

THE APPLIED NUTRITION PROGRAM: THE BASIS OF THE NATIONAL NUTRITION PLAN¹

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Applied nutrition programs, promoted and supported by PAHO/WHO, FAO, and UNICEF, could be the starting point for far-ranging national food and nutrition plans in the developing countries. This article gives an account of Colombia's encouraging experience in this respect, and discusses the many circumstances and factors which have made it possible to expand and amalgamate a variety of nutrition programs into a plan at the national level.

The Problem of Malnutrition

Nutrition problems loom large in the developing countries. One of them is protein-calorie malnutrition, which causes high mortality and morbidity among children under five in two-thirds of the world population. The developing countries are unable to meet even their primary needs, and the death rate in children under five years of age represents 25 to 50 per cent of general mortality, while in the one- to four-year group it is 15 to 30 times higher than in the industrialized countries. However, because of the persistent after-effects of protein-calorie malnutrition, the problem is not merely the child who dies but also the child who survives. These after-effects can be seen in stunted physical growth and development, resulting from a very low daily intake of the proteins which are the vital raw materials for the permanent body-building process of the growing child. Stunted physique is frequently accompanied by varying degrees of mental retardation, the determining factors of which have not yet been properly elucidated. There is no doubt that child malnutrition is one of the chief obstacles preventing the developing

countries from rapidly achieving a substantial measure of economic and social prosperity.

The growing recognition of this problem on the part of public health workers, educators, and other representatives of government departments, international agencies, and private bodies, has encouraged the organization and operation of nutrition programs in all the developing countries over the last two decades.

At first the emphasis was placed on school feeding programs, but at the end of a year or two the need was felt for multisectoral programs which simultaneously cover health, education, agriculture, and community development activities at the local level; as a result, WHO, FAO, and UNICEF promoted the establishment of what are known as applied nutrition programs. More recently still, it was felt that priorities should be fixed so as to give greater importance to children under five and pregnant and nursing mothers as being the groups most vulnerable to malnutrition; and Governments and international agencies alike have come to recognize more and more clearly the need to coordinate national programs to combat malnutrition, following a well-defined country-wide food and nutrition policy.

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The National Institute of Nutrition of Colombia

When the Colombian Government decided, toward the end of 1962, to make a strenuous

effort to reinforce and expand the modest existing nutrition programs, it was felt that the obvious procedure was to establish a technical and administrative structure through which this effort could be channeled. Thus a bill was introduced and passed creating the National Institute of Nutrition as an autonomous body with its own financing based on a levy on the sale of iodized salt through the Salt Mines Concession of the Bank of the Republic, which has a monopoly on salt mining in Colombia.

The multisectoral focus of its programs was assured by designating as members of its Board of Directors the Ministers of Public Health, Education, and Agriculture and the Director of the Association of Medical Schools. In other words, it recognized the multiplicity of causes underlying nutrition problems; and a physician specialized in public health nutrition was appointed as Director of the Institute so as to give it technical orientation in public health.

The basic objectives of the Institute are met through four technical divisions: coordination of applied nutrition programs, supplementary feeding and food services, nutrition education, and nutritional research. Its activities comprise essentially the study of the characteristics of

the country's nutrition problems as a foundation for programming policy; food and nutrition training for professionals at the university and intermediate levels working with the community; the promotion, planning, coordination, operation, and evaluation of applied nutrition programs, including a variety of activities designed to prevent and combat malnutrition with the help of health, education, agriculture, and community development institutions; the drafting and recommendation to the National Government of regulations governing various aspects of feeding, including statutory food standards and the operation of various aspects of the programs; technical advice on the establishment and operation of various types of feeding services; and the control and evaluation of national nutrition programs such as salt iodization to prevent endemic goiter.

In May 1969, the Institute became the Department of Nutrition of the Colombian Family Welfare Institute, a new institution concerned exclusively with the over-all protection of mothers and children of the least privileged social and economic groups. The budget for the Institute's nutrition program, based on a levy on the sale of salt, was 45

FIGURE 1—The National Institute of Nutrition—now the Department of Nutrition of the Colombian Family Welfare Institute—coordinates and directs the programs for the nutritional protection of the mother and child.



million pesos (US\$2.5 million), which reflects a growing interest in social development programs on the part of the Government.

