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PRELIMINARY REPORT ON POTENTIAL RESOURCES
FOR ACTION-ORIENTED RESEARCH PROJECTS IN NUTRITION IN LATIN AMERICA

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PRELIMINARY REPORT ON POTENTIAL RESOURCES
FOR ACTION-ORIENTED RESEARCH PROJECTS IN NUTRITION IN LATIN AMERICA

(Argentina, Chile, Colombia, Costa Rica,
Guatemala, Mexico, Peru, and Venezuela)

15 February to 14 March 1981

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I. INTRODUCTION

The PAHO/WHO technical group that met in Bogota, Colombia, in June 1980 to discuss strategies for promoting and supporting action-oriented research in nutrition in Latin America recommended that a list be compiled of research groups and institutions interested in doing such type of research in the Region.

It was further concluded in this meeting that it would also be useful to have information on such research projects already in progress. It was felt that it was necessary to know about those designed to carry out, through primary health services, actions for improving the food patterns and nutrition of children and of pregnant and nursing mothers.

To be identified as partaking of the action-research approach, it was felt that a project should aim at the diagnosis or assessment of a nutrition problem and the proposal of measures to solve it.

This document compiles the information gathered in eight countries of Latin America: Argentina, Chile, Colombia, Costa Rica, Guatemala, Mexico, Peru, and Venezuela. The information was acquired in interviews with research groups working in the various fields of nutrition in universities and in public and private institutions. In addition, in some countries information was obtained from personnel responsible for the implementation of the nutrition programs of the ministries of health.

The visits were arranged through the PAHO staff in each country in the light of the research done in recent years by some groups in the Latin American countries. To acquire a broad view of the potential for the implementation of action-oriented research projects in each country, a survey was made of the resources on hand in some health ministries, and information was also obtained about applied nutrition programs receiving the most attention.

Chapter II of this report summarizes the results of the visits made by the consultant to the countries, and Chapter III offers some conclusions and recommendations that might be helpful to promote and implement action-oriented research in nutrition projects in Latin America. It is recognized, however, that this preliminary inventory of research resources is only a beginning, and that other groups and institutions will have to be added to this resource, as this important PAHO/WHO collaborative program progresses.

II. VISITS TO THE COUNTRIES

Argentina

Center for Studies in Infant Nutrition (CESNI). This Center is a nonprofit civil association established to promote and conduct nutrition research and programs in relation to the infant population.

It operates in three hospitals where its members are employed. In the Ricardo Gutiérrez Children's Hospital in Buenos Aires, personnel associated with the CESNI run a metabolic unit (six cribs) and a research laboratory endowed with the minimum resources needed for the conduct of balance studies in children with nutritional problems. The nursing staff have been trained in balance techniques.

In the pediatric ward of the Ramón Sardá Maternal and Child Hospital in Buenos Aires, CESNI researchers also have a metabolic unit and a specialized laboratory in which they study various aspects of the nutrition and feeding of neonates born at term and prematurely. This unit is a training center for medical and nursing staff.

Other CESNI's researchers are on the staff of the pediatric ward of the Italian Hospital in Buenos Aires. The Growth and Development Section of this hospital engages in pre- and postnatal growth studies and does research on aberrant growth in children with celiac disease, congenital cardiopathies, and inborn errors of metabolism.

The CESNI's staff consists of a scientific director and two associate directors, who meet every 15 days with research associates (5) and other technical staff involved in research for the purpose of planning research projects and discussing the advance of those in progress.

Within the broad field of interest for research, the CESNI's staff are particularly concerned with studies whose results will generate measures to improve the food patterns and nutrition of the child. They are currently engaged in a study of feeding practices in children under two, and in another, on the bacteriological aspects of preparing baby's bottles in the family. They are also pursuing research in oral hydration and evacuation from the stomach of the electrolytic solutions employed. In addition, they are planning studies of oxygen intake to estimate energy expenditure in children, and in pediatric gastroenterology.

This work is funded by grants to the CESNI from private firms and with the royalties paid by some food manufacturers for the use of four commercial products developed and patented by CESNI's researchers.

The Dr. Noel H. Sbarra Specialized Zonal Hospital. This is a government hospital in La Plata which specializes in the care of children who have been abandoned or are from broken homes and whose mothers are physically or mentally unable to take care of them.

It has accommodations for 150 children under five years, 70 to 80 percent of the space available is utilized. There are 11 physicians, 11 dentists, 4 psychologists, and 4 preschool teachers, in addition to nurses and auxiliary staff to care for the children.

The hospital provides ambulatory care in general pediatrics for children of the city of La Plata.

The children stay for three to six months, either until they are adopted or until the family problem has been solved. Children suffering from malnutrition (about 40%) recover from it and are placed under a psychomotor stimulation program. Clinical monitoring of the children is accompanied by an assessment of their somatic growth and mental development.

While growth and development are the principal fields of research interest, the staff also have in hand a few projects on the acceptance and tolerance of soybean and cereal-based foods. In addition, a research fellow has completed a study of the relationship between hemoglobin levels in the malnourished child and weight gain during its recovery.

Chile

The Institute of Nutrition and Food Technology (INTA). The INTA is run by the Office of the Rector of the University of Chile and through the office of the Vice-Rector for Academic Affairs.

The Institute does teaching and research in nutrition sciences and technology. On the basis of its study of nutrition problems in the country and its search for alternative solutions to these problems, the INTA provides advisory services to the government agencies implementing applied nutrition programs.

On the teaching side, it provides training in different areas of nutrition for researchers and professional, technical, and auxiliary staff.

The Institute maintains a balance between basic and applied research projects. The following are examples of the lines of research on which it has been working in recent years:

- a diagnosis of the nutritional status of the Chilean population;

- an evaluation of the country's nutrition programs;
- the identification and evaluation of the determinants of the nutritional status of the population;
- food technology for the solution of nutrition problems;
- the prevention and treatment of malnutrition, and
- the prevention of iron deficiency.

Today the INTA has in progress 80 research projects on the aforementioned lines. Noteworthy is a longitudinal study of breast-feeding and the determinants of its practice or discontinuance among proletarian families in the city of Santiago.

The results of its research are the basis on which the INTA advises the National Health Services, whose administrative structure is currently under revision. The National Food and Nutrition Council (CONPAN) is the liaison between the INTA and the Ministry of Public Health; this government agency has the function of defining the country's nutrition policy.

Moreover, the INTA maintains active collaboration with the Corporation for Infant Nutrition (CONIN), a private institution that has established 26 nutritional recovery centers with an installed capacity of 1,100 beds.

