Nutrition in the Americas

"Nutrition Programs in Public Health Services" was the subject of the technical discussions at the seventh meeting of the Directing Council of the Pan American Sanitary Organization and the fifth meeting of the Regional Committee for the Americas of the World Health Organization, held October 9–22, 1953, in Washington, D. C. The discussions, based on replies from the governments of the Americas to questionnaires sent out in advance of the meeting, centered around the prevalence of endemic goiter and kwashiorkor, methods for studying nutrition problems, and nutrition in relation to public health programs.

Presented here are Dr. William H. Sebrell's introductory statement at the meeting, selected portions from a paper on endemic goiter by Dr. Nevin S. Scrimshaw, and excerpts from a summary of the replies to the questionnaires. A complete report of the meeting, including a comprehensive summary of the replies to the questionnaires, is scheduled for publication in the March 1954 issue of the Boletin de la Oficina Sanitaria Panamericana.

Participants in the meeting included representatives from 18 governments of countries and territories of the Americas, and observers were on hand from a number of intergovernmental and nongovernmental organizations.

Developing Modern Nutrition Programs

By WILLIAM H. SEBRELL, Jr., M.D.

It is most gratifying to a nutritionist to have seen the continuing development of nutrition programs in Latin America during the past several years. It would be easy to speak solely of public health gains—of successes—in the nutrition field. Examples are plentiful, for this is a time when the intensive application of knowledge acquired over many years is producing dramatic results. Later, I shall mention practical measures that have raised the nutritional status of whole populations. My remarks, for the most part, will reflect the anticipation of a new era in public health, which is the promise of modern nutrition programs.

This favorable picture, however, must not obscure the fact that malnutrition is still prevalent throughout the world. Intensified efforts to combat it in many regions are imperative. In most of the countries in the Western Hemisphere, including the United States, malnutrition is still present (*1–4*). Effects due to vitamin, mineral, and protein deficiency are reported from many areas. These include pel-

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lagra, beriberi, protein edema, macrocytic anemias, and goiter. Kwashiorkor is a serious problem (*5*, *6*), and in some regions, phrynoderma and ocular lesions prevail.

As an introduction to discussions of approaches public health services may make to the broad problems of nutrition, I will try to synthesize the experience of workers in many countries into procedures applicable to health departments in general.

Appraising Nutritional Status

An initial step in any program should be an appraisal of the nutritional status of the population. This requires both a dietary and a clinical survey. The dietary survey should seek a comprehensive answer to the question: What do the people eat? Analyses of data on food consumption, as well as on the nutritive value of the foods, will provide information on the intake of specific nutrients. These estimates can then be weighed against a standard of recommended nutritional allowances.

To the casual observer, Latin America might seem an unlikely place to find nutrition problems. After all, its agricultural resources and potential are unexcelled. The extent and richness of its land, the length of its growing season, and the variety of its products could surely provide a superior diet to every one of its people. In reality, of course, this is an oversimplification. All the information so far collected indicates that diets in many regions of Latin America are inadequate (*1*, *3*, *7*, *8*). Caloric levels are low in many areas. Diets are frequently deficient in essential nutrients, especially vitamin A, riboflavin, and calcium, and shortages of high-quality protein are common.

Exemplary dietary surveys have been conducted by the National Institute of Nutrition in Mexico (*9*). In Venezuela, studies by the National Institute for Popular Nutrition indicate the nature of the problem in that country (*10*). In Puerto Rico, a major nutrition problem has long been recognized. Recent studies by the University of Puerto Rico show that two-thirds to three-fourths of the families subsist on diets clearly inadequate in some or all essentials (*11*).

The program of the Institute of Nutrition of Central America and Panama, which assists in dietary and clinical nutritional appraisals, is an outstanding example of progress. Other activities of the institute include the preparation of educational materials and the study of possible measures for nutritional improvement. This excellent program is attracting worldwide attention.

