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<p>This first international seminar on improving nutrition and nutrition education through school food programs brought together directors of school food programs from 14 countries to review and compare current measures taken to combat malnutrition through school foodservice. The workshop's report contains the current status of school food programs in Japan, Republic of Korea, Republic of China, Hong Kong, Thailand, Malaysia, Republic of Singapore, Philippines, Indonesia, Australia, New Zealand, Fiji, Western Samoa, Hawaii, and the United States. It details school foodservice and the nutritional improvement of children, nutrition education in the school and the community, approaches to nutrition improvement of children, and adaptive research and development of appropriate new methods in school food programs. Recommendations are given for school foodservice, nutrition education and training, and nutrition improvement of a community for use by individuals helping Asian and Pacific countries make better use of school food programs to stimulate better family and community nutrition.</p>		
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— Workshop Report —



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International Workshop on Improving Nutrition and Nutrition Education through School Foodservice

— Workshop Report —



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Preface

Child feeding programs are concerned with responding to the serious worldwide problem of malnutrition and are aimed more and more at affecting the poorest majority in developing countries. This workshop brought together directors of school feeding programs from a number of countries to review and compare current measures used to combat malnutrition through school foodservice programs.

The countries agreed on general recommendations in the area of school foodservice, nutrition training and education, and nutrition improvement of a community. These proceedings are to be used as a reference for individuals helping Asian and Pacific countries make better use of school feeding programs to stimulate better nutrition in families and communities. This report contains the current country status of school feeding programs in Japan, Republic of Korea, Republic of China, Hong Kong, Thailand, Malaysia, Republic of Singapore, Philippines, Indonesia, Australia, New Zealand, Fiji, Western Samoa, Hawaii and United States.

We hope this information will be useful not only to the aforementioned professionals concerned with nutrition and school foodservice, but also others concerned with the development and implementation of school feeding programs.

Dr. Martin J. Forman
Director, Office of Nutrition Technical Assistance Bureau
U.S. Agency for International Development

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Welcome Address

As President of American School Food Service Association, it is my privilege and pleasure on behalf of our National Executive Board to welcome each of you who are participants from other countries to the first International Seminar on Improving Nutrition and Nutrition Education through School Food Service. Each member of our association who is here today is excited about this seminar and has looked forward to this day for almost a year.

American School Food Service Association has a membership of 64,000. We will be celebrating our 30th anniversary at our national convention to be held here in Honolulu at the close of this seminar with approximately 8,000 members and exhibitors attending. This meeting will afford you an opportunity to observe personally programs available to our members and to discuss child nutrition programs in school systems throughout our nation.

We are also delighted that you can join with us in the celebration of America's 200th birthday. In this Bicentennial year, we have encouraged our people to reflect on the association's history, look forward to its future, re-evaluate its roll in the nation today, and consider whether we have been able to fulfill our obligation.

Our association is a professional organization of school foodservice personnel who make available adequate and nutritionally sound breakfasts and lunches to children in kindergarten through high school in every state. Our goal is to reach all school children regardless of family income. Our challenge is to provide appetizing, nourishing meals to help end hunger and malnutrition in America for all time.

In our association, we strive to reach two specific kinds of people—our members and children. To our children we strive to provide adequate nutrition education; to our members we must provide the opportunity to gain self-esteem and professional growth.

As an association, we also strive to develop, advocate, and support legislation that will help us realize adequate foodservice in this nation's schools, to create and support the kinds of educational programs that will increase opportunities for learning, and to develop and publish teaching-learning materials for school foodservice personnel. We strive to help each member reach his or her professional potential.

Our objective is to establish training centers for foodservice leaders—a center for training interns in our field, a center to conduct research development of reasonable standards for school foodservice, and laboratories to test new equipment and analyze new products.

It has been a dream of the American School Food Service Association to provide such a seminar as this with leaders in nutrition and nutrition education from other countries. We are confident that many of our nutrition problems are similar. Perhaps through mutual understanding and involvement, children throughout the world will be better nourished.

We are indeed indebted to and grateful for the cooperative efforts of East-West Center and especially East-West Food Institute and the office of Nutrition of the United States Agency for International Development for their financial assistance.

We welcome the opportunity to get to know each of you personally during these days and to exchange ideas, problems, and perhaps solutions. I am confident each of us will benefit from this experience.

Elsie S. King
President, American School
Food Service Association

Keynote Speeches

WHO CARES ABOUT CHILDREN?

Food has been very much in the news these past few years. But aside from the melodrama of distant famines, and aside from the pain of price inflation, who cares? Thirty-seven percent of the world's population is under 15 years of age, but except for our own families and neighborhoods, for the clientele of schools, health and day-care centers, for those of us who serve in these institutions, who cares?

There has been famine in Biafra linked with the abortive civil war in Nigeria. There has been famine in Bangladesh linked with the disasters of natural calamity and the war of independence. There has been famine in sub-Saharan Africa linked with the drought and overgrazing of pasture lands in that region. There has been some starvation and there has been widespread food shortage during the "Food Crisis" of 1972-1973, when bad weather and economic inflation hit all over the world at about the same time.

Newspapers and periodicals have been full of photographs and articles about starvation and famine. Poignant photographs of afflicted children haunt readers who are impotent to help. These particular starvings are beyond the reach of the American reading and thinking public. They have either already fallen victim to the accidents of climate and history or are surviving due to actions taken by others than ourselves.

In frustration we turn our attention to other things. So do the magazines, newspapers, and television cameras. Who cares? Public attention to the topic of food jumps from the drama of famine to the excitement of fads, but does not rest long on the daily struggle over consumer education, malnutrition, and the like. It's not the kind of thing that makes a good cover story.

Of the four billion people on earth, one and a half billion of these are children. To most people, children are either an "accident" or a "gift."

Children are valued by society as symbols of fertility and survival. To their families they become partly a durable consumer good that provides emotional pleasure and an extension of parental personality, and partly an item of capital investment that provides useful work and economic security.

The Population Institute of the East-West Center is involved in a continuing cooperative study on the value of children. This study is examining the function or role that children fulfill, and the explicit and implied values placed on them.

For instance, based on information from several countries, including the United States, the following functions and roles have been identified as being carried out by children. They preserve and perpetuate tradition that is passed on to them by their parents and their communities. They also serve as agents of change since they are more generally receptive than their elders to new life styles and trend modifications in the social order. They are, in and of themselves, intrinsically precious as beings of great charm, animation, and emotional responsiveness. They are also means to ends, whether it be economic gain to the family or a perpetuation of parental identity by name, personality, or occupation. Having children, however, is not without its costs in attention and resources.

Children, it turns out, are simultaneously desired and rejected. They are loved and cared for, and they are exploited and abused. The exact balance in each case depends on the circumstances of the situation. In the United States alone, there are some 60,000 known cases of child abuse per year due largely to the emotional defects and neglect of parents. Attempts to assign "value" to children have dealt with financial costs and benefits; emotional exchange with parents and relatives, friends and teachers; and the fulfillment of parental aspirations throughout their life paths and sex-linked roles.

Among the positive values are the emotional benefits that accrue to parents as children exchange expressions of love and happiness, and provide companionship and relief from strain, loneliness, and boredom. They also provide economic benefits as cheap or unpaid labor, or as economic security for their aged relatives. Children also are a basis for the personality enrichment and emotional development of their parents who mature and learn through the rearing of children. They serve as an addition to their parents' identity on whom their achievements reflect. They also provide family cohesiveness and continuity.

On the negative side of the catalog of values, children also levy emotional costs because of the stress and anxiety over ill health, nuisance behavior, noise, disorder, and discipline. There are economic costs as well. These are incurred in the expenditures in cash and in kind on education, food, lodging, and clothing, and in the liabilities that their behavior incurs in society. Children restrict the opportunities of their parents to use resources and time in other ways. Children also place heavy physical demands on their parents and incur other family costs as they compete for attention and emotions that might be directed to other individuals in the family.

Groups outside the family have been hesitant to intrude on family prerogatives dealing with the guidance and control of children and the provision for their welfare. This goes for both government agencies and private volunteer organizations. In some societies, children are largely raised by their community of relatives and neighbors. In many American cities, children are tended and cared for up and down the street and up and down apartment house stairs. There are active youth movements in most countries, but the proportion of child involvement is miniscule. Governments have embarked on public programs in education, health, and labor regulation. Although governments have done much to make minimal provision for child welfare and the curtailment of rampant abuses, they have not made effective inroads on problems of malnutrition or consumer ignorance. They have stuck with the more conspicuous problems using the instruments of regulation.

The first child labor law in Britain was passed in 1802. It prohibited the employment of pauper children under nine years of age. In 1815, the British extended this to all children. Massachusetts led the way in the United States by abolishing factory employment for children under 15 years of age. Eighty years later, the federal government passed similar restrictions for the nation as a whole. Compulsory education and communicable disease immunization also have been pursued as an extension of the regulatory function. Consumer education and nutritional support have come slowly and not-so-surely as a hodge-podge of professional, industrial, and bureaucratic interests have met in conflict and reinforcement. The nutritional needs of adults and children are pretty well known. The economic power of the consumer's purse is zealously wooed. Governments endeavor to steer a stable course amidst the conflicting demands of vocal interests. Such a situation does not automatically lead to the best outcome for children. The U.S. federal government created the Children's Bureau in 1912. It has survived to this day as something of a football. It is currently part of the Office of Child Development in the Department of Health, Education, and Welfare.

There are a number of significant privately organized societies that have led the way in the United States. The Child Welfare League of America, the Child Study Association of America, the Foster Parents Plan, and the Association for the Aid of Crippled Children are among some of the best known.

Internationally, UNICEF has shown significant leadership. In 1965 the organization won the Nobel Peace Prize for its services in health, hunger, and education improvement through aid to more than 100 countries and the training of national workers.

The American School Foodservice Association is a large and active organization. This cooperative seminar in which we are now engaged is aimed at improving nutrition and nutrition education among school children through school feeding programs. It has been over a year in the planning between our two organizations. Although the mandate of ASFSA is restricted to the schools and linked with a particular government program, the organization has lifted its perspective to the world scene and to issues broader than foodservice alone. It is through just such raising of consciousness and the exploration of more effective avenues of action that we can begin to give meaningful answers to the question "Who cares about children?"

Nicolaas Luykx

WE CARE FOR CHILDREN!

Fifty years is not a long time really; as a matter of fact, it is my exact age as I stand before you today. And yet, 54 years is all the time we have to prepare for the world's population to triple. There are 4 billion people on the face of the earth today and at present rates of population growth, there will be 12 billion by the year 2030. With a scarcely adequate grain reserve for 30-day world consumption, this earth receives 200,000 new mouths to feed per day. In the 10 days you spend in Honolulu for this series of meetings, the excess of births over deaths will equal 2 million human beings. Malnutrition is already on the rise with 15 million children under the age of five dying annually right now from the combined effects of malnutrition and infection. By the year 2000, 93 out of every 100 babies will begin life in less developed lands. The world population/food balance promises to become critical in years ahead and some 40 developing nations face the prospect of an annual deficit of about 75 to 80 million tons of grain as early as 1985.

Currently, world food production is just about a thread ahead of population growth, but, even so, food is so unevenly produced and distributed that some people overeat, some are under-nourished, and quite a few just plain starve. The deepening crises of decreasing food supplies and increasing food costs have worsened seriously as a result of increases in fuel costs. The direct relationship between food and fuel is shown in a University of Wisconsin study indicating that—in the United States—10 calories of fuel are used to produce every calorie of food consumed.

My message today, however, is not one of death and defeatism. It is one of alarm, concern, and survival. If my first concern is the grievous and precarious balance between food availability and world population, my second major concern is that our children receive the protection and consideration that is rightfully theirs. Our children are brought into this life through no fault nor responsibility of their own. They are physically and mentally defenseless, helpless; they are dependent upon those whose responsibility they are. And yet the pattern has been all too often repeated. In times and places of food inadequacy, those supplies which do exist go to those strong enough to take them. The weak, the young, those unable to fend for themselves are often those left to the last.

Even if we disregard humanitarian and sentimental reasons, there are fundamental, practical reasons why malnutrition of children becomes a scourge upon any nation. First of all, these young people are at a critical age. Malnutrition at this age stunts both physical and mental growth for a life time and, indeed, very probably shortens that life time. Such malnourished infants become an economic weight upon a country, rather than providing the new energy and vitality which any nation so desperately needs.

Secondly, children represent the future of a nation. They eventually should provide its leadership, its strength, its productivity, its hope. Malnutrition at an early age not only impedes the present but blights the future. Dr. Martin Forman, director of the Office of Nutrition Technical Assistance, Bureau of the U.S. State Department, has said, "Of all the activities conducted in the world today in the name of nutrition, supplementary programs for children are the most rewarding." Indeed, as Dr. Forman has reported, the World Food Congress of 1974 stressed the importance of reaching this vulnerable group.

This workshop is the outgrowth of a dream originated by Dr. Forman and me many months ago and warmly supported by American School Food Service Association President Elsie King and by the wonderful staff of East-West Center. Our purpose

has been to bring together directors of school foodservice programs from all of the countries of the Pacific Basin to review and compare current measures used to combat child malnutrition through school foodservice programs.

Our purpose has been to ask together, "Are we securing maximum nutrition for our children from the resources available?" Our purpose in gathering together here is to share ideas and discuss ways of working cumulatively to improve the given amount of food per capita, quality of food versus cost, nutrition education of children, and ways and means by which nutrition education of the children can extend its impact into the home.

What an exciting moment in history it will be if, from this gathering, could come a renewed and encouraged leadership through whose inspiration and zeal the millions of children in the countries represented here could know a better life through better food.

Let my final message then be that professionals must lead in this effort. I like to think American School Food Service Association is an example of this kind of leadership. This organization is composed of 64,000 people who are working professionals in school foodservice in the United States. These individuals give substantially of their own time and money to support the work of this association in order that the children of our nation might be better fed.

To meet with many of you personally in your home countries last November and December was one of the memorable privileges of my life. I wish again to express my appreciation to you for your kindnesses and courtesies. I was enormously impressed by the dedication and the fervor and the determination of all of you to see that the children of your nation receive every consideration. Over and over again, however, I did note a bit of discouragement, a repetition of the phrase, "Of course, we know the need, but we have no budget."

There are few governments in the world—and I believe none represented here—that know the luxury of affluence or the miracle of budget surpluses. There is never enough money to meet all the needs and fill all the demands. Priorities must be developed and pressures must be exerted to see that worthy priorities are met. Those of us who know the nutritional and health needs of our children best must provide the voice of conscience which demands they not be given the least.

I plead with each of you to return home with the purpose in mind of striving to develop a cohesive group to champion the nutritional needs of the children of your country. You will be surprised at the help you receive, for a hungry child has a cry that penetrates the heart of the most indifferent person. Help often may come from unexpected places. In our own instance, crop surpluses brought strong support from the agricultural segment of our economy and physical inadequacy of our young men for military service brought support in the name of national defense.

Brazil, which like the United States has a national school food service association, has taken a somewhat different approach. In Brazil, the effort has been concentrated on organizing the opinion molders in any community—the wife of the mayor or the governor, a prominent physician or dentist, a renowned educator, a military man of distinction. Through this coterie, the Brazilian School Food Service Association has welded a powerful voice in support of its children. Why should there not be a combination of the Brazilian approach and the U.S. approach—the professionals with the technical knowledge combining with the officials who have the public influence to establish priorities in national budgets which will provide for the nutritional needs of our children.

This is an historic meeting—15 nations of the world gathered together in conference because of their concern for the nutritional needs of their children. I shall not ask for a ground swell to come forth from this meeting, for our countries are separated largely by water; therefore, I shall call for a rising tide of determination that the children of this vast segment of the world known as the Pacific Basin shall be well represented by those of us here, that those children shall have as their birthright enough to eat. It is appropriate we meet in the East-West Center and bring together at this point the forces of East and West as an example to North and South, as an example to all the world. By our presence here, by our decisions and by our actions, let us issue a clarion call, a compass call so clearly enunciated that none can miss our message, "We care for our children."

The year of 1976 represents the 200th birthday of the United States of America, the observance of that moment in history when our people fought for freedom and self-destiny and won. It is generally considered the war which created the world's oldest living democracy started April 19, 1775, at a bridge in Concord, Massachusetts. The first gunfire of the war for American independence is often referred to as "the shot heard around the world," for the shock waves and reverberations of this volley have helped man ever since in his struggle for freedom and mastery of his own destiny.

We need add only one letter—the letter "U"—to make a shout out of a shot. Let the "U" be you and me! Let the shout heard around the world come from this room; let our shout echo, reverberate, and ricochet from every capital in the world. Let our shout be, "We care for children." Let no man, no nation, no government be so deaf as to miss our message.

Dr. John Perryman
Executive Director
American School Food
Service Association

Summary

To improve the nutritional status of school children, school feeding programs were initiated or planned in many countries in Asia and the Pacific. Food provided in school could be complete meals such as breakfast and lunch, supplementary hot soup to accompany a lunch box brought from home, or a mid-morning snack such as milk, hot porridge, biscuits, or yeast tablets, depending on the government's policy and support, the availability of food, local dietary habits, and parents' contributions.

In general, school foodservice should aim not only at the provision of foods to children. School foodservice is an effective medium of spreading nutrition education and provides a close linkage between school and community. Within this dimension, school foodservice can have far reaching effects toward the nutritional improvement of both school children and their families. Many countries have turned their attention toward this.

In the countries where local food supply is limited, school foodservice can stimulate food production, particularly vegetables, fruits, legumes, and even milk and poultry, through school/community gardens and other promotion activities. A number of countries have had some successful experiences in this area.

As can be expected, there are great variations in program development, emphases, coverage, and accomplishment as well as government policy and support toward school foodservice programs. An exchange of experiences and points of view can be of mutual benefit.

Early in 1958, a School Feeding Seminar for Asia and the Far East was convened in Tokyo. Much progress has been made since then. Meanwhile, more problems and new demands have been encountered. There was a growing need for holding another international seminar on this important issue that affects the health and well-being of the next generation.

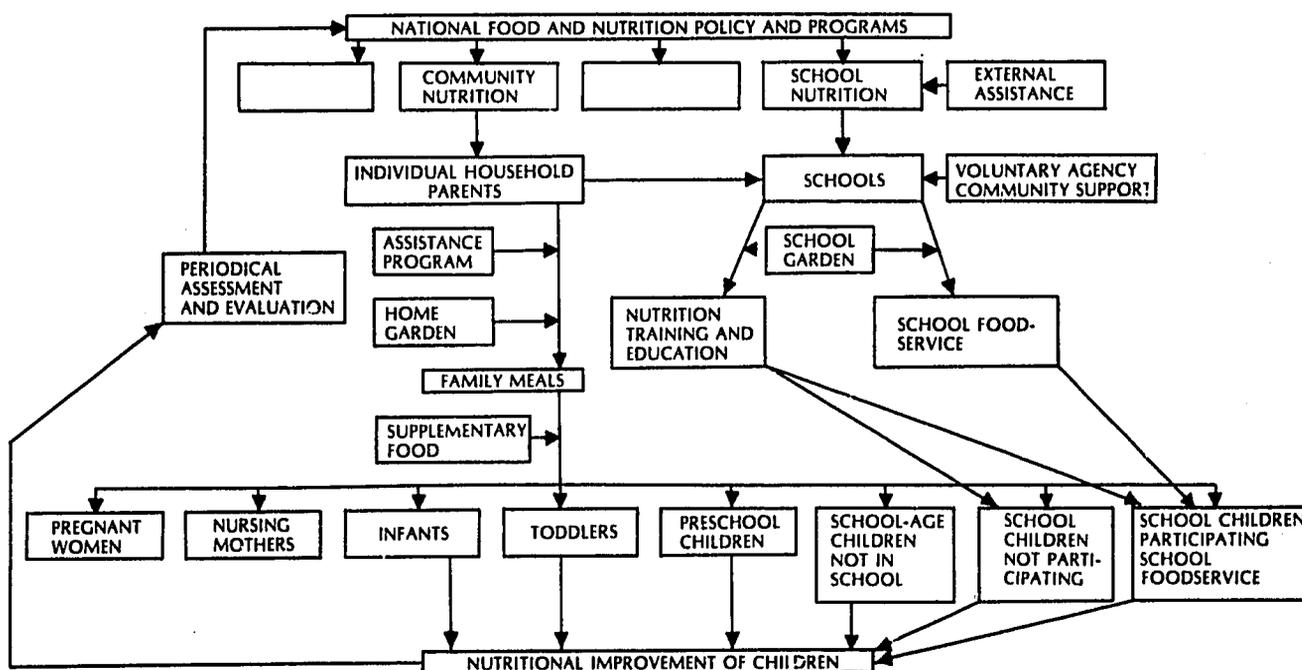
An International Workshop on Improving Nutrition and Nutrition Education through School Foodservice was conducted in Honolulu, Hawaii, from July 27-July 30, 1976, under the joint sponsorship of ASFSA and EWF. The seminar was designed to review and exchange experiences in programs of school foodservice, school nutrition education, school/community food production, and other related activities of the countries present; introduce and discuss methods of program planning, implementation, and evaluation of school foodservice and other related activities; and identify areas that require additional research and suggest action to be undertaken by concerned individuals and institutions.

After two days of country reports and special interest sessions, the entire workshop group broke into three work sessions to make general recommendations in school foodservice, nutrition training and education, and nutritional improvement of a community. Before breaking into groups, participants unanimously adopted the following proclamation:

The strength and wealth of a nation are its children. The seminar calls upon all nations to recognize the plight of the malnourished child. We call upon all governments, individually and cooperatively, to accept the responsibility of protecting their children through feeding and other related programs which will ensure all children opportunity to achieve their maximum physical and mental capabilities.

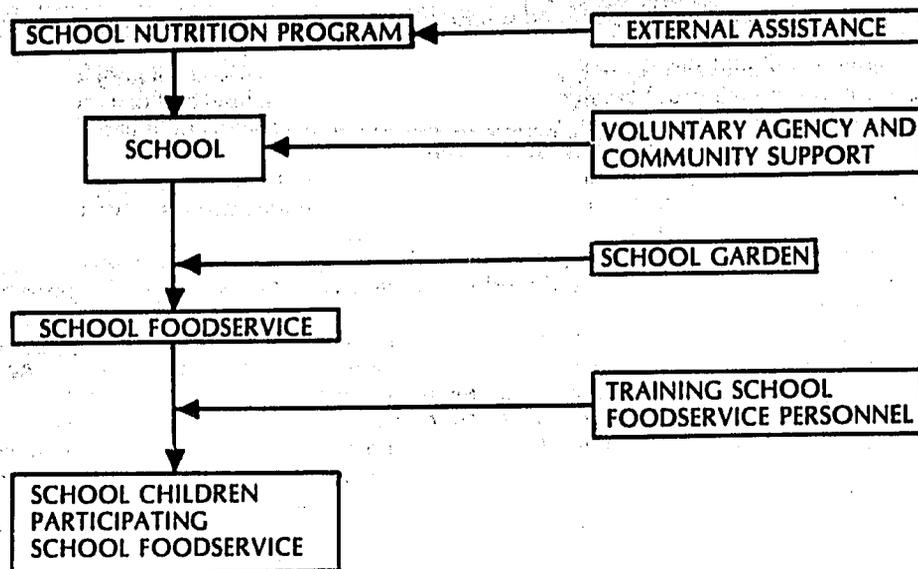
This proclamation was forwarded to the ministries of education and health in the participating countries. Before work sessions began, Mr. Y.H. Yang schematically explained how each task fit into the overall approach to nutritional improvement of children (see Figure 1).

Figure 1
Overall Approach to Nutritional Improvement of Children



General recommendations for each of the areas in Figure 1 came from each of the group work sessions. Each group based its recommendations on materials and reports presented at the workshop. A summary of the recommendations generated in the group work sessions follows in Figures 2, 3, and 4.

Figure 2
School Foodservice Recommendations



General Recommendations—School Foodservice

To initiate school foodservice, the following baseline data should be collected to ensure realistic planning and subsequent evaluation:

- Food and nutritional status of children—food consumption and habits; clinical, anthropometric and biochemical assessment of children's nutritional status; and incidences and prevalence of infection and infestation. (Weight-for-age recording may be used as a single index to assess protein-calorie malnutrition among the children.)
- Nutrition understanding, school attendance, sick absence, and class performance of children
- Community resources available to support school foodservice—community organization and leadership, food production and its potential, government and voluntary agencies at local level interested in supporting school foodservice, and other related information
- Government's policy and plan and availability of financial support
- Technical personnel trained in school foodservice

While program coverage would depend on government policy and availability of resources, it is imperative that priority consideration be given to the areas where high incidence of malnutrition exists. School foodservice should be available to all children attending school, both public or private.

Governments at different levels—namely, national (federal), provincial (state), and local (county and city)—should provide budget for free or subsidized meals to the needy children.

