PRESENT STATUS OF NUTRITIONAL RESEARCH IN MEXICO

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PRESENT STATUS OF NUTRITIONAL RESEARCH IN MEXICO

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Mexico
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SUMMARY

Mexico has been experiencing a major social change, particularly in its rural-urban balance and its production patterns. A very rapid transition from subsistence to commercial agriculture has entailed a crisis of basic products and substantial changes in consumption patterns. The Government has responded by establishing the Mexican Food System (SAM) to promote self-sufficiency in food and improved food distribution throughout the society.

The information needed for programming the SAM has been supplied particularly through three applied research programs: one in food technology for social welfare, another in nutritional epidemiology, and a third for the experimental development of problem-solving methods.

These investigations, joined to other less direct practical research, constitute an infrastructure of knowledge that is fairly advanced for an underdeveloped country, but still insufficient for one that wants to solve its nutritional problem. Hence, specific research must be planned for the long term in the light of resources and needs, and in the short run technological development should be sought for the application of detection-care packages in nutrition and primary health.
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1. THE IMPORTANCE OF THE PROBLEM

The Mexican's traditional diet, based on corn and complemented with a few beans and other foods, has been associated throughout its history not only with a high incidence of malnutrition and high morbidity and mortality from infectious diseases, but also with certain physical, mental and social deficiencies in most of them (1,2).

This situation has been shifting in recent times. Various surveys conducted by the National Institute of Nutrition over the last 23 years have borne witness to major changes in food habits, to such extent that they can be said to have changed in that short span more than in the previous 430 years, where there has been any information at all on them (3, 4, 5).

The latest National Food Survey, conducted in 1979-80 with the interviewing of 21,640 families and 231 rural communities and urban "barrios," brought out significant differences from prior studies (6,7,8). In some sectors there were improvements, but in others serious problems presented. In general, the salient findings were as follows:

1. The average diet of the urban and rural lower classes has improved, mainly because it no longer depends so much on one single food --corn-- the consumption of which has declined, as has that of beans, while more fats, eggs and milk, wheat, and fruits and vegetables are being eaten (see charts 1 and 2).

2. However, analysis of the information by regions and income levels has shown here more than on any previous occasion how misleading averages can be. Only a few groups have been able to change and diversify their diets, while others lack staple grains without, of course, being able to afford substitute foods. What has actually happened is that a gap has opened up even among the poor: many, perhaps close to half of them, have
been able to change and enter upon a process of betterment, but most have been unable to do this, and are hence worse off than before.

In consequence, the frequency of infant malnutrition has distinctly declined in an important part of the lower classes and even among those in rural areas who earn the minimum wage or more, while among the underemployed, who earn less than this minimum, malnutrition remains as prevalent as reported in earlier studies.

The cause of this new situation is manifold. On the one hand, since 1968 a most peculiar food crisis has emerged (9,10) characterized by 1) stagnating corn and bean production in that, whereas during the sixties up to 3 million tons of these crops were exported yearly, today more than 10 million tons are imported; the crisis strikes most severely at dwellers in poor dryland farming areas, and intensifies their flight to urban areas; 2) a sharper shift in the pattern of the national demand for farm products. The growing of crops for export, industrial processing, and luxury consumption in the large cities is now being encouraged, what has prompted a change in agriculture from the traditional subsistence basis to cash crops. And 3) an authentic communications explosion initially fueled by the transistor radio and government manpower and road programs, and more recently by television, which now covers two-thirds of the country (9, 10).

If to the foregoing is added a host of other factors that have also emerged simultaneously, such as inflation, the sudden upsurge of several industries like petroleum, which has increased wages, feed manufacture, which claims one third of the grain crops, and the production of junk foods like "pastelillos," fritters and soft drinks, we can begin to arrive at an explanation for the great change in progress, whose consequences for health cannot yet be glimpsed.