Over the past seven years the Institute has developed a wide range of activities and programs designed to deal with particular aspects and practices of nutrition through three general types of activities: education, supplementary feeding, and above all, sponsorship of local production of protein-rich foods. In the field of research too, the main stress has been on applied and practical research relating to the country's own program, e.g., acceptability of new protein-rich foods and demand for them; determination of the iodine content of salt intended for consumption; establishment of Colombian standards of child growth; nutritional composition of the various types of home-produced foods and regional dishes; preparation of balanced diet schedules; recommendations on food consumption and production targets for the next 10 years; streamlining of nutritional surveys; treatment of tropical anemia; nutritional rehabilitation of children using Opaco-2 corn and soya protein; problems of absorption and intestinal parasitism; enrichment of weaning foods; relationship between malnutrition and mental development; utilization of Opaco-2 corn for human consumption and methodological research into various nutrition services and activities such as the teaching of nutrition in primary schools, and the organization and operation of nutrition education and rehabilitation services.

The Applied Nutrition Program

There is no doubt that the main focus of the work of the National Institute of Nutrition has been the Integrated Program of Applied Nutrition (PINA). Not all the activities of the Institute can be regarded as part of it, but most of them have a more or less direct connection with the program. The work of PINA in Colombia is the outcome of the combined efforts of governmental agencies concerned with public health, agriculture, education, and community development, and of PAHO/WHO,

FAO, and UNICEF, directed and coordinated by the Institute.

Applied nutrition programs have been established in about 70 countries throughout the world. Noteworthy among the many difficulties encountered in carrying out food and nutrition activities efficiently are the following:

- 1) The frequent lack of coordination among the agencies—national, intermediate, and local—responsible for the various aspects of feeding of the population. This is due largely to ignorance of the fact that nutritional problems have many causes and need multisectoral programs to combat them.

- 2) Ignorance or underestimation of the magnitude and vital importance of the problems on the part of the decision-making level, and the consequent lack of incentive to carry out programs to solve them.

- 3) Shortage of technical personnel with food and nutrition qualifications to undertake the planning, development, and evaluation of programs in this field, and ignorance of food and nutrition on the part of nonspecialized personnel, professional and subprofessional, having responsibility for community education activities in the fields of health, agriculture, and education.

- 4) Lack of sufficient and adequate technical and food resources, and funds, to enable a country to establish sound, active and direct education programs on the production and consumption of foodstuffs, and supplementary feeding programs for the more vulnerable population groups.

The general purpose of PINA in Colombia is to improve the nutritional status of the population by coordinating the resources and activities of various official, semi-official, and private bodies, especially those concerned with health, agriculture, education, and community development, the sectors most directly linked to the factors responsible for a country's nutritional problems. The applied nutrition program operates as part of the general policy of economic and social development and with due regard to the country's particular circumstances and resources.

To achieve this general purpose, the applied nutrition program determines the characteristics of the country's nutritional and feeding

problem; it promotes and organizes training in food and nutrition for the professional and intermediate staff of health, agriculture, education, and community development institutions in direct contact with the community; it strives to improve the nutrition and health status of the population by means of nutrition education and supplementary feeding activities and programs carried out through health services, education and social welfare bodies, etc., with a view to preventing and treating malnutrition in the more vulnerable groups; it promotes more abundant local supplies of foodstuffs, especially protein-rich foods, through agricultural extension schemes; it works for better family living conditions through home economics; it integrates the country's food and nutrition activities by coordinating at various levels the programs of government, semi-official, and private agencies working in these fields; and finally, it tries to secure the allocation of increased technical resources and international, bilateral, and national funds for the financing of such programs.

PINA is a mechanism for the technical and economic coordination of the participating agencies, with a view to the practical application of its underlying principles, and in particular: maximum utilization and exploitation of the available regional economic and technical resources and active participation by the beneficiary community in the actual implementation of the program; promotion, protection, and improvement through education, of the nutritional status of the community, the aim being to make the best use of the country's resources; executive action to spread responsibilities among the various participating bodies according to the particular technical and economic resources of each; and finally, information to persons at the policy-making level on the importance and scope of nutrition problems and efforts to stimulate and channel their interest and that of international agencies toward nutrition and food programs.