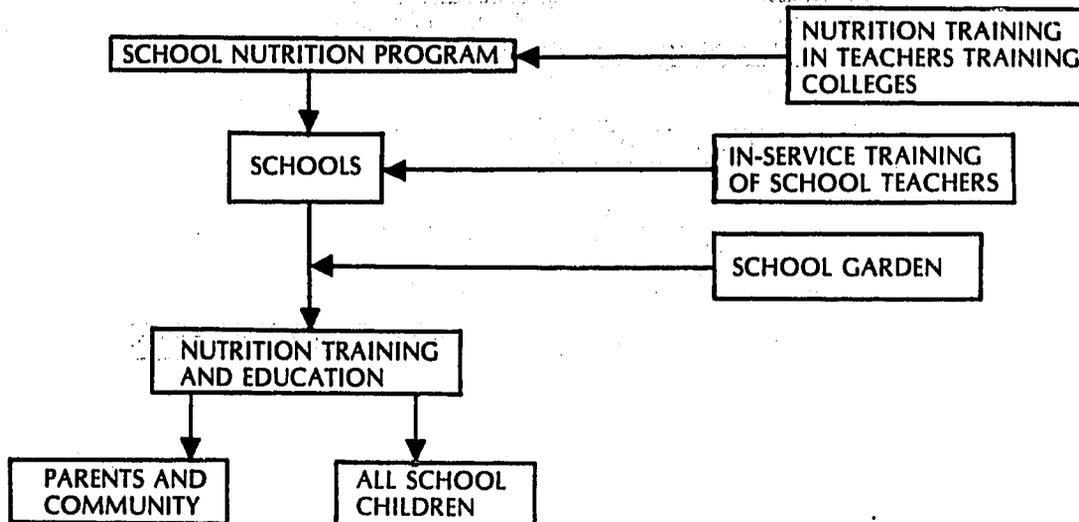
Training of school foodservice personnel should be job-oriented and conducted by professionals with background in nutrition and institutional foodservice. Refresher training should be conducted periodically according to need.

While food from external sources is valuable to stimulate the initiation of a school feeding program, it is extremely important that, in long run, food for school feeding come from domestic resources—namely, food in kind or money supplied by the government, parents' contributions, produce from school or community gardens, and contributions from voluntary agencies. Ultimately, parents should assume the major responsibilities.

With the exception of the United States and Japan, school feeding programs in the region can hardly, in the foreseeable future, cover a substantial portion of school children. It is essential that nutrition education in schools be strengthened as part of an overall education system and that school foodservice be integrated in nutrition education programs.

General Recommendations—Nutrition Education and Training

Figure 3
Nutrition Training and Education Recommendations



The following people should be involved on a cooperative basis in nutrition training of children:

- Supervisors of nutrition and nutrition related programs
- School principals and classroom teachers
- Home economics, health, and agricultural teachers
- Cafeteria managers and other school foodservice personnel
- School children and mothers helping in preparation and serving of food
- Community leaders, administrators, policy making officials
- Parents

Nutrition education should be introduced/strengthened in elementary and secondary schools, teachers training colleges and other related institutions, the community and among the general public, and in the school foodservice program.

Nutrition education should be provided in curriculum and extra-curricular activities for all students from preschool through high school. This education should be sequential, integrated, culturally relevant, both theoretical and applied, and taught as a behavioral science. Nutrition education in schools should be made mandatory through enabling legislation and/or regulations and adequate funding should be provided to implement the program.

Competency in nutrition education should be demonstrated by early childhood and elementary school teachers who receive certification and by secondary school teachers through the completion of a special training program required of nutrition teachers.

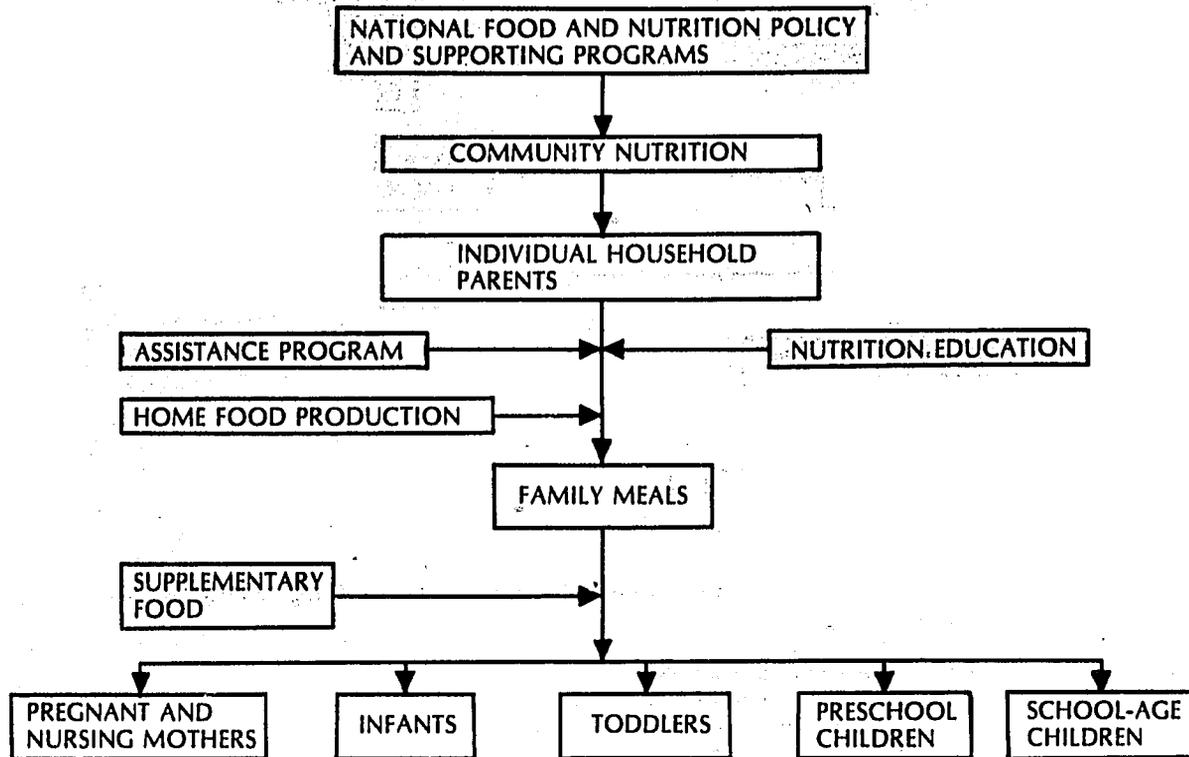
To effectively introduce/strengthen nutrition education in the community among the general public, a number of activities should be implemented such as nutrition education projects in school including teaching and dissemination of nutrition information through sisters-and mothers clubs, mothers' classes, and public events; nutrition education projects through health centers and maternal child health programs; community nutrition programs sponsored by colleges and universities and other interested agencies; mass media techniques such as radio, television, newspaper, wall-posters, etc.; foodservice programs for specially needy groups; and nutrition education through civic clubs, church organizations, etc.

Nutrition education should be strengthened in school foodservice programs. The managers of school foodservice should be trained to provide leadership for nutrition education, and student teachers should be required to be involved in school foodservice. Parents and community leaders should be involved in planning for introduction of nutrition education in school foodservice, and a trained nutritionist in each secondary school should be provided as a result of appropriate legislation.

School foodservice should be an integral part of the total nutrition education system. Home-school-community gardens should be developed to enhance the nutrition education program. Finally, involved groups should be trained as a team to implement programs of nutrition education.

General Recommendations—Nutrition Improvement of a Community

Figure 4
Nutrition Improvement of a Community Recommendations



Insufficient knowledge and understanding of the value of nutrition to good health, and wrong concepts, through tradition or culture, concerning certain types or kinds of food adversely affect the nutritional status of people, not only among the poverty-stricken but also among the affluent. All should be educated, motivated, or helped to avoid unbalanced diets and underfeeding as well as overfeeding. Malnutrition is harmful to physical and mental development and jeopardizes health, resulting in the reduction of the people's working capacity as a nation.

The broad goal of a community nutrition program is to improve the nutritional status of people in a community, either a village, a province, or a whole country. Special attention should be given to the nutritionally vulnerable groups through feeding schemes and nutrition education.

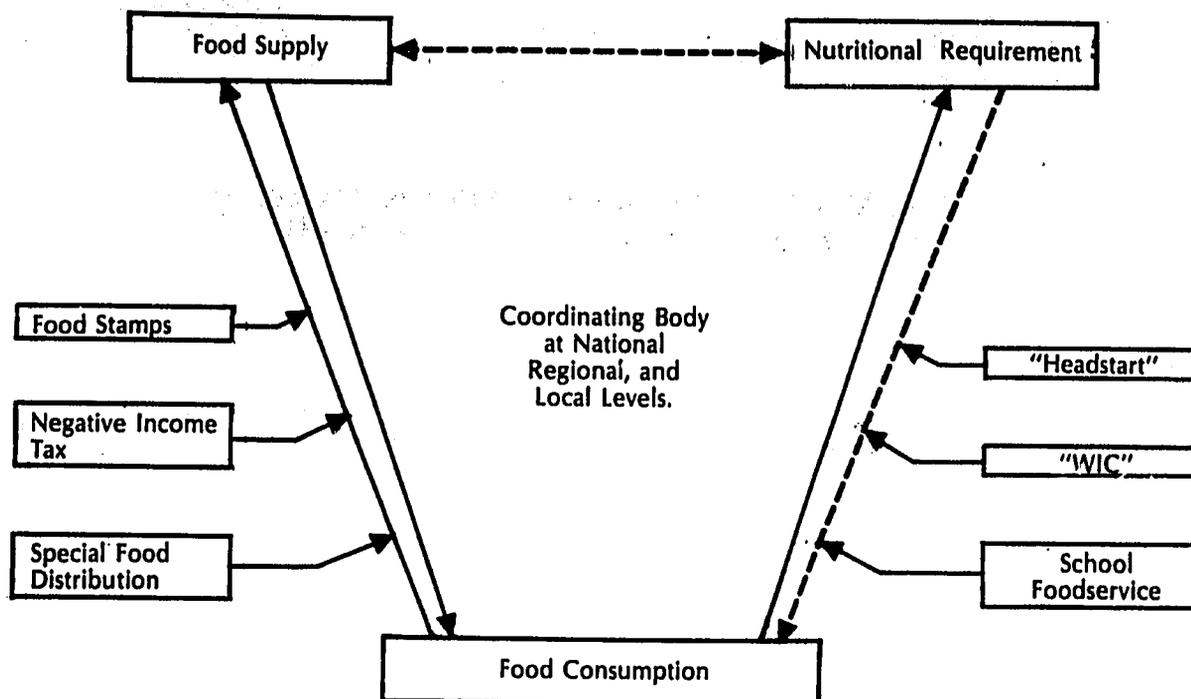
Objectives are to develop national food and nutrition policy and program, make food available in the community, make efficient use of available food resources, develop feeding programs for nutritionally vulnerable groups, and develop schemes of community nutrition education.

All countries should be encouraged to develop a national food and nutrition policy aimed at the nutritional improvement of all people. For realistic formulation of government policy, baseline data should be gathered from existing research and applied programs. Where no baseline data is available, countries should initiate studies to collect such information.

Baseline data required for policy-formulation and program planning include anthropometrical and biochemical assessment on nutritional status of people, mortality and morbidity statistics, incidence and severity of nutrition related diseases, food consumption and sources of food, food beliefs and dietary habit including infant feeding practices, and current and potential food production at national and local levels.

Major components of national nutrition program are shown in Figure 5.

Figure 5
Components of National Nutrition Program



Owing to the complexity of the factors affecting food consumption and nutritional status of people and the need to involve many disciplines in the solution of problems, it is essential that a program coordination body should be created. At different action levels—namely, national, regional, and local—this body with the participation of all related departments and agencies, including agriculture, health, education, economic planning, community development, social service, and church and voluntary agencies, will analyze factors affecting food consumption and nutrition status. While the national coordination body deals mainly with policies and overall program evaluation, coordination for routine implementation should be a regional (provincial/county) and local (village/town) responsibility. Of course, the actual operation should still be in the hands of individual ministries.

A national food and nutrition program should consider ways and means to improve health and nutritional status of people; food availability, with particular emphasis on domestic food production; food conservation, preservation, and processing at home and at the village level; equitable distribution of food in the community; introduction of special intervention programs according to need; and strengthening home economics and nutrition education.

Nutritionally vulnerable groups include pregnant women and nursing mothers, infants and children, and other vulnerable groups (depending upon the situation in different countries).

Suggested ways to improve nutritional status of pregnant women and nursing mothers include exposure to intensive health and nutrition education, rehabilitation of mothers through child-spacing, and supplementary feeding if necessary. The nutritional status of infants and children may be improved through promoting breast-feeding, introducing supplementary foods at the appropriate time, offering health protection and nutrition education for toddlers, preschool, and school children, and expanding the school feeding program.

In conclusion, the workshop was not long enough to make more specific recommendations for additional research in areas of immediate concern. The time constraint made it impossible for completion of aforementioned objectives. Workshop participants did exchange school feeding program ideas and techniques through country reports and special technical papers as referenced in the proceedings. Within the reports and technical papers, numerous ideas are presented to stimulate better nutrition in families and communities of developing countries.

Recommendations from this workshop represent the state of the art as it is known today in the represented Asian and Pacific countries. Participants provided sufficient detailed summary information on school feeding programs to include in the final report. This information points out similarities in school feeding programs and serves as the basis for group work discussions. Recommendations for a future workshop include evaluating the results and reports of this workshop, reestablishing program emphasis, and requiring future participants to review these proceedings and reports prior to attendance at another workshop.

While the scope and magnitude of the workshop were too great to accomplish all program objectives, these proceedings contain the most current data on the respective Asian and Pacific countries and are an invaluable resource for individuals researching school feeding programs. This was the first general overview workshop in this area of mutual interest in 20 years, covering all aspects of school feeding, nutrition education and training, and specific problems with community nutrition efforts.

Follow-up workshops will incorporate the general overview outcomes of this workshop and will concentrate on a specific interest areas such as school foodservice feeding programs, nutrition education and nutrition training programs, or community nutritional improvement programs.

Section I: School Foodservice and Nutritional Improvement of Children

GENERAL OBJECTIVES AND COMMON PROBLEMS IN SCHOOL FEEDING PROGRAMS IN ASIA

School food provision in Asia can be traced back to the beginning of this century or perhaps earlier. The current state of development varies greatly in different countries, from stainless steel kitchen equipment and automatic cooking devices to improvised "three-stone stoves" outside of classroom buildings. A variety of foods are offered to children, from nutritionally balanced, attractive, complete lunches to a few donated milk biscuits. Coverage can be as much as 99 percent of the total enrollment of all elementary schools in the country to only an infinitesimal fraction of the target school population.

The first School Feeding Seminar for Asia and the Far East convened in Tokyo in 1958 under the joint sponsorship of the Food and Agriculture Organization of the United Nations, the World Health Organization, and the United Nations Children Fund. This event stimulated considerably the development of school feeding programs having defined objectives in a number of countries in Asia.

While the objectives of school feeding in different countries may not be uniform, there are several major objectives shared by most of them with different degrees of emphasis. In operating a school feeding program, many problems, expected or unexpected, may be encountered. It is most valuable to have the opportunity to exchange experiences in solving these problems.

General Objectives

If we look at the early history of school food provision, "filling hungry stomachs" was undoubtedly the major and, sometimes, the only objective of the endeavor. Often, the program was initiated in indigent areas by civic minded people for humanitarian purposes and food was usually free to the less privileged children. Nutritional quality of meals was not a prime consideration.

The idea of using school feeding as an intervention measure to improve nutritional status of children is relatively new. Nutrition surveys in different countries revealed serious malnutrition problems of school children, notably growth retardation, deficiencies in vitamin A, riboflavin, thiamine, ascorbic acid, and iron. Mid-morning snacks or complete lunches were designed to provide calories, protein, and other nutrients deficient in children's family diet. This is a common objective shared by all school feeding programs in Asia.

Spreading health and nutrition education through school feeding program is highly advocated. Through the school feeding environment, children can learn sanitation, personal hygiene, food selection and preparation, nutrition value of different foods, and the qualities of a nutritionally balanced meal. Mothers and other family members also can benefit from participation in school feeding and other related activities. A number of countries feel that this is the prime objective of a school feeding program and that it could have life-long effects on the health and nutritional well-being of all people.

While convenience is not among the primary objectives of school feeding, it becomes increasingly evident that parents find that school food provision frees them from the trouble of preparing lunch boxes for children in early morning. Both parents may be employed due to rapid industrialization in a number of countries. The labor shortage in rural areas, particularly during the farm's busy seasons, also prevents parents from spending much time in the early morning preparing food for their children. Thus, school feeding programs fulfill a growing need of both urban and rural families.

During postwar years, rice production in some Asian countries has not met local demand. These countries have depended on imported rice to fulfill domestic food requirements. On the other hand, wheat prices in the international market are only half of those of rice, since wheat is produced in the United States, Canada, and Australia, countries not affected by war devastation.

Many rice-eating countries, notably Japan, Korea, and the Republic of China, have made a great effort to encourage wheat flour consumption in order to reduce rice import or free rice for export, thus benefiting the individual consumer as well as the national economy. School feeding is undoubtedly a good channel for promoting wheat flour consumption. Japan and the Republic of China now find difficulty in disposing of their surplus rice, and very soon Korean will reach rice self-sufficiency. This objective for school feeding may be soon eliminated.

The school feeding program also can be initiated with political motives, showing the concern for the community among politicians who wish to obtain support from the area. The program is also a means for generating some income for the school through the operation of a cafeteria, canteen, and other food operations by the teacher-parent association, school cooperatives, or some individual person. Often this is a real objective behind a school feeding program.

Common Problems

There are many problems arising from school feeding programs common to most countries in Asia. School is a government institution and school feeding can affect all the children in elementary and secondary schools. The blessing and support of government, especially the ministries of education and finance, is most essential. Without top policy support, the program can hardly go far. It should be recognized that many programs compete for the education budget. Priorities are different in different countries. Unless school feeding can be considered an integrated part of the overall school system—a valuable investment for next generation—its chances of success could be very remote. With the exception of only a few countries, government support to school feeding programs is relatively weak. Legislative action in school feeding can prove most valuable.

On the other hand, school feeding programs are not necessarily well supported by local community primarily due to poor communication between the school and community leaders. Some schools fail to motivate community interest and utilize and develop community resources to support feeding programs. Parents should understand that the purpose of school feeding is to benefit their children not to impose a burden on them. They should be actively involved in planning, cooperation, and supervision of a local school feeding program in order to win their confidence and support.

Efficient management of available resources to meet the objectives is essential to the success of all programs. That many school feeding programs in Asia failed or enjoyed little progress can be attributed to poor program management. Planning should be carefully made based on objectives and available resources. Starting the program with a pilot or experimental project can save costly failures.

An important component of program management is the training of personnel. Training should be job-oriented and duties and responsibilities of people involved in the program should be clearly defined. Even though training is expensive, it is nevertheless a worthy investment. Program evaluation, a periodic assessment of the program's direction and speed toward its objectives, should be an activity of program operation. It is also a means to attract government and community support.

In view of the fact that school feeding programs involve health, education, agriculture, and other related disciplines, close coordination and cooperation among concerned agencies should be maintained and strengthened. The starting point is joint program planning so that mutually agreed upon commitments to assist the program can be carried out smoothly. Currently, coordination is poor in most countries. School feeding programs are considered a part of the education department and have little support from other agencies.

Periodic coordination meetings, if well planned, can iron out many problems encountered in the program and provide increased support from the cooperating agencies.

The education emphasis in school feeding appears to be diminishing gradually in some Asian countries. Mothers no longer help in food preparation since ovens, pressure cookers, and automatic equipment need well trained hands. Children no longer work in school gardens since no more land is available for gardens due to rapid urbanization. Even classroom teachers often do not eat lunch with children. School feeding gradually turns to cafeteria feeding and the nutrition education component is not emphasized as before. While this development may be unavoidable, other approaches to nutrition education should be developed along with school feeding programs.

Outlook

The elementary school is the only public institution spreading to every corner of the country and keeping day-to-day contact with most, if not all, families. Classroom teachers far outnumber all other public servants. The school is the most respected institution in the community. Any activity initiated through school automatically carries weight.

School feeding is a direct approach to improve nutritional status of children who are in the stage of rapid growth and development requiring special nutrition protection. Through well designed activities such as teacher-parent associations and sister-mother club meetings, and teachers' home visits, school is an efficient channel to reach preschool children and other nutritionally vulnerable groups.

School feeding should not limit its scope only to the provision of food to school children. It is a medium of health and nutrition education. In rural areas, the program should be designed to stimulate local food production as well.

Y.H. Yang

SCHOOL FOODSERVICE AS AN INTEGRATED PART OF CHILDREN'S NUTRITIONAL IMPROVEMENT PROGRAM

The National School Lunch Program was created in 1947 to give children a nutritionally adequate hot lunch at school; serve as a means of distributing some farm surpluses; and train children, and thereby families, in good food habits. Requirements for Type A school lunch were set so that the lunch supplied from one-third to one-half of the food needed daily by a child and contained one-third to one-half of all nutrients required, not just bulk and calories. Adjustments now need to be made in quantity for the younger child and especially for the high school teenager.

Emphasis on Nutrition Training and Education

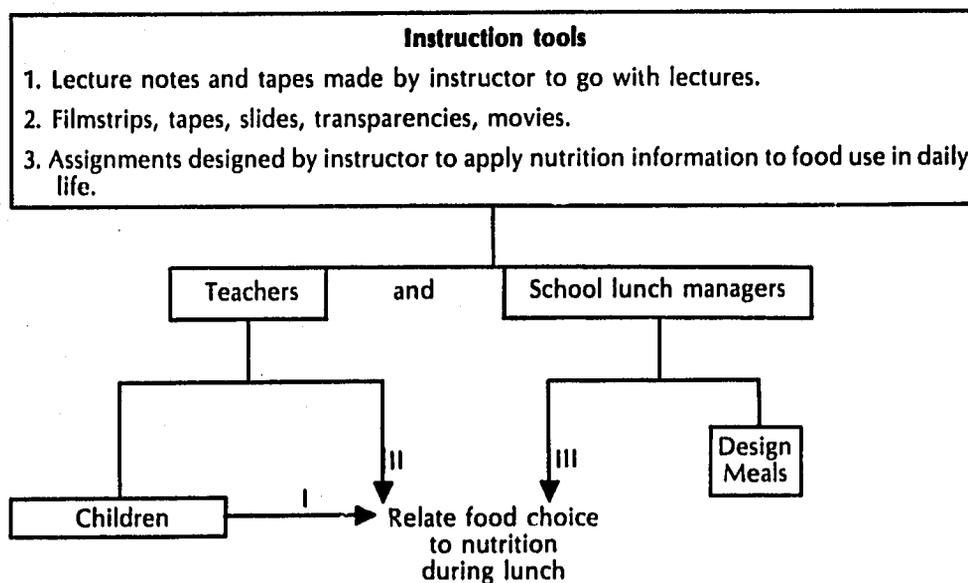
The success of this program depends on cooperation among three main parties involved—the school lunch managers in the cafeteria, the children who consume the lunch and are the targets of the program, and the teachers whose responsibility is to teach children.

In Hawaii, evidence shows that the target group's acceptance of school lunch and the training of children on good food habits are weak elements of the school lunch program. This may be seen in reported plate waste, minimal nutrition teaching in elementary schools, and confusion about nutrition knowledge documented among certain products of the school systems. Efforts to improve acceptance of school lunch foods hinge on strengthening the weak elements. Thus nutrition education should be a viable part of the school's curriculum and teachers should receive in-service training on basic nutrition information, how to teach nutrition facts to children, and how to use nutrition information in their homes.

A Recommended Model

Figure 1 shows how these recommendations might be achieved.

Figure 1
Nutrition Education for Teachers: A Self-Guided Home Study Course
Food and Nutritional Sciences (FNS) Course no. 480, University of Hawaii



For program effectiveness, processes one through three must occur frequently. In Hawaii, since the advent of collective bargaining, process two is eliminated. The bargaining union has bargained lunch time out of teachers' responsibilities. Only very dedicated teachers and school lunch managers can make processes one through three occur simultaneously. This has happened at Maui. The school lunch manager who took the "home study course" coordinated with the kindergarten teachers and the principal of the school and designed a special nutrition education project. All the elements of the model were functioning and during the time the special project continued, it was very effective.

Bluebell R. Standal

TRAINING OF SCHOOL TEACHERS IN THE KOREAN SCHOOL LUNCH PROGRAM

To make training effective, Korea's Learning System was introduced in curriculum development for the training of school teachers in the school lunch program. The duties and responsibilities of a school teacher assigned to be school lunch supervisor were defined and hence training was designed to develop the necessary competencies.

A primary school teacher as school lunch supervisor has two years of junior teacher's college training under the supervision of a school master in general education areas. He works mostly with primary school children, and has special responsibility for the school lunch program. Furthermore, he has the additional responsibility of disseminating nutrition information and providing guidance in food habits for better health of children and community people.

General Duties and Job Analysis

Duty I. Plan menu for school lunch every day.

Task 1. Investigate foods available for school lunch besides bread.