In regard to teaching, the INTA cooperates with the national manpower training policy at different levels in the areas of nutrition and food technology. It also cooperates in the teaching of nutrition and the basic sciences in different biomedical courses. At the graduate level, it confers the degree of Master of Human Nutrition and of Food and Nutrition Planning. Under an agreement with the United Nations University (UNU) in effect since 1977, the INTA functions as a center of excellence associated with the university for manpower training and research under the World Hunger Program (WHP).

It now has a multidisciplinary team of 102 professionals in the areas of agriculture, chemistry, economics, sociology, dentistry, medicine, and veterinary medicine. They work in the reasonably equipped laboratories of the Institute and in the Metabolic Unit, the rehabilitation centers, and in ongoing field programs.

The National Food and Nutrition Council (CONPAN). This is an agency of the Ministry of Public Health which plans and coordinates the country's food and nutrition programs. It has its own legal personality and network.

CONPAN's function is to propose policy models in food and nutrition for the solution of the current problems in this area in Chile, and its purpose is to design nutritional planning systems with a view to the eradication of malnutrition.

CONPAN promotes and supports food technology studies and regulates, monitors, and evaluates the advertising of food products. It is also promoting a uniform policy in the field of nutrition education, is proposing standards and encouraging instruction, as well as the dissemination of information in these areas.

All these purposes of CONPAN are being accomplished under priorities established for research in nutrition, feeding and food technology, in the light of the country's current problems, manpower resources, and scientific institutions. As required by the problems and allowed by the available resources, CONPAN promotes lines of research and gives economic support to projects which it selects for the solution of existing nutrition problems.

The United States Agency for International Development (AID) granted a loan to CONPAN in the last two years (1979 and 1980), to support its research projects. This year, it is operating solely with government funds, from which it supports 12 research projects: four connected with the National Supplementary Food Program of the Ministry of Public Health; two with the National School Feeding Program; one with the National Preschool Care Program; two in connection with the Programs for the Prevention of Malnutrition and Rehabilitation of Malnourished Children, and three associated with the Social Development Plan and with institutional support projects.

CONPAN has a staff of eight professionals, three of them physicians.

Colombia

The School of Interdisciplinary Studies (FEI), Javeriana University. A recent (1975) addition to the Javeriana University, the FEI has structured a program leading to the master's degree in food and nutrition.

Research is the central axis of the master's program, and is carried on by the students with the help of tutors. Aside from this research, the personnel in charge of the area of health, nutrition, and population engage in nutrition research. At present they have completed two protocols for action-oriented research. One of them is for a study of the determinants of food practices among children in a rural community in order to propose measures for improving those practices which rely solely on the community's resources. The protocol, an extensive and orderly document, offers as the basis for the five general and seven specific

objectives of the project, a series of general concepts which, while doubtlessly sound, make no reference to research by others. Its lengthy (two pages) hypothesis states a series of ideas and concepts in general terms, and does not delimit the variables under study or supply the working definitions that every research project must have; nor does it provide any precise information on the "instruments" for collecting information or the criteria to be used to measure the expected change from before the study to after it.

The other protocol refers to a research project similarly designed but supposed to be carried out in the urban setting of the city of Bogota.

The Colombian Family Welfare Institute (ICBF). The ICBF's programs are conducted through an administrative structure that comprises the divisions of Food Production, Nutrition Education, Applied Nutrition, and Research.

No research project is underway in the Research Division, which has been without a chief for six months. Its staff consists of a pediatrician, a veterinarian, and technical laboratory personnel for conducting biochemical nutrition studies.

Meanwhile, the Applied Nutrition Division has been carrying on research side by side with the instruction it provides for medical students, resident physicians, and nursing staff of the Bogota Children's Hospital. This division has a public health physician, a pediatrician trained in nutrition, and another physician. With this staff the division has been permanently interested in designing and testing methods for evaluating the weight gain and size growth of Colombian children. This interest stems from a concern to find more accurate instruments for diagnosing the nutritional status of children. They have not lost sight of the need that the instruments designed be simple enough to be used as much by the health personnel at work at the first level as by physicians and nutritionists.

Costa Rica

The National Institute of Health Research (INISA). Established in 1973 to investigate the determinants of community health problems in order to propose alternative solutions. This institute also promotes collaborative health studies with other institutions in the country and abroad. Its professional staff is actively involved in the training of research workers in different fields of medicine, and it coordinates its operations with the social action program of the University of Costa Rica and the National Government.

INISA's research programs are multidisciplinary and use the institute's own laboratories and those of different departments of the University, on whose campus it is quartered. A field unit is also maintained at Santiago de Puriscal.

INISA's research today focuses primarily on the identification of the health problems of the Costa Rican children. At the Puriscal field unit a long-term (20-year) project is underway for ongoing research in the biomedical aspects of child growth and development and in the social pathology that influences those processes. A subject of particular interest in this research is the feeding and nutrition of children and pregnant women.

Puriscal municipality has about 24,000 inhabitants and averages 600 births a year. Although the intention has been the longitudinal observation of all children born in the municipality, difficulties of communication prevent close observation in all but three districts.

INISA is financed by the University of Costa Rica and also receives funds from the Ministry of Health and the Social Security System, and from the National Council for Research in Science and Technology.

The Institute has 12 full-time, 6 half-time and 4 seconded researchers.

The National Institute of the Health and Nutrition Sciences (INCIENSA). This is a decentralized governmental institution which engages in welfare activities and in instruction and research in nutrition and other health fields.

It provides care for children suffering from severe malnutrition and referred to it by health promoters working throughout the country. This care is provided in a hospital ward in which children are restored to health. Attached to this ward is an eight-crib metabolic unit in which balance studies are carried on. The nurses responsible for these studies were trained at the Institute of Nutrition of Central America and Panama.

INCIENSA is amply endowed with laboratory facilities in a modern and functional building. It has laboratories for biochemistry, agricultural chemistry, genetics, food technology, and parasitology.

Its research subjects are varied, ranging from the excretion of fats in malnourished children at different stages in their recovery and the early detection of inborn errors of metabolism to the search for insecticides in cattle feeds and the study of different Leishmanias.

The National Children's Hospital. This is a specialized hospital that provides third-level care to Costa Rican children. It is part of the National Health System and functions in a normative role in the area of child health and care.

In view of the changes that have taken place in the vital statistics of recent years and in the pathologies of children admitted to the Hospital, it has been decided to place more emphasis on hematological problems and congenital diseases; "with the disappearance of malnutrition as a public health problem," the feeding and nutrition of the child is not a component of the institution's policy.