In some countries the development of applied nutrition programs has been slow and has met with serious economic, technical, and

administrative difficulties. This is understandable if we consider that its development and expansion can only be brought about by a gradual process of training of technical personnel at the professional and subprofessional level. Equally understandable is the great difficulty facing programs whose basic problem is the coordination of agencies and officials.

Impact of the Applied Nutrition Program

One of the most interesting and laudable aspects of applied nutrition programs is the extremely important role they have been playing in certain countries, in some instances as pioneers of nutrition programming; as a means of enlightening public opinion concerning the scope of nutrition problems and the need to solve them; as centers for action to influence the various levels of national administrations, and especially the policy-makers that have the power to establish priorities for their economic and social development programs; as catalyzers of interest and concern on the part not only of Governments but of the private sector, in regard to community problems and plans for solving them; as centers for the intersectoral integration of programs, giving more meaning and effectiveness to the plans of various bodies; as indicators of essential technical requirements disregarded initially in programs but making for consolidation and future expansion once achieved; and finally, as an essential means of binding together and channeling economic and technical resources derived from various sources.

The process is simplicity itself; but it has not always been possible to foresee it at the actual time of initiation of programs, which have tended to be regarded as "a broad type of coordinated educational activity involving agriculture, health, and education authorities and other institutions interested in this type of problem and designed to improve the production, consumption, and distribution of food for the benefit of communities, and especially of mothers and children in rural areas. The guiding principles of these activities are coordi-

nation of the various agencies and institutions and active participation by the population itself.”

Thus defined, applied nutrition programs have a relatively limited range. Nevertheless, once the first steps have been taken in the direction of planning, coordination, and development, a multitude of needs have emerged, calling for more and more activities on a growing scale to ensure their continuity, and especially their expansion, from the pilot demonstration areas where they are organized in the first instance to the stage of general application throughout a country.

A brief enumeration will indicate the basic needs that have been gradually emerging from the minimum initial program in a pilot area.

Once these needs are met, they automatically imply a vast expansion, frequently covering the entire national territory in respect of one or more aspects of the program. It should be explained that the comments on this point are based on our experience with the applied nutrition program in Colombia, where according to the views of international experts who have inspected similar programs in Latin America and occasionally in other parts of the world, this type of program has reached a higher degree of development, and has been more successful, than anywhere else.

Personnel Training

In the field of personnel training, the plans for the future consolidation and expansion of

FIGURE 2—The program for training nutritionist-dietitians has led to a rapid expansion of the nutrition activities.



applied nutrition programs have created a variety of needs:

a) The primary need that has emerged is for food and nutrition specialists in the medical and paramedical fields. It was found necessary to organize a specific program for the training of nutritionists and nutritionist-dietitians, first of all in institutions abroad and later within the country, by means of specialized centers or courses. Thus, in conjunction with the National University, a new university course was established for nutritionist-dietitians, and three years ago, for the first time in Latin America, the school conferred the degree of *licenciatura* (B.A.) in nutrition and dietetics, following four years of university studies. Similarly, a national course in public health nutrition was organized with a view to training physicians as coordinators of the applied nutrition program. There are also the advisory services provided to schools of dietitians with a view to giving a public health focus to the teaching of this discipline. Colombia awards the title of nutritionist-dietitian to an average of 60 students each year.

b) It was considered vitally important that public officials at the professional and sub-professional levels working with the community should become "catalyzers" for the teaching of specialists in nutrition and dietetics. An ambitious plan was therefore worked out and has gradually been put into practice for formal and in-service training in food and nutrition not only for professional workers (physicians, nurses, and dentists) but also for intermediate-level personnel (primary schoolteachers, nursing auxiliaries, agricultural extension workers, home improvers, community development promoters, and voluntary personnel). To this end the teaching of food and nutrition has been introduced into the curricula of medical and nursing schools, and assistance is now given in the development of these programs. At the same time an in-service training plan has been drawn up consisting of short courses and seminars on the same subjects for these various types of workers. The extent of the effort made over the last six years can be judged from the fact that in this way, out of a potential group of 100,000, instruction has been given to 25,073 persons at the intermediate level and 4,845 at the professional level, while 70 per cent still remain to be trained.