Task 2. Plan menu.

Duty II. Supervise cooking and preparation of lunch in school kitchen.

Task 1. Plan kitchen facilities and feeding utensils for children.

Task 2. Plan kitchen layout and arrange facilities and utensils in proper position.

Task 3. Arrange daily working schedule for laborer and helper in the kitchen.

Task 4. Inspect cooked food before discharge from the kitchen.

Task 5. Inspect kitchen cleaning and arrangement after cooking done.

Duty III. Teach foods and nutrition to primary school children.

Task 1. Plan a program.

Step 1. Develop syllabus of the text according to timetable of the semester.

Step 2. Prepare teaching aids such as posters, models, pictures, etc.

Task 2. Conduct the classes.

Task 3. Evaluate the results.

Step 1. Assess whether students can match their nutrition information with items on the lunch tray.

Duty IV. Disseminate nutrition information to the community for better understanding of school lunch program.

Task 1. Formulate mothers' classes and fathers' classes.

Step 1. Prepare teaching materials such as models, pictures, and manuscripts on nutrition principles.

Step 2. Formulate the team to help prepare school lunch for the children.

Task 2. Formulate nutrition classes for village leaders and related personnel in the community.

Duty V. Plan some supportive activities to help school lunch such as raising rabbits, chickens, and pigs, and home gardening for green vegetables.

Task 1. Consult with school headmaster and other related school personnel concerning problems of preparation for raising animals and home gardening.

Task 2. Start the program.

Training Courses

Training of teachers in nutrition education is essential in attaining a satisfactory school food and nutrition program. The objective of teacher training is to create the most effective and economic means of implementing nationwide school feeding and nutrition education programs. The specific objective of teacher training is to help start proper school feeding programs in remote areas, such as rural, coastal, mountain, and offshore areas where malnutrition or undernutrition problems are much more prevalent than in urban areas.

The Ministry of Education initiated and conducted three consecutive training courses for teachers: project planning workshop, an in-service workshop including a workshop for food production staff and a workshop for food preparation staff, and an evaluation workshop.

Project Planning

The purpose of the project planning workshop is to introduce the objectives and requirements for establishing a pilot school nutrition program and to exchange information available for preparation of the individual plans of operation in a pilot school. Participants and responsible administrators include headmasters and chairmen of teacher-parent associations from individual schools, county, food supervisors, and province officials concerned. The workshop lasts four days and takes place at Ewha Womens University.

Courses and other activities included in workshop are shown in Table 1.

Table 1
Project Planning Workshop Courses

Subject	Content	Hours
Principles of nutrition	Importance of nutrition; functions of nutrients	2
Korean food situation and policy	Introduction of food and nutrition survey	2
Concepts of school feeding and the necessity of nutrition education	Purposes and aims of school feeding	2
Nutrition education	Goals of nutrition education; methods of school nutrition education; introduction of nutrition education materials; demonstration of puppet show	2
Management of food hygiene and sanitation in the school feeding program	Hygiene and sanitation; poisonous foods	2
Water supply	Supplying safe water to the students	1
Plan of kitchen setup	Planning model kitchen; determining size of kitchen	2
Guidelines for self-sufficient pilot feeding program	Purpose of pilot program; approaches of program; how to involve community in program	2
School feeding program as an education activity	How to integrate nutrition into other subjects	2
Presentation of preliminary plan of operations for each school and open discussion	Presenting each participant's preliminary plans of operation; how to initiate program; administrative procedures.	3

Field trips are taken to Namgok school (1972 pilot project school), the applied nutrition program of office of rural development, and the institute of Livestock Research.

In-service Workshop

The purpose of the in-service workshop for food production staff is to develop the competencies of participants to assume leadership of the pilot community supported school feeding program and to increase their technical knowledge so that they can carry out these operations effectively. Participants include province/special city food supervisors, county food supervisors, and headmasters of the schools. The workshop lasts six days and takes place at Ewha Womens University and at the technical bakery school.

Courses and other activities included in the workshop are shown in Table 2.

Table 2
Food Production Staff In-Service Workshop Courses

Main Topics	Subjects	Contents	Hours
Foods and Nutrition	Basic principles	Functions of food; food values; nutritive requirements for school age children	2
	Food situation in Korea	Actual status of food supply and demand in Korea (according to the food balance sheets); future policy	1
	Food consumption patterns in Korea	Caloric and nutrient intake in Korea—by categories; intake of school-age children.	1

Main Topics	Subjects	Contents	Hours
Foods and Nutrition (continued)	Planning school feeding menus	Presentation of the food stuffs to be used for school feeding; meal preparation for school-age children; nutritive requirements for school-age children; school feeding menu-practice	3
	Nutrition education	Presentation of nutrition education materials; presentation of puppet show	1
	Nutrition education techniques	Objectives of nutrition education; nutrition education at school	1
	Community nutrition education	Contents and methods of nutrition education practiced by Office of Rural Development	1
School feeding: Importance and present status	School feeding as an education activity	Significance and importance of school feeding in the domain of education activities	1
	Nutrition education through school feeding activities	Report of study on effect of school feeding on food habits	1
	Baking theory and practice	Raw material and products; outline of techniques and facilities; baking practice	5
	Food hygiene	Food hygiene law; food poisoning and diseases; handling food stuffs and cooking equipment	
Food production	Growing of green leafy and yellow vegetables	Fundamental theory and cultivation techniques; kinds and facilities suitable for school gardening; main points to be kept in mind for growing; economic outlook; vinyl house	2
	Pomiculture	Fundamental theory and management techniques; suitable kinds and facilities for school gardening; main points to be kept in mind; economic outlook	1.5
	Soy-bean production	Fundamental theory and growing techniques; suitable kinds and facilities for school gardening; main points to be kept in mind; economic outlook	1.5
	Rabbit breeding	Fundamental theory and breeding techniques; suitable species and facilities for school breeding; main points to be kept in mind; meat processing methods	1.5
	Poultry breeding	Fundamental theory and breeding techniques; suitable species and facilities for school breeding; main points to be kept in mind; economic outlook; duck breeding techniques and facilities; species; main points to be kept in mind	2
	Pig breeding	Fundamental theory and farming techniques; suitable species and facilities for school farming; main points to be kept in mind; economic outlook; heat processing method	1.5

Main Topics	Subjects	Contents	Hours
Food production (continued)	Beekeeping	Fundamental theory and farming techniques; suitable species and techniques for school breeding; main points to be kept in mind; economic outlook	1
	Inland fish breeding	Fundamental theory and farming techniques; suitable species and techniques for school breeding; main points to be kept in mind; economic outlook	1.5
Presentation of the pilot school feeding operation	Field survey	Ha-jum elementary school Kangwha Gun, Kyonggi Province	4
	Briefing	Briefing on the operational status of the 74 established community supported pilot feeding schools	2.5
Other	Special lecture		0.5
	Special lecture—community cooperation		1
	Items for discussion—Suggestions—Proposals		2
	Evaluation		0.5

In-service Workshop for Food Preparation Staff

This workshop has been planned for the staff in charge of operating school feeding and nutrition education programs. Its aim is to explain the goals and to impart knowledge needed to implement these programs. Staff in charge of feeding and nutrition education from schools and the staff of the Ministry of Education are participants. The workshop is nine days in duration and takes place at Ewha Womens University.

Courses and other activities included in workshop are shown in Table 3.

Table 3
Food Preparation Staff In-Service Workshop Courses

Main Topics	Subjects	Contents	Hours
Lectures	Concept of school feeding and directions for its improvement	History of school feeding; objectives of school feeding; present status and future direction	2
	School feeding as an education activity	Need for the program; significance of program; goals of program	2
	Food situation in Korea and related policy	Status of food supply in Korea	1
	The need for a coordinated community approach to school feeding	Involving the community and related agencies in the program; how to get parents involved	2
	Methodology for effective food production activities in the elementary school	Kinds and quantity of production for an effective program; effective management of food production activities	2
	Nutrition in relation to growth	Functions of food; nutrient requirements; nutrition in relation to growth	3
	Status of Korean food intake	Status of food intake in different areas; status of students' food intake	1
	Experimental cooking	Functions of foods; basic food groups; nutritional value of foods; basic food preparation principles; cooking methods	4

Main Topics	Subjects	Contents	Hours
Lectures (continued)	Theory of food processing and preservation	Food preservation principles; methods of food preservation	2
	Meal planning	Meal planning; planning meals to meet day's requirements; basic principles in meal planning	2
	Nutrition education	Goals of nutrition education; method for school nutrition education; introduction of nutrition education materials; demonstration of puppet show	4
	Implementation of nutrition education in the curriculum	Incorporation of nutritional education into different subjects of the school curriculum; analysis of present curriculum	1
	Community nutrition education	Community nutrition education content and methods	2
	Food hygiene and sanitation in school feeding programs	Food hygiene law; food poisoning and disease; food and equipment handling	2
Practice	Lab, practice in preparation of proposed inexpensive, balanced regional menus	Side dishes; complete balanced meal; rabbit dishes	6
	Practice of food processing and preservation	Principles of food preservation in jars; practice of food preservation in jars	3
	Theory and practice of baking	Bread recipes and ingredients; techniques and equipment for baking; baking practice	4
	Techniques of nutrition education materials	Introduce easy-to-make and inexpensive education materials; develop some of the materials for nutrition education	2
	Meal planning preparation	Calculation of nutritional value of meal; utilization of locally available foods for menus	2
	Field trips	Visit to Urban Model Feeding and Nutrition Program in Seoul	Chang-choong elementary school
Visit to Office of Rural Development		Introduction to the applied nutrition project and rural guidance program	2
Visit to dairy farm and milk processing company			4
Group discussion	Visit to Seoul Junior Health College		2
	Divide participants in small groups	How to utilize locally available foods in menu planning; effective methods of meal management; method of introducing nutrition education through school feeding	4
	Evaluation Program		1
	Course evaluation		1
	Total		67 hrs.

Evaluation workshop

The purpose of the evaluation workshop is to exchange experience on management of the pilot program and to discuss operational problems, both among participants and with the Ministry of Education staff. Participants include headmasters of schools, senior supervisors of related GUN county boards of education, senior staff of related provinces, and staff of the Ministry of Education. The workshop lasts three days and takes place at the education research institute of Kangwon Province Board of Education.

The workshops include lectures on the importance of nutritional supplements for growing children; methodology for the effective food production activities in primary school; status and demand projection on food and nutrition in Korea; methods of nutrition education; results of baseline and progress survey in pilot school; need for a coordinated community approach to school feeding; and improvement in school feeding and nutrition education programs. Field trips include visits to the self-sufficiency program of Kwang-duck Primary School in Kangwon province. Group discussions cover how to encourage parents' participation in school nutrition programs and to secure financial resources; how to manage gardening and animal raising most effectively in the primary school; implementation plan for nutrition education; and how to improve the nutrition value of meals and achieve more effective management of feeding.

Sook-he Kim and June-kyo Park

TRAINING OF SCHOOL FOODSERVICE PERSONNEL IN KAPIOLANI COMMUNITY COLLEGE, UNIVERSITY OF HAWAII

This curriculum, being offered in the foodservice division, Kapiolani Community College, is designed to prepare students for employment in the foodservice field, principally in the area of management and/or supervision. After 60 semester hours, graduates will earn an associate in science degree and may qualify as managers, supervisors, or assistant managers of foodservices in restaurants, hotels, public schools, institutions, clubs, and hospitals.

Basic Requirements—18 Semester Hours

Communication (3)—written English; oral communication; literature.

Quantitative (3)—mathematics.

Natural Sciences (3)—dealing in scientific information and inquiry. Biology, botany, chemistry, microbiology, oceanology, physics, zoology.

Social Sciences (3)—dealing in personal and societal problem-solving and the undertaking of responsibility for issues and public concerns. American studies, anthropology, economics, geography, political science, sociology.

Humanities (3)—dealing in values, the testing of assumptions, and arrival at moral choices. Humanities, philosophy, religion.

Practical and Fine Arts; Physical Education (3)—dealing in creativity, appreciation of others' creativity, and development of skills to use leisure time. Arts; drama, health and physical education, music, literature.

Major Requirements—42—Foodservice (FSER)

FSER 103, First Aid—(1)

The student will gain new and useful information for application to healthful daily living, with emphasis on the prevention of accidents and first aid care. Includes cardiopulmonary resuscitation.

FSER 120, Introduction to Foodservice—(2)

An introductory course in commercial foodservice, including discussions of career opportunities in the industry, and essential information about foods, sanitation, safety, terminology, and work habits.

FSER 123, Nutrition and Menu Planning—(2)

Principles of nutrition as related to foodservice and to the maintenance of good health. Preparation of well-balanced menus, taking into consideration the factors of format, cost, procurement, production, merchandising, and the use of essential nutrients.

FSER 131, Storeroom Operations and Stewarding Procedures—(3)

Study of the organization and operation of a central storeroom. Provides experience in ordering, receiving, pricing, storing, distributing, and controlling the flow of foods, supplies, and equipment. Also covers the organization and operation of stewarding department, including dishmachine operation and general maintenance of equipment.

FSER 135, Dining Room Service—(6)

Study and practice in various types of table service with proper serving etiquette, including experience in a public dining room.

FSER 140, Fundamentals of Cookery—(7)

Principles and skills in baking and cold food production. Includes practice in preparing salads, sandwiches, appetizers, and desserts. Covers the techniques of using standardized recipes and the handling of commercial tools, equipment, and materials.

- FSER 231, Purchasing and Cost Control—(4)**
 Study of food control systems used in hotels, restaurants, and institutions. Principles of and practice in purchasing foods and supplies. Experience in preparing daily and monthly cost reports and sales analysis.
- FSER 240, Culinary Art in Food Preparation—(7)**
 Principles and skills in quality food preparation and quantity food production. Deals especially with foods commonly served by hotels and specialty restaurants. Culinary experience at various kitchen stations.
- FSER 250B, Equipment Layout and Design—(3)**
 Principles of space arrangement and work simplification. Study of planning, selecting, maintaining, and locating commercial equipment and facilities for various types of foodservice operations. Schematic drawings to show efficient food preparation and service layouts.
- FSER 250C, Food Service Management—(4)**
 Analysis of management functions in commercial and institutional food and beverage production and service through case studies. Includes a study of production planning, kitchen organization, merchandising, and personnel and labor relations.
- FSER 251, Foodservice Internship and Seminar—(4)**
 Supervised on-the-job foodservice experience in hotels, restaurants, public schools, clubs, and hospitals. Regular appraisal of learning progress (see Figure 1).

Course Outline—Foodservice Internship and Seminar

Course Objectives: Upon completion of the course the student should:

1. learn to use those kinds of equipment peculiar to school foodservice departments.
2. learn the accepted procedures of setting-up the serving lines and the service of meals according to the standards of the Department of Education.
3. learn the daily and monthly bookkeeping and record keeping procedures peculiar to school foodservice departments.
4. prepare the daily computation of school lunch transactions (numbers served and cost of food sold).
5. prepare the purchase requisitions and call purveyors for orders.
6. record supplies received and used on the perpetual inventory cards.
7. check invoices and submit the "invoice transmitted form" weekly.
8. prepare the daily cash for cashiers and observe the procedures for making ready for armored car pick-up.
9. prepare the daily work sheets for cafeteria staff.
10. check and assign student monitors.
11. learn to get along with cafeteria staff.
12. learn how to calculate the nutritional requirements according to the standards set forth by the School Lunch Program and the Type A lunch standards.
13. help prepare in the entree and baking departments.
14. learn the reporting procedures required of school lunch managers.
15. become acquainted with the school administration and school schedules.
16. learn some Department of Education policies and procedures.
17. learn what special requirements one must have to qualify for employment as a school lunch manager.

Methods of Instruction

Class discussion—students and instructor evaluate work experiences, discuss duties and responsibilities on the job, discuss personnel problems, and develop decision making techniques.

Individual conferences—students with special needs and problems may seek individualized instruction and advisement.

Student reports—student will be required to submit Work Experience Evaluation Forms and a narrative report of the work experience.

On-the-job experience—supervisor of the work station will be expected to evaluate the student according to the criteria of the college. This evaluation will be made on a Student Rating Sheet and will be submitted to the college upon completion of the student's assignment at the school.

With the permission of the school principal and designated supervisor, regular visitations are scheduled at the site by the instructor.

Figure 1
Kapiolani Community College
Foodservice Education Division

Food Service Internship

Date _____

Name of Institution _____
 Address _____

This agreement is between Kapiolani Community College, Honolulu, Hawaii, and _____, in order to provide identified learning experiences for students in the Food Service Internship Program.

The school foodservice facility will:

1. designate a person who will function as a laboratory education supervisor in order to coordinate the affiliation of the students and the college.
2. provide site orientation for students and college faculty.
3. provide field experience for students who have completed all the prerequisite courses in Food Service, in various aspects of the designated Food Service Facility. Hours of field experiences should total approximately 225 hours.

The college will:

1. require each student to maintain a medical accident insurance.
2. provide time sheets and related materials required by student during observation or field experience.
3. provide each student with sufficient knowledge in the basic concepts of Food Service Management before entry into the field experience sites.
4. require the student to be in acceptable dress for all field experience and observation, including an identification tag.
5. provide at least 3 visits by the college instructional staff to each facility in order to coordinate instructional and field experiences.
6. plan a rotational student assignment schedule including dates.

Effective date: _____ This agreement to remain in effect until _____.

Facility Administrator/Director _____ date: _____

Field Experience Supervisor _____ date: _____

Program Coordinator _____ date: _____

College Division Chairman/Assistant Dean _____ date: _____

Fred Ditzel

THE FAMILY LIFE EDUCATION TEACHER IN SUPPLEMENTARY FEEDING PROGRAMS IN INDONESIA

The concept of Family Life Education (FLE) originated from the 10 aspects of Indonesian family life: family relations, child development and care, foods and nutrition, clothing and textiles, housing, health, budgeting, home management, security, and family planning. Family Life Education has been implemented in the general schools since 1967. Nonformal education programs were developed to promote the concept early in 1962. FLE is implemented in three ways: as an integrated program (segments of FLE are infused into subjects such as health, social studies, and religion); as an individual study area, parallel to other study areas in the curriculum; as a prevocational course.

Foods and Nutrition

As a part of Family Life Education, foods and nutrition are taught in the schools. Curricular activities include identifying healthful foods in local markets, planning balanced meals, and introducing new nutritious foods (other than the traditional items sold at the local market). Other activities correlate body measurements to food intake and involve gardening and small fish ponds. Some efforts at poultry and goat farming also have been made.

Supplementary School Feeding

A school feeding program, as in countries having a school day from 9:00 a.m. to 4:00 p.m., is not known in Indonesia. Because class periods last three to four hours in the elementary schools and six hours in the secondary schools, lunch is usually taken at home. Many students, however, do not have breakfast before they go to school. They may carry a sandwich, a rice box, or other foods to be eaten during a break. Still, many of them buy snacks at the food stall usually set up by the schoolguard's wife. This food stall, called a "warung," sells foods such as candies; cookies; ice cubes containing water, sugar, coloring, and flavor; crispies; and soft drinks. Better quality foods are *gado-gado* (a vegetable dish with peanut sauce), fried soybean curd, and fried soybean cake.

The Family Life Education Teacher

Because foods and nutrition are taught as both integrated subjects and independent courses, the teaching responsibility is in the hands of FLE teachers as well as health teachers and social studies teachers. Since the FLE program is relatively new, there are not enough teachers familiar with the program and there are not enough teacher training institutes providing FLE programs. Graduates from the teacher training institutes tend to migrate to bigger cities, leaving their original profession to go into business and various industries. Rural areas outside Java are particularly short of FLE teachers. As the FLE teachers' role in implementing good food habits is obvious, their share in establishing a school foodservice should be recognized.

School health surveys in recent years indicate a high percentage of elementary children consuming a poor diet. Protein calorie malnutrition is evident. Vitamin A deficiency ranks second. Goiter is third in line. Nutritional anemia is also widely prevalent. Nutrition education, therefore, should include information on the effect of a balanced diet on growth and

development of the child, and how and why food makes a difference. Educating children to select the right foods from the schoolyard food stall should be part of the program. Helping with the family meals is a household activity commonly shared by students. Thus, learning experiences should be centered around problems involved in preparing and serving simple but attractive meals. The development of good food habits should be stimulated.

The FLE teacher should be able to set up a simple supplementary feeding program without putting the traditional food sellers at a disadvantage. In fact, preparation of the food could still be done by the schoolguard's wife, after she has been taught how and what to serve by the FLE teacher. The teacher-parent association could give a hand on a voluntary basis. Nutritious meals such as mung bean soup, *gado-gado*, and dishes made of soybean curd or fermented soybean cake should be promoted and no more food vendors from the street should be allowed to operate around the school. The food stall holder should be approached and informed of the necessity of serving food attractively and meeting sanitary requirements. A simple kitchen should be built and a veranda or a hall be changed into an attractive eating place

Constraints to Overcome

Because the government's first priority is providing sufficient school buildings for each age group, implementation of the feeding program receives little attention. This means that an educational program should be set up in order to brief school administrators, teachers, and parents. More teacher training institutes should be established and the enrollment of FLE students increased. A foods and nutrition training program should teach the vast number of teachers at all levels spreading over the entire archipelago. Although means of communications and transportation are developing at a fast rate, remote areas are still difficult to reach. An increase in the teachers' salaries would help in keeping them on the job.

Although constraints are not easy to overcome, attainment of better nutrition through a supplementary feeding program is not beyond reach, especially because of the recent attention given by the government to foods and nutrition. Facilities and safe water supplies should be provided to the schools in order to start a school foodservice program. Teachers and food handlers should be given in-service training on how to cook and serve food. Food stall holders should be briefed, and food vendors should be forbidden to operate around schools.

S. Tjokrowiriono

MOBILIZATION OF COMMUNITY RESOURCES TO SUPPORT THE SCHOOL LUNCH PROGRAM

Malnutrition still exists in many developing countries such as Asia, Africa, and Latin America. A great number of children are suffering severely from under-nutrition. Protein-calorie malnutrition is the most prevalent.

Infant mortality and early childhood deaths are generally high in developing countries. In Thailand, for example, according to the 1974 report of the National Economic Development Board, approximately 45,000 children died within their first five years. Cause of the deaths is associated with low resistance to diseases as a result of malnourishment and unsanitary living conditions.

The malnutrition problem stems from various factors. Major causes are economic deprivation and low educational level among the people of low socioeconomic groups. In Thailand, it was reported that a higher number of cases of malnutrition were found in the city slum areas than in the rural areas. This might be due to the fact that the cost of living is much higher in the city and the environmental conditions are poorer.

In developing countries, governments and even international agencies play important roles in trying to solve malnutrition problems. Many projects and programs are operated in order to promote the health conditions of the people. The governments' endeavors, however, are insufficient to meet the massive problems that have occurred in the country. While governments play a significant role in all promotion programs, implementation is usually remiss because bureaucratic regulations delay rapid progress.

International agency programs are mostly successful, but whenever financial support ceases, programs are likely to be terminated. Local resources there must be utilized. The community resources arrangement should have a significant role in any promotion program in the country.

School Feeding

School feeding service is a health promotion program that should be supported by voluntary organizations at the local level. Schools in different locations have different problems. For instance, some schools lack water while others lack cooking facilities. Some schools are located far from the market, making it difficult to get food items. Many schools have personnel problems, while other schools have building problems.

All these examples illustrate the fact that there is no particular formula for lunch program management that can be used by all. Community support should be organized and aimed directly at bolstering school lunch service. Organized community resources include college student groups who are taking courses in nutrition or home economics, medical or nursing students who are on duty during their field work session, village religion and youth groups, local agricultural extension and community development officers and public health nurses, village committees, and teacher-parent association groups.

Suggested contributions and activities are teaching basic nutrition to school children, arranging exhibitions and health

programs in the schools; fund raising; donation of cooking facilities; school agriculture promotion and food marketing; donation of daily allowances for a needy child to buy lunch (foster parenthood); providing or supplying some foods; taking turns cooking at the schools; and offering training programs for administrators and other personnel.

Motivating the Community

Volunteer groups could work vigorously to support the school lunch program for several reasons. They might see that school principals create good relationships within the community, that school achievements are a result of hard work, that achievements of children are a result of the school lunch program, and that recognition and cooperation given to the school by the local government results from the lunch program.

Although the school lunch program in Thailand has only recently been recognized by the government, voluntary working groups have always been very active in promoting school feeding around the country. One of the most outstanding activities is the fund raising done by the School Lunch Committee from 1974 to 1976. This committee is composed of about 25 persons from various government agencies. The committee's purpose is to persuade elementary schools in rural areas to set up lunch programs for which an amount of money is given. The committee raised over \$17,000 within a year and distributed \$250 to one school in each of the 71 provinces throughout the country. Training in school lunch management was given to the principals, the home economics teachers, and the head educational officers of each school. Nutrition education and agricultural promotion were included in the training program.

Many activities are carried on by other private organizations. Nutrition education is provided by several university student groups who introduce improved methods of teaching nutrition in the schools. Health education always accompanies nutrition education.