The Hospital has 465 beds, which are 70 percent in use, and a staff of 120 physicians and 112 physicians in training.

The Department of Nutrition of the Ministry of Health. The most important of this Department's programs are associated with the supplementary feeding program underway since 1951 in 600 localities in the country. The present coverage of these programs is about 120,000 children under six years of age, who are fed meals in two shifts.

It is estimated that the meals fed to the children under this program supply 70 percent of the recommended daily intake of protein and 50 percent of that energy. The meals are served in "Education and Nutrition Centers," where a motivational program directed at the children is also conducted.

Children under two, and older children unable to come to the centers, are given rations of whole milk powder, or a mix of this milk with rice cereal, and sugar (35 percent, 40 percent and 25 percent, respectively).

In regard to research, the Department has an epidemiologist who periodically analyzes somatic changes in the children as the principal indicator of his ongoing epidemiological surveillance.

Guatemala

The Institute of Nutrition of Central American and Panama (INCAP). In the current agreement on the Institute among the Member Countries of Central America, INCAP is defined as a scientific and technical cooperation agency whose general purpose is to foster and contribute to the development of the nutrition science and its practical application. To accomplish this purpose, INCAP engages in manpower training and development, provides technical cooperation to its Member Countries, and pursues lines of research in nutritional problems prevalent in the region.

Among its research activities, the current agreement posits the need to carry on operations research in the Member Countries for the development and transfer of appropriate nutrition technologies and their application to health programs, particularly at the primary care level.

Thus, the theoretical framework in which INCAP is being reorganized places special emphasis on research geared to immediate action by personnel at the primary health level.

INCAP engages in research over a broad spectrum of nutrition sciences, both for basic and for clinical and community application purposes. This research is funded by grants from international agencies and private foundations, apart from the annual financing provided by the countries of the Central American area and PAHO/WHO.

The INCAP's Human Biology and Nutrition Division has been pursuing research in family diets based on available foods and which may be employed for weaning purposes. In this search for culturally acceptable foods, such as corn, it has been endeavored to keep the calorie content stable, and to change only the protein content. The Division's purpose is to extend its observations to groups of children attending day care centers, for a period of one year.

Aside from this research, the Human Biology and Nutrition Division has been carrying on studies in the metabolic unit to establish amino acid requirements in preschool children, and a series of studies on the immunology of the child suffering from severe malnutrition, in order to improve his immune response. It has plans for studies of milk with prehydrolyzed lactose with a view to its administration to malnourished children who are deficient in lactose. Research is also going forward on physical activity as a growth stimulus.

In addition, the Division has been doing field work in a suburb of Guatemala City, where studies are going forward on the early diagnosis of malnutrition by volunteer promoters drawn from the community itself. The idea is that a model be developed which is reproducible in other areas with similar problems. The activity is in the stage of penetrating the community, and has reached the point where the planning of research projects can now begin. The International Rotary Club has provided a one-year grant to continue the social service work now in progress.

The Division has also completed a study of practices in the feeding of small children. The object of this study was to establish the notions underlying feeding and weaning practices, so that measures could be taken to improve infant nutrition. Information was obtained in interviews of key persons and by gathering information on a questionnaire that was designed amid extensive discussion. Six survey workers gathered the data

in three population groups: one in the high urban socioeconomic stratum, and two in the low socioeconomic stratum--one in a rural and the other in an urban setting. In each stratum, 80 to 85 families were interviewed.

To determine the reproducibility of the data, a group of mothers were repeatedly interviewed by the six survey workers. It was established that the information is not reliable when data are required on, for example, the age at which weaning foods are offered. However, the information is reliable enough as an indication of the patterns of such weaning.

In collaboration with the Ministry of Public Health and Social Welfare of Guatemala, INCAP is closely involved in the so-called Integrated Nutrition and Primary Health Care System in Rural Areas (SINAPS). The purpose of this project is to improve the nutritional and health situation in Guatemala and to extend the coverage of nutrition and health services.

The purposes of SINAPS are to design, implement, and evaluate a community-assisted integrated system of primary health care, nutrition, and family guidance.

SINAPS is currently nearing the completion of a methodology to be employed in the subsequent stages. The present program covers three pilot areas containing 40,000 inhabitants, and it is expected to expand this coverage to 400,000 people. Promoters selected from the communities and who have completed a 60-hour course in health and nutrition subjects are functioning under this program as transmitters of the information they have been fed. The program is funded by the AID.

Mexico

The Nutrition Division of the National Nutrition Institute. The Nutrition Division advises the Secretary of Health and Welfare in the solution of the nutrition problems prevailing in the country. It carries out continuing research in the community diagnosis of diseases of deficiency and excess, and implements pilot studies for action in order to arrive at models that will be applicable to the areas in which the problems are prevalent. The Division also maintains constant epidemiological surveillance through nutritional and dietary surveys, and keeps balance-sheets of food supplies.

In the area of food technology, it is pursuing various lines of work to plan the creation of foods based on mixtures of vegetables or with seafood as new sources of protein for human consumption.

This Division is part of the Mexican Food System, the Mexican Government's most important food program, and as such implements pilot programs for evaluating the benefits of niacin and vitamin A-enriched sugar in a region of the country where deficiencies of these two vitamins are endemic.

Its research is financed under its budget in addition to grants from the National Council for the Sciences and Technology (CONACYT) and foreign foundations.

The National Institute of Child Health Science and Technology (INCYTAS-DIF). This is an institution of the National System for Comprehensive Family Development (DIF), which is concerned with research in science and technology to promote and preserve child health.

Of high priority in this broad field of action is the nutrition work done at the Rural Research Center of INCYTAS-DIF, which researches the determinants of the nutritional status and mental development of rural children. Moreover, with a view to operations research, the Institute has been designing and evaluating nutrition and health indicators that may be used by primary health workers.

The field work of the INCYTAS-DIF is supported by adequately equipped biochemistry, neurophysiology, microbiology, and virology laboratories, and the multidisciplinary nature of the Institute's staff enables it to work in different areas of nutrition.

INCYTAS-DIF is financed by the DIF, and occasionally receives funding from foreign foundations and CONACYT.

The Nutrition and Gastroenterology Department of the Children's Hospital of Mexico. This Department engages in care, research, and teaching. It consists of a hospital ward with 14 cribs, of which four are for studies of metabolic balance, and an adequately equipped laboratory for the biochemical study of nutrition and gastroenterology problems. It is staffed by two physicians, two nutritionists, two biochemists, one biologist, and one bacteriologist, in addition to nursing staff trained in balance research.

