WORLD HEALTH ORGANIZATION
REGIONAL OFFICE
FOR THE EASTERN MEDITERRANEAN

ORGANISATION MONDIALE DE LA SANTÉ
BUREAU RÉGIONAL
POUR LA MÉDITERRANÉE ORIENTALE

SEMINAR ON NUTRITIONAL PROBLEMS
IN THE WEANING PERIOD

Addis Ababa, 3-15 March 1969

EM/SEM.NUTR.PROB.WEAN.PRD/6
5 February 1969

INCAPARINA: ITS DEVELOPMENT, COMMERCIAL DISTRIBUTION AND ACCEPTABILITY IN LATIN AMERICA

by

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I. PURPOSE FOR WHICH INCAPARINA WAS DEVELOPED

Several factors in Central America - where mortality among pre-school children is at the present time ten to forty times higher than in Europe, the United States and Canada - are responsible for the relatively poor nutritional status of the population. Animal sources of protein are scarce, although there is a potential for increasing their production in this area. The extremely low purchasing power of the people, however, prevents the available supplies of milk, eggs, meat, poultry and fish from reaching a significant sector of the population in these countries; it also limits the demand and therefore, the production for local consumption. Currently high birth rates are tending to aggravate the situation further, for even where more proteins of animal origin are available, the population growth is out-distancing available supplies and will probably continue to do so, until full-scale, economic development has been achieved. Dietary customs and food taboos also prevent the use of proteins of animal origin, since such foods often are not considered suitable for the feeding of small children. Thus children are denied animal proteins at the very time when they are most necessary for their health and growth. Insufficient protein in their diets combined with other factors, particularly frequent infectious diseases, often results therefore, in protein deficiency disease with all its well recognized serious consequences.

After nearly ten years of studying the serious problem of protein malnutrition among young children and working to develop practical preventive measures for its member countries, the Institute of Nutrition of Central America and Panama (INCAP) concluded that a high quality cottonseed flour or other similar protein concentrates derived from the oil seed industry combined with a cereal grain, could be a satisfactory and inexpensive dietary source of good quality protein in the Central American area and, possibly, in other regions with similar environmental conditions and nutritional problems.

The need for developing protein-rich vegetable mixtures, acceptable to people who are either unable or unwilling to use proteins of animal origin, and using low cost, local resources was recognized. One of such mixtures to which the name of Incaparina was given, was fully tested and ready for commercial production and distribution in 1960.

II THE PRODUCT, ITS SCIENTIFIC DEVELOPMENT AND TESTING BY INCAP

INCAPARINA is the name given by INCAP to its vegetable mixtures containing 25% or more of proteins, comparable in quality to those of animal origin and which have been proved suitable for feeding of young children, as well as adults.

The present formulas for Incaparina are the culmination of eight years of laboratory research and seven years of commercial development. The products have the appearance and consistency of a finely ground flour and can be easily prepared in the home as an "atole", a warm drink found to be popular in many Latin American countries. Cooking the mixture in the home conforms to the cultural pattern of the consumers, and it also purifies the water which must be added to the product. Incaparina can also be incorporated into many other foods such as soups, puddings, cookies, etc., and can be adapted to most dietary patterns of the developing countries.

The laboratory trials of Incaparina, Formula No.9, conducted by INCAP several years ago proved that the protein content and quality of the mixture approach those of milk. With the addition of synthetic Lysine, as it is now being distributed in Guatemala, the nutritive value is even closer to that of milk in all respects. This most recent improvement in the product was made in 1967 when the price of synthetic Lysine became sufficiently low to permit the enrichment without changing the low price to the consumer. In addition to protein of high nutritive value, the mixture provides also adequate amounts of vitamin A, riboflavine and calcium nutrients which are also deficient in the normal diets of the populations for which this food supplement is intended.

Feeding the mixture to children under controlled conditions has demonstrated conclusively that the mixture - with some additional calories - can provide sufficient protein and other essential nutrients to maintain adequate nutrition. (1) Although Incaparina has been used to cure serious cases of protein malnutrition, it was developed and is being used primarily for preventive purposes. The product is not a medicine, it is a food.

In cooperation with the Guatemalan Ministry of Health, acceptability trials were conducted by INCAP in several communities during the first half of 1959. These areas were representative of the various cultural, economic and climatic levels found in most of Central America. Among other findings, these trials revealed that 80% of the children who drank the "atole" made from Incaparina liked it and drank it willingly. Over 75% drank two to three glasses each day for the sixteen-week period of the trials.