Demonstrations of food preparation were done by many volunteer groups. Introduction of nutritious low-cost foods were made in the villages. All these activities, however, are still insufficient and irregular. The main problem of the volunteer groups is lack of funding. Evaluation programs, therefore, cannot be executed.

Euwadee Kanjanasthiti

HEALTH AND SANITATION CONSIDERATIONS IN SCHOOL FOODSERVICE

At present, school sanitation is still unsatisfactory in Thailand as well as in other developing countries. The problems are mostly concerned with school location and inadequate sanitary facilities such as lighting, ventilation, safe drinking water, and sanitary privy. In 1975, a sanitary survey was made in 57 schools in Bangkok metropolis by the School Health Division. Findings of the survey are shown in Table 1.

Table 1
Sanitary Survey Findings 1975

		% of Total
Total schools surveyed	57	100.0
- primary schools	32	56.1
- secondary schools	25	43.9
- located nearby garbage disposal	3	5.3
- located near nuisance (car, motor boat, airplane)	13	22.8
- inadequate lighting	19	33.3
- inadequate ventilation	2	3.5
- unsanitary canteen	20	35.1
- unsanitary sewage disposal	17	29.8
- refuse and garbage disposal		
- incineration	13	22.8
- collected by metropolis service	44	77.2
- inadequate sanitary privy	32	56.1
- drinking water		
- rain water	12	21.1
- city water supply	45	78.9

In 1974-1975, a workshop on school health for provincial principals and health personnel was conducted. Questionnaires on school sanitation were sent to the principals of 2,039 schools in 15 provinces. The survey findings are shown in Table 2.

Table 2
Results of 1974-1975 Survey

Number of schools surveyed	2,039
Number of pupils or students	536,009
Adequate source of safe drinking water	1,083 (53.1 percent)
Inadequate source of safe drinking water	680 (33.4 percent)
Source of unsafe drinking water	276 (13.5 percent)
Adequate sanitary privy	698 (34.2 percent)
Inadequate sanitary privy	1,233 (60.5 percent)
Unsanitary privy and no privy	108 (5.3 percent)

The Sanitation Division, Department of Health, has launched a school water supply program that will be increased annually. It is expected, therefore, that in the next 10 years school children in rural areas will be supplied with safe drinking water. Each school construction plan is designed to include a privy. The principal will try to allocate funds for this purpose. To meet this need, it is suggested that there be a privy construction item included in the construction plan. The removal of the privy item would not be permitted. In addition, existing schools without privies would be allocated funds for construction of adequate privies to meet the need.

Health Habit Training

In fact, training for health habits should start from infancy and preschool. Parents should be responsible for such training. At school, teachers play an important role in giving health instruction. The objective of health instruction in school is to teach pupils and students about personal hygiene and environmental health to help them maintain and improve their own health and take appropriate measures in protecting the health of others.

Actually, health instruction in schools in Thailand is the teachers' responsibility. The method of teaching is to let the pupils read and take notes from the health education textbooks. Health demonstrations and activities or practices are very rare and there also is a lack of appropriate teaching materials. Limited evaluation indicates that school teachers consider this subject is less important than other subjects. In addition, some pupils and students have incorrect health attitudes or beliefs from their homes and community. The teaching of health habits is, therefore, less effective than it should be.

The Ministry of Public Health, Ministry of Education, and the Ministry of Interior have realized these problems. In 1974, a joint committee on health education was organized. The objectives and the role of this committee are to work for improvement of teaching and learning processes on health education in school in accordance with the local health problems of students and people in the community. A pilot project for this purpose is now in the implementation period.

Health habit training should include a curriculum modified according to health problems of local students and people in each community. All teachers who are responsible for health education should be properly trained in a special course. If it is impossible to carry on, in-service training should be conducted for the teachers, especially for those who teach this subject. Effectiveness in health habit training for school children depends on the teachers' attitudes about health, the support of school administrators, and provision of budget to produce or procure health education materials.

Health activities should be arranged for the school children to gain more learning experiences, and incorporated in the many extra-curricular activities, such as school sanitation programs, communicable diseases control programs, first aid rooms, students physical examination and treatments, and school lunch program. Parents and community should play an important role in supporting and cooperating with the health habit program. They can provide individual glasses for drinking water and toothbrushes for use at home and school. In addition, the school council and teacher-parent association should be organized for participation in health activities from the community.

Food Sanitation

Food sold by vendors for the mid-day meal of school children is neither nutritious, nor sanitary (see Appendix I). To improve the situation, in 1974, the School Health Division launched a project entitled "Food Sanitation in Schools" which had as its objectives to study raw data of food sanitation and study the health of food handlers in schools, improve food selling in schools according to processes of food sanitation, increase food sanitation knowledge of students and food handlers in schools, and prevent school teachers and students from gastro-intestinal diseases.

This project began during the last term of academic year 1974 (December 1974) and continued until academic year 1975 (March 1975). About 23 schools in Bangkok metropolis were surveyed and studied. Steps for implementing food sanitation included a sanitary survey for dining halls, a sanitary survey for food stalls, and bacteriological examination of food utensils. Further steps were physical examination including fecal examination and X-ray; treatment and advise for those who have diseases and follow-up procedures in every case; dissemination of information to food vendors on how to keep food in sanitary conditions and methods of sterilization for food utensils; dissemination of knowledge about food sanitation including demonstrations for the teachers and students allowing them to recognize how important sanitation is and to act as controllers or motivators for the food vendors; six month and thereafter annual examinations and resurveying of food sanitation including bacteriological examination of food utensils for assessment.

Future Plans

At present, the project is under operation. Because of a very limited number of personnel and a small budget, the project will be extended gradually to about 30 schools annually. It is expected, however, that the results of these activities will be a guideline to improve food sanitation in schools for the whole country.

Ulit Leeyavanija

Section II: Nutrition Education In School and in Community

SCHOOL FOODSERVICE AS AN INSTRUMENT TO STRENGTHEN NUTRITION EDUCATION IN SCHOOL

Dr. Merlin K. DuVal, former assistant secretary for health, U.S. Department of Health, Education, and Welfare has said, "Nutrition education is a process whereby the significant facts of nutrition are acquired by people in such a way that nutritional behavior changes..." The definition makes nutrition education sound simple. When it comes to interpreting nutrition education into goals, approaches, instruments, and measures of effectiveness, there is considerable inconsistency and disagreement as to who should be the responsible body of school professionals.

Nutrition education is a very young science, and there is not an abundance of controlled research that can validate the need for the specific curriculum. Throughout the United States, nutrition education has been extemporaneous and not designed to meet long-range goals. The White House Conference on Food, Nutrition, and Health, called in 1969 by President Richard Nixon, proposed many recommendations to eliminate hunger and promote a massive effort in nutrition education. As a result of this conference, many different food programs have been created and/or expanded. Food stamp recipients and free school lunch programs have grown in number. Breakfast programs for children, food programs for elderly, pregnant, and nursing women, plus foodservices for summer recreation programs have been instituted.

Consumer programs on unit pricing, open dating, and nutritional labeling have advanced since the White House Conference. Even with congressional concern, in 1975 the United States, supplied with figures from the department of Health, Education, and Welfare and verified by the Harvard University School of Public Health, spent \$110 billion on health care. Thirty billion dollars is attributable to diseases in which nutritional factors either played the primary role or were highly contributory.

The need for organized nutrition education efforts in the United States is immediate. The need is immediate for the simple reason that the days of "cheap food" are over. There are no farm subsidies. There are no huge stock piles of food anywhere in the world. Retro chemicals have increased all related food usage costs. Labor costs have increased. Low productivity in food production has increased.

Before we can educate children, they must be fed at school. Studies have helped define the nature of the nutritional problems and often have proposed solutions. Malnutrition does exist at both ends of the socio-economic scale. We need to look at the child and apply the skills, services, knowledge, and interests of many individuals, both professional and non-professional, in an instructional program to meet his needs. Nutrition education must be viewed as opening new avenues of alternatives, giving children positive attitudes about all foods they eat, and providing them knowledge to evaluate each available food within the context of a "well-balanced" diet.

The school lunch program is an excellent "living laboratory" where children can learn how to make good food choices. Eating habits are learned responses; therefore, dissemination of information in the classroom must be tempered with meaningful interpretation through the cafeteria experience in order to produce an educated, independently functioning individual.

Everyone who is concerned about the education of people and the welfare of the community plays a role in the nutrition education process. The school lunch program has become the largest single feeding program in the nation, and 350,000 school foodservice professionals can serve as an extension of the school educational arm in the cafeteria. The child needs to learn the skills to choose a well-balanced diet through knowledge presented in the classroom. The school foodservice department's big contribution is to help children develop good eating habits based on basic nutritional principles. Because children learn by doing, serving nutritionally balanced meals each day and encouraging children to eat these lunches can develop good food habits. By cooperating, teachers and school foodservice professionals can provide information on cultural food preferences, engineered foods, other factors affecting food availability, and food patterns that provide meal options.

Because the three meal pattern is nearly extinct, children must be taught how to choose the right combination of foods from the 18,000 items available. The United States' problem is one of over availability of snack food alternates that satisfy the immediate hunger of the child but do not necessarily provide the one-third goal of the recommended dietary allowances as established by the National Academy of Sciences. At least those children participating in the school lunch and related child nutrition programs receive approximately 58 percent of their recommended dietary allowance if they participate in both the breakfast and lunch program. School foodservice professionals have been the catalyst in almost all nutrition education efforts in the United States. Numerous approaches to nutrition education include organizing, through the school administrator, in-service training programs for school personnel, students, and parents; establishing communication networks about nutrition through various forms of media among selected school and community agencies at state, regional, and local levels; providing continuous guidance to school district personnel regarding the implementation of preventive nutrition and health education programs, their evaluation and appropriate alternations; exploring and utilizing mass media resources to publicize and inform school officials, parents, students, and concerned industry groups of relevant nutrition issues and school foodservice programs; and practicing good nutrition through well-planned meals at school.

School foodservice is an instrument to strengthen nutrition education. The lunch program has barely been used as an

educational tool. We must remind ourselves that the task of educating the whole child is complex. What results is a process of gradual maturation in which there is an integration of concepts with behavior. In nutrition education, we are faced with establishing priorities and developing systems that will mold and modify the behavior of these children. By working as a team — principal, superintendent, teacher, school foodservice professional, students, and parent — we can help prepare the child to meet the challenges of food selection for adequate diet. The lunch program is celebrating its thirtieth anniversary this year. We have just begun to educate the child about nutrition through education. The school lunch program is available to 89 percent of the schools. We are striving at the federal level to someday make nutrition education a reality to those same schools before the end of the next decade.

Clarice Higgins

TRAINING AND EDUCATION IN A COORDINATED FOOD AND NUTRITION PROGRAM

Increasing the capabilities of the trainers and those directly involved in the coordinated national food and nutrition program is a primary requisite to its successful implementation. School feeding and nutrition education in school is an integrated part of the program. The purpose of training is to develop a cadre of workers who will be or are involved in program planning, implementation, and evaluation. They provide the academic and practical experiences necessary in their work in the nutrition program. School leaders and workers are equipped with a broader knowledge of nutrition and related disciplines together with an understanding of the coordinated approach in solving nutrition problems.

Types of training are classified according to different levels—national, regional, provincial, and municipal—or according to orientation training, in-service training, and preservice training.

The national level training institute is conducted by a permanent staff of the National Nutrition Training Center or the Applied Nutrition Training Center and utilizes specialists from other agencies and institutions. National institutes are conducted for six weeks and are actually basic training in applied nutrition. Participants are key personnel of national and regional offices who are believed to have the greatest multiplier effect in influencing existing and future community agents. This training is multiagency. The course includes a three-week study of fundamentals in nutrition, agriculture, and health with appropriate practicum and another three weeks of exposure to planning and evaluation of a school and community nutrition program in actual operation. This administrative arrangement provides excellent opportunities for the trainee to gain training and experience in varied leadership roles. Personnel trained in this course are expected to provide leadership in conducting appropriate training courses in their locality.

Provincial level training is an echo of national training. Trainees come from provincial and district offices. It is multidisciplinary in nature, as participants come from the office of the governor, provincial community development office, and extension, health, and agriculture offices. Local or municipal training is conducted for school teachers and other municipal officers and lay leaders. In this group are the municipal mayors, barangay captains (village chiefs) and other leaders who can help disseminate nutrition information to the people in the community.

Training Objectives

Training is classified according to objectives. Orientation training is required to acquaint all officials and teachers with the objectives and methods of the program. In-service training is conducted within the respective disciplines and partly on an interdisciplinary basis to equip personnel for the job to be done within their own agency such as the training of nutrition supervisors or agriculture supervisors, or the training of nutrition supervisors, agriculture supervisors and health supervisors together.

The preservice training program in the teacher training institutions, which serves as the nutrition education and information center in the province, is of great significance. Nutrition teaching is integrated in some courses of the teacher training institutions. In their practice teaching, student teachers acquire functional and practical experiences relative to the nutrition program. They receive realistic laboratory experiences in actual food production, in snacks and meal preparation, and nutrition teaching in the community. These experiences are significant in that the future teachers become able and willing to participate in the objectives of change of food and nutrition habits through children. Duration of the training depends on the objectives of the training and the participants.

Nutrition Education in the Schools

Whenever nutrition education in the schools is discussed, the question of “why nutrition education?” arises. Are the children not eating or, if they are, is the food they are eating enough and of the right kind? Often, children are seen eating candies, ice candy, snow balls, etc.

In recent weight surveys, it was found out that three million out of nine million school children in the elementary grades are undernourished. The next question is “why?” Nutrition surveys found they are deficient in calories, protein, and vitamin A.

The school then launched the school nutrition program which is a comprehensive educational program that aims to improve the nutritional status of the school children. The program includes selective food production, nutrition education and training, supplementary feeding, and environmental health education.

Selective food production emphasizes the production of foods rich in the nutrients found to be deficient in the diet of children. Nutrition teaching comes in when school pupils learn the food rich in proteins, calories, vitamin A and iron. They are encouraged to plant mung beans, soybeans and other legumes, leafy vegetables, and papaya, and cereals like corn and rice in the school garden. Pupils, especially those taking gardening, are required to have home garden projects. The garden or agriculture teacher checks these projects in his home visits. The school garden raises foods that are used in the school feeding program.

The school feeding program is another venue for nutrition education. Nutritious foods are served. Children discuss what foods are being served and why. Likewise, nutrition teaching is carried out indirectly when the mothers or out-of-school youth help prepare snacks or hot lunches.

The policy of the Department of Education and Culture is to integrate teaching of nutrition in all subject areas to all grade levels of students—elementary, secondary, and collegiate. Guides integrating nutrition teaching together with corresponding unit text materials were developed during the curriculum workshops in the National Nutrition Training Centers. Appropriate nutrition education aids also are developed to support integrated nutrition education. Teachers are trained in content and methods of teaching nutrition in a training series conducted in their schools. Recent evaluation of school feeding and the nutrition education program showed a lower percentage of undernourished pupils, less absenteeism, more attention to work, and more active pupils.

Guidelines for Training

This guide outlines the suggested training courses for personnel involved at various levels. The courses include topics on the organization and management techniques in the implementation of the various aspects of the coordinated program. Emphasis is placed on the fundamentals of nutrition, food preparation, and food utilization as well as on methods for increasing self-sufficiency in food at the barrio (village) level, particularly protein and calorie sources and other protective foods. Practical approaches and opportunities for developing skills in the different aspects of community nutrition work also are embodied in the training program.

Organizing the Training Activities

The training program plays a major role in promoting active participation and sincere involvement in the implementation of the coordinated program. It can only achieve this if the organizers are fully aware of the necessary steps that will contribute to the efficient conduct of the courses.

Some steps that will help provincial planners in carrying out the training program include creating a planning committee composed of the nutrition program officer as chairman of the committee who shall serve as training coordinator; the project officer on training as vice chairman who shall be responsible for the organization, planning, and administration of the provincial training program; and the project officers in nutrition education and all key personnel who are graduates of the National Nutrition Training Center as members who shall assist in the execution of the training program.

Provincial planners should determine the date and place where each type of training is to be held. A timetable will help in scheduling the series of training programs and will be useful in organizing needed resources.

Planners must decide who should be invited to participate and prepare a letter addressed to the Provincial Head of Office (copy furnished to the national office), Head of Office (copy furnished to the national office), inviting their attendance at the training activity. Selection of participants should be based on their being actually involved in the program, their potential usefulness to the program, and their not having as yet completed any similar training activity. Reference should be made to the specific categories of participants to be invited as outlined in each training course.

Planners also should organize a secretariat to be in charge of physical arrangements (training hall, tables and chairs, sound system (if needed), blackboard, etc.); documentation (attendance sheets, training materials needed, etc.); invitations and follow-up with participants, lectures, and resource persons.

Determining fund requirements and the source of funds is also necessary. For project areas under the Four-Year Plan a modest amount for stipends will be provided by UNICEF. Transportation expenses for participants will have to be provided by the respective agency. For nontargeted areas that may want to implement the training programs, technical assistance (availability of speakers and/or resource persons through the National Food and Agriculture Council) and material assistance (teaching kits from the Food and Nutrition Research Center, NIST, and NSDB) are available.

Provincial planners also should prepare a list of teaching resources, aids, and techniques. Emphasis should be placed on mobilizing local resources as much as possible, and on utilizing graduates of the previous training programs. Guest speakers may be drawn from those who have graduated from the National Nutrition Training Center or key personnel who are knowledgeable in their own disciplines such as the nutrition program officer to discuss policies, objectives, concepts, and aspects of the Coordinated Food and Nutrition Program; provincial health officer to discuss the role of good nutrition in growth, development, and maintenance of health and environmental sanitation; project officer on supplementary feeding to talk on preschool feeding programs; agriculturist to talk on increasing food production and demonstrate techniques in crop production; home economics supervisors to deal with food needs and improving family diets and to talk on school supplementary feeding and education programs; home management supervisor to teach food preparation, discuss communication techniques, and teach the use of educational materials in nutrition, giving emphasis to learning and motivation; community development officer to talk on the need for cooperation and the role of community leaders in the program; and local leaders to discuss what the community can do in implementing the coordinated program.

Field trips and barrio visits for actual observation of nutrition activities and projects are also necessary. Arrangements have to be made in advance to provide participants with first hand experiences. Useful films are available on loan from the Division Office of the Bureau of Public Schools. Audiovisual facilities also are available on advance notice from the division office of Agriculture and Natural Resources Department. Leaflets, pamphlets, and other educational materials may be obtained directly from the Food and Nutrition Research Center, NIST, NSDB, or through the National Food and Agriculture Council.

Towards the end of each training session, an evaluation of the course in terms of objectives should be made as a means of improving future training programs.

Description of Training Courses

Since there are few personnel at all levels trained to deal with the practical aspects of community nutrition problems, national training activities are particularly directed towards the persons who are believed to have the greatest "multiplier effect" in influencing existing and future community agents. This group includes the administrators and supervisors of the cooperating agencies who are involved in the coordinated program such as the general office of the Bureau of Public Schools and the Bureau of Private Schools, those who organize and supervise programs at city/provincial and local levels from the division office, the Agriculture Productivity Commission, Presidential Arm on Community Development, Departments of Health and Social Welfare, Philippine Rural Reconstruction Movement, and representatives of both public and private organizations concerned with home and community improvement and welfare.

The course is of six weeks duration and is designed to provide the trainees with a combined academic-practical training in the actual tasks they are to perform on their return to their respective stations. Specifically, the objectives are such that at the end of the training, the trainee should be able to show an understanding of the rationale, philosophy, objectives, methods/techniques, and approaches of the Coordinated Food and Nutrition Program; identify and analyze problems related to the program and offer possible solutions; assume leadership roles in the Community Food and Nutrition Program; and synthesize knowledge and information gained in the institute to be able to plan, implement, and evaluate a nutrition program in his locality.

The faculty is composed of specialists in agriculture, health, nutrition, and nutrition education of the Department of Education. Consultants and resource persons are drawn from both national and regional offices, Agricultural Productivity Commission, Department of Agriculture and Natural Resources, Philippine Fisheries Commission, the Department of Health, the Presidential Arm on Community Development, the University of the Philippines, Nutrition Foundation of the Philippines, and the Food and Nutrition Research Center, NIST, NSDB.

The course includes a three-week study of fundamentals in nutrition, agriculture, and health with appropriate practicum and another three weeks of exposure to planning and evaluation of a school and community nutrition program in actual situations. This administrative arrangement provides many excellent opportunities for the trainee to gain experience in varied leadership roles.

Personnel trained in this course are expected, among other things, to provide leadership in conducting appropriate training courses in their own localities.

Orientation for Provincial / City and District Administrators

A three-day training is given for key officials of the province/city such as the governor or city mayor and chiefs of offices or the head of private schools, division office supervisors, district supervisors, and representatives of private agencies or groups. The training aims to give the key personnel in the province/city orientation on the following: problems related to nutrition in the province/city; rationale, philosophy, objectives, aspects and methods/techniques, and approaches of the Coordinated Food and Nutrition Program; need for coordination among the agencies cooperating in the implementation of the program; and a coordinated plan of action.

Echo Training for Baseline Investigators

This is a three-day training at the local level for all personnel of the cooperating agencies in the community. Trainees are expected to gain knowledge and skill in collecting baseline data.

Depth Training of Local Leaders

This is a five-day training for personnel of cooperating agencies who are mainly responsible for the implementation of the food and nutrition program both in school and in the community.

Lay Leadership Training

This aspect of the training program is considered very important because of the valuable contributions that lay leaders give to program development. Involvement of lay leaders is "a development process in itself as it helps to change their attitudes, knowledge, and skills and enables them to become influential leaders in their communities." In this group are the mayors, barrio captains, councilmen and *purok* leaders. In each training course some 20 to 30 lay leaders are recruited from the community involved in the program. This group is expected to help disseminate nutrition information and teach the skills they learned to the people in the community. Among such skills are preparing supplementary foods, planning and preparing adequate diets, making a compost heap, applying commercial fertilizers, spraying, water chlorination, and constructing blind drainage and sanitary toilets, etc.

Silvinia Laya

NUTRITION EDUCATION TO PARENTS THROUGH ELEMENTARY SCHOOLS

In China there is an old saying, "The hearts of all parents under the heaven are the same." Parents throughout the world, disregarding their differences in color, faith, sex, age, education, and economic and social status, have the same feelings for their children. They all love their children. They want to do the best they can according to the best they know for the good of their children, and they have particular concerns over the health and the development of their children.

There is another side of the picture that must not be overlooked. Many parents, despite their love for their children, do not feed their children properly, even in families with no financial difficulties. Many parents just do not have the necessary knowledge of nutrition. This is particularly true in areas where education is not open to all and where there is no effective program for extending nutrition education to parents.

Gathering many distinguished experts, scholars and administrators in this field from so many nations provides a great opportunity to exchange experiences and opinions on how nutrition education to parents could be best provided, and to find out some of the channels through which parents can be reached effectively.

The best, or at least one of the best, channels of nutrition education to parents is the elementary school because it is the most widely and evenly distributed agency throughout a country. In many countries, there is at least one school in every one of the school districts, urban and rural. By providing nutrition education to parents through elementary schools, one can reach the largest number of parents with the least extra cost. Elementary schools are the most effective channels because the ultimate aim of elementary education is to help children have a sound and healthy development. Nutrition education is given to children in all elementary schools and the school lunch program and other foodservices are provided in many schools. Elementary schools, therefore, not only have the qualified personnel to provide nutrition education to parents but also have the need and the responsibility to do so. Elementary schools are the easiest channel. Most, if not all, elementary schools have teacher-parent associations. Relations between parents and teachers generally are close and natural, and most parents are interested in participating in school activities.

Nutrition Education in China

As to the question of how nutrition education could be provided for parents through elementary schools, there are many alternatives. Each school should develop its own method and its own program tailored to the interest of its parents and its financial and manpower situations.

In China, nutrition education is given to parents through teacher-parent association activities such as lectures on nutrition in teacher-parent association meetings with discussions following.

In teacher-parent association meetings, children's health records are distributed with other school records to parents and parents are invited to discuss questions concerning nutrition and health of their children and their relation to their children's school work. Cooking lessons are arranged for parents and periodical cooking demonstrations and exhibitions of pictures and charts are organized. Parents are shown in simple rules-of-thumb how to select and cook various foods to get the most nutritional value while minimizing cost and preparation time.

Occasionally, parents are invited to have lunch with their children in school. The purposes are to acquaint them with knowledge of the basic nutritional needs of children and the nutritional values of various foods and to invite their participation in and support of school lunch programs.

While the teacher-parent association and its activities are generally schoolwide, with hundreds or sometimes thousands of people participating, only one mothers-and-sisters club is organized for each class. The smaller size brings the members closer. They come together more frequently and there is no formality. Unlike the usual teacher-parent association program, club activities are mainly geared toward each individual child and his particular needs and problems. The members are mothers and sisters partly because the women have more flexible time schedules. In China, mothers usually out-number fathers in school activities. Sometimes, big sisters of the school children come to participate on behalf of their parents. Selection of food, preparation of meals, and feeding of the children, are generally tasks for mothers or mothers with the help of big sisters. Mothers-and-sisters clubs organized for each class prove to be a most effective and satisfactory way to provide nutrition education to parents and to improve the state of nutrition and food habits of each individual child. That is why most schools in China now have mothers-and-sisters clubs.