Among the lines of research that the Department has pursued in recent years breast-feeding may be mentioned, its prevalence and reasons for weaning; the effect of early weaning on the nutritional status of the nursing infant; early introduction of solid foods and obesity in the second semester of life; alternatives for feeding the nursing child suffering from diarrhea; the effect of television on the preference for foods and candies among school children; the lead content of the evaporated milk available in the market; the sodium and potassium content of the processed milks available for infant feeding, and preparation of milk formulas by mothers and nursing staff.

All this research has been funded with the Hospital's budget for the Department.

The care and teaching functions are performed primarily in the ward, where the Hospital's resident physicians are given training in nutrition and gastroenterology.

Peru

The National Institute of Nutrition. This institution is the Ministry of Health's national, technical, and regulatory center for food and nutrition, and is one of the National Health Institutes which constitute a decentralized public agency of the health sector. The Institute of Nutrition plans, supervises, and evaluates scientific and epidemiological research in the nutrition field, and is responsible for the development of food mixtures formulas that are inexpensive to make and of high biological value. Promoting and protecting the nutritional status of vulnerable human groups is just one of its purposes.

In the research area, there is an agreement with the Federal Republic of Germany under which the latter country is collaborating actively in the study of the legume Lupinus mutabilis and the alga Scenedesmus as protein sources. A team of eight German professionals is at work in the Food Chemistry Laboratory, which has been reasonably equipped with assistance from the Federal Republic of Germany, and accounts for almost all of the Institute's research output.

The data obtained from a nutritional survey of 2,000 families done between 1975 and 1976 are still being tabulated and analyzed.

The Anglo-American Clinic. A private hospital at which for just over 15 years facilities have been provided for the conduct of research in clinical nutrition. For this purpose, it has a small ward with metabolic cribs, and a laboratory annex fitted with equipment for balance research.

The research done in this unit is confined to the clinical study of malnutrition in children exclusively.

The Andean Technological Development Project (PADT). The countries of the Andean Subregion (Bolivia, Colombia, Ecuador, and Venezuela) have combined their efforts for the implementation of the Andean Technological Development Projects (PADT) in the food area for the purpose of placing on the market relatively inexpensive foods of high nutritional value.

The Food PADT is designed as a combination of actions in which Andean technicians and specialists join to develop technology applicable to foods of agricultural and marine origin.

Research projects are currently underway in the following areas:

- the development of intermediate foods from raw materials available in the Region (five projects);
- the experimental production and presentation on the market of new low-cost foods;
- the technology, production and marketing of baby foods, and
- a study of opportunities for technological innovation.

All this research is financed with funds provided by the countries of the Andean Group and international institutions and agencies.

Venezuela

The National Institute of Nutrition. This is an agency of the Ministry of Public Health and Social Welfare and is responsible for the design and implementation of research, training, and service programs.

Its service programs are implemented throughout the country by nine regional units, each consisting of a medical specialist in public health, a nutritionist, and administrative staff. Each unit supervises and evaluates the work of the nutrition units operating in all the states. A nutrition unit consists of one nutritionist and two auxiliaries.

The Institute's service function is performed through 10 supplementary food programs for children, pregnant women, wetnurses, students, and low-income persons and families. It also runs a 30-bed Clinical Nutrition Center for the recovery of children between six months and six years of age suffering from malnutrition. The Center also provides medical advice on nutrition problems in children and adults.

The Institute's research has been directed at the development of food formulas based on dehydrated milk fortified with cereals or by mixtures of wheat, soybean, and corn, to develop flours for making crackers and "arepas". After these foods have been tested, they are produced by private firms which supply them to the Institute for distribution in its supplementary feeding programs.

Research is at present focused on planning a nationwide nutrition survey. This survey is to obtain information from 4,000 to 5,000 families on their socioeconomic status, food consumption, feeding practices of nursing children, and the somatometry of the children. In addition, blood samples are to be taken to estimate vitamin A, hemoglobin, and iodine levels. The survey is scheduled to be carried out before June 1981.

Moreover, the Institute is in the opening stage of implementation of an epidemiological surveillance project with the technical cooperation of PAHO.

On the teaching side, training courses are conducted for the food-handling staff of the Institute's programs.

The Coordinating Committee for Food Research. Set up in 1979 as a nonprofit civil association, this Committee is made up of 13 representatives of government, universities, and private institutions providing instruction and doing research in the various fields of nutrition.

The Committee's purposes are: a) to guide research in food and nutrition technology in accordance with national policy; b) to analyze the country's nutrition problems, in order to propose lines of research that can be pursued in coordination by the research groups represented on the Committee, and c) to advise the ministries having responsibilities in food production and marketing.

In the first stage of its work, it is seeking to coordinate research projects on milk substitutes, composite flours, the use of soybean as human food, and iron uptake. The Committee believes that the various groups doing research in these subjects should designate representatives to constitute a technical advisory board for each project, to review the findings and present the final conclusions to the Committee.

The Nutrition Research Unit. This unit, established under the auspices of the National Council for Research in Science and Technology (CONICYT), is part of the academic program for the degree of master of food and nutrition planning conducted by the Central University of Venezuela. The unit participates in the teaching work and serves as an advisory body to the National Institute of Nutrition in different aspects of food and nutrition.

The unit is staffed by a PAHO nutrition adviser and two students in the master's course; they are all actively involved in the planning of the national nutrition survey and in the search for indicators that can be used by the National Institute of Nutrition in the epidemiological surveillance of the nutritional status of the Venezuelan population.

III. CONCLUSIONS AND RECOMMENDATIONS

The concept of action-oriented research in the nutrition field and of its incorporation into primary health care services through effective community participation has not yet been developed in most of the countries visited. Several of the groups interviewed were interested, and would participate in collaborative studies, focusing at first on the feeding of children under three, to determine the usual practices and identify which aspects help or hinder the correct use of the foods eaten by the family and which are usually available in the community itself.

Nutrition research and studies usually seek solutions to the most prevalent problems, such as protein-energy malnutrition in infants, nutritional anemias, endemic goiter, vitamin A deficiency, etc. However, little of this work is undertaken with a clear recognition of the need to apply its results through immediate actions, and much less is any research done to generate concurrent community action for the solution of problems identified locally.

An exception to this could be research dealing with the identification and design of high nutrition vegetable mixes for the immediate purpose of improving the nutritional status of children, and the fortification of staple foods to supply specific nutrients to correct specific deficiencies.