On the one hand, there can be no question about the desirability of moving beyond the meager, monotonous corn-based diet that had so thoroughly shaped the Mexican into a limited stereotype in his growth, psychological development and behavior. On the other hand, the direction of the change --prompted by solely commercial interests toward the
consumption of foods based on sugar and refined flours, which are only apparently better because they are easier to cook, eat and digest—raises many questions about the long-term consequences.

Besides, for the present, all these dietetic changes pose an even more urgent problem, that of the population that has been unable to make the change because it exists outside the monetary economy and, therefore, is unable to purchase what the new economy offers, while unfortunately, suffering from the crisis in the supply of, versus the demand for, traditional foods, which has reduced the population to truly distressing straits in several regions.

The Government, and particularly the President himself, have understood this food and nutrition situation, and have responded by setting up a comprehensive project called the Mexican Food System, which through a series of programs integrated vertically from production to consumption, and horizontally from one end of the country to another seeks to restore self-sufficiency in food, and at the same time, to improve its distribution so that the needier sectors can be supplied. The major partial successes this project has already scored in its first year of implementation have encouraged the authorities to strengthen it further in the future (11,12).

The situation described provides a broad setting for nutritional research in Mexico, which must not only accomplish the conventional purpose of shedding more light on nutritional phenomena in their biological context, but will also determine their social dynamics in the transition through which the country is passing, and particularly with the practical purpose that has been clearly defined by the needs of the Mexican Food System.

II. NUTRITIONAL RESEARCH IN MEXICO

Nutritional research in Mexico abounds in results and may be said to occupy an important place on the world level. Actually, it is better known and appreciated in the scientific community outside the country.
It began late in the last century, in 1889, in the Yucatán Faculty of Medicine, with the thesis of Dr. Domínguez Peón on the etiology and treatment of pellagra, which generated major controversy and, of course, prompted fresh studies and research on the subject, like those of Correa Patrón in 1908 and the classical work of Dr. Carrillo Gil in 1932 on pellagra and xerophthalmia in Yucatán (13,15).

After the Mexican Revolution of 1914-18, and perhaps in consequence of the food problems that followed in its wake, great concern was stirred among pediatricians in Mexico City about malnutrition, and a number of research studies were begun on its clinical and epidemiological goal aspects, like those of Drs. Torroella, Miranda, Varela, Jiménez and others, which culminated in the world-famous "studies of the undernourished child" published about 1950 by the Hospital Infantil de México team, headed by Dr. Federico Gómez, and which included such prominent researchers as Drs. Ramos Galván, Cravioto and Frenk, who have maintained a high scientific output down to this day (16-25).

Moreover, in 1945 the Government established the Institute of Nutrition Science under the Secretariat for Health and Welfare. This institute's most important work was done in food science, in which it analyzed most Mexican foods, through it also conducted, in collaboration with Harvard University, five major diet surveys which resulted in the scientific characterization of Mexican urban and rural food patterns (26-30). The Nutritional Diseases Hospital, established at about the same time, conducted research along several lines on adult malnutrition, and particularly on the interaction between nutrition and hormones, under Drs. Zurirán and Gómez Mont (31-35). The Institute of Nutrition Science was merged into this hospital, which then became the present-day National Institute of Nutrition, vested by law with responsibility for a very important part of the research on community nutrition in the country.

III. MAJOR AREAS OF CURRENT RESEARCH

It is difficult to make a proper inventory of all the nutrition research going on in the country. An anthology is in production, whose
bibliography was helpful to this writer and is bound to be so, for those
who are interested in the progress being made in some specific areas
(36). I will therefore offer only a few general comments.

Research remains active and, compared with that going forward in
other health areas, may be described as of good quality and abundant. In
fact, some years ago it far exceeded the capacity of the Government to
implement its findings. Much more was known about problems and their
solutions than was actually being done about them. Suddenly, however,
particularly when the Mexican Food System was approved, the situation was
turned around, and it is now clear that, for all the progress made
before, information, and to some extent an infrastructure of knowledge as
well, is lacking.