To educate a mother is to educate the whole family. For the promotion of nutrition of the whole population it is most important that everyone be given some basic nutrition education. Nutrition education of mothers through elementary school could be the best approach to start such national programs. In extending parent education through mothers, not only mothers-and-sisters clubs are organized in Chinese schools, but also many mothers classes are organized. Some elementary schools even have classrooms assigned for the use of mothers. Nutrition is always one of their main interests.

Home Visit

The home visit is a routine responsibility of every classroom teacher in China and is always the most effective opportunity for nutrition education. Points brought up by the teacher during these visits receive better acceptance by parents, because they are seen as applying directly to the particular child and the particular problem. It is most helpful where the teacher emphasizes to the parents the state of nutrition and health of their children.

The potential of the elementary school in giving nutrition education to parents is great. The elementary school also has the potential to create enthusiasm among parents to support school lunch and other related activities in school. Elementary school teachers are community educators and most trusted workers. They must be effectively utilized particularly in nutrition education programs.

Chu-sheng Yeh Cheng

EVALUATION OF NUTRITION EDUCATION PROGRAM

In the United States there is no federal mandate for nutrition education. A few states, for example, California, Massachusetts, New York and Florida, have passed state legislation that establishes a specific amount of funds for special programs in nutrition education-health related activities. Currently, nutrition education is fragmented and sometimes administered by school foodservice personnel, local nutritionists, or interested teachers who have attended Dairy Council programs. Throughout the country, nutrition education related materials are developed by industry, textbook companies, private individuals without extensive training in nutrition or educational methodology, educational associations, and public health nutritionists. These materials represent films, games, booklets, pamphlets, posters, classroom activities and lesson plans to encourage teacher interest by providing complete kits so they can squeeze nutrition education into their busy class schedule. The fundamental problem in all current efforts is there is no proven evaluation mechanism. Since nutrition education is not a sequentialized component of each state's educational plan there is very little concrete evidence on which to evaluate nutrition education effectiveness throughout the United States.

In my school district, we made the following assumptions before implementing a nutrition education effort:

- Children's food habits could be improved through a nutrition education program.
- Our nutrition education emphasis would be based on the needs of the children as evidenced by a food habits survey.
- After the pilot period, guided by a nutritionist, the nutrition education program would be continued.
- After the pilot period, leadership would be required by school personnel with support and followup by school foodservice personnel.
- The success of our efforts would require continuous planning and participation and evaluation by teachers, pupils school foodservice personnel, and other community leaders, including allied nutritionists.

We found that the teacher's interest in nutrition, especially in the food habits of the students, was positively related to the teacher's effectiveness in teaching nutrition. Through the school lunch program, we measured the success of our nutrition education efforts through greater food acceptability and decreased plate waste. We included tasting parties, visitations by foodservice supervisors and managers to the classroom where they explained the lunch program and why different foods were required, some programs were video-taped and shown to other classes. Parents were involved by invitation to special food fairs.

The bridge between nutrition education as a science and nutrition education as a part of daily food choice was successfully crossed. From our nutrition education experiences we observed that a food habits survey can be an effective method of stimulating teacher interest in nutrition education. Once teachers are made aware of their students' nutrition education needs, they introduce activities to fulfill those needs and they rely heavily on school foodservice supervisors and directors for materials and resources. When the parents become involved, the teacher's interest increased. Teachers felt a need for guidance from qualified dietitians or school foodservice professionals during the entire nutrition education experience. As the teachers increased their nutritional knowledge they seemed convinced that nutrition education should be a part of the school program.

In our estimation, our nutrition education efforts have helped educate teachers, students, and the entire community about the importance of eating a balanced diet and a variety of foods.

Through school foodservice, we have access to the "learning laboratory," the cafeteria, where students can practice good eating habits and food selection principles they learn about in the classroom. There are still several hurdles to cross in the United States before nutrition education becomes a preventive health measure available to all children without additional expense. School administrators need to recognize contributions of nutrition to general education of all students. Teachers must be trained in nutrition to recognize needs of students; the school foodservice program provides an important teaching situation and should be utilized as such.

Nutrition does not have to be a separate course but should be integrated with other subjects. The federal government must set the standard for nutrition education legislation before all states will incorporate more than a fragmented approach to the subject. School foodservice professionals need to work with teachers and principals and provide the nutrition expertise where appropriate in the school district.

Ruth Dam

Section III: Approaches to Nutrition Improvement of Children

NUTRITIONAL PROBLEMS OF CHILDREN IN ASIA AND THE UNITED STATES AND THEIR CONTRIBUTING FACTORS

The Truk District of Micronesia or the United States Trust Territory is a specific geographic area that illustrates the effects of both Asian and American factors in preschool nutrition. Reported high infant mortality rates and high prevalence of infectious diseases among preschool children in the area is a matter of great concern. Furthermore, in 1973, the Truk District Hospital reported 37 infant deaths and 15 one to five year deaths due to gastrointestinal or respiratory diseases or malnutrition. Along with the Truk District Department of Health Services a nutritional status survey among a random sample of preschool children living in Moen municipality, the district's headquarters, was conducted in 1974.

A total of 241 children, or about 15 percent of the population in this age group, participated in the survey. Dietary, anthropometric, hemoglobin, and selected background information were collected. The mother, grandmother, or other person caring for the child was asked to report all food items eaten during the previous 24 hours. Amounts were estimated by checking the capacities of local utensils with standard measuring cups or by weighing representative leftovers on a portable gram scale. Measurements were converted to gram weights, and intakes of calories, protein, calcium, iron, and ascorbic acid were calculated.

A straight-edged and squared wooden block and a high-pressure tested portable spring scale were used for height and weight measurements. Blood samples were taken from a finger or heel prick, using lancets and heparinized capillary tubes. Samples were stored in an ice cooler for subsequent laboratory analysis.

The interview included information on current illnesses, infant feeding and weaning practices, and food preparation methods. Observations on water sources; refrigeration, cooking and storage facilities; vegetable gardens; fishing practices; and availability of animals for food were recorded.

Because there were no growth standards for Trukese children, the height and weight of each child was compared to the Harvard standards, as recommended by Jelliffe. The height for age data showed that the Trukese children were comparable to the Harvard standards until about 12 to 18 months of age. After that, most children fell below the fiftieth percentile. This could be due to genetic or environmental factors. The weights of the Trukese children were similar to U.S. standards until the same age period. Then, the trend was similar to the height data. We also plotted the weight per height data and compared them to the Harvard standards. Most children were within acceptable limits of the fiftieth percentile. A recent World Health Organization report suggests that children with low weight and height for age, but normal weight for height, may have the stigma of past long deficiencies of calories or protein or both. This category would include "recovered children or so called nutritional dwarfs." There also were selected cases of obesity.

Jelliffe and others recommend that the U.S. fiftieth percentile be used as the standard in nutritional status surveys. Using this method, we found that 27 children were 70 percent or less than the weight per age standard and seven were 70 percent or less than the weight per height standard.

With hemoglobin criteria of 10 g/100 ml for 1 to 23 months of age and 11 g/100 ml for 24 to 50 months, there were three children in the marginal group and three in the deficient group. Over one-third of the sample reported respiratory or gastrointestinal diseases or both. Five children over one year of age had clinical signs suggesting protein-calorie malnutrition.

Older children were breast fed for a longer time period than younger children, suggesting a recent trend away from breast feeding. By one year of age, most children were consuming other foods, such as rice, bread, bananas, sweetened tea, and coconut water, in addition to breast milk or formula. During preschool years, the major additional foods, by frequency, were sugar, canned sardines, reef fish, breadfruit, doughnuts, spam, white sweet potatoes, and taro. There was an obvious lack of fruits and green or yellow vegetables, all currently or potentially available.

Compared to the U.S. recommended dietary allowances, about 60 percent of the sample had inadequate caloric intakes, and about 30 percent inadequate protein intakes. These data exclude the 48 children receiving some breast milk. Between 75 to more than 90 percent appeared to have intakes of calcium, iron, and ascorbic acid below the recommended levels. Dietary patterns indicated that other essential nutrients would be low.

The Truk District reveals conditions similar to many developing countries in Asia and to low socio-economic areas of the United States. Previous traditional diets of cereal crops, local vegetables and fruits, and fresh fish are being replaced by processed foods of poorer nutritional quality. Bottle feeding has replaced breast milk, and young infants and children are probably receiving overly diluted formulas that are often contaminated. Diets and health of young children have deteriorated due to various socio-cultural and economic factors. These include increased employment of mothers, crowded living conditions in urban areas, poor sanitation, deficient and contaminated water supplies, widespread advertising of commercial formulas, status values attached to highly processed Western foods, and inadequate medical and health care. Applied child nutrition programs must consider all of these factors to improve the health status of this highly vulnerable group.

THE DIET OF SCHOOL CHILDREN IN NANAKULI

Although very little systematic study has been done on the relationship between socio-economic status and dietary habits, there is good reason to believe that two of the variables that affect food consumption patterns are per capita income and educational status. Thus, it is reasonable to assume that when family per capita income falls below a critical point, food expenditures will be reduced below the level required to maintain an adequate diet. Likewise, it is reasonable to expect education to be related to food habits and eating patterns that are transmitted to children. The less educated are also less likely to come into contact with health and nutrition propaganda, as well as be influenced after exposure. For these reasons, it was expected that the diet of Nanakuli school children would show deficiencies, and the results of the study confirm this expectation.

Research Methods

During the 1964-1965 school year, when the dietary data were collected, there were approximately 1,950 students attending Nanaikapono School, ranging from kindergarten through grade 10. Because the study required the keeping of written food consumption records, it was decided to eliminate all classes below grade four. A three-day food record covering Sunday, Monday, and Tuesday was used. Teachers instructed children on filling out the records. Children kept temporary records of what they ate each day and this information was transferred to form sheets as part of a school lesson under the supervision of the teachers. The survey was carried out on November 28, 29 and 30, 1964, with no major difficulties. A total of thirty-five classes and 998 students were involved, although some of the students were absent on one or two of the days and their records were therefore incomplete.

The figures describing the diet of Nanakuli school children obviously must be taken as a rough approximation. Methods used in collecting and quantifying the data allow considerable room for error. Because errors of omission rather than fabrication are more likely to occur in self-report records, the nutritional figures are undoubtedly lower than actual intake. Because the same method was used to collect the mainland data, however, the comparisons have some operational validity. Also, relative intake of nutritional components and the account of foods eaten are probably reasonably valid since errors of omission are likely to be random and fabrication errors are likely to be closely confined to the more usual foods. In other words, although nutritional status can only be grossly estimated from the data, the actual character of the diet can be inferred with reasonable assurance.

Analysis and Results

The dietary data were coded following the system already established by the Hawaii Cardiovascular Study under the supervision of Dr. David Bassett. Reports of nutrient intake by time period (i.e., breakfast, lunch, dinner, and interim snacks) and food group source for each individual were obtained. The average nutrient intake for each grade by sex of the subjects was then computed and compared with the recommended daily allowance (RDA) prescribed by the National Dairy Council for children in that age group. Where deficiencies were in evidence, the percent below RDA was calculated. The results appear below in Table 1.

An examination of Table 1 reveals dietary deficiencies in calories, calcium, iron, vitamin A, and niacin for every grade. Thiamine and riboflavin were deficient in the diets of specific groups but on the whole were present in satisfactory quantity. The means for protein and ascorbic acid were adequate for all groups. In general, this evidence supports the expectation that the diet of Nanakuli school children is substandard. This result is partly due to the frequency with which the subjects apparently skipped meals: 62.7 percent of the children did not report any food intake for one or more of the nine meal periods during the three days surveyed. For every 100 mealtimes the students missed 15.2 breakfasts, 15.4 lunches, and 7.8 dinners. This data confirms the subjective impressions of school teachers and administrators who noted in interviews that children often skipped meals.

The average nutrient intake of the Nanakuli children in the 9 to 11 age range was then compared with a sample from Kansas and Ohio, whose nutritional status was reported in "Nutritional Status U.S.A." The families of these mainland samples, like those of the Nanakuli sample, were of relatively low socio-economic background; 32 percent of the Kansas families and 15 percent of the Ohio families reported yearly incomes of less than \$3,000.

The results show that the caloric intake of the Nanakuli children is somewhat lower than the mainland samples. For calcium and vitamin A, the local children are the only ones well below the recommended daily allowance, while for thiamine and riboflavin they are close to the RDA but still well below the intake levels of the Kansas and Ohio groups. The iron and niacin intakes for all three groups are slightly less than the recommended allowances. For protein and ascorbic acid the Nanakuli children were slightly above the other groups and well above RDA.

Although these comparisons of means would not appear to be cause for much alarm, when considering the diet of the Nanakuli school children, except perhaps for calcium and vitamin A, we should not be misled by averages. A more significant indicator is provided by the proportion of children who are below the safety margin (two-thirds of RDA) on each nutrient.

Although the average intake of ascorbic acid of the Nakuli sample is adequate, nearly 50 percent of the children are below the two-thirds safety margin. Similar percentages were below the two-thirds margin in calcium and vitamin A, and approximately 20 percent were below in thiamine, niacin, and iron. For protein and riboflavin, less than 15 percent were below this minimum standard. With the exception of protein, the percentage of Nanakuli children below the two-thirds margin is substantially greater than the mainland groups for every nutrient. It would therefore appear that, although the average diet of the Nanakuli children does not vary significantly from the mainland low-income groups, there is greater variability among the local population. As many as half of the children in Nanakuli may be living on dangerously substandard diets.

Conclusions

The goal of this study has been to evaluate the adequacy of diet among school children in Nanakuli. The results lend support to those who have subjectively described the diet of the children in the area as inadequate. Indeed, the current study presents evidence that the proportion of children in the study sample who may be seriously undernourished is significantly higher than children from the same socio-economic stratum on the mainland.

Although the income level of most of the Nanakuli families is relatively low, this alone would not seem to account for the inadequacies reflected in the children's diet. A well-balanced diet is probably within the reach of most families, provided they select their foods judiciously. However, observations over the past two years in the community suggest that much less thought is given to a balanced diet than to quantity and ease of preparation, and that the high proportion of meals missed indicates that irregular eating habits contribute to the problem. Also, local food tastes practically exclude a reasonable consumption of fresh fruits and vegetables.

A good deal of evidence has been accumulating that suggests that prolonged marginal deficiencies, such as those that appear to characterize the diet of Nanakuli school children, contribute to the perpetuation of poverty both by increasing susceptibility to illness and by directly affecting performance capabilities. It would appear, therefore, that any remedial program instituted in Nanakuli, or similar areas, that does not provide for an improved diet, will be severely handicapped in its attempt to break the poverty cycle.

Table 1
Daily Average Nutrient Intakes of Nanaikapono
School Children Grades Four through Ten

Number of Students	Grade	Median Age	Calories		Protein (gm)		Fat (gm)		CHO (gm)		Calcium (gm)	
			M	F	M	F	M	F	M	F	M	F
M 86 F 60	RDA* Grade 4 % below RDA	9	2400 1767 27	2200 1585 28	60 81	55 70	— 71	— 60	— 209	— 196	1.1 0.77 30.0	1.1 0.74 33.0
M 41 F 50	RDA Grade 5 % below RDA	10	2400 2144 11	2200 1933 12	60 88	55 76	— 90	— 76	— 256	— 248	1.1 0.9 18	1.1 0.8 27
M 49 F 52	RDA Grade 6 % below RDA	11	2400 1964 18	2200 2131 5	60 8	55 92	— 82	— 90	— 230	— 253	1.1 0.9 45.0	1.1 1.0 7.0
M 55 F 33	RDA Grade 7 % below RDA	12	2400 1674 44	2200 1738 30	60 72	55 70	— 72	— 72	— 193	— 214	1.1 0.8 45.0	1.1 0.7 48.0
M 38 F 52	RDA Grade 8 % below RDA	13	3000 2280 24	2500 2133 15	75 104	62 84	— 96	— 86	— 258	— 261	1.4 1.1 21.0	1.3 0.8 38.0
M 57 F 36	RDA Grade 9 % below RDA	14	3000 2358 21	2500 2231 11	75 100	62 90	— 101	— 83	— 284	— 267	1.4 1.0 30.0	1.3 0.9 32.0
M 27 F 33	RDA Grade 10 % below RDA	15- 16	3000 2238 34	2500 2053 11	75 93	62 81	— 96	— 83	— 261	— 256	1.4 0.8 43.0	1.3 0.8 38.0
M 353 F 316 669	Average % below RDA	26	16								33.0	32.0

*RDA - Recommended daily allowances - revised 1963

Table 1a
Daily Average Nutrient Intakes of Nanaikapono
School Children Grades Four through Ten

Number of Students	Median Age		Iron (mg)		Vitamin A I.U. x 1000		Thiamine (mg)	
			M	F	M	F	M	F
M 86	9	RDA*	15.0	15.0	4.5	4.5	1.0	0.9
F 60		Grade 4	12.4	11.2	3.2	2.6	0.93	0.74
		% below RDA	17	25	29	42		
M 41	10	RDA	15.0	15.0	4.5	4.5	1.0	0.9
F 50		Grade 5	13.8	12.8	3.5	3.0	1.1	0.95
		% below RDA	8	15	22	33		
M 49	11	RDA	15.0	15.0	4.5	4.5	1.0	0.9
F 52		Grade 6	13.1	13.6	3.1	3.9	1.0	1.1
		% below RDA	13.0	9.0	31.0	13.0		
M 55	12	RDA	15.0	15.0	4.5	4.5	1.0	0.9
F 33		Grade 7	10.3	10.0	2.8	2.6	0.8	0.9
		% below RDA	31.0	33.0	44.0	48.0	33.0	10.0
M 38	13	RDA	15.0	15.0	5.0	5.0	1.2	1.0
F 52		Grade 8	14.0	11.9	4.1	3.3	1.2	1.0
		% below RDA	7.0	20.0	18.0	34.0		
M 57	14	RDA	15.0	15.0	5.0	5.0	1.2	1.0
F 36		Grade 9	14.0	12.6	4.0	4.0	1.2	1.2
		% below RDA	7.0	16.0	20.0	20.0		
M 27	15-	RDA	15.0	15.0	5.0	5.0	1.2	1.0
F 33	16	Grade 10	14.8	3.2	3.4	2.9	1.2	1.0
		% below RDA		12.0	32.0	42.0	14.0	
M 353		Average						
F 316		% below RDA	12	19	28	33		
		669						

*RDA - recommended dietary allowances - revised 1963.

Table 1b
Daily Average Nutrient Intakes of Nanaikapono
School Children Grades Four through Ten

Number of Students	Grade	Median Age	Riboflavin (mg)		Niacin (mg)**		Ascorbic Acid (mg)	
			M	F	M	F	M	F
M 86	9	RDA*	1.4	1.3	16.0	15.0	70	80
F 60		Grade 4	1.9	1.38	13.9	12.8	88	69
		% below RDA			13.0	20.0		
M 41	10	RDA	1.4	1.3	16.0	15.0	70	80
F 50		Grade 5	1.5	1.7	13.7	12.4	76	92
		% below RDA			14.0	17.0		
M 49	11	RDA	1.4	1.3	16.0	15.0	70	80
F 52		Grade 6	1.7	1.9	14.0	13.5	105	70
		% below RDA			12.0	10.0		
M 55	12	RDA	1.4	1.3	16.0	15.0	70	80
F 33		Grade 7	1.4	1.3	11.3	11.6	73	88
		% below RDA	21.0	13.0	43.0	32.0		

M	38	RDA	13	1.8	1.5	20	17	80	80
F	52	Grade 8		2.2	1.6	16.1	14.4	107	112
		% below RDA				19.0	15.0		
M	57	RDA	14	1.8	1.5	20	17	80	80
F	36	Grade 9		1.8	1.8	16.8	14.3	130	153
		% below RDA				16.0	16.0		
M	27	RDA	15-	1.8	1.5	20	17	80	80
F	33	Grade 10	16	1.8	1.3	15.7	14.4	123	116
		% below RDA				29.0	4.0		
M	353	Average							
F	316	% below RDA				21	16		
	669								

*RDA - recommended dietary allowances - revised 1963

**The figures from the sample are mg. of niacin whereas the RDA values are the milligram equivalent of niacin, which include preformed niacin and niacin from food tryptophan.

Kajorn L. Howard

EFFECTIVE USE OF AVAILABLE RESOURCES FOR THE NUTRITIONAL IMPROVEMENT OF CHILDREN THROUGH EFNEP

The Expanded Food and Nutrition Education Program (EFNEP) as administered by the Cooperative Extension Service of the United States Department of Agriculture is designed to reach low-income audiences to help them improve their dietary level through nutrition education and to help them become more efficient and effective users of available resources.

The adult phase of EFNEP is charged with providing a food and nutrition educational program to enhance the quality of the families' nutrition. The youth phase is charged specifically with providing educational programs to youth from low-income families primarily in urban areas.

Food and nutrition is the principal content of both the adult and youth program. The overall objective of the adult phase is to help low-income families, especially those with young children to acquire the knowledge, skills, attitudes, and changed behavior necessary to improve their diets in normal nutrition. Three overall objectives of the youth phase of the Expanded Food and Nutrition Education Program are to:

- provide education for youth in the principles of nutrition and diets and in the acquisition and use of appropriate foods.
- contribute to the development of low-income youth through improved nutrition.
- contribute to the improvement of diets and nutrition of the total family by means of educational programs for youth.

Paraprofessionals are employed and trained to do direct teaching with enrolled adults and youth in food and nutrition related subject matter. The program aides (paraprofessionals) work closely with the other agencies concerned with the nutritional needs of adults and youth. They teach homemakers basic nutrition and how to meet the nutritional requirements of the children for health and growth. The program aides encourage families to apply for and take advantage of the school lunch program. They often are asked by homemakers how to prepare some of the foods served by school lunch programs.

Nutrition program aides teach nutrition to homemakers with children in their homes on a one-to-one basis or in small groups. Children may learn along with the mother or in a youth group. The aide teaches the homemakers what foods their families need daily for good health, how to prepare these foods to conserve the nutrients, how to substitute when familiar foods are not available, and how to shop for low-cost foods. They encourage homemakers who can to plant a garden and grow nutritious vegetables and fruits for their families and show them how to use community resources to meet their family needs.

Most communities have health clinics as part of the county services available to the low-income population. Here a nutritionist will work with the mother and child to help them understand the relationship of nutrition to good health. Mothers who express a desire to learn more about good nutrition are referred to the Expanded Food and Nutrition Education Program or to other extension programs.

Many homemakers do not understand how to qualify and apply for food stamps. The nutrition aides encourage homemakers who are eligible to apply for food stamps and many times help them fill out the applications when they have difficulty reading and understanding the application forms.

The extension home economist works with all levels of income to stimulate interest in programs to improve the nutritional level of the general public. This is done through organized club programs, special interest groups, open meetings, radio, newspaper, television, exhibits, displays, etc. Special projects on nutrition are a very important part of the 4-H youth program and are supervised by professional home economists, leaders, and volunteers.

There are numerous agencies and organizations that offer their resources to help families in the nutritional improvement of their children. These include religious organizations and groups, community development agencies, volunteer groups, professional societies, etc. A nutritional council composed of representatives of these organizations can bring about more effective use of available resources to help improve nutrition of children and families.

Mary H. Bennett

HEALTH PROTECTION OF SCHOOL CHILDREN

Indonesia is divided into 26 provinces, and each province is divided into regions and again into districts or *kecamatan*s. In every district there is one health center or *pus kes mas* and up to 25 elementary schools. The school health program in Indonesia, as in all developing countries, is directed mainly to providing healthful school living; protection of school children against communicable and other preventable diseases; and development of school, home, and community cooperation in health promotion.

School Health Service

In 1972, the first regulation on school health was passed. Children entering school had to have a smallpox vaccination, and children with communicable diseases were not allowed to attend classes.

In view of limited resource facilities and available school health manpower, not all schools are covered by the School Health Service. Priority is given to governmental primary schools. Due to lack of health manpower in the health centers, classroom teachers are trained in school health. In every elementary school, one teacher is responsible for school health. At the moment there are 29,000 trained teachers. With training during the next two years, an additional 16,000 teachers should be trained. In every school there is a school health corner where all activities on school health are centered.

Environmental Sanitation

Provision of a healthful school environment is a function of utmost importance. Many communicable diseases could be prevented easily if there were enough sanitary facilities including latrines, water supplies, garbage disposals, good lighting, and good ventilation. With the aid of UNICEF, many schools were provided with pumps for sanitation purposes.

Health Education

A precondition for introducing formal health education into the curriculum is to ensure that adequate sanitation and hygiene conditions are provided by the school. This in itself has considerable educational value. In addition, teachers are trained to make full use of opportunities for health education whenever they teach and relate health teaching to the needs and interest of their pupils.