It is important to mention that all the groups interviewed are developing or have already developed food mixes of high nutritional value comparable to those of more expensive foods. These mixes will not, however, become part of the popular diet on their merits alone; studies are also needed to find ways of persuading the community to accept them, and there has been strikingly little concern to undertake such studies.

Research on breast-feeding and weaning practices done and in progress in some countries have disclosed a number of problems, and the information obtained is beginning to generate action programs for their solution. Studies to interpret the causes and dynamics of these problems will have to be made with the active participation of the population and of research teams combining the biological, economic, and social disciplines.

Important in the nutritional area of public health are supplementary food programs for children, pregnant women, and wetnurses. Expensive as these programs are, the evaluation of their nutritional benefits to target populations leaves much to be desired, being usually confined to determine the total quantities of food delivered and the numbers of persons receiving them. In few countries are operations subject to cost-benefit analysis so that the return on the programs may

be assessed. Among those in charge of directing and implementing nutrition programs in the health ministries the view is frequently found to prevail that the everyday workload of action and services programs, makes such research almost impossible. This view partly explains why evaluations of supplementary feeding programs and other operational studies have no important place in applied action programs.

On the other hand, in almost all the countries there is an awareness that research teams and those in charge of action programs in health ministries are divided by wide conceptual disagreements on strategies for solving different food and nutrition problems. This chasm must be bridged, and to do so offers a challenge to action-research programs, which afford more communication and cross-fertilization between sectors that share an interest in promoting solutions to nutritional problems.

Thus, work to promote action-research programs in nutrition should focus first on improving communication between multidisciplinary teams --of biologists with social scientists and economists, for example-- engaged in research and those responsible for planning and implementing action programs. The more the identification of priority problems and of action programs likely to solve them, is facilitated by communication of the results of research, the more fully the action-research concept will be realized.

Since every program imposes the need for evaluation, on the basis of which the program is revised or others implemented, the personnel executing applied nutrition programs should be aware that evaluation is a form of action-research which in the short run can generate administrative and technical changes that will afford a more effective use of resources.

Finally, it should be noted that every country visited has the infrastructure required for the conduct of food and nutrition research projects, particularly INCAP, INISA, INTA, and INCITAS, which are better equipped not only for research, but for technical and professional personnel training as well. As this preliminary inventory grows, as yet little-known potential resources for action-research are bound to come into notice.

IV. PERSONS INTERVIEWED

1. Argentina

CESNI:

- Dr. Alejandro O'Donell
- Dr. Enrique O. Abeyá Gilardan

R. Gutiérrez Children's Hospital:

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REPORT OF THE PAHO/WHO TECHNICAL GROUP MEETING ON
ACTION-ORIENTED RESEARCH IN NUTRITION
THROUGH PRIMARY HEALTH SERVICES

BOGOTA, COLOMBIA

16-20 JUNE 1980

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1. INTRODUCTION

Protein-energy malnutrition in young children is undoubtedly the most serious nutrition problem in the developing countries because of its magnitude, characteristics, and economic and social consequences. The Investigation on Mortality in Childhood coordinated by the Pan American Health Organization in the Region of the Americas revealed that malnutrition or immaturity are the basic or associated causes of 57% of all deaths of children below age five. Moreover, it has been found that young children surviving advanced malnutrition have a low intellectual and physical performance, resulting not only from inadequate food intake but also from the lack of the psychosocial and affective stimuli that assure mental development in a child.

Contrary to what was expected as a result of economic progress in certain countries, the problem of malnutrition among children is increasing. This has been corroborated in five countries of the Central American area. This increase extends both to the number of individuals affected and to the number of population groups at risk of malnutrition.

The significant growth of knowledge in the food and nutrition areas in the last 30 years has not been matched by a parallel increase in the application of that knowledge within the community. There are several reasons for this. One of the major obstacles has been the persistent use of conventional methods for delivering services and the extremely low coverage of health and nutrition services in some countries. The groups at highest risk have almost invariably been those receiving the lowest coverage. The situation is recognized by the governments and has led them to develop and expand their primary health services as a strategy for expanding the coverage of health services. It has also been observed that efforts to improve feeding practices are based on principles which are not always attuned to local conditions, and that nutrition recommendations addressed to the various members of the families cannot be followed by them because they are unrealistically at variance with prevailing conditions.

It is therefore urgent, indeed imperative, to develop types of technology tailored to local conditions that can be used by the health services, particularly at the primary care level, in solving nutrition problems. This requires new approaches, which ideally should be based on community participation and a more effective use of existing resources. Active community involvement is especially important in nutritional work, for it is the local population that takes the final decisions and actions to improve food practices. This is something that cannot be done for the people.

In regard to utilization of local resources, recent advances in food practices could be achieved in most places where malnutrition is widespread by using the locally available food. Present knowledge in the field of nutrition makes it possible to devise a nutritionally adequate diet based on the foods available under a wide variety of ecological conditions and

affordable by the various populations groups. This has been proven by means of controlled epidemiological and clinical studies. What now remains to be done is to determine in a systematic way, under the conditions prevailing in a particular community, whether this is applicable to the different age groups, especially to young children, and to endeavor to identify and remove the possible constraints to the achievement of this purpose.

In addition, few studies have been made for the purpose of designing new approaches and types of food and nutrition intervention that might yield better results in terms of significantly reducing the problem in low-income communities.

This points up the urgent need to carry out operations research studies in the countries of this Region in which required knowledge is put to immediate use in health care and service schemes in order to evaluate their efficiency and effectiveness for improving the existing situation, especially in regard to the diet and nutrition of pregnant women and young children.

II. BACKGROUND

The World Health Organization together with its Member Governments has proposed to the world an ambitious goal which calls for health for all by the year 2000. The nutrition community, with the support and coordinating leadership of WHO, has taken new strides in trying to develop effective preventive actions against malnutrition throughout the world, including a better definition of the role of the health sector in nutrition and hence, in contributing towards a healthy and productive life for all people in developing nations. An important document explaining this position and particularly the expected contribution of scientific research to this endeavor, is the report of the Program Advisory Group for the Action-Oriented Research and Development Program in Nutrition which met in Geneva from 30 October to 1st November 1979.

This document states that within WHO and with the aid of external funding, a special research program will be established that focuses upon nutrition, and is responsive to the true needs observed at community level with the objective "to accelerate the development of more effective actions to ameliorate and control malnutrition in developing countries." The same document contains general directions on how to achieve this objective and clearly states that initial emphasis of the research program should be on "self-reliance in child feeding" and, consequently, to the development of the institutional resources and capabilities to conduct such research.