Parents of the children included in the trial showed great interest in the product and indicated their willingness to purchase it when it would become available commercially if its price was reasonable. (2)

Before offering Incaparina to possible producers, INCAP tested the product on a commercial basis in 1959. With the cooperation of interested commercial firms and the Guatemalan Ministry of Health, INCAP undertook a three-month sales trial in the town of Palin, a community of 3,600 inhabitants conveniently located near Guatemala City. Palin, with a mixed population of Indians and Ladinos (Indians 60%, Ladinos 40%), provided a fairly representative economic and social cross-section of the Guatemalan market; and, at the same time, was not so large as to over-tax the limited production and packaging facilities available to INCAP. By the end of the first week of this preliminary trial, sales in twelve small retail stores were averaging about 150 of the 75-gram bags per day. At the end of the first four-week period, a total of about 4,500 bags, or slightly more than 750 pounds of Incaparina had been sold. (3)

The success of this small trial led to a temporary arrangement with a Guatemalan company to expand production and distribution in order to test the market more fully. This second market trial conducted in 1960, lasted for seven months during which over 700,000 lbs. were sold in the Capital City of Guatemala and in several other communities. It was only following this extensive feasibility testing that Incaparina was made available to the food industry.

III BASIC CONCEPTS OF THE INCAPARINA PROGRAMME

The commercial application of Incaparina, as carried out by INCAP during the past seven years, has been based on the principle that a low cost protein-rich product will find its greatest use among the largest number of consumers needing such a product, if the following concepts are observed in the programme's administration.

A. Nutritional Adequacy

The nutritional adequacy of the several Incaparina formulas now in commercial use have been thoroughly proved through biological and clinical testing and the data has been widely published. (1) Quality control, which is a part of the arrangement between INCAP, the governments concerned and the authorized producers, is used to assure that this nutritional adequacy is being maintained.

B. Lowest Possible Cost to the Consumer

Low cost is, of course, essential if the product is to reach those most in need of such a supplement. The price to the consumers, with a special low price to Governments and other organizations promoting the institutional use of Incaparina, is established in the authorizations granted to producers and is controlled by INCAP and, in some countries, by the Government. The price is established at the lowest possible point which will assure a reasonable commercial return when a substantial volume of sales is achieved.

C. Locally Available Raw Materials

To the extent possible, the raw materials in the product must be available locally. This, of course, is a fundamental principle if the low price is to be maintained. This principle has been recognized in the United Nations Report on the Protein Problem (4) and has been applied to Incaparina.

This concept has also served to encourage the development of badly needed new low cost sources of good quality protein concentrates within the individual countries. The number of processing plants capable of producing a suitable cottonseed protein concentrate for human consumption has increased significantly in Central America and in Colombia since the introduction of Incaparina. This development is extremely important if the Latin American countries are to effectively reduce their reliance on imported foods of good nutritive value. In addition, a successful protein-rich food programme can make a significant contribution to economic development as well as improved health through the up-grading of locally produced foods.

D. Commercially Available For Regular Use in the Home

It is generally recognized that the groups most vulnerable to protein and other nutritional deficiencies (pre-school children, lactating mothers and pregnant women) can be most effectively reached in the home, though supplementary feeding programmes can, of course, also make a contribution. Therefore, the Incaparina programme has given primary emphasis to normal commercial distribution, the channel through which food products normally reach the home. This objective is now being achieved in those countries where the product is in full scale commercial distribution. Where it is now on the market Incaparina is competing successfully with many food products of much lower nutritive value and higher cost to the consumer.

E. Produced and Distributed by Qualified Food Industry Companies

If the above principles are to be successfully carried out, the product must be in the hands of fully qualified organizations who are capable of

producing and marketing the product with a maximum of efficiency. This is particularly true with respect to the marketing and distribution of protein foods as has been recognized in the recommendations of the United Nations report on The Protein Problem. (4) INCAP's careful investigation and qualification of companies to handle Incaparina is a fundamental part of the Programme.