In a recent report by the Food and Agriculture Organization, some interesting estimates are made concerning Latin America's untapped resources (*1*). Not more than 5 percent of the total territorial expanse has been cultivated, and only two-thirds of that is under crops in a single year. Of course, there are numerous obstacles to initiating the development of land and other resources, but many Latin American countries are making good progress.

The dietary survey, though valuable in itself, must be integrated with a clinical study of the nature and extent of malnutrition. This requires the services of physicians trained in the recognition of deficiency diseases. The value of the clinical study can be greatly enhanced by suitable laboratory tests.

Determining Reasons for Malnutrition

Complete analysis of the problem should not only tell what deficiencies prevail, but should seek the reasons for them. Clinical problems of malnutrition are often less formidable than geographic, economic, and social obstacles to improving the diet. For various reasons some areas produce a narrow range of commercial rather than food crops, such as cotton, sugar, coffee, tobacco, fiber, or rubber. Importation of food may be necessary, though the diet is most likely to be inadequate where incomes are low and food prices high. The problem then is especially difficult. It is sometimes possible to raise livestock or other produce as well as the commercial crop, or cheap staple foods may be nutritionally improved.

Dietary patterns, however, are often very tenacious, and attempts to introduce new and strange foods, such as yeast or even dried milk, may fail without a proper program of education. Over the years, the problem of how to change dietary habits has been studied by such

competent groups as the Committee on Food Habits of the National Research Council (*12*). It is now known that dietary patterns, even though firmly rooted, undergo continual change and may be gradually modified, especially through the education of children.

Planning Corrective Measures

Once the problem has been determined, corrective measures should be planned, with two principal objectives. The first, of course, is to control or eradicate serious clinical malnutrition. The second objective is rehabilitation and the prevention of further nutrition problems. The importance of the latter responsibility is frequently underestimated. So dramatic sometimes are the results of treatment, as in certain vitamin deficiences, that the necessity of establishing an improved dietary pattern may be neglected.

The attainment of these objectives may entail such diverse techniques as education, legislation, food enrichment, demonstrations, and the training of personnel. In all phases of the program, long-range goals, such as the improvement of dietary habits, should be observed; but immediate results may also be necessary. A realistic public health program does not necessarily attack at once the basic factors of malnutrition. In the beginning, it is often expedient to concede to their rigidity and to work within their limitations.

The administration of nutrients in medicinal form is the most direct way to correct certain serious deficiency states. It is also the most temporary way, for in a broad sense it treats the symptoms and not the cause. In the United States, physicians are finding that the use of appetite depressants for the correction of obesity—now our major nutritional disorder—is subject to the same disadvantages. The deleterious dietary pattern remains to produce a relapse and sometimes to discourage further effort.

A well-established technique, which is quickly effective and perhaps the best adjunct to a long-range campaign, is the improvement of staple foods with vitamins, minerals, or other nutritional elements. Such improvement of foods in the United States has been described as low-cost insurance against nutritional ills (*14*). Examples are the addition of thiamin, niacin, riboflavin, and iron to bread, wheat flour, and maize products as a measure against pellagra, beriberi, and iron-deficiency anemia. Other examples are the use of vitamin A in margarine, vitamin D in milk, and iodine in salt.

Practical Value of Nutrition Programs

As proof of the practical value of a nutrition program, no stronger case could be cited than that of pellagra in the United States. In the 1920's and 1930's, this was the United States most serious deficiency disease (*14*). I can well remember when the number of persons afflicted was at least 200,000. In 1928, at the height of reported mortality, there were over 7,000 pellagra deaths, or 6 per 100,000 population. Nearly 98 percent of those occurred in southern States where most of the available land was used for nonfood crops, such as cotton and tobacco.

For the past 25 years, the death rate from pellagra in this country has shown a general downward trend. This is attributable not only to our national nutrition program, but also to better medical treatment, shifting of the population, extensive changes in agricultural practices, and gradual economic improvement in the south.