PAHO's involvement in this program was presented to the PAHO/ACMR meeting in San Jose, Costa Rica, in May 1980 under the heading of Action-Oriented Research in Nutrition through Primary Health Services. The main objective as stated in this presentation was the implementation of a program of action-research in nutrition directed toward the identification and facilitation of practical actions which could be carried out at the level of the community and within the prevailing economic and social limitations. The necessity to disseminate knowledge about nutrition which could be used by workers at all levels in health and in other related disciplines. The ACMR accepted the report and recommended its implementation on a Regional basis, and stated that means should be found to implement this program along these lines, taking into consideration the conclusions and recommendations of a PAHO/WHO Technical Group Meeting which was to meet in Bogota, Colombia on 16 to 20 June 1980, precisely to discuss this subject.

III. OBJECTIVES OF THE MEETING

The objectives of the meeting were set out in concert with the first priority for research stated by the WHO Program Advisory Group and were as follows:

1. Identify research activities required to improve the knowledge of the factors which determine child feeding practices.
2. Identify research needed to determine those activities required to improve child feeding.
3. Propose research activities to assist in identifying the food and nutrition components within a primary health care package.
4. Identify research areas dealing with the operational mechanisms for the implementation of food and nutrition activities within primary health care.
5. Propose research activities and new approaches to insure the application by the community of better feeding practices particularly in young children, pregnant, and lactating women.

IV. PROGRAM PRINCIPLES

It is important to reiterate that in fulfilling the objectives of this program, problem-oriented research defines best the research activities which are to be undertaken, independent of whether the investigations require basic, applied or operational research.

Furthermore, because of the vulnerability of the young child and of the effects of inadequate feeding practices in its growth and development, the group focused its attention on research areas which could assist the primary health worker to improve young child feeding.

The above objectives were arrived at in order to enhance the research activities to be undertaken, having very clearly in mind that the nutritional status of an individual and of populations is a result of the interaction of multiple factors many of which are not only beyond the scope of nutrition, but also beyond the scope of health. The technical group purposely limited its discussions to the consideration of factors which affect feeding practices and to the identification of research activities directed toward assisting the primary health worker to improve those practices leading to self-reliance in child feeding by the communities themselves.

Although the group discussions were directed mainly towards the above objectives, it was recognized that the food intake during pregnancy and lactation determines--within limits--the health of the newborn and its future growth and development. It also may be an important factor influencing age of weaning. To a certain extent then, the same research activities related to the feeding of young children can be applied, with pertinent modifications to the mother, because mother and child constitute a dyad during the first year of the child's life.

Other general guidelines for the research to be undertaken within this program were accepted by the groups, these being:

1. That the research proposed should have both a capacitating participation and an interpretative outcome to a rapid application of results;
2. An evaluation component should be inbred into any action resulting from these investigations in order to have feed back from the field experience to guide research in the gaps of knowledge detected in the application of appropriate technology derived from the research program;
3. It was recognized that a vast knowledge was available in many aspects of child feeding but that also many important gaps were easily detected which hamper the application of such knowledge. As a result, a very dynamic multidisciplinary research program based on and responsive to the needs and resources at the communitiy level should emerge;
4. The program should aim to develop generalizations and principles that may be used to diagnose situations and to predict the most desirable and viable actions appropriate to particular ecologic and socioeconomic settings, and

5. The program should emphasize the identification, promotion, and support of local research groups including, besides financial help, technical assistance and cooperation throughout the research, starting with the experimental design and, if necessary, extending up to the conclusion and analysis of each study.

V. BASIC RESEARCH QUESTIONS

In general, the meeting centered its discussions on the basic questions of:

1. What causes good and poor nutrition in children within a specific setting?
2. How do the feeding practices, whether adequate or inadequate, relate to (1)?
3. What determines such practices?, and
4. How could these practices be improved within different social, cultural, economical, ecological, and biological environments?

The end result of these lines of research would be improved knowledge in the multicausal factors which affect feeding practices, food intake and adequacy, including social, technological, and biological components in a unity of action-oriented research.

Based on this improved knowledge, research efforts are to be devoted to the search for sensitive and precise indicators able to identify and ideally rank the factors which affect feeding practices in young children and which appear related to the nutritional status of communities, families, and individuals. The final aim of this line of research, which could proceed together with the research outlined in the previous paragraph, will be the identification of predictive tools applicable by the primary health worker in nutritional surveillance systems. These indicators should allow the health system to predict the risk of undernutrition and to identify areas of corrective action.

Another broad area of research centered upon the need to gain extensive knowledge of the participatory capacity of the primary health worker and other communal organizations in the application of nutrition concepts and technology for the diagnosis, surveillance, prevention, and correction of malnutrition. This broad area considered not only the educational and specific technical material in nutrition to be given to these health workers, but also the constraints in their applicability within different communal settings. The health sector was always considered within the context of a developmental team within each community's circumstances.

Another broad area of research discussed by the group was related to the factors which could favor or impede the receptivity of the population and or organized groups to nutrition messages and actions proposed and prompted by the health sector. This line of research would include, therefore, the characteristics of the interactions of the health sector within development teams and with the community.

The group indicated that the research program should always be open to new approaches in the area of education, social, and economic change and organizations, appropriate technology in food sciences, food conservation and preparations which would favor feeding practices for the young child.

Finally, the group was also very much concerned about the necessity, through these research efforts and other health actions, of promoting local groups capable of contributing to the objectives of this program and of defining the means to which organizations within the communities could become more effective in motivating the population to become active members in their efforts to eat better and be healthier.

VI. IDENTIFICATION OF RESEARCH AREAS

The participants at the meeting were constituted in a general assembly and in three different working groups (Appendix 1). The discussions followed the proposed agenda (Appendix 2), in the understanding that the design of specific research proposals will be part of the follow-up action of this meeting.

A preliminar catalogue of research areas was identified by the groups and it is outlined in the following paragraphs.

1. Research on factors which determine child feeding practices

To define some of the basic factors affecting weaning and feeding practices in children under three years, it is fundamental to design sensible indicators which can be used by primary health workers at the community level.

The search for the indicators has to be made by means of rapid cross-sectional surveys in comparatively large numbers of communities to assess the influence of different ethnic, sociocultural, and environmental conditions. It is possible that some of those identified factors will require more profound investigations at a later stage.

It is also necessary to design family and community "at risk" indicators of inadequate feeding, which can be incorporated into a food and nutrition surveillance system.