F. Governmental Support of Incaparina

The following quotation from the United Nation's Report on The Protein Problem clearly states the responsibility of governments with respect to products such as Incaparina:

> "Irrespective of the particular channels of distribution in a given country, governments clearly have the responsibility for promoting the availability of protein foods of high quality at the lowest practical cost and of encouraging their use by the segments of the population most in need of them." (4)

The procedure under which INCAP consults with the Government concerned prior to granting an authorization for the production and distribution of Incaparina in a given country, is based on this very sound principle. The extent of governmental support, in collaboration with the food industry involved, has been a key factor in the success of Incaparina in those countries where it has now achieved wide distribution.

Where Incaparina is on the commercial market, it has received strong support from public health officials as well as the medical profession generally. In both Colombia and Guatemala, government health centres are cooperating in the promotion of the use of Incaparina as a well recognized preventive measure for protein malnutrition. In fact, Incaparina has become a routine recommendation by both public health and private physicians in both countries. Similar support is anticipated in the other countries where the product is now being introduced.

IV COMMERCIAL APPLICATION

The basic concepts, as outlined above, have been applied through the formal arrangements which have been made between INCAP the Governments concerned and the participating private industry food companies. INCAP, which holds the rights to the trade mark name, Incaparina, and the formula patents, makes these rights available to qualified food industry companies under a specific set of conditions which have been designed to protect the basic concepts. These conditions are the same for all Incaparina producers.

The mechanics are handled through a formal authorization to each of the companies handling the product. These authorizations specify the price at which the product is to reach the individual consumer, with a special low price for bulk quantities to be used for institutional feeding programmes. INCAP control of the product's quality, as well as the advertising, promotion, package labeling, etc., is also provided for. In addition, each of the authorized producers makes a small contribution to INCAP, based on the volume of its Incaparina business, for further research in protein foods.

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 the area of its competence, does stand ready to assist producers on request, but does not otherwise intervene in the commercialization process.

Following the consumer acceptability and market testing of the product by INCAP, the initial attempt at commercial application was started early in 1961 by the Guatemalan company which had been authorized to handle Incaparina in that country. Sales volumes did not develop as expected in

Guatemala during the first two or three years. Nevertheless, the producer and INCAP persisted with the project in order to develop a more successful marketing programme. The break through occurred in 1964 when certain changes were made in the marketing and promotion of the product. During the latter part of that year, sales climbed rapidly, assuring the commercial feasibility of the project and confirming the consumer acceptability of Incaparina in Guatemala. During this period, much was learned by both INCAP and the Guatemalan producer with respect to some of the peculiarities of the commercial marketing of such a low cost protein food.

Attempts to introduce the product in some of the other Central American countries during this pioneering period were, however, not so successful. The projects which were launched during 1962 in both El Salvador and Nicaragua were terminated by the mutual consent of INCAP and the producers when it became apparent that they might not succeed.

In the light of present experience it is now possible to pin point some of the reasons for these early failures. In one instance, failure was probably due to both insufficient experience in the food industry, plus a lack of the financial resources to sustain the effort for a sufficiently long period to establish the product in the market. An additional factor in both cases was the attempt to launch the product on a full scale commercial basis without sufficient consumer acceptance or market testing in the individual countries. It will be recalled that these essential steps had been taken in Guatemala by INCAP prior to regular commercial distribution in that country.

Another lesson which was learned through these early failures, was the need to have a sufficiently large market in order to achieve the volumes required to sustain the low price. Fortunately, Guatemala seems to have a sufficiently large population for a product of this type. This was apparently not true with respect to the other Central American countries, each of which have a significantly smaller population. It was this economic

fact which led to the regional marketing concept now in effect for Incaparina, among the INCAP member countries. Under this arrangement, which was made effective in 1966, Guatemala, Honduras and El Salvador are handled by one Incaparina producer, based in Guatemala. The remaining two Central American countries of Nicaragua and Costa Rica are the responsibility of another producer based in Nicaragua. For various economic reasons, Panama is handled as a separate market by a local producer though the major ingredients for the Panama Incaparina are provided under a cooperative arrangement with one of the Central American producers.

In summary, it can be said that the early years constituted a period of exploration and mutual learning which might be expected with any worthwhile undertaking in an area as new as low cost protein foods. Nevertheless, it was an important period for the programme as it provided the experience, including that gained through the unsuccessful efforts in both Venezuela and Brazil, on which subsequently successful operations are now being built. This is reflected in the present commercial distribution of Incaparina on a full scale basis in both Colombia and Guatemala and the efforts now under way to secure its place on the market in the remaining Central American countries and Panama. The experience gained is also being made available to other countries where the product may be under consideration by interested governments and food companies both within and outside of Latin America.