It is interesting to note the pellagra mortality at key points in the nutrition movement. Pellagra results from a diet low in two nutrients, either of which will prevent it: the vitamin niacin and the amino acid tryptophan. In 1914, Goldberger and his colleagues in the Public Health Service began the studies that soon proved the deficiency origin of the disease. In a short while, they demonstrated that many foods were protective (*15*). Control measures were instituted and gradually expanded. By 1937, the year niacin was isolated, pellagra mortality was about half that in 1928, or 2.5 per 100,000.

Cures with niacin were reported that year by several clinicians, and thereafter the decline was more rapid. In 1943, 2 years after niacin-enriched foods appeared on the market, the rate was 1 per 100,000. By 1951, according to provisional data obtained from the National Office

of Vital Statistics, it had dropped to 0.1, representing an unprecedented low of 208 reported deaths in the entire country. There are indications that even this figure is high, as a result of incorrect diagnoses.

In the United States, as in other countries, mortality data do not reflect the true health importance of the deficiency diseases, since very few affected persons die. It is the number of cases—the people limited in their capacity to work and enjoy life—with whom we are especially concerned. It was therefore gratifying to learn that not a single pellagrin was found among 10,000 recent admissions to the Hillman General Hospital in Birmingham, Ala., one of the country's most prominent centers for pellagra research, in a region where the disease was once rampant.

Another example of a promising nutrition program is the rice enrichment program in the Philippines (*16*). Over 11,000 persons were examined for beriberi before and after the introduction of rice improved with thiamin, niacin, and iron. The incidence of beriberi declined by approximately 90 percent in the study area. A recent report estimates the cost of enriching the rice to be only two- or three-tenths of a cent per pound (*17*). If enriched rice can be made available to all the people of the Philippines, it will undoubtedly control beriberi, which is one of their most serious health problems.

Integration With Other Activities

The organization and development of a nutrition program requires integration with many other medical and social activities. For example, nutrition is an important element in tuberculosis control, school health services, industrial hygiene, dental care, and sanitation. A comprehensive program will include services to local units, education of health department personnel meeting nutrition problems, aid to educational groups, work with physicians, and operation of nutrition clinics.

The relation of nutrition to other health department activities is sharply illustrated by results of malaria control in North India (*18*). As the malaria is reduced, the land becomes useful and economic status rises. In one area, grain and oil mills and other industrial enterprises increased from 11 to 29 over a 2-year period.

We should not overlook the powerful stimulus of improved nutrition to industrial and agricultural output. It is estimated, for example, that better nutrition among workers on certain sections of the new Pan-American Highway has tripled the rate of construction. Improved health through better nutrition and other means would facilitate the approach to adequate food production throughout the world.

For those who protest that their country cannot afford a nutrition program, it can be shown that no country can afford to be without one. The poorer economic classes are most liable to malnutrition, and hence the economic burden is heavily borne by society at large: the employer and the State. The costs may take the form of medical expense, public assistance, and lost manpower, profit, and revenue. On the other hand, the study and treatment of malnutrition may pay very positive dividends, not only to the individual in terms of diminished suffering, but to the employer and the nation as a whole.

Redirection of Programs

I have pointed out that the ultimate objectives of a nutrition program are long-range ones. The value of periodic assessment is thus apparent, and we must persevere, particularly if progress seems slow. Over an extended period, one problem to be expected is an occasional change in program needs, often necessitating a degree of public reeducation. In the United States, the need is shifting from control of deficiencies to nutrition research in the chronic diseases, such as cancer, arthritis, diabetes, arteriosclerosis, dental caries, and mental and neurological disorders.

Control of infectious diseases and maternal and infant mortality—progress attributable in some measure to better nutrition—has resulted in a general aging of the population. With the increased life span, disability and mortality from diseases associated with age have mounted rapidly. The need for reeducation enters when a review of progress against the deficiency diseases erroneously suggests that nutrition science

has reached the point of diminishing returns.