c) It is noteworthy that this training in applied nutrition has recently achieved regional coverage with the organization in Colombia of

the Regional Center for Training in Food and Nutrition Economics (CRECENA), which takes full advantage of the experience of the applied nutrition program not only in theoretical teaching, but more particularly in field work making use of the existing organization of the program in various parts of the country. CRECENA was recently awarded the Maurice Pate prize by UNICEF for its outstanding work in nutrition education throughout the Hemisphere.

d) The effect of the applied nutrition program on community education programs, with the help of the mass communications media, has acquired national dimensions with the inauguration of an educational television program. The teaching of schoolteachers and children has been added to the instruction already given in the natural sciences, and the community program covers one local group in the urban zone of Bogotá (People's Training Program) and two nationwide schemes, for mothers in the lower income groups, using health centers and schools, and for housewives generally. Broadcast programs and the press supplement the work being done by PINA at the local level.

e) Finally, the need to prepare sufficient teaching material for the various professional and subprofessional categories and levels, and for the community in general, has led to the establishment within the Institute of a national center for the preparation, printing, and distribution of the educational material used extensively in the applied nutrition program at the local level.

Nutrition Research

The applied nutrition program has provided incentives to institute an eminently practical type of research designed to simplify the problems involved and ensure the optimum development of the scientific aspects of the programs. Thus a series of applied research projects have been carried out to facilitate the work of the applied nutrition program. The following are examples of the tasks involved:

a) The need for repeated basic nutrition studies in the areas covered by the applied nutrition program prompted a very comprehensive research scheme with a view to making these studies as simple as possible; and it was discovered that valid results on family food consumption could in fact be obtained from food surveys carried out in only two days.

b) The need for protein-rich foodstuffs particularly suitable for feeding children stimulated the promotion and support of research on new protein mixtures and the design and implementation of a research project on the use of Opaco-2 corn, with a view to fortifying the starchy foods consumed by families in the lowest socioeconomic classes. The aim is to simplify the educational task of introducing the names and tastes of new foods, by making use of those customarily eaten by undernourished children.

c) The need for anthropometric reference points for evaluating the rehabilitation of undernourished children highlighted the urgency of carrying out research on physical growth and development and establishing a Colombian standard for use as a basis of comparison, and also stimulated the application of specially designed methods of measuring the physical growth and development of these children.

d) The task of diagnosing the food and nutrition problem in a given population likewise brought out the need to determine the stratification of the social and economic classes in a community, by means of the protein-economic coefficient applicable to any region.

e) To ensure that the educational work carried out in conjunction with the applied nutrition program in the primary schools achieved the best possible results, it was felt necessary to undertake research into the methodology of teaching schoolchildren and to apply the results of this research generally in all primary schools throughout the country.

f) The need for better results from supplementary feeding schemes undertaken in connection with the applied nutrition program, for reduced costs, and for improved distribution and utilization of perishable foods such as milk, fish, and cheese, suggested studies on the methodology of these schemes and on the nutritional value and acceptability of new foods like the vegetable mixtures or milk biscuits supplied by the World Food Program, or of locally prepared bread made with milk, fish, and cheese.

g) The need for a firm basis for setting priorities in nutrition education and supplementary feeding programs as part of national economic and social development plans suggested longitudinal studies on malnutrition and mental development, and these are now being carried out by the Colombian Family Welfare Institute in collaboration with Harvard and Cornell Universities.

h) The need to perfect the actual planning of the applied nutrition program and the evaluation of the findings has stimulated the development of research into ways and means of reorienting future programs. Examples are the studies on the organization, functioning, and operating costs of small poultry farms, on the organization and functioning of nutritional rehabilitation services, and on the output, coverage, and cost of nutrition programs carried out in health centers, school canteens, agricultural extension agencies, and nutritional rehabilitation services where the CENDES planning methodology has been put into operation.