Control of Communicable Diseases

In elementary schools, communicable diseases are most common. Routine observation of the child's health at the beginning of the school day and prompt referral of children needing medical attention to the school nurse or doctor in *pus kes mas* is of primary importance. Schools are an integral part of the program for detection, control, and prevention of communicable diseases. Teachers, therefore, should not only be alerted to the recognition of the presence of such diseases, but also should know the first aid as well as have a simple knowledge of BCC and smallpox immunization.

In Indonesia, tuberculosis is still a common disease. In a recent campaign every child under 14 was vaccinated. As a consequence, every child is examined for a test scar at the school entrance. If the child doesn't have a scar, he is given a second BCC or is not permitted to enter school. Tuberculosis incidence is highest among teenagers.

Indonesia has been declared free of smallpox. Since that time Indonesians have to be vaccinated only twice in a lifetime—during infancy and at school entrance. Formerly, children had to be vaccinated against smallpox every two or three years and when there were breakouts.

Growth Record

Weight and height measurements are the most sensitive indicator of the nutritional and health status of children and provide motivation for development of good health practices among school children. Any failure to gain weight during a school year indicates that something is wrong. The height and weight of children in elementary schools are recorded on their individual charts, while anthropometrical measurements are done only in a few provinces. Minimum procedures in annual hearing and visual testing are done by teachers or nurses twice a year.

Future Plans

In Indonesia, school health is organized by the Ministry of Health through its sub-directorate of school health and sport medicine. Thus, the school health program is a combined program with physical fitness. In 1977, the Ministry of Education and Culture will open a school to train teachers to become physical and health educators in elementary schools.

Sonja Poernomo

BETTER NUTRITION: A COMMUNICATION PROBLEM

There has been much discussion about kinds of foods, food supply, food technology, government subsidies, etc., in improving the nutritional status of people. It is important to note that when one talks about improving—that is, changing—nutritional behavior, an important part of this process is actually behavioral change related to communication. There is an abundance of evidence suggesting that people frequently have nutritional food available to them but fail to take advantage of it. One major example is the evidence of food waste in school lunch programs. Another is the availability of vegetable greens and fruits among populations deficient in vitamin A and vitamin C.

Included in any strategy to improve the nutritional status of a group should be an explicit communication strategy. Unfortunately, many programs that include nutrition education or communication often do so with ad hoc programs designed by persons without suitable communication expertise. Alan Berg in *The Nutrition Factor*, for example, notes that one of the reasons for the failure of many nutrition education programs is that they have been carried out by nutritionists. The point to be stressed here is that nutrition programs must be serious enough about communication to include as a partner in the planning of such programs a person skilled and sympathetic to the role of communication in precipitating change.

Another important consideration that must be given to developing a communication strategy for improving nutrition is a reorientation on how to communicate. The general practice has been for the change agents—nutritionists, extension people, community development officials, etc.—to establish the pattern of communication to suit the convenience of the change agency. The real challenge is to examine the community context and design a communication program that starts where the “client” group is.

The Pila Project

An example of this approach is the pila communication project (supported by the Pan American Health Organization) recently carried out in Guatemala. This was an attempt to deliver nutrition, health, agricultural, and other types of information to rural families on a rubber and coffee plantation. After discovering what kinds of information would be most helpful to these families, daily living patterns of the people were observed. Among other things, it was discovered that the women worked from approximately 4 a.m. to 7 p.m., leaving virtually no time for meetings or training programs. Examination also revealed that the women spent about two hours a day washing at the community pilas, a kind of public laundering place. These pilas, then, were selected as possible communication settings. Content was developed on tape cassettes and small inexpensive tape playback units were placed in each pila for a period of three weeks. Each day a different 30 minute tape was played over and over during a period of two hours in the morning and two hours in the afternoon.

The result was that the women listened, liked, and acted on the basis of the information provided. It should be stressed that the information was packaged in an interesting format using drama, music, quizzes, localized interviews, stories for children and adults, etc. The point is that the communication system was patterned so that the content and the method of delivery were appropriate for the client group. The system was inexpensive and simple, and that was precisely what was called for in this situation. Furthermore, it did not take the constant attention of a professional field worker to keep the system going. Changes resulting from the project included a switch from using the traditional midwife in the community to using the more sanitary plantation nurse for child bearing; getting more people to properly use Incaparina, a high nutritive food supplement; and getting inoculations for baby chicks to ward off Newcastle disease, a problem that had discouraged families from raising chickens—and thus had diminished their consumption of eggs and poultry meat. In this project simple communication technology was used to communicate with rural people pretty much on their terms.

The School as a Setting

The school is an excellent setting for bringing nutritious foods and nutrition information to school children. Feeding programs put into action information that can be conveyed in nutrition education programs, providing foodservice people and the education people cooperate in developing innovative and creative activities.

One of the major shortcomings of this plan is that it does not reach those children who are usually most devastated by some degree of malnutrition. These are the young people who drop out of school, and dropping out is one of the major educational problems in the developing world's educational systems. This also includes preschool children, classically a vulnerable group. The school can play a role in meeting the nutritional needs of these persons. First, the school can reach parents through the children in school and can provide them with nutrition education and information. For example, a school might develop some interesting cassette tapes and allow a school child to take these tapes home with a tape playback machine for use overnight in the home. Often this is enough of a novelty that not only might the child's parent listen to it, but friends, neighbors, and relatives also become part of an informal listening group. Thus, parents of preschool children can be reached.

The key is to create content that conveys the message faithfully, but also is entertaining and interesting enough to encourage adults to listen. Simple dramas, music, interviews with local people, etc., all can be used to accomplish this. It should be stressed that this is not a complicated or threatening task to undertake. It takes desire and dedication on the part of the school to meet community nutrition problems.

Another way the school can be involved in bettering the nutrition of the community's people is through informal adult education programs. The school has the facilities. It has people trained in educational techniques. What it needs is the force of administrative decision and the input of nutrition experts either within the school or from public health/nutrition agencies to make the system work. But simply announcing a session and holding it in the schoolhouse during the evening is not likely to accomplish the goal. Those developing such programs have to go to the people they are trying to reach to discover what is the best mechanism for conveying information; what are the activities the people might enjoy participating in (certainly this is not likely to include sitting in a classroom in an intimidating atmosphere); what is the information people need?

The latter usually cannot be articulated directly, but can be discovered by sympathetic listening to people talking about their problems.

The Communication Input

It really makes little sense to expect durable results from activities intended to improve nutrition if there is not an explicit communication strategy built in. It is important to have the contribution of communication experts—although by professional title they may be called something else—to help plan that strategy. Unfortunately, the communication expert is too often drawn into the process after the key strategy decisions are made, and he or she is then expected to make the visuals, write the bulletins, or make the recording. The latter is more the technician's job—and it's important. Designing the strategy in the first place is the most important point. And it should be emphasized again, that the strategy must take into consideration the culture of the target group. Education and information programs that conform more to that culture rather than suit the convenience of those agencies carrying out the program must be planned.

Royal D. Colle

Section IV: Adaptive Research and Development of Appropriate New Methods

RADIO AND TELEVISION SCHOOLS AS A TRANSIENT MEASURE OF TRAINING SCHOOL TEACHERS IN NUTRITION PROGRAMS

In recent years, experts and policy makers concerned with problems of developing countries have been changing their view of malnutrition. What was once seen only as a welfare problem is beginning to be regarded as a major obstacle to development as well. With broadening understanding of the effects of malnutrition on human growth and performance, and ultimately on national economic growth, foreign assistance agencies and governments in many low-income countries are turning to nutrition in their search for ways to overcome chronic poverty.

Because nutrition has been identified as a way to overcome chronic poverty, varied strategies, measures, techniques, inventions, and research methods have been tried, tested, and applied by countries to combat malnutrition. One of the measures being tried is establishing a radio/television school to train school teachers/mothers/housewives in the nutrition program.

Radio and Television Broadcasting

The fact that broadcasting is a mass medium, the impact of which is not confined to particular social strata or geographic areas, makes it an especially valuable tool in the pursuit of education.

While radio and television have their own assets and limitations, they share certain common and peculiar features that place them in a particularly favorable position to make a contribution to society. They are independent of traditional ground communications and can reach any place anywhere (particularly once space communications are being used), unhampered by mountains, swamps, and deserts. Everyone can receive their message—literate and illiterate alike—which makes their appeal universal. The instantaneousness and flexibility of radio and television production enable them to adapt themselves more than any other media to changing ideas and conditions. They address themselves to the entire personality of the listener or viewer, as their programming can range widely over information, education and entertainment.

Radio and television have both emotional and intellectual appeal and can thus be powerful agents of motivation as well as of information. They can be received both by individuals and by groups, thus penetrating into the intimacy of the home or acting as agents for group formation and community action.

Radio is relatively cheap in production and reception, and is independent of the availability of electricity. Television, while more expensive, has the more profound impact, thanks to the completeness of its audiovisual presentation and its greater suitability for group reception.

Radio, and especially television, are the most "personal" of all mass media of communication, as they establish an almost intimate relationship between the speaker and the distant listener or viewer. Their wide instantaneous range makes them effective agents of national and international cooperation and understanding.

Inevitably, these important assets are accompanied by certain deficiencies. The broadcast media lack the spontaneous interaction of teacher and student; they lack the permanency of the printed work; they tend towards centralization and do not adapt themselves easily to local conditions and preoccupations; they require a technical infrastructure and suitable maintenance. These and other limitations underline the importance of combining their use with other media of communication, and underpinning them with an organizational and maintenance structure.

Radio and Television Nutrition Schools

Practically all radio programs have a certain educational significance, if only in the sense of conveying to isolated listeners in remote villages or lonely mountain stations a sense of participation. The feeling of being part of a whole makes for a better citizen; in fact, it seems to be the precondition for being a citizen in the politico-sociological sense of the word.

Thanks to the vividness of its presentation, particularly on television, broadcasting can disseminate rapidly and to a vast public new approaches and practices in health and nutrition. Experiences of the teleclubs in India and the UNESCO pilot project at Dakar, Senegal, in the use of television for the education of illiterates in new practices of health and nutrition, testify to the potential effectiveness of the medium in this field.

The education of women is the key to improving home conditions and child rearing practices as well as other aspects of life. Here broadcasting, the only medium of communication to reach the intimacy of the home of a largely illiterate sector of the population, has an exceedingly important role to play. Programs for women regularly received frequently become trusted monitors that help wives and mothers adapt themselves to the changes in society around them.

The Philippines' nutrition classes on the air have been organized by various agencies including the Food and Nutrition Research Center (FNRC), NSDB, the Nutrition Foundation of the Philippines (NFP), the Department of Education (DEC), and others. Called the "Nutrition School of the Air," the serialized lessons on basic food and nutrition are part of the Mass Communication Program under the Philippine Food and Nutrition Program. The NFP conducts the school regularly in cooperation with major radio stations. More recently, the FNRC joined with the Voice of the Philippines, National Media Produc-

tion Center, to conduct the school on a nationwide broadcast over the Pulong-Pulong portion of Lulu Santiago's "Hiyas ng Tahanan" program. The programmed course covers 11 topics based on priority information areas developed by the Interdepartmental Committee on Nutrition Communication, NFAC.

Objectives of the Nutrition School of the Air include generating and sustaining awareness on the Philippine Food and Nutrition Program, motivating community participation in the nutrition program, increasing knowledge on the need for good nutrition, stimulating the community to want more nutrition information, and encouraging adoption of improved practices based on priority nutrition information messages.

Scripts have been developed to suit the nationwide hook-up "Pulong-Pulong sa Kaunlaran" portion of the "Hiyas ng Tahanan" program over which the scripts were used originally. The school was conducted in an interview style in the vernacular. Nutrition specialists were invited to an interview with the emcee of the show. These interviews were based on the scripts prepared by nutrition educators of the Food and Nutrition Research Center from nutrition lessons reviewed by the Interdepartmental Committee on Nutrition Communication.

The 11 lessons have been divided into three sets, each set consisting of three to four lessons. A review follows every set to review with participants the nutrition facts presented. Participants are encouraged to ask questions on topics given. When the need arises, sessions are allotted for answering letters containing questions on nutrition mailed by participants. These mailed-in questions constitute the direct form of feedback.

At the end of the course, an examination is given on the air. The examination is aimed at assessing the participant's ability to retain nutrition facts absorbed, interrelate nutrition concepts, and apply what they have learned. Likewise, the end-of-course assessment is a means of gauging whether or not intended messages reach the target.

Nutrition Institute for Distance Study

The Nutrition Institute for Distance Study (NIDS) is a social development project of First Lady, Mrs. Imelda Romualdez Marcos. Her study is intended to give basic nutrition training to various sectors through the distance study system. The distance study system is an innovative system of continuing education utilizing radio, television, and printed media to disseminate programmed information on a national scale. The need for the institute rose from the fact that the Philippine Nutrition Program uses a coordinated approach that relies heavily on various groups serving as coordinators, trainers, or implementers of the barangay network for nutrition service and surveillance. There is an urgent need to train these groups for such roles and to help them integrate nutrition education in classroom and community activities in the shortest time possible.

Graduates of the Nutrition Institute for Distance Study program may train Philippine Nutrition Program implementers, reach directly the household of institutional implementers, and directly influence the dietary practices of vulnerable groups and other members of the family. The NIDS program is offered as a crash program for coordinators, trainers, and implementers of the Philippine Nutrition Program, such as school teachers, Municipal Nutrition Committee members, Barangay Nutrition Committee members, rural health workers, and rural extension workers.

The Institute has designed a system for independent study at a distance using a multimedia approach. Courses are broadcast in designated areas covered by the program, telecast in major cities with existing television stations, and supplemented by print materials.

Agencies in this project are the Department of Education and Culture (DEC); Nutrition Center of the Philippines (NCP); Department of Public Information (DPI); National Media Production Center (NMPC); Kapisanan ng mga Broadcasters ng Pilipinas (KBP); Daily Express Incorporated (DEI); Focus/Evening Post (F/EP); and Philippine Journal of Education (PJE). NCP will develop and produce curriculum materials in print and for radio and television dissemination. The KBP will disseminate these materials and other programmed information through its member stations. The DEC enrolls teachers for the initial course offering, evaluates participants' performance, and grants them credits through the designated training centers.

The Nutrition Course for Teachers is designed to reach the 300,000 teachers nationwide with nutrition information within a year's time. Through the teachers, the program is expected to reach 15 million students every school day. The program will be offered in four phases: Phase I—first semester, school year 1976-1977, launching data gathering; Phase II—second semester, school year 1976-1977, pilot studies in the Visayas; Phase III—summer 1977, evaluation of feedback based on pilot studies in the Visayas; Phase IV—first semester, school year 1977-1978, nationwide coverage.

Teachers interested in participating in the program may enroll at training centers to be designated by the DEC. Instructions and supplementary materials will be available there. They may apply for enrollment in any of four levels: graduate level—three units; undergraduate level—three units; certificate of participation; and service credits. Registration, matriculation fees, and additional course requirements will be stipulated by the DEC.

The program will help enrollees to integrate nutrition education in classroom subjects and cocurricular activities, and to promote sound dietary practices in their respective communities. Program enrollees will gain improved nutrition knowledge, and consequently better nutrition and health. The program will improve the enrollees' professional competence and increase their opportunities for advancement. They will receive a certificate of participation or service credits or can earn three units of graduate or undergraduate credit upon completion of requirements stipulated by the Department of Education and Culture.

Problems and Recommendations

Although there seems little question that radio and television schools can be a measure of training school teachers in nutrition, the problem of its being only a transient or temporary measure to train teachers is posed because in some countries, radio broadcasting is still in its beginning and hardly reaches outlying rural areas. Based on UNESCO'S publication no. 49 dealing with radio and television in the service of education and development in Asia, it was reported that 12 Asian member states are well below the accepted minimum of five radio receivers for every hundred people, and of the 12 member states that have introduced television, only one country is well above the UNESCO minimum of two sets for every hundred people. In addition, the high cost of airtime, especially in television programs is also a potential problem.

Organizers of the nutrition school find it hard to limit the content of the course. As a result, some nutrition priority messages are not very much emphasized.

Another problem of radio and television broadcasting involves the information learned not being immediately measurable. This aspect calls for additional implementers/administrators to check on the application process. Little teacher/listener participation is also prevalent. Only those people who enroll or send in their names are participants in the course.

Because of these problems contributing to the problem of radio and television schools being a transient means of nutrition education, some steps can be taken to strengthen the efficacy and permanency of radio and television schools. Radio and printed media can be synchronized. An example of this is being done in the Philippines. The nutrition education aspect of the food featured for the month will be conducted simultaneously in the radio program "Hiyas ng Tahanan" (Jewels of the House) every Wednesday starting March 3, 1976, from 11:00 to 11:30 in the morning and in the weekly issue of *Liwayway Magazine's* "Tahanan at Pagkain" section (House and Food). The broadcast is released in print in the same week. For the broadcast, FNRI will make arrangements for nutrition and food experts to be interviewed on food values, preparation, and cooking tips. Application of information in providing the nutrient needs of vulnerable groups will be printed in *Liwayway*. Thus, the synchronization is aimed to complement the value of both radio and print as channels for nutrition education.

For follow-ups of immediate application, educational materials will be accompanied by a short questionnaire on the practice of immediate application of information disseminated during the month. Answers will be mailed back on a self-addressed stamped envelope sent with the questionnaire.

To encourage more listener/teacher participation, some techniques, credits earned, cash prizes, and others items are offered as incentives. An example is the "Best Recipes of the Month" wherein listeners will be encouraged to send in their favorite recipes featuring the food vehicle for the month. Incentives in the form of cash prizes will be given to the three first, second, and third prize winners. Another method is phone or mail inquiries encouraged from the listeners. Credits or units will be earned by teacher participants on one of four levels: graduate level—three units; undergraduate level—three units; certificate of participation; and service credits.

It may be agreed that a system such as the Radio and Television Nutrition Schools could not match the educational effectiveness of a full-fledged school system. On the other hand, however, the education provided in this manner might go a long way toward closing the serious gap between knowledge of nutrition and the application of this knowledge that exists today and that needs to be bridged as rapidly as possible.

Cornelia C. Mojica

SELF-HELP EFFORT TO DEVELOP FOOD RESOURCES FOR SCHOOL FEEDING IN TAIWAN

Taiwan, a province of the Republic of China, is a sub-tropical island with an area of 14,000 square miles and a population of 16 million. It is one of the most densely populated areas in the world. As a result of social stability and economic growth in Taiwan, per capita income in 1975 reached \$700, or more than five times than that of 1952. Daily per capita availability of energy was only 1,277 calories in 1945. It increased to 2,218 calories in 1955 and, in 1973, reached 2,737 calories, the highest among Asian countries. Life expectancy has increased to 67 years for males and 72 years for females as compared with 41 and 46 years respectively for 30 years ago.

School Feeding Program

It is a general practice in Taiwan that most school children and teachers bring lunch boxes and take their mid-day meals in a school. The school provides facilities to warm up the lunch boxes. In indigent areas, however, some children either bring no lunch boxes or have very little food with them. A pilot school feeding project was initiated in five mountain schools in 1957 and some food assistance was received from external welfare foundations. Because this project fulfilled the needs of children, school feeding activities expanded in many other areas. From 1964 to 1969, staple foods such as wheat flour, nonfat milk powder, and cooking oil, were provided by U.S.A.I.D. under the Public Law 480 program. The World Food Program provided food assistance to the project from 1969 to 1972. All external food donation ended in 1972. Since then, school feeding programs in Taiwan have been operating with self-help efforts. The number of participating schools was extended to 410, and 229,784 children were covered in the project.

The mid-day meal usually consists of a baked or steamed bread (145 grams), one dish of meat, fish, eggs, or beans, cooked with vegetables and a nutritious hot soup. The cost per meal paid by a student is NT \$5-7 (U.S. 12-18 cents). The neediest 10 percent of participating students are fed free, with a budget from the provincial government.

Self-Help Effort to Develop Food Resources for School Feeding

In operating school feeding programs, the government and school provided funds for kitchen construction (or remodeling) water supply, and kitchen facility, and feeding utensils as well as for a supervising teacher (usually only part-time) and, sometimes, kitchen labor. Day-to-day expenses, including the cost of food ingredients, fuel, and kitchen labor, were paid

by parents. Calculated at 240 meals a year, the price a pupil has to pay for school lunch is as much as \$36. This amount could be a considerable burden to low-income families in mountain and salt areas, particularly when two or three children of the same family are in school. Ten percent of government subsidy can hardly cover all the needy families.

To solve the problem, much effort was exerted to reduce the cost of food and to improve the components of school meals through self-help efforts.

School Garden

The school garden is an integrated activity of the school nutrition education program, introduced in most rural schools with or without school lunch provisions. Areas for school vegetable gardens ranged from a few hundred square feet to half of an acre, depending on the availability of land and water. Parents or other community resources assisted in the leveling and preparation of land, while the government provided garden tools, fencing materials, seeds, sprayers, and chemicals. Plots were divided and allocated to different classes for cultivation. Contests were frequently held among classes within a school or among schools within a county to stimulate attention for the garden. In general, one-fourth to one-half of the amount of greens for school lunch could come from school garden.

Fruit trees were planted at school for fencing, shading, and ornament. Papaya, guava, acerola, avocado, and citrus trees are popular in school compounds. Often, a school raised fruit tree seedlings for distribution to the community. Training classes on school gardens were held annually with the assistance of horticulturists from the provincial level and agricultural extension officers at county level.

Home Garden to Support School Lunch Program

In schools where land is limited, the school encourages children to keep at home, along with their home garden, a special vegetable plot for school lunch purposes. Fresh produce is brought to school when pupils come in the morning. This practice is especially workable in small rural schools, but the supply is not always reliable.

Parents' Contributions in Kind

Parents are encouraged to pay the cost of their children's school lunch in kind with rice, sweet potatoes, and beans produced from their own farm. Again, this is mostly practiced in rural schools. Some civic-minded community leaders or voluntary associations occasionally make contributions of rice or wheat flour, usually in quantity, to the school lunch program to help the less privileged children.

Small Animal Raising and School Dairy Projects

Even though plate waste in school feeding is kept to a minimum, it is inevitable that there are some foods not used up in the day. Hog raising projects became popular among the school lunch schools. Hogs were slaughtered on the occasion of celebrations such as school birthdays and graduation ceremonies. Hog manure was used to make compost for school gardens.

The raising of poultry, rabbits, and milk goats is practiced in a number of rural schools, mostly through local 4-H club activities. The produce is sometimes used in school lunch. Two schools in Taiwan initiated dairy cow raising projects in school to provide fresh milk for school feeding. In one school, with some 1,000 children, fresh milk was supplied free of charge daily at 180 cc. per child during the semester term. The other school could supply fresh milk every other day.

Future Plans

The impact of the school lunch program was documented through repeated surveys to compare nutritional status of children in feeding and control schools. Results led to the continuation of the school lunch program in Taiwan with self-help effort from both government and community, even though external food assistance discontinued after 1972. Current coverage, however, is only 9.7 percent of total enrollment in elementary schools and 17.2 percent in terms of number of elementary schools. Apparently, the program requires much expansion in order to give a meaningful contribution to the nutritional improvement of school-aged children. The provincial government is now formulating steps to expand its coverage in the next five years as an integrated part of its plan to strengthen elementary and junior high education.

Chen Shen

LABOR-SAVING EQUIPMENT USED IN SCHOOL LUNCH PROGRAM IN JAPAN

The School Lunch Law of Japan provides that the purchase and installation of cooking machinery required for the execution of school lunch programs should be borne by the establisher of a school. The government, however, grants a subsidy to schools to cover half or one-third of purchase costs for the listed in Table 1.

**Table 1
Equipment Subsidized by Government Grants**

Equipment	Price (¥)	Features
For food preparation		
Vegetable cutter	155,000-175,000 (517-583)	All vegetables and fruits can be cut into any desired form at a very fast rate.
Tuber parer	143,000-304,000 (477-1,013)	This parer is designed to peel tubers such as potatoes at the rate of one or two minutes per 10kg, while washing them, thereby considerably saving preparation time.
Multipurpose cooking equipment	264,000-306,000 (880-1,020)	This equipment can be used for various purposes by attaching specially-designed heads, for grinding meat or for cutting vegetables.
Rice washing machine	80,000-90,000 (267-300)	This machine is designed to wash rice automatically with water pressure and discharge any foreign materials and waste water.
For cooking		
Mixer	122,000-172,000 (407-573)	Such soft solids as butter, mayonnaise, and cream can be mixed or dissolved in a very short time.
Fryer	144,000-2,805,000 (480-9,350)	Comes in various sizes, automatic or not. Automatic fryers are designed to fry foods automatically at a very fast rate without failure. A quality monitor mechanism can adjust oil temperature so that a set temperature is always kept, and a conveyer speed also can be adjusted with a transmission.
Roaster	190,000-2,422,000 (633-8,073)	Available in various sizes, automatic or not. Automatic roasters are capable of roasting 2,000 to 4,000 items per hour without unevenness. They do not generate any smoke, thus keeping working areas clean.
Steam cooker	250,000-550,000 (833-1,833)	A large amount of rice, eggs, and some other items can be steam-cooked at the same time.
Rice cooker	462,000-3,960,000 (1,540-13,200)	Comes in various types. A fully-automatic cooker, it is designed to measure, wash, cook, and dish up rice.
Other		
Automatic tableware washer	828,000-2,020,000 (2,760-6,733)	Tableware on a conveyer can be prewashed and washed with jet water. Only a few operators are required to process a large amount of tableware in a very short time. No tableware breakage during the washing process has been reported.
Tableware sterilizer	552,000-1,083,000 (1,840-3,610)	Wet tableware can be dried and sterilized with hot air at 80° C.