V. EVALUATION OF THE PROGRAMME

We believe that we should evaluate the effectiveness of the Incaparina Programme, as in most public health programmes, on the assumption that the recommended measure is beneficial, an assumption which should be as substantiated as possible. In the present case, there is no reason whatsoever to doubt that the addition of a substantial quantity of good quality protein and other essential nutrients to the present diets is beneficial, although it may not be the complete answer to the problem of malnutrition.

If this is accepted, what should be measured, therefore, is the proper consumption of the product by the desired population group. Then, the programme objective pre-established as the basis for evaluation, should be to obtain a desirable level and coverage of consumption. In other words, the operation must be evaluated and not its effects, assuming that the effects are automatically known if the activities are properly carried out. When there is reasonable assurance that the activities have been carried out as planned, and yet there is no indication of the expected results, it would obviously be necessary to find the reason for this lapse. It may be that unexpected circumstances or other unrelated factors are operating. According to these principles, INCAP has established the following goals for the programme of industrial production and commercial distribution of Incaparina:

a) To insure that the product distributed fulfils the established standards in nutritive value, sanitary and organoleptic characteristics.

b) To insure the widest and most adequate consumption, particularly by population groups in greatest need of the product.

The first objective is evaluated by periodic analysis of product samples in INCAP laboratories. These analysis include: chemical analysis, with special attention to protein content, available lysine and total and free gossypol; bacteriological examinations for total bacterial counts and presence of coliforms and enteropathogenic bacteria; organoleptic studies of general appearance, color, texture, consistency, flavor and odor.

To evaluate the feasibility of attaining the second goal in new markets, INCAP requests that authorized producers undertake, a) consumer surveys to determine how the product can best fit in with the food patterns of the population and how it can best be distributed and promoted;

b) pre-marketing surveys of similar products, and of those with which the new product is going to compete; c) consumer acceptability trials, in order to decide on the type and form of product with more chances of acceptance; d) market tests, in controlled representative areas, in order to plan for national production and distribution. All the information collected by these studies, though held by the company, is made available to INCAP. In turn, the Institute provides advisory services for the authorized producers.

Once the product is on the market, INCAP continuously collects information on production, sales, methods of distribution and methods of preparation, as well as any other pertinent information related to the programme. Then the company, with technical assistance from INCAP, when required, and the Institute itself, or independent organizations whenever it is considered necessary, conduct surveys on the actual use of the product. These surveys are designed to learn who is consuming the product, how they are consuming it, what the population knows about the product, how they have obtained this knowledge, their reaction to the product, and similar information needed to orient the distribution and promotion programmes.

A. The Results Achieved

Based on the above concept of evaluation, the ultimate test is, therefore, the extent to which the groups to whom the protein food is directed will use it. Furthermore, if it is to be considered as a long run contribution to the problem of malnutrition in a free economy, it must be purchased and not merely accepted as a donated food. Only in this way will the product achieve the regular use in the home which is required to improve the diet, and to have any really significant long range nutritional impact.

1. Sales Volume

The effect, if any, that Incaparina has had can only be evaluated in

the countries where it has established itself in the market place, such as in Colombia and Guatemala. The majority of the Incaparina distributed in these countries during the past few years has been sold through the normal commercial channels to families for home use. Total sales in these countries have increased steadily for several years as shown in Figure 1, Incaparina Sales. This favourable trend is continuing in both countries and total sales in Latin America should expand significantly as additional countries, where the product is now being introduced, achieve regular commercial distribution.

2. Field Studies

Of possibly greater significance than sales volume alone, is the field data now being accumulated on the extent to which Incaparina is being purchased and used by different population groups. Though some data of this type has been obtained in Colombia, the most conclusive studies are those which have recently been made in Guatemala.

The first such study was conducted as part of the INCAP/OIR Nutrition Survey of Guatemala in 1965. (5) During this study, information on Incaparina was obtained from 389 families located in thirty-nine of the total sample of forty rural 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 group, were only serving it to their children. Hence, it would appear that, shortly after the expansion of distribution in 1964, Incaparina already was reaching a reasonably 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. (6) 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 as such, were the basis for non use. In fact, the majority of the non-users gave a favourable opinion on the various aspects of the product, such as its price, method of preparation, commercial availability, etc.