Applied or Service Programs

The influence of the applied nutrition program on the development and improvement of various phases of similar programs can be gauged from the following factors:

a) The need to ensure that nutrition education programs start at the primary school level led to the preparation of a special guide for the teaching of nutrition as an essential pointer for primary schoolteachers. The guide has been officially adopted by the Ministry of Education of Colombia and is used as a basis for school food and nutrition activities carried out through the applied nutrition program.

b) The need for promoting the establishment of small-scale livestock projects led to the organization and operation of mills for the preparation of animal feed or food concentrates for sale at low cost to the more needy peasant families, and gave a stimulus to revolving funds for supervised credit using the money earned from the animal feed program.

c) The need to cope with nutritional rehabilitation in the most vulnerable groups of children—those of preschool age—and to educate their mothers, prompted the organization of special nutrition education and rehabilitation services and food education units. This so-called Preschool Protection Program (PPP) has obtained concrete aid from the National Federation of Women's Institutes in the United Kingdom through the British Committee for the Freedom from Hunger Campaign.

d) Perhaps one of the most impressive advances achieved in the face of the need for technically improving and extending supplementary feeding programs has been the recent integration into a single scheme—the National

Program of Nutrition Education and Supplementary Feeding (PRONENCA)—of all those isolated programs carried out with insufficient technical guidance by government and private bodies and voluntary agencies. PRONENCA represents an ambitious 10-year plan of national scope designed to give increasing coverage to the more vulnerable groups in the population—preschool children, pregnant women, nursing mothers, and schoolchildren. The coordination of PRONENCA comes under the National Department of Planning, the Department of Nutrition of the Colombian Family Welfare Institute, and the Institute of Agricultural Marketing (IDEMA), and it distributes equitably throughout the country the food aid coming from abroad, whether multilateral (WFP) or bilateral (AID, CARE, CARITAS), using this aid in the educational programs organized by the applied nutrition program with the participation of departmental or provincial governments through their health, education, and social welfare services. By 1970 the coverage of PRONENCA was 2 million beneficiaries and the distribution of food 40,000 metric tons.

e) Finally, it is worth mentioning that the coordinated action of the applied nutrition program, gradually extended to cover various

areas of operation, has acquired remarkable scope and strength and has been able to enlist the active and direct participation of a growing number of entities and officers, for the most part attached to the Government. To ensure a sound coordination framework for the food and nutrition programs, PINA and PRONENCA have set up coordinating and programming committees and groups at the national, departmental, or divisional level, the latter having basic responsibility for the administration and executive direction of the programs. Moreover, the results of this coordination have induced the national Government and local governments to assign increasing technical resources and funds to the national program. The comparative table shows the resources available for the nutrition program in Colombia in 1963 and 1970.

The result of Colombia's effort over a period of seven years to combat malnutrition is a consolidated operation embracing a vast national nutrition program under the Department of Nutrition of the Colombian Family Welfare Institute. At present the Department comprises a total of 186 professionals, including 36 public health physicians, nutri-

FIGURE 3—Improvement of the nutrition of the preschool-age child is a long-term investment.



TABLE—Growth of the technical resources and finances of the nutrition programs in Colombia between 1963 and 1970 (National Institute of Nutrition of Colombia).

Resources	1963	1970	Percentage increase
<i>Professional staff of the National Institute of Nutrition</i>	22	187	750
a) Medical specialists (public health, nutrition, pediatrics)	3	36	1,100
b) Nutritionist-dietitians	8	120	1,500
c) Other professionals and technicians	11	31	182
<i>Agencies participating in PINA and in research projects</i>	36	165	358
a) International and foreign agencies	5	13	160
b) Colombian agencies	31	152	390
<i>Public service officials working in PINA at departmental level^a</i>	22	286	1,200
a) Public health	7	84	1,100
b) Agriculture	9	104	904
c) Education	6	98	837
<i>Participating public service workers with nutrition training at departmental or local levels^b</i>	850	29,918	3,520
a) Professional	250	4,845	1,938
b) Intermediate	600	25,073	4,179
<i>Budget for the National Institute of Nutrition programs (in Colombian pesos)^c</i>	3,590,000	219,889,668	6,025
a) Levy on the sale of salt	1,795,000	27,600,000	1,438
b) Grants from the Ministries of Health and Education	800,000	17,481,250	2,085
c) Contribution of Departmental Governments to PINA	500,000	14,370,000	2,774
d) UNICEF contributions to PINA	495,000	1,563,720	3,059
e) Multilateral food aid (WFP) ^d	—	150,000,000	—
l) Other grants for nutrition	—	8,874,698	—

^aPersonnel belonging to the PINA programming groups.