Equipment	Price (¥)	Features
Milk refrigerator	552,000-1,176,000 (1,840-3,920)	This refrigerator is designed to specially store milk delivered from suppliers once every two days at a set temperature without deteriorating the quality and taste of milk.
Freezer	667,000-896,000 (2,223-2,987)	Semi-processed frozen foods can be stored in this freezer.

Equipment for which purchase costs are borne by the establisher of a school are listed in Table 2.

Table 2
Equipment Purchased by School Establisher

Equipment	Price (¥)	Features
Continuous apple cutter	650,000-850,000 (2,167-2,833)	A large amount of fruits such as apples and peaches can be peeled and cut into halves, fourths, or eighths in a very short time. Cores also can be automatically removed.
Meat chopper	80,000-140,000 (267-467)	This equipment is designed to grind meat and to mash fish and potatoes in a short time.
Hydroextractor	830,000-840,000 (2,767-2,800)	This is a high-speed centrifugal hydroextractor that dehydrates vegetables and other foods.
Ham slicer	137,000-208,000 (457-693)	Designed to slice processed foods such as ham and sausage rapidly without generating any waste.
Convection oven	698,000-750,000 (2,327-2,500)	This oven is very useful to evenly and rapidly cook foods and to defrost frozen foods with strong caloric force.
Tilting pan	737,000-927,000 (2,457-3,090)	Suitable for cooking foods by instantly adding high heat. Foods can be boiled, roasted, and fried with this pan. Because the pan can be tilted with a handle, it is easy to cook with, to remove cooked foods from, and to clean.
Food tin washer	2,420,000-3,690,000 (8,067-12,300)	A high-speed washer to completely wash food tins with jet water from the specially-designed upper, lower, right, and left nozzles. No prewashing is required.
Warm storage	320,000-685,000 (1,067-2,283)	Thanks to this equipment, school children can enjoy warm and tasty dishes.

Note: Figures in a parentheses are in U.S. dollars (U.S. \$1 equals ¥300). All other figures are in yen.

In addition to the above equipment for labor and time saving, the following cooking systems have been adopted with a view to encouraging support of the school lunch program. The first system is called "school kitchen system" in which school lunches are individually prepared by each school. The second one is a "central kitchen system" wherein school lunches for several schools are prepared. The ratio of cooking staff excluding nutritionists is one per 156 school children in the case of a small school kitchen without modernized facilities and one per 226 school children in the case of a large-scale school kitchen equipped with sophisticated equipment. Labor saving efforts prove to be successful.

Moriyuki Kato

FOOD FORTIFICATION AND ENRICHMENT IN THE SCHOOL FOODSERVICE PROGRAM

Although the United States is considered to be a country with an abundance of food available at reasonable prices, it is not necessarily the best nourished nation in the world. Life expectancy is not the best, although since 1900 it has increased. The United States has not realized its full potential nor has it utilized resources in the most economical way to obtain a greater life expectancy, especially when compared to countries with less available resources and less technical knowledge. A considerable portion of people in the U.S. do not have nutritionally adequate diets. Inadequacies are found in individuals from high income families as well as in diets of individuals from lower income levels.

Inadequate dietary intake exists at all income levels suggesting that the inability to purchase or obtain adequate amounts of essential food is not the only reason for these inadequacies. Rather, it suggests that nutritional information is not universally implemented, practiced, or accepted. Cardiovascular diseases and obesity are number one health problems.

In the area of enrichment and fortification, the United States has responded to the needs of its people and foods have been fortified to restore known nutrients lost in processing. Milk has been fortified with vitamin D to facilitate calcium utilization. Bread is enriched to return the B vitamins and minerals present in the whole grain but lost during necessary processing. Rice is enriched or specially processed so that vitamins are retained and converted when parboiled rice is produced. Vitamin C is restored to processed potatoes and also to pineapple juice. These are examples of a naturally occurring nutrient added back to a processed convenience food. Many deficiencies diseases such as rickets have disappeared mainly because of the enrichment or fortification of foods.

More controversial is the use of several engineered foods substitutes for the naturally occurring foods. An engineered food for school foodservice programs is a food that has its ingredients processed in a new form. This is not to be confused with a fortified food. An engineered food may or may not be fortified. It may be natural or imitation. The term "engineered food" is used to describe foods prepared or processed to improve nutrition, reduce cost, offer greater convenience in meal preparation, improve acceptability and improve stability. This type of food has been used to provide a highly nutritious supplement to undernourished or malnourished people, including CSM (corn, soya, milk) under Food for Peace Program and WSB (wheat, soya blend) under the CARE program.

Several years ago, about 1971-1972, at the time of the world food crisis, school feeding programs began to use several new engineered foods.

- High Protein Pasta Products—such as spaghetti, macaroni, and noodles. These products substitute for one-half of the two-ounce requirement of the cooked meat or meat alternate on the Type A lunch. These products have 20 to 25 percent protein and a protein efficiency ratio of 2.38 against 3.5 or 3.7 for meat.

- Textured Vegetable Protein—a plant protein (mostly soya) approved for use since 1971. Faced with tremendous increases in food prices and a shortage of grain and an increased cost of animal protein, the United States Department of Agriculture approved for use not more than 30 percent of hydrated textured vegetable protein as a meat replacement. Textured vegetable protein has more protein than meat although its protein efficiency ratio is lower than meat. (1.8 versus 3.5 or 3.7). Used in combination with meat, it has what is called a "synergizing effect"; that is, in combination with meat, the mixture provides a greater amount of essential amino acids. Textured vegetable protein of itself is very low in fat, but when used in combination with meat will absorb one-half fat normally drained from the meat during the cooking process. There are no standards of identity for products containing textured vegetable protein.

- Fortified Baked Product with Cream Filling for Use in Breakfast Program and Supplement Nourishment.

- Fortified Doughnut—these products when served with one-half pint of fluid whole milk (3.5 percent) butterfat, will meet the requirement of a three component breakfast (fruit, cereal, and milk).

- Imitation Cheese—may be used as with 50 percent natural cheese. The use of these foods is controversial among experts. Dr. Aarn Altschul, Department of Community Medicine and International Health at Georgetown University, Washington, D.C., has stated: "In our preoccupation with food problems of children, and more recently with the general problem of affluent malnutrition, we sometimes are prone to overload the great advances of nutrition in our society." He further stated: "The beauty of the concept of the engineering both for nutrition and sensory quality in foods, is that any nutritional problems that might develop may be rectified and this possibility is easier for fabricated foods than it is for the so-called natural foods."

Speaking at the same conference several years ago, W.B. Murphy, retiring president of Campbell Soup Company, questioned the use of these foods with this warning. "As of today, textured protein products are inferior to meat, to poultry, to fish, to milk, and to eggs in nutrient quality. They do not have the same ideal balance of essential amino acids; they do not have all of the minerals and other micro-nutrients; and they do not have the same level of nutrient availability. They cannot be supplemented with missing nutrients because all the nutrients are not known and supplementation does not necessarily mean equivalent availability."

The rationale of the Department of Agriculture in approving these products is that while it is desirable to obtain adequate nutrition through a properly balanced diet of conventional foods and while it is true that there is an abundance of natural foods in this country, some children are not receiving an adequate diet. Where foods are offered, dietary habits and customs sometimes prevent consumption.

Objections to artificial engineered foods include that while an engineered mixture may contain a considerable number compounds, those compounds do not approach those in foods such as orange juice, meat, milk, or vegetables. Not enough is known about nutrients to insure that any engineered food is an acceptable substitute for natural foods. The foodservice program has its purpose for children to learn to eat a variety of foods and to develop good food habits. Provision of an engineered food which may or may not be available to the child at home, defeats this purpose.

It is not my intent here today to further debate the wisdom in using these products. We have tested some of them for

acceptability; some have been adapted, others discarded. We do specify enriched products where known nutrients are lost in processing. We are reluctant to substitute fabricated, imitation, or fortified products unless there is careful analysis and documented evidence of a nutritional need. We do use the textured vegetable foods. The foodservice program has its purpose for children to learn to eat a variety of foods and to

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Janet Shinn

WATER TREATMENT, STERILIZATION, AND FOOD SANITATION IN THAILAND'S SCHOOL FEEDING PROGRAM

At present, the group of diseases classified as dysentery, typhoid fever, diarrhea, enteritis, and intestinal parasitism are still leading illnesses in Thailand. It is estimated that 6 out of every 10 cases of illness throughout Thailand and possibly in other tropical countries are due to one or more of these "filth diseases." The main reasons for these high morbidity rates are that village people are not interested in cleanliness. Premises are left unsanitary. Used water pooled under the house offers an ideal breeding place for flies, mosquitoes, and other insects. Water supplied for villages comes from unprotected sources, such as ponds and improperly constructed wells. Sanitary privies are not commonly constructed or used, and villagers lack knowledge and understanding of the relationship between unhygienic conditions and disease.

To solve these problems, a water supply program for the rural people, including the school-age population, was launched in the year 1960 under the name of "Village Health and Sanitation Project." Up to now, 11,285 water supplies have been constructed in rural areas.

In 1975, a sanitary survey was made in 57 schools in the Bangkok metropolis by the School Health Division. Findings of the survey concerning the water supply showed that for drinking water 12 schools (21.1 percent) used raw water and 45 (78.9 percent) used water from the Bangkok metropolis supply.

During 1974-1975, a workshop on school health for provincial principals and health personnel was conducted. Questionnaires on school sanitation were sent to the principals of 2,039 schools in 15 provinces. There are approximately 27,000 primary schools and nearly 1,000 secondary schools in 71 provinces all over the country. Survey findings are shown in Table 1.

Table 1
Sanitation Survey Findings 1975

Number of schools surveyed	2,039
Number of pupils or students	536,009
Adequate source of safe drinking water	1,083 (53.1 percent)
Inadequate source of safe drinking water	680 (33.4 percent)
Source of unsafe drinking water	276 (13.5 percent)

Problem Solving

The sanitation division of the Department of Health has launched a school water supply program that will be increased annually. Starting in 1977, at least 1,000 to 1,500 school water supplies per year will be constructed. It is expected, therefore, that in the next 10 years school children in rural areas will have safe drinking water.

For water treatment in Thailand, hypochlorite powder which contains 60 to 70 element chlorine is used. The concentrations of residual chlorine in water 30 minutes after treatment is shown in Table 2. This is the most inexpensive way to ensure safe drinking water.

Table 2
Residual Chlorine in Treated Water

Residual chlorine in pipe water supplies for drinking:	0.2-0.4 ppm.
Residual chlorine in pipe water supplies for drinking during outbreaks of communicable diseases:	1 ppm.
Residual chlorine in periodic sterilization of protected sources of water such as ponds:	100 ppm.
Residual chlorine in utensils sterilization:	50 ppm.

Food Sanitation in the School Feeding Program

In Thailand, particularly in rural areas, students usually carry their lunch to school. Some, however, return to have their lunches at home, and some buy food at schools. For the convenience of students, schools often allow vendors to sell food during lunch time. It is known that these vendors normally sell their food to make a profit rather than to promote children's health. Most food items are not nutritionally accepted. In addition, they are in unsanitary conditions dangerous to the consumers. Hence, foodborne diseases such as diarrhea, food poisoning, enteric fever, and intestinal parasitic manifestation occur frequently among the school children. To improve the situation, in 1974 the School Health Division launched "Food Sanitation in Schools" project which is intended to study raw data of food sanitation and study the health of food handlers in schools; improve food selling in schools according to requirements of food sanitation; spread knowledge of food sanitation to students and food handlers in schools; prevent school teachers and students from gastro-intestinal diseases.

This project began during the last term of academic year 1974 (December 1974) and continued until academic year 1975 (March 1975). About 23 schools in Bangkok metropolis were surveyed and studied. Steps for implementing food sanitation included a sanitary survey of dining halls, a sanitary survey for food stalls, and bacteriological examination of food utensils. Further steps were physical examination including fecal examination and X-ray; treatment and advice for those who have diseases and follow-up to be performed in every case; education for food vendors on how to keep food in a sanitary condition and on methods of sterilization for food utensils; dissemination of food sanitation knowledge to the teachers and students; six month and thereafter annual examinations and resurveying of food sanitation conditions, including bacteriological examination of food utensils as a periodic assessment.

At present, the project is under operation. Because of a very limited number of personnel and a small budget, the project will be extended gradually to about 30 schools annually. It was expected, however, that the results of these activities would be a guideline to improve food sanitation in schools over the whole country.

Ulitt Leeyavanija

Country Reports On School Foodservice

East Asia

JAPAN

Consisting of four major and numerous smaller islands, Japan is an oceanic country, which is sandwiched between the Japan and the Pacific Oceans at the east of the Asiatic continent. Its population amounts to 110 million as of 1975, showing a year-to-year growth of 1.3 percent in the past 10 years. Because mountains and forests cover the majority of the land space, Japan's population density is very high with 53.5 percent of its population found in a limited area representing a 1.73 percent of its total land space. Japan's GNP for 1974 was ¥136 million. Of this total, the national income was ¥113 million, or about ¥1 million per head.

Educational System

The present organization of the educational system in Japan is shown in Figure 1. Table 1 shows the number of institutions, students, and teachers. There are special schools for physically or mentally handicapped children. They include schools for the blind, mentally retarded, crippled, etc. All deaf or blind children of school age who are not enrolled in an elementary or a lower secondary school are required to attend one of these special schools. From 1979, all otherwise handicapped children who are not enrolled in any compulsory school also will be required to attend special schools.

There are a small number of elementary and lower secondary schools having special classes for children with comparatively mild handicaps. There also are a variety of educational establishments known as "miscellaneous schools," that offer vocational and practical education in different kinds of skills and techniques. At present, there are about 1.22 million students enrolled in these schools. There are three kinds of schools: national, local public, and private. The majority of elementary, lower secondary, and upper secondary schools are local public schools, while the greater number of kindergartens, universities, and junior colleges are private.

In Japan, all parents are obliged to have children under their protection receive a nine-year general education (six years of elementary schooling and three years of lower secondary schooling). The principle of free compulsory education is defined in the Constitution of Japan. Pursuant to this definition, no tuition fee has been charged in schools of compulsory education (elementary schools, lower secondary schools, and corresponding departments in schools for the blind, deaf, and otherwise handicapped) which are established by the Ministry of Education, Science, and Culture or local authorities. Both compulsory school attendance and completion percentages of those children qualifying for compulsory education reach almost 100 percent, provided that those children whose school entry is being waived or suspended due to special reasons are excluded.

The number of school days averages 240 per year. The school year begins on April 1 and closes on March 31 every year and is divided into three terms ending with a long vacation in summer, winter, and spring respectively. One classroom in schools of compulsory education has an average standard capacity of 45 pupils. Each school is composed of a principal, head teacher, a teacher in charge of each class, nurse-teacher, nutritionist, and other school personnel. Almost all teachers have a bachelor's degree and are selected from those who have passed an examination for a teacher license.

Figure 1
Organization of the School System

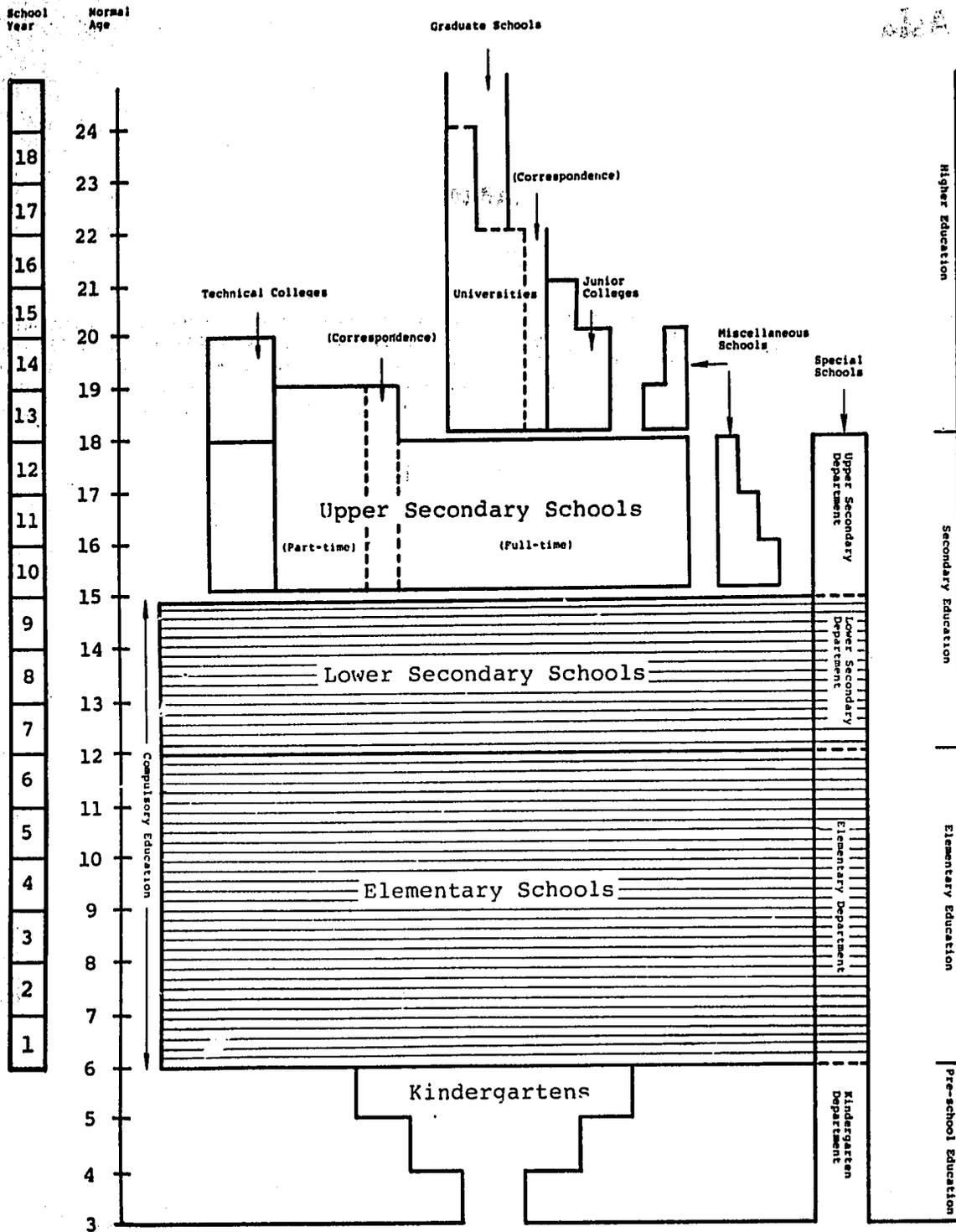


Table 1
Number of Institutions, Students and Teachers
(as of May 1, 1975)

	Insti- tutions	Students			Teachers (Full- time)
		Total	Male	Female	
Kindergartens	13,108	2,292,180	1,171,099	1,121,081	85,690
{ National	47	5,575	2,785	2,790	237
{ Local	5,263	565,145	288,806	276,339	22,388
{ Private	7,798	1,721,460	879,508	841,952	63,065
Elementary Schools	24,652	10,364,855	5,308,156	5,056,699	415,039
{ National	71	46,868	23,808	23,060	1,761
{ Local	24,421	10,259,857	5,262,420	4,997,437	410,788
{ Private	160	58,130	21,928	36,202	2,490
Lower Secondary Schools	10,751	4,762,444	2,434,613	2,327,831	234,832
{ National	76	36,685	19,531	17,154	1,645
{ Local	10,120	4,573,227	2,356,619	2,216,608	226,556
{ Private	555	152,532	58,463	94,069	6,631
Upper Secondary Schools	4,946	4,332,719	2,185,053	2,147,666	222,733
{ National	17	9,919	5,985	3,934	575
{ Local	3,701	3,014,755	1,588,112	1,426,643	171,311
{ Private	1,228	1,308,045	590,956	717,089	50,847
Special Schools	578	63,548	37,155	26,393	20,098
{ National	32	2,972	1,743	1,229	708
{ Local	533	59,811	34,960	24,851	19,234
{ Private	13	765	452	313	156
Universities	420	1,734,082	1,365,824	368,258	89,648
{ National	81	357,772	279,881	77,891	42,020
{ Local	34	50,880	36,304	14,576	5,602
{ Private	305	1,325,430	1,049,639	275,791	42,026
Junior Colleges	513	353,784	48,658	305,126	15,556
{ National	31	13,143	9,927	216	654
{ Local	48	17,973	4,708	13,265	1,617
{ Private	434	322,668	34,023	288,645	13,285
Technical Colleges	65	47,955	47,219	736	3,691
{ National	54	38,194	37,498	696	3,023
{ Local	4	3,942	3,911	31	339
{ Private	7	5,819	5,810	9	329

School Foodservice

Recent food status in Japan is shown in Table 2.

Table 2
Agricultural Production
(In 1000t, %)

Year Item	1955	1960	1965	1970	1974	Imports Domestic pro- ducts + Imports ×100	
Rice	12,385	12,858	12,409	12,689	12,292	0.5	
Wheat	1,468	1,531	1,287	474	232	88.6	
Barley	1,148	1,206	721	418	182	95.9	
Potatoes	2,908	3,594	4,056	3,611	4,377	0.2	
Soybeans, dried	507	418	230	126	133	96.1	
Maize, dried	100	113	75	33	33	99.8	
Cucumbers	402	462	773	965	963	2.3%	
Tomatoes	192	242	532	790	818		
Eggplant	467	449	623	722	663		
Cabbages	443	686	1,157	1,437	1,432		
Chinese cabbages	587	998	1,541	1,739	1,710		
Spinach	156	231	322	363	335		
Welsh onions	306	410	568	614	557		
Onions	424	601	860	973	1,021		
Japanese radishes	2,337	2,859	3,085	2,748	2,725		
Taros	496	496	478	542	431		
Mandarin oranges	461	894	1,331	2,552	3,389		17.9%
Apples	390	876	1,132	1,021	850		
Grapes	72	155	225	234	295		
Japanese pears	121	240	346	445	507		
Peaches	79	170	229	279	259		
Persimmons	284	337	346	343	284		
Tobacco	150	121	193	150	151	/	
Crude tea	73	78	77	91	95		
Sugar beets	375	1,074	1,813	2,332	1,878		
Meat	/		1,329	1,890	2,117	16.1	
Milk, Dairy products			4,575	4,761	4,875	17.5	
Catches by fisheries (excl. Whaling)	4,908	6,193	6,908	9,314	10,808	9.7	

The record shows that the first school lunch in Japan was served to needy children in 1889. In the early 1900s, lunch was served at school not only for charity purposes, but also to improve conditions of malnutrition and weak constitution. The present system, however, which was adopted newly in 1947, covers all school children, not discriminating against regions and personal circumstances. A survey conducted in May 1975, shows satisfactory development of the system, reaching 14,917,727 children, 84.4 percent of the total number of school children in Japan.

The primary objectives in enacting the School Lunch Law (see below) in 1954 along with other related laws and ordinances are to promote health and strength of school children by serving balanced and nutritious meals; to contribute to the sound development of the mind and body of pupils by fostering desirable dietary habits; and to contribute to the improvement of the food life of the nation.

The school lunch program is a required part of school education. It offers not only nutritionally balanced meals but also very important educational opportunities for closer contact among people, for richer and more enjoyable school life, and for formation of human relationships through having lunch together with teachers and pupils. In its short history of some 30 years, the school lunch program in Japan has contributed to sound development of the mind and body of school children and has been highly appreciated and seriously regarded.

The School Lunch Law

(Law No. 160, June 3, 1954 as amended subsequently by Law No. 41, 1956, Law No. 20, 1957, and Law No. 90, 1974.)

Purpose

Article 1.

The aim of this law is to provide necessary instructions concerning the operation of the school lunch program and therewith to popularize and improve it in recognition of the fact that the school lunch is conducive to the sound physical and mental development of pupils, as well as to help improve the dietary habits of the Japanese people.

Objectives

Article 2.

In the implementation of school lunch, efforts should be made to attain the objectives listed below, with a view to achieving the educational goals of schools of compulsory education;

- (1) To foster right understanding of and desirable habits in diet of daily life;
- (2) To enrich the school life and cultivate desirable sociability;
- (3) To understand the role of food in life, improve nutrition, and promote health;
- (4) To lead to understanding concerning production, distribution, and consumption of food.

Definition

Article 3.

In this law, school lunch shall be lunch for the pupils at schools of compulsory education, served for the purpose of achieving the objectives listed in the preceding article.