This survey also secured data on who within the family were receiving the supplement. Here it was found that 64% of the consumer families were providing it to children under one year of age, 89% to the children one to two years and 91% to the two to five year age group. This would indicate that the families using Incaparina are serving it to the critical pre-school age child as the type of supplement that the product is primarily 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 consumer families.

The most extensive study of the distribution, consumption and use of Incaparina in Guatemala was carried out by the Institute for Foreign Agriculture of the Technical University of Berlin during last year. This study, which was conducted independently of INCAP, covered a carefully selected sample of 1,250 families and some 240 retail stores located in all parts of the country.

The complete study is to be published by the University as a doctoral thesis later this year. With the permission of the Berlin Institute, it has been possible to include some of the preliminary findings in this paper.

With respect to who Incaparina is reaching, the Berlin Institute study agreed within six percentage points with the other 1968 study. Families consuming the product were found to be 64% and 58% of the separate samples studied. It is, therefore, possible to project with considerable certainty that more than 350,000 Guatemalan families are now consuming Incaparina. Both studies also showed that more than half of the consuming families are using the product regularly.

The study of the Berlin Institute, which secured data on consumer's incomes, showed that 29% of the families reporting less than US$ 20 per month income were consuming the product, evidence of substantial use by the lowest income group. This percentage rises to 61% for the US$ 20-100 bracket, indicating that, even at the low price, available income is a factor in the consumption pattern. Among the highest income group, receiving more than US$ 100 per month, it was found that 76% of the families are consumers. This confirms that the product has successfully avoided the image of a "poor people's food" which would have been undesirable from the marketing point of view.

Regular purchase through normal commercial outlets was also confirmed by the Berlin Institute Study. Seventy percent of the very small retail stores, typical of the country's commercial structure, were found to be stocking Incaparina as a regular item, as were the larger stores and supermarkets.

Using a widely distributed corn starch product of similar price and use, but of very low nutritive value as a control, the Berlin Institute data shows that Incaparina outsells the "control" in 30% of the stores and has a comparable sales volume in 22%. Total sales volumes are thought

to be considerably higher for Incaparina than the other product on a national basis. This has a special significance as it shows that a more nutritive food can compete successfully with a less nutritive item which has been well established on the commercial market for many years.

INCAP welcomes objective field studies of this type as they provide, in our opinion, the most practical way to evaluate the effectiveness of protein food programmes. We, as well as others interested in products of this type will be waiting with interest the publication of the Berlin Institute Study.

3. Comparison with Other Popular Foods

Another measure of the possible nutritional impact of Incaparina is through a comparison of its nutritive value and price with similar popular foods with which it is now competing in the market place. The favourable position of Incaparina from both the economic and public health points of view, are well illustrated in the two graphic presentations in Figure 2, Comparative Cost and Protein Value of Incaparina and Other Products.

It is, of course, recognized that some of the products in Figure 2 are well established and are widely used throughout Latin America even though they have little or no nutritive value. Nevertheless, the nutrition education efforts of governmental authorities are considerably strengthened when a low cost protein-rich product, such as Incaparina, is readily available in the commercial market. Efforts to direct consumers away from the non-nutritive products are, also, greatly assisted by the promotional efforts of the Incaparina producer in favour of the protein-rich product.

This is an illustration of the collaborative nature of a protein food programme where both government and the food industry are cooperating toward the same public health objectives as has been demonstrated with Incaparina.

VI PRODUCT IMPROVEMENTS

Technical improvements in Incaparina have gone hand in hand with its commercial application. This has also been a cooperative endeavour of INCAP, the food industry companies and the governments concerned. Progressive improvements have occurred in the formulations as well as in the packaging and presentation to the consumer. Of special importance has been the nutritive improvement of Incaparina through the addition of synthetic Lysine, as mentioned previously. It is significant to point out that all of these improvements have been made without increasing the price of the product to the consumer.

INCAP is, of course, continuing its research, in close collaboration with the food industry, universities and other interested organizations, toward further product improvement. This research includes not only work with the basic vegetable mixtures but also the development of supplementary nutritive products containing Incaparina. One such product, which is now ready for commercial application, is an Incaparina cookie and several other forms are in the research stage. These developments should contribute significantly to the future prospects of Incaparina as a widely used protein supplement.

