a toasted rather than a precooked corn flour. The toasting can be accomplished with readily available coffee roasting equipment which could be obtained at relatively low cost. The modified Incaparina was found, through INCAP analysis, to have retained the same nutritive attributes as the precooked corn flour formula. Consumer acceptability tests indicated that the toasted corn product has a promising market in Panama. Pilot-production facilities for the modified product were set up in 1966.

To further simplify the manufacturing process to meet the special conditions of the Panama market, INCAP suggested that the producer confine his processing to the preparation of the corn flour and purchase a premix, containing the protein concentrate plus the vitamin and mineral additives. This suggestion was adopted and the premix was obtained from the Incaparina producer in the neighboring country of Colombia, and later from Guatemala. This is, of course, a somewhat more costly operation. Nevertheless, economic studies would indicate that, at a price of (U.S.) 5¢ per 75 g. bag, this could be a viable project if volumes in excess of about 30,000 lb. per month could be achieved.

Market testing was then resumed with the modified product in the City of David and the surrounding area later that year. The Ministry of Health, in view of its desire to have Incaparina on the market, collaborated closely with the producer in an intensive promotional campaign throughout the test market area. Sufficiently successful results were obtained to extend the distribution gradually to other areas, including Panama City, the major population center.

It remains to be seen whether or not a sufficient sales volume can be secured in a market as small as Panama's to support the project as a successful business proposition. If so, this approach may eventually provide a solution for the many smaller countries where sources of a suitable protein concentrate are not available, the market is relatively small, but the need for such a product does exist.

This approach, of course, requires government collaboration in support of the product plus, if possible, permission to import the premix free of duties. Also, the producer must be willing to make the necessary investment in such product development work as consumer and market testing, promotion, etc. The reduced capital investment in manufacturing does, however, help in making such projects somewhat more practical than a fully integrated operation for the many markets of limited size.

Future Prospects

The 6-year effort with Incaparina in Central America, which has not been without its problems and frustrations, seems to have demonstrated rather conclusively that a properly conceived and developed protein-rich, low-cost supplement can be produced and distributed as a commercially successful product.

Though it is too early to make any definite judgment as to its public health impact, a few preliminary judgments could be made. The beneficial effects of the consumption of a product of this type are well known and fully documented. It is now a fact that a substantial quantity of the product is reaching consumers who are regular purchasers. The present rate of consumption of Incaparina in Central America of about 860 metric tons per year is, no doubt, only a small part of the market potential for such a product.

Probably the most significant point, however, is that this has been achieved with a product based on locally available sources of protein not previously used to supplement the human diet. It is also significant that, except for the limited institutional use, most of the Incaparina is now, and has been for some time, purchased through normal commercial channels. This has been a growing phenomenon, as shown in the graphic presentation of the commercial sales of Incaparina in Central America (Fig. 5).

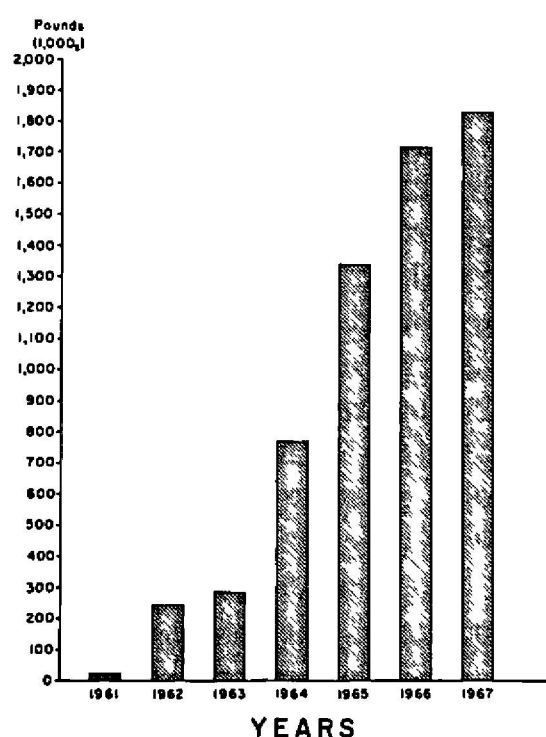


Fig. 5. Incaparina sales in Central America and Panama, 1961-67.

Assuming that the consumption pattern which has now been achieved in Guatemala can be extended to all of the Central American countries, sales should reach about 3,000 metric tons annually. As there is still an untapped potential in Guatemala, as demonstrated by continuing sales growth, the actual Central American potential market is probably considerably greater.

What are the prospects for further achievement with Incaparina in Central America? The past year has been one of preparation to introduce the product beyond the borders of Guatemala and Panama. As described above, this effort is now well under way and it is in the hands of experienced and competent food companies. This bodes well for the all-

important marketing aspects which are now based on solid consumer research and the necessary marketing experience.