Specifically the group identified several areas where investigation is needed:

1.1 Existing feeding practices:

- a) Duration of unsupplemented breastfeeding and age when weaning is completed;
- b) Age at which weaning foods are introduced;
- c) Type of foods and cooking practices used during the weaning period;
- d) Pattern of introducing different weaning foods;
- e) Intrafamilial food distribution.

1.2 Prevalent weaning practices:

- a) Optimum duration of unsupplemented breastfeeding in different ecological environments, considering psychoemotional factors and the nutritional and immunological properties of human milk;
- b) Reasons why different weaning foods are introduced at certain ages and the logic behind its reasoning, and
- c) Identification of the most important factors, determining changes in feeding practices and their trends.

1.3 Foods used during the weaning period:

- a) Are the weaning foods traditionally used by the community adequate to the child's physiological needs?
- b) Are the "new" weaning foods adequate to the child's physiological needs?
- c) How and where does the family obtain these foods and which are the resources to buy them?
- d) Are the foods considered adequate, available in the community,
 - i. for reasons of seasonal variability?
 - ii. because of marketing and distribution constraints?
- e) If the foods are available, which are the factors that determine their acquisition and use?
 - i. It may depend upon the family's acquisitive patterns;
 - ii. It may depend upon cultural factors:

- Why certain foods are considered socially unacceptable?
 - Which are the origins of the taboos related to certain foods?
 - Why certain taboos persist when the reason for them no longer exists?
 - What elements ritualize certain actions carried out during child feeding?
- iii. It may also depend on the advertising carried out by the food industry;
- iv. On practical reasons related to the food processing technology, such as:
- difficulties in cooking (or otherwise processing) certain foods at home;
 - lack of storage facilities;
 - foods which deteriorate easily.
- f) in which form are the foods given to the child?
- i. Is the method of preparation the most adequate to obtain the highest benefit from the nutrient content?
 - ii. Are the amounts given adequate to the physiological characteristics of the child during the weaning period? Are they given with the necessary frequency?
 - iii. Which foods are given and which ones should be recommended in special circumstances (i.e. during and after episodes of gastroenteritis)?
- g) Which are the factors that determine the food distribution pattern within the family?
- i. Cultural considerations (i.e. more attention given to children of one sex; the use of food as a form of reward or punishment; priority to the first or last born, etc.)
 - ii. Economic considerations (i.e. larger amount of "better" foods for the bread-winner).

2. Research needed to determine activities required to improve child feeding

2.1 Investigations to identify the common characteristics of families "at risk" of malnourished children, in order to take the necessary preventive measures.

2.2 Research of changing feeding practices:

- a) Comparison between different techniques that can be utilized to produce changes in the feeding practices and its content, including research into the different methods to apply those techniques;
- b) Methods to increase the status of certain common foods of adequate and even higher nutritional value;
- c) Use of marketing techniques, including mass media communication and advertising techniques similar to those used by commercial firms;
- d) Research into the techniques to prepare messages;
- e) Effect of different messages on feeding practices;
- f) Methods to maintain the interest of the community, once change has been achieved;
- g) Investigations on the contrast between the felt needs of the community and their motivating factors, and the result of the programs directed to behavior modification.

2.3 Research of methods to improve the availability and utilization of foods

- a) Supplementary feeding programs: are they effective? Do they compete with existing practices which should be maintained? Do they create undesirable demand for uncommon foods?
- b) Methods to facilitate food production at home level;
- c) Develop diets more appropriate to the nutritional needs, based on locally available products;
- d) Effect of national food and nutrition policies on feeding practices, such as policies regarding food exports and imports, subsidies, salaries, etc.;

- e) Appropriate technologies for food preservation applicable at household level;
- f) New technologies to facilitate processing of certain foods commonly given to young children, including cooking technology;
- g) Technologies to improve food hygiene;
- h) Development of appropriate techniques of chemical and microbiological tolerance in food preservation;
- i) New food processing techniques, at household and community level, to improve the child's biological utilization of the food.

3. Research activities to define the food and nutrition component of a primary health care package

The group identified activities which are carried out in most primary health care services and activities which should be carried out.

Research activities the group suggested to include in primary health services are:

- 3.1 Monitoring the food intake. It is necessary to develop a simple methodology of assessing food intake which permits the primary health worker to carry out a preliminary screening into three main groups:
 - i. intake considerable above, the recommended allowances (over 120%);
 - ii. those whose intake is more or less adequate (between 80% and 120%), and
 - iii. intake markedly below the recommendations (less than 80%).
- 3.2 Education to improve food intake, both in quality and quantity.
- 3.3 Education on the technology of food preparation (processing at household and community level, taking into consideration quantity, quality, and hygiene, and the promotion of local volunteers in child feeding.
- 3.4 Integration of the primary health worker into other development teams whose program has a social component, geared towards solving the nutritional problems.

To achieve this integration, it is necessary to carry out research to identify coordinating mechanisms of various disciplines at local level.

- 3.5 Early diagnosis of malnutrition and surveillance.
- 3.6 Appropriate management of malnutrition within the health sector, particularly with reference to adequate feeding.
4. Research areas dealing with the implementation of food and nutrition activities within primary health care
 - 4.1 Training and capacitation of primary health workers (PHW)
 - a) Analysis of existing problems in the light of the "trainability" and time available to the PHW for carrying out its duties;
 - b) Specification of changes expected in the community. This will permit to define the kind of training of the PHW;
 - c) Identification of elements which determine motivation, frustration, and apathy of the PHW;
 - d) Develop mechanisms to allow the PHW to make decisions, taking into consideration the norms established and available facilities;
 - e) Assessment of standards in the different relevant sectors related to nutrition and the consistency of messages the PHW transmits to the families;
 - f) Assessment of human resources available to carry out specific activities at the primary health care level, with emphasis in investigating the possibility of utilizing different types of personnel (volunteers, salaried workers, etc.);
 - g) Comparison on the content, and of the training and the techniques used in the training of the PHW, in relation to the activities to be carried out;
 - h) Define the action tools to facilitate the activities of the PHW in relation to the existing situation.
 - 4.2 Content, format, and transmission of the educational messages
 - a) Research on the type of messages (simple and direct) which are expected to produce behavioral changes, so as to obtain the desired effect;