On the contrary, the problem has shifted to one of learning how the various nutrients act within the body—their specific role in metabolism. The extension of nutrition research along these lines has been very fruitful. Many facts pertaining to the chronic diseases are emerging.

Let me mention some of the major health problems in the United States in which the mechanisms of nutrition are definitely implicated. One is obesity, characterized by failure of the appetite to maintain caloric balance—and I begin with this disorder because mortality data indicate that it predisposes to early death from a variety of other causes (*19*). Atherosclerosis, the major arterial disease, involves an excessive deposition of cholesterol, a fatlike substance not only produced in the body but found widely in foods. Diabetes, which afflicts an estimated 2 million Americans, is of course associated with the faulty utilization of carbohydrate. A successful public health program may be expected to throw such nutrition problems into prominence.

Summary

The world today—no nation excepted—faces many needs relative to nutrition. In some areas, there is gross starvation, demanding such measures as emergency feeding, economic support and adjustment, and revision of agricultural practices.

Dangerous deficiencies of particular nutrients are also prevalent. Such deficiencies are common even in regions where calories are adequate. Thus, nutrition surveys are widely required, to indicate the specific treatment needed. Food improvement may be indicated. In every nutrition program, there is need for cooperative efforts among various branches of the health service, government departments, and other organizations.

A permanent program with a long-range view is essential if advances are to be sustained. Changing needs should be anticipated, and these will include the nutrition problems of chronic disease. From the beginning, education of the public, in an effort to establish correct dietary patterns, should be prominent.

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Endemic Goiter In Latin America

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Both the first conference on nutrition problems in Latin America held in Montevideo in July 1948 and the second held in Rio de Janeiro in June 1950 recognized that endemic goiter is a serious public health problem in most of the countries of Latin America and made recommendations aimed at its prevention. In the 2 years since the Rio de Janeiro conference, considerable progress has been made by a number of Latin American countries in determining the extent of their endemic goiter problem. The report of the successful treatment of endemic goiter with potassium iodate in Central America (*1*) and the effectiveness of iodized salt distribution begun in certain districts of Colombia in 1949 (*2*) give new assurance as to the practicality of prophylactic measures.

Although the problem of endemic goiter in Latin America is more widely recognized than ever before, and present technical knowledge is sufficient to insure the elimination of goiter as a public health problem, few specific additional measures have been taken toward this goal since the Rio de Janeiro conference. New legislation, the implementation of existing laws, and voluntary efforts have lagged behind scientific studies of the problem.

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Treatment and Prophylaxis

The second Latin American nutrition conference recommended that the governments for which endemic goiter is a health problem take the necessary steps to bring about the iodization of salt. In 1950 the distribution of iodized salt was begun in the northern zone of the Department of Caldas in Colombia. Examination of nearly 9,000 school children in this zone in 1952 revealed an average incidence of endemic goiter of 33 percent compared with 90 percent in the 1945 survey (*2*). This represents a decrease of 64 percent in the incidence of endemic goiter in the areas in which salt iodized to 1 part in 20,000 was distributed. Several other Latin American countries are known to have salt iodization programs in at least the planning stage.

The instability of potassium iodide, especially under tropical conditions, and the necessity for drying and packaging salt iodized with this compound have been major obstacles to the introduction of iodized salt in many parts of Latin America. The report from Central America of the effectiveness of potassium iodate in the treatment of endemic goiter may be of far-reaching importance in this regard (*1*). Eight hundred and eleven school children in El Salvador and 197 in Guatemala with an initial incidence of goiter of 34 and 57 percent, respectively, were treated with placebo, 6.5 mg. of potassium iodide, or 8.5 mg. of potassium iodate weekly. During administration periods of 15 and 20 weeks in El Salvador and 25 weeks in Guatemala, the incidence of goiter did not change significantly among the groups receiving placebo, whereas the reduction in endemic goiter among the groups treated with potassium iodide was 40, 33, and 62 percent, respectively, in the three trials, and among the groups treated with potassium iodate, the reduction was 44, 44, and 69 percent. At the end of the treatment