The Mexican Food System has stirred much interest in foods and
to patterns in different institutions of research and learning, both on
the national and the regional level, and this is prompting the establish-
ment of a number of research teams. However, the largest volume of
findings is still being obtained by the institutions with the longest
tradition and, hence, with the greatest methodological infrastructure.
Research definitely cannot be improvised by the simple decision of poli-
ticians or officials, although learning this is going to cost a great
deal in wasted funds and efforts.

This situation suggests the need to reconsider the advisability of
decentralizing research in nutrition as in the other areas of science,
and of spreading resources thin, setting up many mediocre teams scattered
throughout the country and in all institutions, or of strengthening one
or a few central establishments that are capable of really solving the
problem. My personal impression is that we, in the underdeveloped
countries, cannot afford the luxury of such demagoguery as "decentralizing
research," "spreading it throughout the country," and so forth, without
weakening it.

In order to plan the Mexican Food System, the advisers of the
Office of the President convened a majority of the specialists in the
subject and succeeded in bringing together about 200 of them in 21 study
groups. The first point that became apparent was the relative abundance of technical infrastructure in some aspects. There was an adequate fund of knowledge in nutritional agricultural economics and distribution and marketing systems, as also in the nutritional aspects proper of food and food patterns. This is not usual in underdeveloped countries, as most of them are known to lack a technical infrastructure. However, it has to be admitted that this was only the first step and that, from now on, the scientific and technological effort will have to be stepped up if the pace is to be maintained.

Most nutrition research done in Mexico is to the applied kind since, while much of it has not been pursued for any immediate purpose but only to acquire knowledge, its relevance to concrete practical needs is obvious.

Perhaps the area of research that is apparently furthest removed from practical application, but in practice has yielded the most usable results, is that on the etho-ecology of the mother-child pair in poor settings, which ranges from the problems of breast-feeding to those of the development of children of late ages. The principal workers in this subject are Drs. Cravioto and Arroyo of the DIF, Dr. Ramos Galván of the Mexican Social Security Institute, and Celia Martínez and this writer of the National Institute of Nutrition. Most of these studies are known widely and discussed at the world level (37-45). Many of their results have been put to use in applied programs in Mexico since 1972. The most notable examples have been the Family Guidance Program for the countryside conducted in 1974 and 1975, and the one on nutritional education for rural development (46-47).

Clinical research in infant nutrition has continued along traditional lines, and important results have been obtained by several other groups such as those headed by Drs. Vega Franco, Larracilla Márquez, Cuéllar, Krachmer, Parra, Armendares, Heredia Duarte, Díaz del Castillo, Jurado Luengas, etc. (48-56). Other research is that of Lisker on lactose tolerance, Maisterrena and Tovar on endemic goiter, and Sánchez Medal and Lorfa on the problem of iron and anemia (57-59).
On the epidemiological side, however, there are three major areas of study being carried out by the National Institute of Nutrition and sponsored by the National Council on Science and Technology (CONACYT): low-cost food technology for social welfare, nutritional epidemiology, and experimentation in problem-solving methods.

The program of research in food technology for social welfare is already 18 years old, although only in the last few years has it had stronger financial support. It is motivated by the great lack of efficient foods at a cost proportional to their nutrient content, and their aim is, therefore, to make use of advances in modern food technology, not for business but for social welfare. The main lines of effort are to extend and lower the price of milk, fish and meat and to combine grains and other products (60-64). The program is closely bound up at this time with the manufacture of nutritional products by a government processing company, Nutrimex, which will turn out about 30,000 tons of products a year after the end of this year.

The research project has been expanded, for it includes not only the analysis of raw materials and the study of formulations, but development of pilot technologies as well. About 50 products have been studied, of which four are or have been on the market and in mass production, and have been well received (conlac, soyacit, lactodif, and prote-ida), and four more figure in the short-run plans of Nutrimex (65-66).