The long-standing problem of a fully adequate supply of good-quality human consumption cottonseed flour was only fully resolved during the latter months of last year. In fact, some temporary shortage of the protein concentrate did hamper production during a brief period in 1967. Basically, the problem had been the lack of interest on the part of the cottonseed processing industry, which until recently had not been convinced of the market for a human-grade product. The Incaparina experience, and other factors, have now brought a welcome change. This year several Central American plants are planning to go into production with an INCAP-approved flour. Hence, an adequate supply of low-cost protein concentrate seems assured.

In spite of some increase in the prices of corn and unprocessed cottonseed throughout the region during the last year, it has been possible to hold the price line of Incaparina to the consumer. It is hoped that the increasing volume of Incaparina sales, plus modernized production facilities such as the new plant in Guatemala (Fig. 6), will

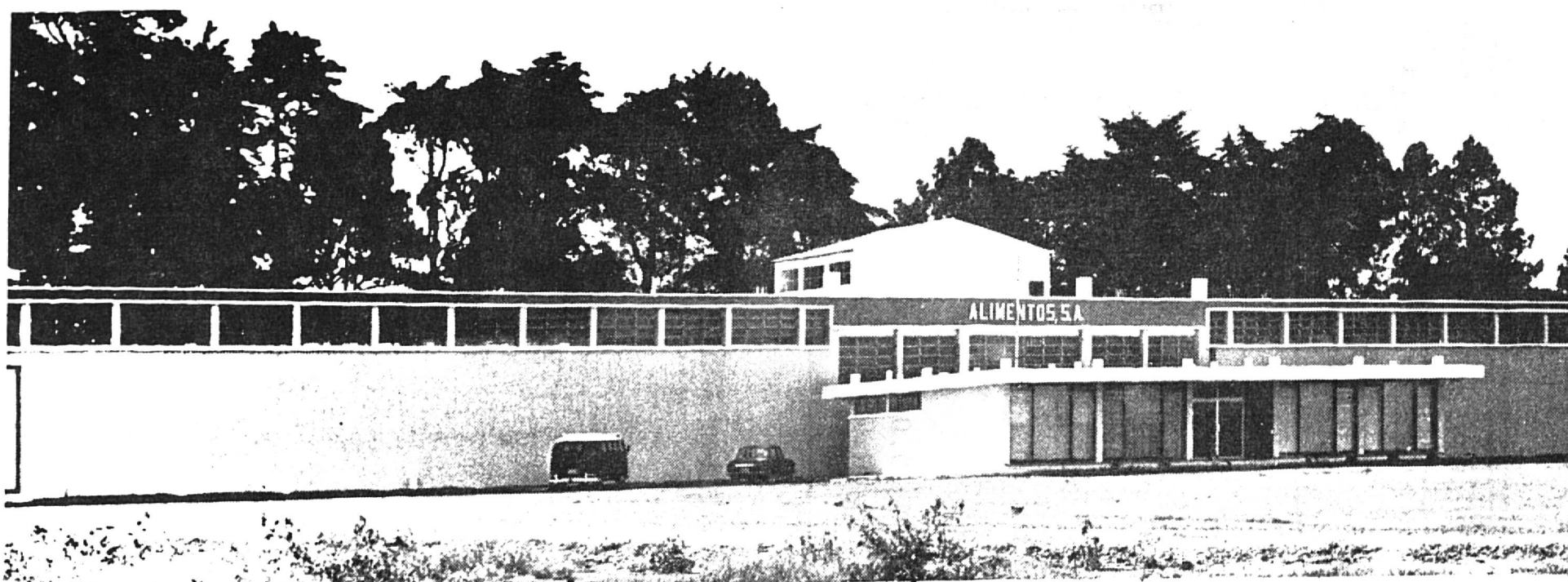


Fig. 6. Recently completed plant of Alimentos, S.A., Guatemala City, the Incaparina producer for Guatemala, El Salvador, and Honduras.

make it possible to hold the price at present levels or, possibly, obtain some reductions. This, of course, is difficult to predict but is a basic goal of the program. A price and protein comparison of Incaparina with other products of similar use in Guatemala is shown in Table I and, graphically, in Fig. 7.

It seems reasonable to assume that Incaparina will eventually find a substantial institutional market in Central America. The fact that this has not developed as anticipated is due, as pointed out above, to the ready availability of the donated U.S. Food for Peace program products to most institutions. However, this has not seriously hampered the over-all program. In fact, the channeling of most of the product through regular retail outlets for consumption in the home has two advantages. First, the long-range effectiveness of such a protein food in terms of nutrition is directly related to home use. This is where the most serious nutritional problems exist, particularly with reference to the preschool child and the pregnant and lactating mother.