- b) Communication methods that can be utilized by the PHW to transmit the messages;
 - c) Evaluation of the impact of the messages upon the feeding practices.
- 4.3 Identification of simple parameters to assess the nutritional status and food intake of the children. Its use will direct the activities of the PHW in nutritional surveillance.
- 4.4 Identify simple community indicators to diagnose the basic factors causing deterioration of the child's nutritional status, particularly considering intrafamilial dynamics, social factors, and those related to morbidity and mortality.
- 4.5 Possible mechanisms of data gathering and interpretation of practical use in problem solving.
5. Research activities and new approaches to insure the application by the community of better feeding practices
- 5.1 Research into new technologies to be used at community level for the processing of foods used in feeding children under three years.
- 5.2 Factors which limit centralization of food processing. Such centralization would result in decreasing processing costs and food wastage.
- 5.3 Social systems of communication and transmission of information which determine food habits.
- 5.4 Community habits of food consumption.
- 5.5 Methodologies to create awareness of the problems and the desire to change.
- 5.6 Investigation on the contrast between the felt needs of the community and its determining factors, and the result of programs direct to modify feeding habits.
6. Research related to the nutritional status and feeding practices of pregnant women

Although the discussions were directed towards problems related to young child feeding, it was recognized that food intake during pregnancy and lactation determines, within limits, the health of the newborn. It also may be an important factor influencing age of weaning.

To certain extent, the same research activities related to young child feeding can be applied, with certain modifications, since mother and child constitute a dyad during the first year of the child's life.

Specific areas for research are:

- 6.1 How deficient is the food intake during pregnancy.
- 6.2 Feeding practices during pregnancy and factors affecting those practices.
- 6.3 Impact of improved food intake during pregnancy on the nutritional status of children under six months.
- 6.4 Impact of improved food intake on breast milk production.
- 6.5 Relationship between food intake and some obstetric conditions:
 - i. infections during pregnancy;
 - ii. prematurity;
 - iii. toxaemia;
 - iv. others, such as concentration of CO in blood, etc.
- 6.6 Relative importance of food intake and other factors such as age, frequency of pregnancies, sexual practices, etc.

VII. PROPOSED ACTION AT REGIONAL LEVEL

In order to comply with the recommendations of the PAHO/ACMR which indicated that the means should be found to implement a Regional research program in nutrition along the lines presented by WHO, the following actions seem pertinent:

1. Carry out an inventory of resources and programs
 - 1.1 Human resources in:
 - a) Nutrition and health research scientists interested in community work and in interacting with social scientists and educators;
 - b) Social research scientists interested in nutrition research and in interacting with educators, and nutrition and health scientists;

- c) Educators and community development persons interested in actively participating in research and in interacting with the two above mentioned group.

1.2 Primary health care program

This inventory would be primarily directed towards identifying on-going or future programs where evaluation of the program and the training of personnel at the primary and intermediate levels are seriously implemented.

1.3 Community development and social organization groups

The inventory should look for groups which are solidly conceived, in operation, and with adequate control and evaluation to insure the quality of the data.

2. Promote interaction among scientists

Detected in the previous inventory and centered around the preparation of research proposals along the lines suggested by PAHO/WHO for the Action-Oriented Research Program in Nutrition.

3. Offer training opportunities for field personnel

This can be achieved by technical cooperation among countries. The basis for training can, for example, stem from research project outputs such as the presently in progress at INCAP on infant feeding practices. This project was conceived and implemented with the advice and active participation of sociologists, nutritional anthropologists, and nutrition scientists. The final report should include a complete section on standard operational procedures for this type of research.

4. Set up a project review board

Its role would be not only the review of research applications but also that of providing help to possible grantees, so to develop proposals into projects of relevance and of solid scientific quality. They hope this body will also serve as advisor in institutional strengthening and as orientator in the search for the necessary funds. Active cooperation with WHO in this regard is expected.

VIII. STRATEGIES FOR PROGRAM IMPLEMENTATION

1. The most expeditious means of beginning the Action-Oriented Research Program in Nutrition in the American Region is by the promotion of research opportunities within the objectives of this program at different academic centers and research groups who have proved know-how in the field of

research and ideally in nutrition. New groups identified as able and interested in research along the guidelines of this program should be fostered.

2. Recommendations should be given so that multidisciplinary teams are established with the idea of promoting new community-centered groups which will participate actively in the research.

3. In the meantime, the Project Review Board should be named.

4. An inventory of human resources, programs, and groups, as indicated in the previous section should be started.

5. Funds should be obtained to open training opportunities in field research of the type required by this program.

6. Training centers should be identified through the inventory previously referred to.

7. Continued financial support should be available to strengthen and consolidate such training programs.

8. In the promotion of this program, emphasis should be given to the revolutionary concept here proposed, which is: to make the community the central structure in the health system (primary health care and nutrition included) and in their own development plans.

9. It must be realized that in order to implement this concept a new set of information is required upon which the formulation of the program must be based.

10. Moreover, communal participation and very active interaction with central technical personnel must be contemplated since the earliest phase of the investigations up to the evaluation process, keeping in mind that this involvement must lead to the capacitation of all the participants.

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APPENDIX 2

AGENDA

- A. Review of research needs and opportunities for action in nutrition
1. Analysis of community and intrafamilial factors determining infant feeding practices before, during, and after the weaning period.
 2. Study of family feeding practices to identify positive and negative factors influencing the adequacy of energy-protein intake of the child during health and disease.
 3. Satisfaction of nutritional requirement of the young child in usual conditions of life at the community level, such as food availability, purchasing power, beliefs, and mores, etc.
 4. Role of primary health workers as elements of education and transference of appropriate practices related to mother and child feeding.
- B. Proposals for action-oriented research in nutrition through primary health services
1. Design of effective and feasible actions to improve the nutritional status of the community, taking into consideration social and economic restrictions usually present in rural and peri-urban settings.
 2. Identification of nutrition activities to be incorporated as integral components of primary health services as well as into other community development programs.
 3. Recognition of factors determining variations on the nutritional status of mothers and children living in similar restricted environmental conditions and feeding practices, so elements associated with better nutrition can be promoted.
 4. Development of simple procedures for the identification of at-risk subjects, follow up the programs and establish nutritional surveillance systems at community level.
 5. Formulation of appropriate strategies to assure community participation in the implementation of nutrition education programs aimed particularly to the improvement of nutrition of mothers and young children.

C. Identification of national resources for the formulation of a Regional Action-Oriented Research Program in Nutrition through primary health services

1. Inventory of available resources in the Region for this program (governmental health institutions and nutrition services), research institutions, private research groups, universities, etc.
2. Recommendations on the coordinating mechanisms at national and international level (institutional and human resources) to develop this program.
3. Formulation of a Regional proposal to implement the Action-Oriented Nutrition Research Program.