VII FUTURE POTENTIAL

The contribution which a product such as Incaparina can make to improve nutrition, not only in Latin America but elsewhere in the world, is now well documented. Through the pioneering efforts of INCAP, the governments and the food industry companies who have collaborated in the Incaparina Programme, the feasibility of such a low cost protein-rich supplement has not been demonstrated. It has also been shown that the policies, which INCAP has applied, can provide the assurances that the low price and high quality of the product can be maintained in the public interest while, at the same time, promoting the ever wider use of the supplement by those who need it. It can, therefore, be concluded that the future prospects for further development along the same lines are now very promising.

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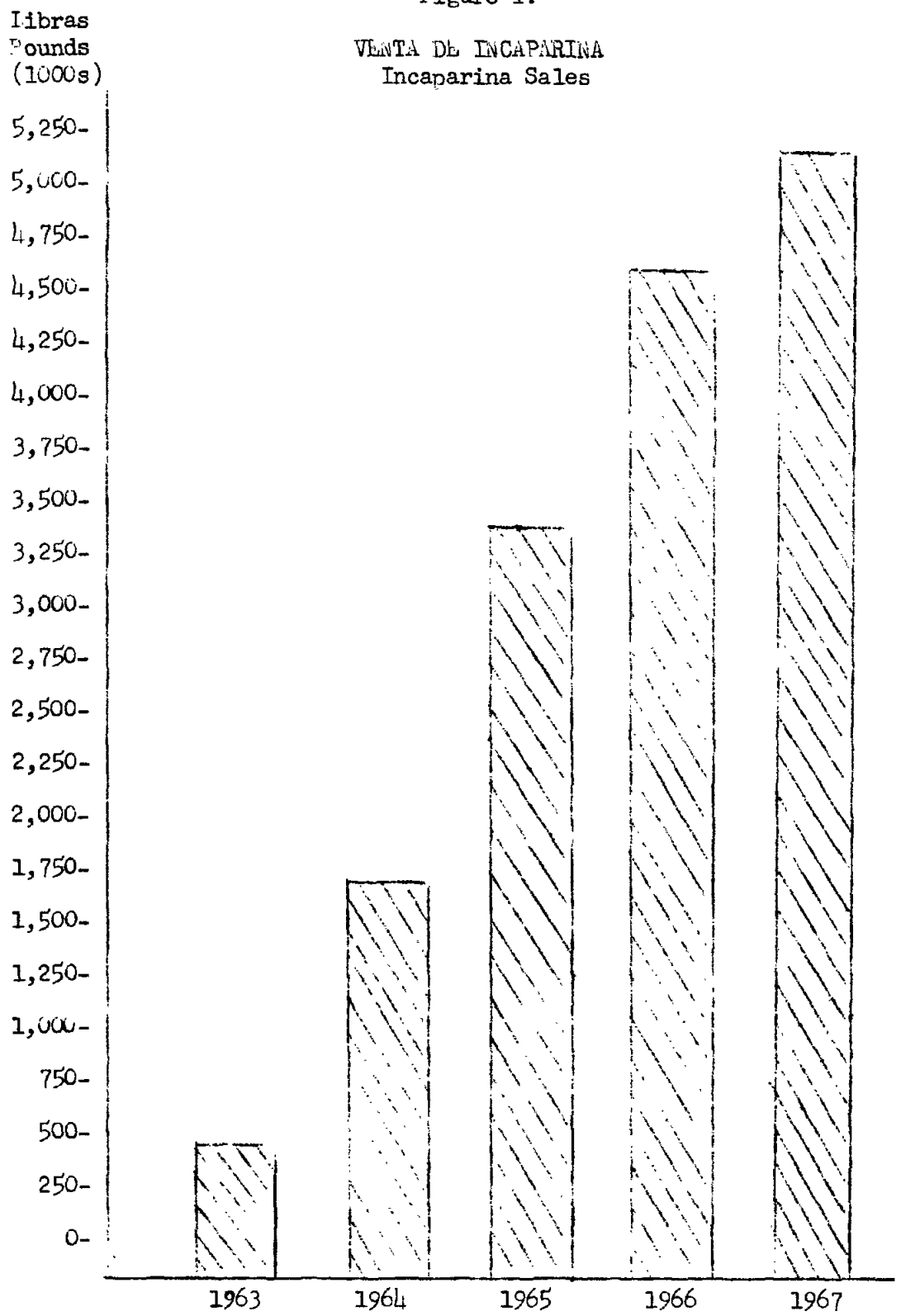
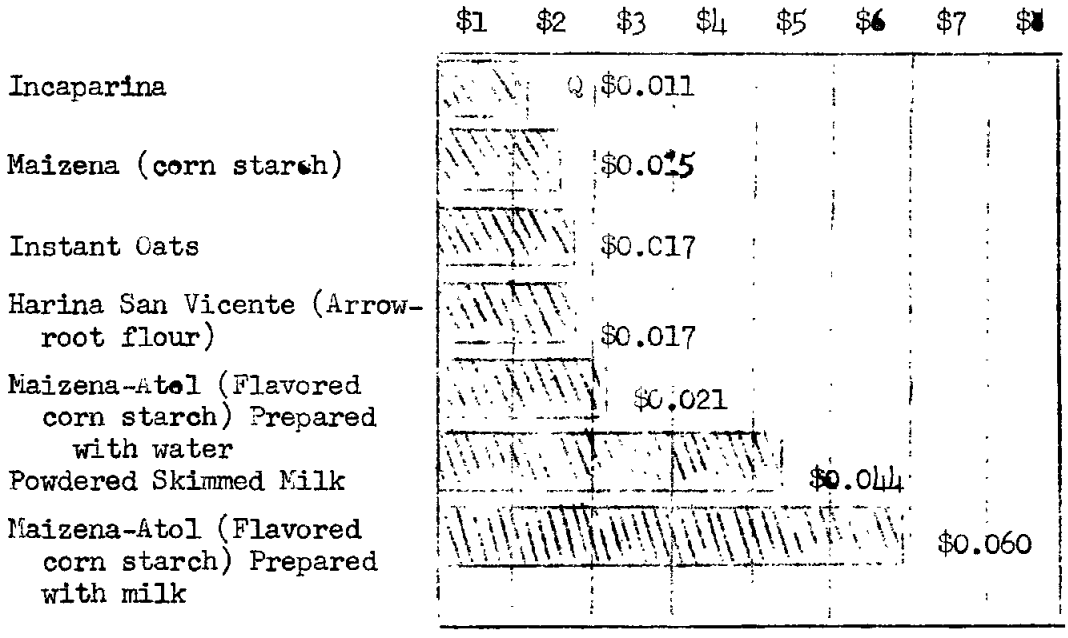
Figure 1.