The program of epidemiological research in national nutrition has been even more extensive, and is essentially in two parts: on the one hand, a diagnosis of the situation, including the Second National Food Survey of 1979 and the Epidemiological Surveillance System (SIVIN), which were used to plan much of the Mexican Food System, and, on the other hand, the wide area of the definition of special problems by sectors and population levels.

The National Food Survey was carried out with the help of the Secretariat for Health and Welfare and the National Indian Institute, and yielded a more precise assessment of the current situation in the country (6-10).
The Epidemiological Surveillance System in nutrition (SIVIN) has just gone into operation, and is designed for the detection of, and attention to, nutritional problems by administrative agencies. There are three levels: the first is superficial but extensive in its coverage, as it will be applied in all peripheral health units; the second will only be applied to a representative sample of the health units, and is more specific; and the third is rather a research program for the evaluation of indicators and for determining the interaction among them and identifying certain problems better.

The SIVIN is being set up so as not only to assist in the detection of problems, but also, through certain almost automatic procedures, to suggest ways of solving them. It will operate from the outset with a minimum package of measures in maternal and child nutrition and health based on the results obtained by traditional methods, and particularly by the experience obtained in two experimental primary health projects: one urban at Los Hornos, in the Federal District, and another rural at Calmea, Puebla State; however, it is expected to modify the package longitudinally in accordance with the results of SIVIN (67-68).

The other area of nutritional epidemiology is the study of the special problems being generated by what we have been referring to as the great nutritional change. So far, there has been a series of partial projects financed by CONACYT (69-73): Migrations and Nutrition, Alcohol Intake and Nutritional Status, Evaluation of the Impact of the Mass Media on Popular Food Patterns, the Problem of Worker Nutrition by Levels, etc., which this year it is proposed to consolidate and blend better into two major projects, one in periurban areas covering: "diets in transition and their impact on health" and the other rural, intimately bound up with SIVIN (level 3) and focusing particularly on the validation of indicators.

What the Institute has done in the development of problem-solving methodologies has been a series of model-applied programs on the community level for the subsequent evaluation of their impact and an assessment of their possible value as solutions. The focus has been primarily on educational aspects, though work has also been done in several other
areas such as the prevention of malnutrition, community development, primary health, and others (74-87). Altogether, the Institute has had 17 rural methodological research centers in the last 20 years.

IV. THE CONTRIBUTION OF RESEARCH TO HEALTH PROGRAMS

In Mexico, nutritional research may be said to have always been in the service of the health agencies. What has happened is that there have also always been certain misunderstandings between research workers and administrators, which happily are being tending to disappear recently thanks to the determined efforts of the authorities and to the programming of the Mexican Food System.

People working in the area of applications have regarded workers in research institutes as overly technical, inflexible and unrealistic, whereas some researchers regard applied work as overly medicalized, with more interest in the curative area with little orientation toward nutrition, excessively routine. Although there is some truth in both arguments, this should not constitute a hindrance to proper communication between the two sides.

There is no denying that the possibilities for interaction between research and application are greater, essentially because of the interest of the health agencies in extending the coverage of their services through two major primary health projects, the one for social security in depressed areas (the IMSS-COPLAMAR Program), and the other for health in periurban areas (SSA).

It is indeed difficult to achieve good nutrition programs outside of the primary health concept, the lack of which has definitely been to blame for the delay in building nutrition into health programs in underdeveloped countries. It has been said that Western medicine reached our outlying countries more as a vehicle for penetration by big business, such as the drug and equipment firms, than as a way of solving health problems. There must be some truth in this because, after all the years that Western medicine has been with us --and by now as a naturalized
citizen—the essential health problem, that of malnutrition and disease in the masses persists, and therewith high rates of infant morbidity and mortality, along with all the problems of individual and collective development.