Second, and perhaps just as important from the point of view of the success of the protein food concept in general, the Guatemalan experience has demonstrated the economic viability of such a product without any reliance on direct subsidies or the support of massive governmental or other institutional purchases. In other words, Incaparina seems to have been able to meet the challenge of the market on its own, up to this point. The prospects now seem favorable in the other Central American markets which are now being

TABLE I

PRODUCT	COMPARATIVE COST PER SERVING			COST OF PROTEIN CONTAINED IN VARIOUS PRODUCTS			
	Cost per lb.	Amount Used per 8-oz. Glass	Cost per Glass	Retail cost ^a per lb. in Guatemala		Cost per lb. of Protein (454 g.)	Quantity of Protein per U.S. 0.10
					Protein ^b		
	dollars	g.	dollars	dollars	%	dollars	g.
Incaparina	0.20	25	0.011	0.20	27.5	0.73	62
Powdered skim milk	0.80	25	0.044	0.80	35.0	2.29	20
Instant oats	0.39	20	0.017	0.39	15.0	2.60	17
San Vicente flour (Arrowroot)	0.30	25	0.017	0.30	1.4	21.43	2.1
Maizena (corn starch)	0.28	25	0.015	0.28	1.0	28.00	1.6
Maizena-Atol							
With flavors	0.80 ^c	-	-	0.80 ^c	1.0	80.00	0.6
With water	-	12	0.021				
With milk	-	12	0.060				

^aGuatemala prices, January 1968.

^bProtein percentage taken from INCAP-ICNND Food Composition Table or INCAP analysis.

^cEight packages of 60 g. each.

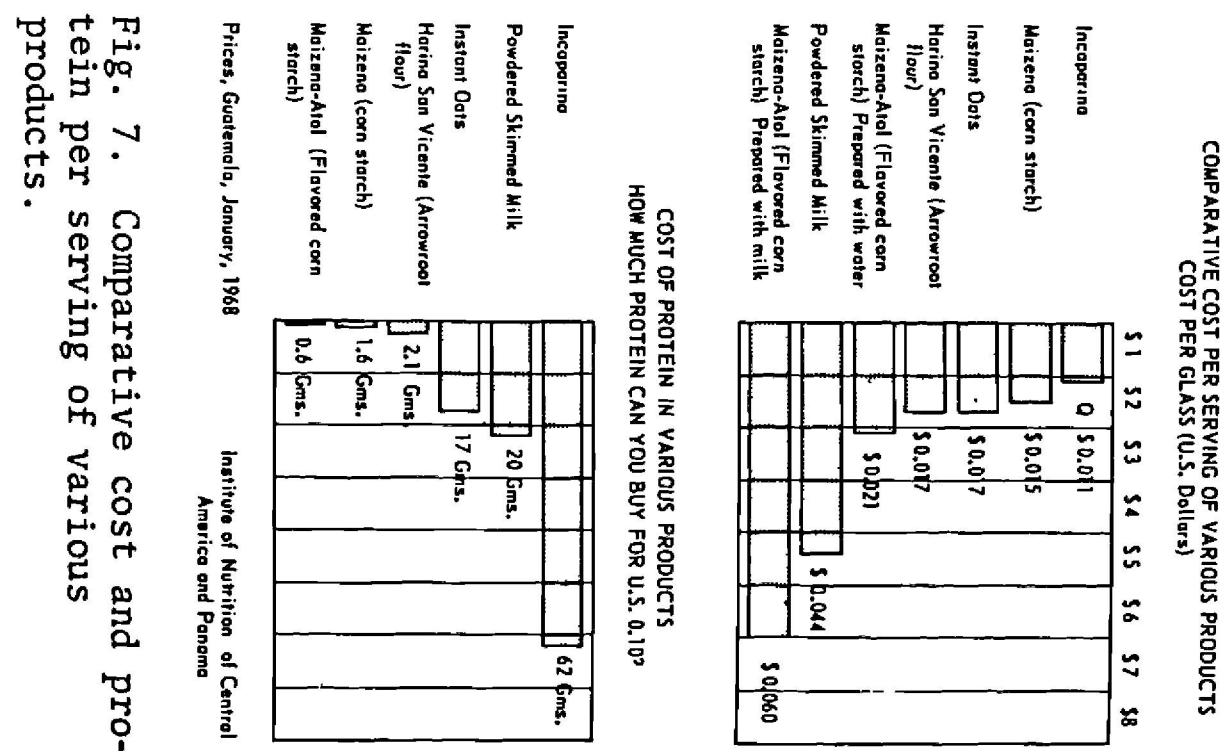


Fig. 7. Comparative cost and protein per serving of various products.

opened up. As Dr. Aaron M. Altschul, well-known authority on protein foods, and others have frequently stated (11), this is the ultimate test of a low-cost protein food.

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