Incap 68-34

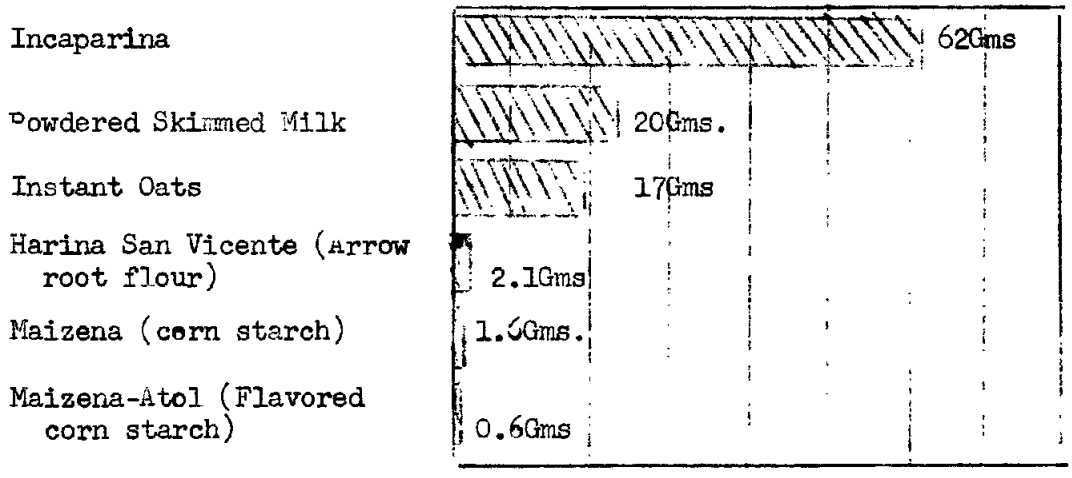
Figure 2

COMPARATIVE COST PER SERVING OF VARIOUS PRODUCTS
COST PER GLASS (U.S.Dollars)



COST OF PROTEIN IN VARIOUS PRODUCTS

HOW MUCH PROTEIN CAN YOU BUY FOR U.S.0.10?



Prices, Guatemala, January 1968

Institute of Nutrition of Central America and Panama