In underdeveloped countries, the primary health concept must relate not to the kind of contact with the population or to the simplicity of the measures, but to the purpose of the action. It must attack the underlying restraints on human potential, which community research is increasingly identifying with the so-called malnutrition-infection complex, particularly at early ages. Action taken in this setting would be of a primary order because it is directed at safeguarding the most precious part of the human being as a biological organism, which is his potential for development and his capacity for participation in society. Such measures would help to develop that which is promised in the genes, and thereby contribute to full realization of the potential of the species.

This has always been described as a difficult goal on the grounds that malnutrition depends so much on socioeconomic circumstances, as if all the other problems of health and disease were not just as much or even more dependent on it.

I have said over and over that the problem of malnutrition is one of the easiest to solve because it only arises when conditions become extreme and exceed the capacity of individuals to adapt to them. The population vulnerable to malnutrition may be said to resemble a group of persons walking at the edge of a precipice, in a situation of exaggerated risk, so that many fall and many others lead precarious lives, yet, all it takes to solve the problem is for them to move a few meters away of the edge.

To walk a few meters away from the edge of biological maladaptation is easy; it requires no expensive diet of milk, meat and eggs, nor, to be sure, do the standards recommended by the developed countries have to be met, since the excessive diet they suggest actually brings individuals to the edge of another precipice, that of the degenerative diseases.
Just a few changes, at times the addition of a single food, or a better mix of what is already being eaten, could suffice. This is certainly true of the small child, who already has access to a good food -- his mother's milk -- which needs only to be complemented with what is available at home.

The principle I have upheld -- that small dietetic improvements can work major changes in nutrition -- is now more valid than ever, as has been amply demonstrated in China, and research has the serious responsibility of finding ways to accomplish improvements through primary health programs.

The new health-package technologies are an immediate response to the problem. It used to be much asserted that medicine cannot be administered like a cooking recipe. This has made it possible for each physician to do as he sees fit, even though it is clear that each problem has only one indicated solution. In any case, it has to be conceded that in underdeveloped countries it is not possible to care for the poor on a case-by-case and problem-by-problem basis. It is demagogical to assert that they can be, when it has never been possible to do so and never will be, and it is only asserted to be so in order to perpetuate the present chaos. Primary health packages may perhaps make it possible to attend to only 80 per cent of the cases with an efficiency of 80 per cent, but they can do this rapidly and extensively by covering broad population groups. What remains uncovered is what may be left to individual medical treatment or, more probably, for new technologies, which with more experience or new research may attain greater coverages.

The possibilities for interaction between research and applications is unquestionably greater in Mexico today, chiefly because of the interest of the health agencies in extending the coverage of services through two major primary health projects, that of social security in depressed areas (the IMSS-COPLAMAR Program) and the one for health in depressed periurban areas (the SSA).

In any case, it is a fact that the new primary care programs are already a part of public health and scarcely amenable to change. Therefore, nutrition work will now be able to find in health the permanent
place that had been so widely desired by those in direct contact with community problems. As an additional result, more use will be made of research, which will now have to move more rapidly on every front, and particularly in the ecological and sociological aspects of interaction between nutrition, health and disease, and in methodologies for implementing such solutions as detection-care programs.
NUTRITION DIVISION - NATIONAL INSTITUTE OF NUTRITION

CHANGES IN THE RURAL DIET COMPOSITION IN 16 YEARS
ACCORDING TO THE FOOD PROTEIC CONTRIBUTION

ACCORDING TO SURVEYS
CIRCA 1963

ACCORDING TO THE FEDERAL DISTRICT
SURVEY OF 1978

CHANGES IN THE URBAN DIET COMPOSITION IN 16 YEARS
ACCORDING TO THE FOOD PROTEIC CONTRIBUTION

ACCORDING TO SURVEYS
CIRCA 1963

ACCORDING TO FOOD NAT. SURVEY
OF 1979
V. BIBLIOGRAPHY