^bIt is estimated that some 80 per cent of the personnel trained by PINA are at present working directly under the Program and the rest indirectly. The figures are cumulative.

^cThe official rate of exchange in January 1970 was 17.82 pesos = US\$1.00.

^dNot including bilateral food aid (AID, CARE, CRS/Caritas) or the corresponding Departmental counterparts, since these grants are not absorbed in PINA's operating funds.

tionists or pediatricians, 119 nutritionist-dietitians, and 31 others (veterinarians, agricultural extension experts, economists, chemists, statisticians, nurses, and laboratory technicians).

The applied nutrition program has increased its scope considerably over this period; it now covers 14 departments plus the capital district of Bogotá—approximately 16 million inhabitants or 75 per cent of the population of the country. Both PINA and PRONENCA will be expanded to cover the rest of the country in the near future, and with this in mind the

Institute is developing a training plan for its personnel and has assigned nutritionist-dietitians to the departmental health services in the areas to which the applied nutrition program will be extended first.

National Nutrition Program

On the basis of the foregoing, it seems abundantly clear that the ultimate goal of all applied nutrition programs established in developing countries should be that already achieved by Colombia, namely to convert them

into an ambitious national nutrition program integrated with the national health, education, and agricultural plans. Thus new perspectives open up, and we discern the potential value of the applied nutrition programs as a means of spurring the development of activities that will culminate in successful food and nutrition programs of national coverage. We are likewise prompted to take a more optimistic look at programs that have been developing laboriously and slowly, since not all countries are in the same fortunate position, and in some there are far more stubborn obstacles preventing the programs from speeding up social and economic development. It can hardly be expected, after all, that the serious food and nutrition problems which have been afflicting the Latin American peoples for centuries can be satisfactorily solved in a few decades.

If government circles are adequately informed concerning the effect of nutrition problems on economic and social development, and are urged to give more and more support to nutrition programs so as to consolidate and expand them, nutrition will be given a high priority in national economic and social development plans. This is the key to the success of the program in Colombia.

A nutrition program, national in scope, is the end result of a chain reaction that can begin in conditions that may be technically and economically distinctly unpromising—provided constant support is maintained once it has begun. Nutrition activities should not be developed as isolated programs, but should be fitted into the framework of government plans for health, education, economics, and agriculture. The operation will come into its own when these activities are made an integral and regular part of health, education, and agriculture programs.

In conclusion, it may be well to emphasize, on the basis of Colombia's experience, the necessity and importance of identifying in any given developing country the public health agency showing most interest in and enthusiasm for programs to solve the country's nutrition problems. This agency should be given concrete

and substantial assistance, technical and economic, to enable it to expand and strengthen its technical leadership team and to nurse the awakening interest of the national government in nutrition programs. In this way, countries will be encouraged to allocate more technical resources and more funds for nutrition programs, and in due course they will rank high on the priority list in the government's plans for speeding up economic and social development.

Summary

Colombia has a highly successful food and nutrition program. Its success is due largely to the following factors:

- The applied nutrition program is in the hands of an efficient government body (the Department of Nutrition of the Colombian Family Welfare Institute), headed by professional nutrition and public health specialists, with technical and other assistance from PAHO/WHO and other international organizations.

- Financial help provided by a levy on the sale of salt gave an impetus to this program, which is now largely financed from domestic sources.

- Training of nutritionist-dietitians, and courses in public health nutrition for physicians, have been a feature of the program from the outset.

- The activities of the program involve coordination at the national level of efforts to make the best use of available food resources; to promote and improve the nutritional status of the community, and to keep the decision-making levels of government and all interested agencies informed of the importance and implications of nutrition problems.

- Research is aimed at finding essentially practical solutions to the country's specific nutrition problems.

- The program has built up a nationwide organization which might well be used by other developing countries as an example of how modest, uncoordinated food and nutrition programs can be developed to the point where they command a high priority in national economic and social development plans. □