3-2. In this law school of compulsory education shall mean the elementary schools, lower secondary schools, or the elementary and the lower secondary departments of the schools for the blind, deaf, or otherwise handicapped as stipulated in the School Education Law (Law No. 26 of 1947).

Duty of School Establishers

Article 4.

The establishers of the schools of compulsory education shall endeavour to operate the school lunch program in their schools.

Duty of State and Local Bodies

Article 5.

The state and local public bodies shall endeavour to promote the popularization and sound development of school lunch.

5-2. Establishers of schools of compulsory education may have facilities (called "school lunch centers" in the following article) capable of supplying school lunch to two or more schools of compulsory education as facilities required for the implementation of school lunch for their own school.

5-3. A person in charge of the professional affairs of school lunch nutrition at school lunch centers or schools of compulsory education shall be a licensed nutritionist as provided for in Article 2 paragraph 1 of the Nutritionist Law (Law No. 245 of 1947) and shall possess sufficient experience and knowledge required for the implementation of school lunch.

Expenses

Article 6.

Out of the expenses for facilities and equipment necessary for the implementation of the school lunch program as well as those for its operation, such ones as stipulated by the government ordinances shall be borne by the establishers of the schools of compulsory education.

6-2. Expenses for the school lunch excepting those provided for in the preceding paragraph (hereinafter referred to as "school lunch expenses") shall be borne by the parents of the pupils supplied with the school lunch, who are defined in Article 22 paragraph 1 of the School Education Law.

State Subsidy

Article 7.

For the establishers of public or private schools of compulsory education, the state may, according to government ordinance, subsidize within limits of the budget part of the expenses for the facilities

or equipments necessary for the operation of the school lunch.

7-2. In case establishers of public elementary and lower secondary schools subsidize the parents of pupils supplied with the school lunch, who are provided for in Article 22 paragraph 1 of the School Education Law and who come under one of the following items, for part or all of the school lunch expenses to be borne by the said parents, the state may, according to the government ordinance, subsidize the said establishers for the time being for part of the expenses within the limit of the budget of the state.

(1) Needy people provided for in Article 6 paragraph 2 of the Daily Life Protection Law (Law No. 144 of 1945), excepting those parents who are provided for in Article 22 paragraph 1 of the School Education Law and who, concerning their pupils, receive the school lunch expenses according to the educational assistance under the provision of Article 13 of the Daily Life Protection Law.

(2) Those who are in need to the extent equivalent to the needy people provided for in Article 6 paragraph 2 of the Daily Life Protection Law and who are prescribed in the government ordinance.

Application for Subsidy

Article 8.

Establishers of the schools of compulsory education shall, in case they desire to have the state subsidy under the provision of the preceding article, submit application for the grant of subsidy to the Minister of Education, according to the government ordinance.

8-2. The Minister of Education shall, in case he has received the application for the grant of the subsidy under the provision of the preceding paragraph, decide whether he will grant the subsidy or not and inform the establishers of the schools of compulsory education of his decision.

Refundment of Subsidy

Article 9.

The Minister of Education shall, in case the person who has been informed of decision of the grant of the subsidy according to the provision of paragraph 2 of the preceding article comes under one of the following items, cease the grant of the subsidy or make him refund subsidy already granted.

(1) In case the person has used the subsidy for purposes other than that for which the subsidy was granted;

(2) In case he has without any appropriate reason failed to acquire, within the year of the grant of the subsidy, the facilities or equipments subsidized for;

(3) In case he has used without any appropriate reason the facilities or the equipments subsidized for, for purposes other than that of the subsidy or disposed of them without obtaining the permission of the Minister of Education;

(4) In case he has offended against the conditions of grant of the subsidy;

(5) In case he has received, or intended to receive the subsidy by means of defrauding.

Wheat

Article 10.

In cases where the state, according to the sale and delivery program as decided upon by the Minister of Agriculture and Forestry after consultation with the Minister of Education, and in accordance with the provisions of the Foodstuff Administration Law (Law No. 40 of 1942), delivers, for the use of the school lunch program any of the wheat or the wheat flour made thereof which has been purchased by the state at the account of the Foodstuff Administration Special Account, the proposed price of such wheat or wheat flour shall, regardless of the provisions of Article 4 paragraph 3 item 2 of the same law, be decided by the Minister of Agriculture and Forestry provided that such procedure be deemed necessary for the improvement of the food life.

Wheat Flour

Article 11.

The person who has purchased for use of the school lunch program the wheat or the wheat flour provided for in the preceding article, and the person who keeps in storage the said wheat or the wheat flour for him, shall not transfer the said wheat or the wheat flour for use other than in school lunch nor use them for a purpose other than school lunch.

Reports

Article 12.

The Minister of Education or the Minister of Agriculture and Forestry may, in cases where he deems such necessary for planning or execution of the sale and delivery program provided for in Article 10, require the establishers of public or private schools of compulsory education to submit their reports on necessary matters concerning school lunch.

Government Ordinance

Article 13.

The procedure and other matters necessary for execution of this law shall, excepting those provided for in the same, be laid down by government ordinance.

At present, the following three categories of school lunch are served: complete lunch with bread or rice, milk and a main dish; complementary lunch with milk and a main dish; and service of milk only. The ministry is making efforts for wider service of a complete lunch which is most effective.

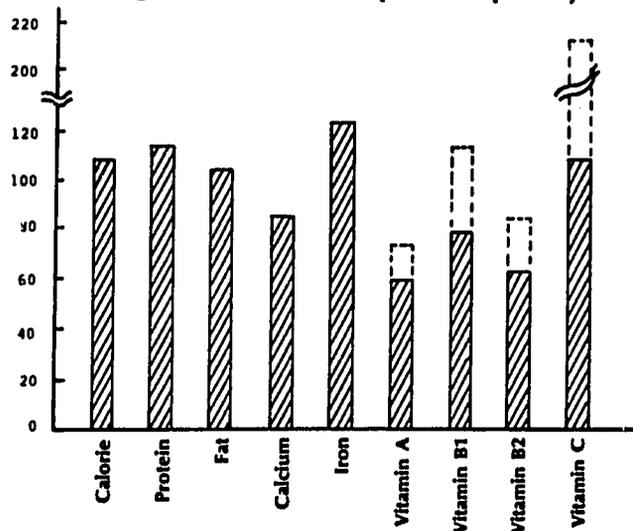
Table 3
Coverage of School Lunch in May 1975

School	Number of students participating in school lunch program & their percentage of the total number of students			
	Complete lunch	Complementary lunch	Milk only	Total
Kindergarten	249,210 (10.9%)	62,988 (2.7%)	149,100 (6.5%)	461,298 (20.1%)
Elementary School	10,001,181 (96.5%)	60,093 (0.6%)	208,042 (2.0%)	10,269,316 (99.1%)
Lower Secondary School	2,630,474 (55.2%)	41,974 (0.9%)	1,285,315 (27.0%)	3,957,763 (83.1%)
Night Part-time Course of Upper Secondary School	93,431 (49.3%)	83,638 (44.1%)	1,254 (0.6%)	178,323 (94.0%)
Special School	47,466 (74.7%)	526 (0.8%)	3,035 (4.8%)	51,027 (80.3%)
Total	13,021,762 (73.7%)	249,219 (1.4%)	1,646,746 (9.3%)	14,917,727 (84.4%)

Nutritional Control

According to a survey conducted in 1971, the actual average nutritional intake in Japan per head per day is shown in Figure 2. Calories, proteins, fat and iron, and vitamin C are close to standard values, but intake of other nutritional elements such as calcium, vitamin A, vitamin B1, vitamin B2 are conspicuously lower than standard. Considering data in Figure 1 show the national average, much variation can be found among people of different regions, eating habits, income groups, and age groups. Guidance is now being provided for maintaining required daily nutritional quantity on the basis of these variables and also for promoting health and establishing proper eating habits.

Figure 2
Average Nutritional Intake per Head per Day



*Comparative intake values of nutrition in 1971 against standard nutritional values expected to be attained in 1975 (the latter equals 100)
*Dotted line shows percentage of vitamins decreased on a process of cooking.

The standard for required nutritional quantity in school lunch has been reestablished from time to time as necessary. The existing standard, as shown below, is the April 1974 revision.

Table 4
Standard for Average Nutritional Quantity
Needed by Pupils per Head per Meal

Item	Nutritional Quantity				
	Preschool Children	Elementary School Children		Lower Secondary School Children	Evening High School Students
		Age 6 - 8	Age 9 - 11		
Calories (Cal.)	500	600	700	850	900
Protein (g)	20 (9)*	23 (10)	30 (13)	36 (15)	32 (13)
Fat (g)	14	17	20	24	25
Calcium (g)	0.3	0.3	0.4	0.5	0.5
Vitamin A (IU)	750	900	1,100	1,100	1,300
Vitamin B 1 (mg)	0.4	0.5	0.6	0.7	0.7
Vitamin B 2 (mg)	0.5	0.6	0.7	0.8	0.8
Vitamin C (mg)	19	19	20	22	25

*Figures in parentheses represent animal protein.

While the health of school children has been a predominant factor in establishing this standard, each school should consider on actual application of the standard their students' nutritional intake at home and special features of the school and the region and should decide nutritional values suitable for each region, school, or each age group of school children.

A study conducted for the period 1971-1974 on nutritional intake from school meals by pupils in relation to the standard of nutritional quantity needed by each pupil, as Table 5 shows, indicates that most nutritional elements are met except vitamin A, which is slightly lower than the standard amount. Local variations of the intake values, however, are quite large, and some measures should be taken to correct these discrepancies among individual regions and schools and to improve further the nutritional contents of the school lunch in these substandard regions and schools.

Table 5
Comparison of Actual Nutrition Intake in Relation to Standards for Required Nutritional Quantity
for School Lunch (Elementary School Children)

	Calories (Cal.)	Protein (g)	Fat (g)	Calcium (mg)	Vitamin A (IU)	Vitamin B 1 (mg)	Vitamin B 2 (mg)	Vitamin C (mg)
Standard values	650	26.5	18.5	350	1000	0.55	0.65	20
1971	739 (114%)	27.5 (103%)	25.7 (139%)	376 (107%)	956 (96%)	0.62 (113%)	0.65 (100%)	21 (106%)
1972	736 (113%)	27.0 (102%)	26.6 (146%)	365 (104%)	976 (98%)	0.61 (111%)	0.65 (100%)	21 (105%)
1973	735 (113%)	26.9 (101%)	26.2 (143%)	361 (103%)	932 (93%)	0.60 (109%)	0.64 (99%)	21 (105%)
1974	738 (114%)	27.0 (102%)	26.8 (145%)	356 (102%)	892 (89%)	0.61 (111%)	0.64 (99%)	22 (110%)

Upper figures represent national averages of nutritional intakes. Lower figures in parentheses represent ratios of actual intakes against the standard values.

There are three expense categories for monies spent in operation and administration of the school lunch program: equipment and facilities, labor of cooking personnel, and materials and supplies for the meals. Of these expenses, those for materials and supplies are borne by parents, and the rest borne by establishers of schools. Charges on materials and supplies for the school lunch are different among individual schools and regions. Children are fed at school five times a week, or 180 to 200 times a year. Free lunches are provided from funds of government and local authorities to needy children and pupils, approximately 550,000 in total. All children at the school with the school lunch program are provided for equally.

Personnel

There are two types of professional personnel in the school lunch staff: school nutritionists who are in charge of nutritional controls of the school lunch and the cooking staff who is engaged in actual cooking (see Table 6). The school nutritionist was institutionally established as regular educational employee in 1974. The Ministry of Education provides bases and proper guidance for the cooking staffs. They attend yearly seminars sponsored by the government and participate in self-development activities such as overseas educational trips or training meetings in various forms.

Table 6
Number of School Nutritionists
Number of Cooking Staffs

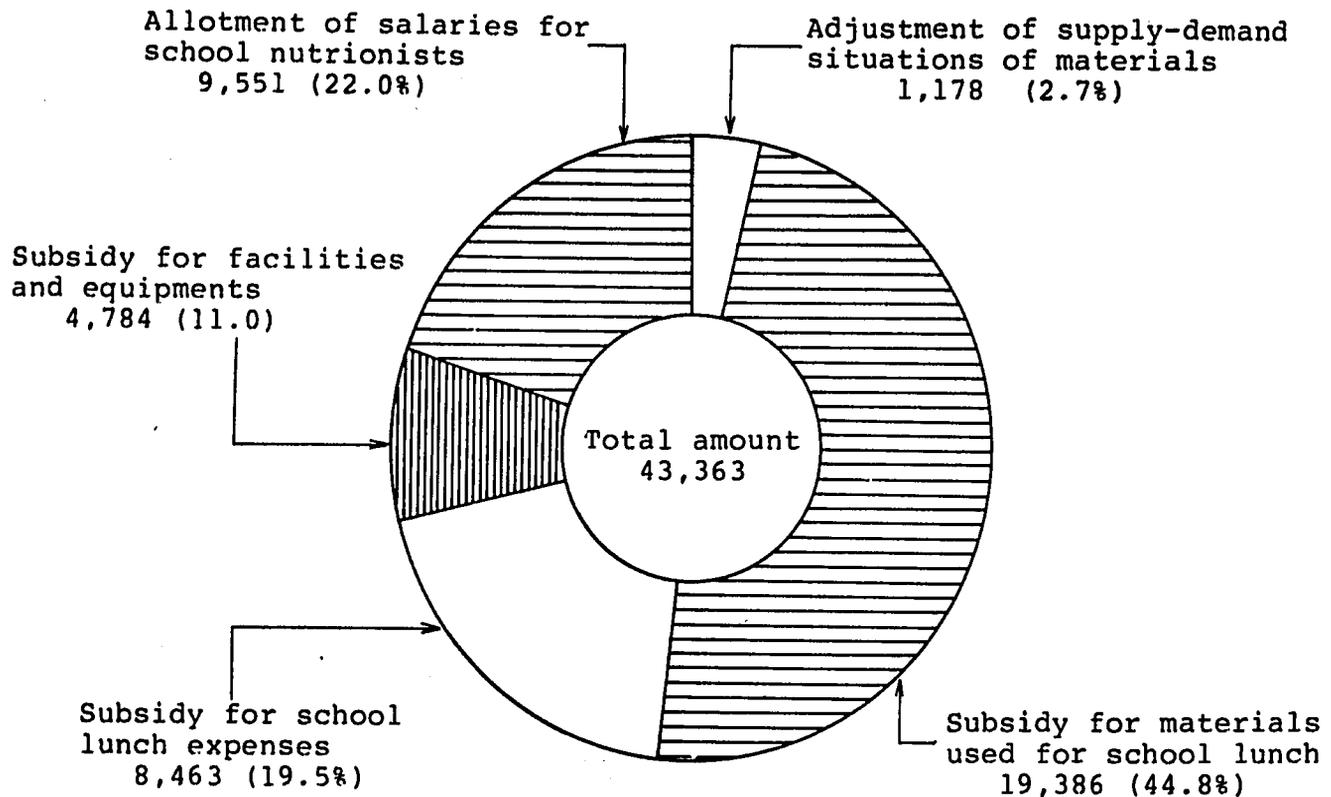
Institution	School Nutritionists	Institution	Cooking Staffs
Prefectural Board Of Education	66	Elementary School	41,999
Municipal Board Of Education	590	Lower Secondary School	6,987
Elementary School	3,179	Night Part-time Course Of upper Secondary School	1,545
Lower Secondary School	737	Special School	1,096
Night Part-time Course Of upper Secondary School	273	School Lunch Center	22,147
Special School	259	Total	73,774
School Lunch Center	2,369		
Others	38		
Total	7,511		

Government Subsidy

The government subsidizes the school lunch program (see Figure 3) for its sound development and popularization mainly for following purposes:

- for expenses for facilities and equipment necessary for operating the school lunch program
- for school lunch expenses for needy people and for those who study in evening schools
- for expenses in adjusting supply-demand situations of materials
- for materials used for the school lunch program such as wheat flour, milk, etc.
- for salaries for nutritionists who are in charge of the school lunch program

Figure 3
Government Subsidy to School Lunch 1976-1977
(in million yen)



Administration, Supervision, and Community Involvement

The function of the Ministry of Education, Science, and Culture is to promote and disseminate formal education, social education (including sports), sciences, and cultural activities and to deal with governmental services on religion. The Ministry has so far established and operated national universities, junior colleges, technical colleges, national youth centers, various museums, etc. It is responsible for providing guidance and advice for local educational and cultural affairs. Proper recommendations can be extended to local educational authorities for improvement and correction, if necessary.

The Ministry is empowered to authorize local governments and nongovernmental bodies to set up institutions of higher education and to guide and supervise them. Affairs related to protection of cultural properties and copyrights and activities for improvement of cultural life are also under its jurisdiction. A structural diagram of the Ministry of Education is shown in Figure 4.

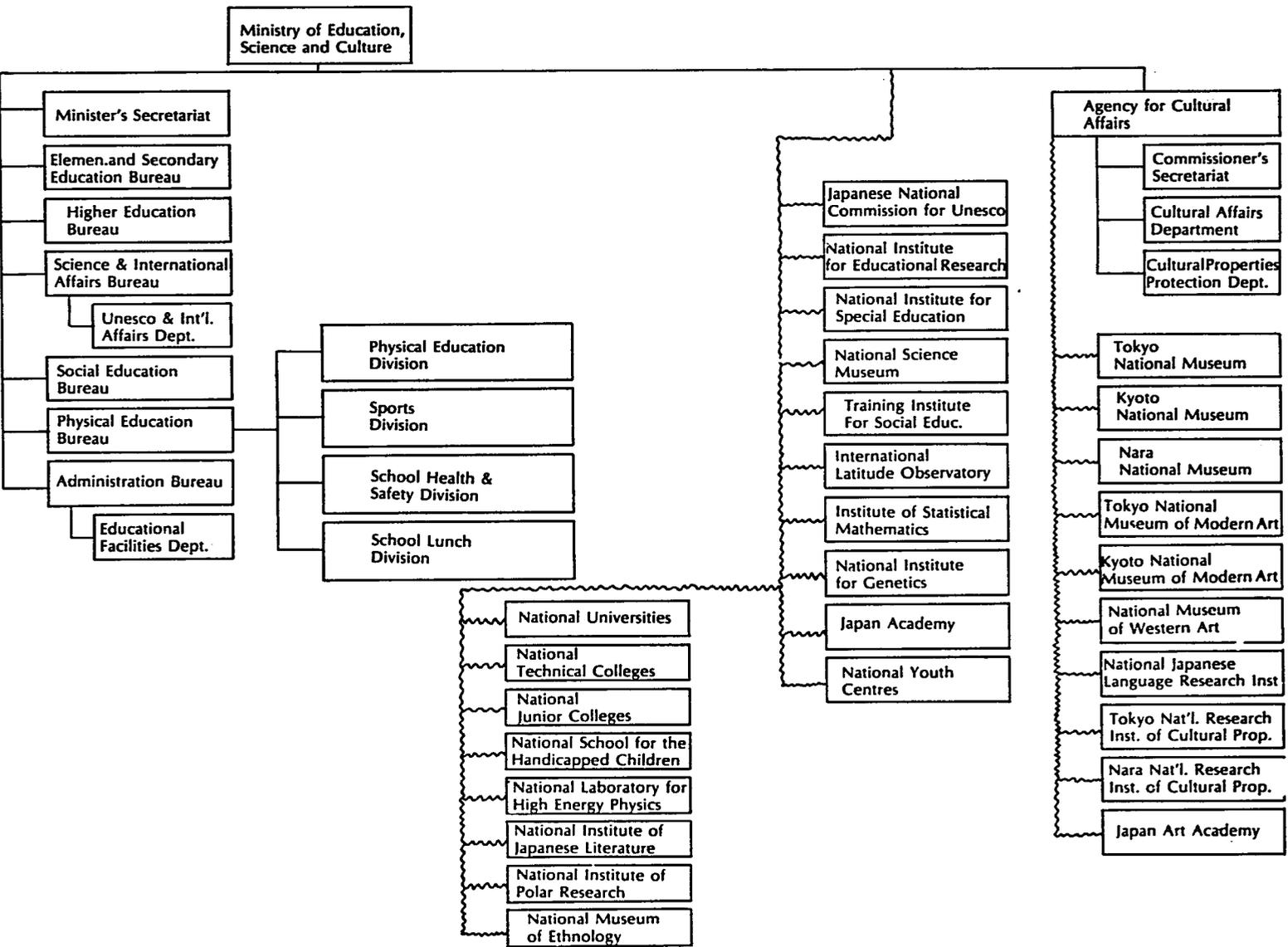


Figure 4
Organization of the Ministry of Education, Science, and Culture

Organization of Local Educational Administration

Japan consists of 47 prefectures, each of which is further divided into a number of municipalities. There are 3,267 municipalities throughout the country (as of 1974). Each prefecture or municipality has a board of education responsible for educational administration. There are no set patterns of organization for local educational authorities. A typical organization is shown in Figure 5. Each prefectural board of education is composed of five members appointed by the governor. The board appoints a

superintendent of education, who serves as chief executive officer for the board. The main functions of the prefectural board of education are:

- giving guidance and supervisory advice concerning education to the municipalities under its jurisdiction and having them submit relevant reports
- giving financial aid to municipalities with regard to educational affairs
- managing and operating prefectural schools and other educational institutions
- handling personnel affairs related to teachers and others working at elementary and secondary schools and other educational institutions under its jurisdiction

Each municipal board of education is composed of three to five members appointed by the municipal mayor. One of the members also serves as superintendent of education. The municipal board of education deals with operating and managing the elementary and lower secondary schools and other educational institutions under its jurisdiction, school attendance of children, school curricula and instruction, social education (including sports activities) for adults and youths, promoting arts and culture and protection of cultural properties.

**Figure 5
Typical Organization of Boards of Education**

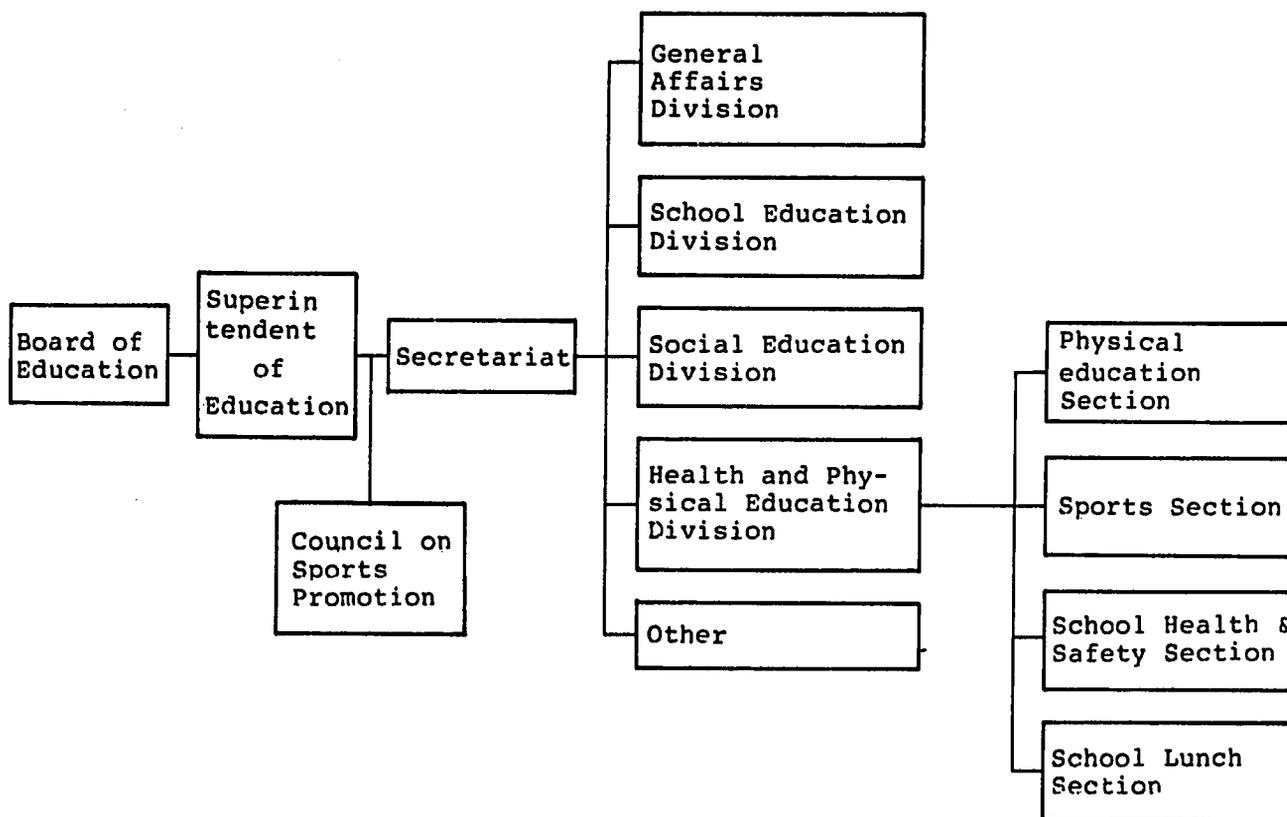
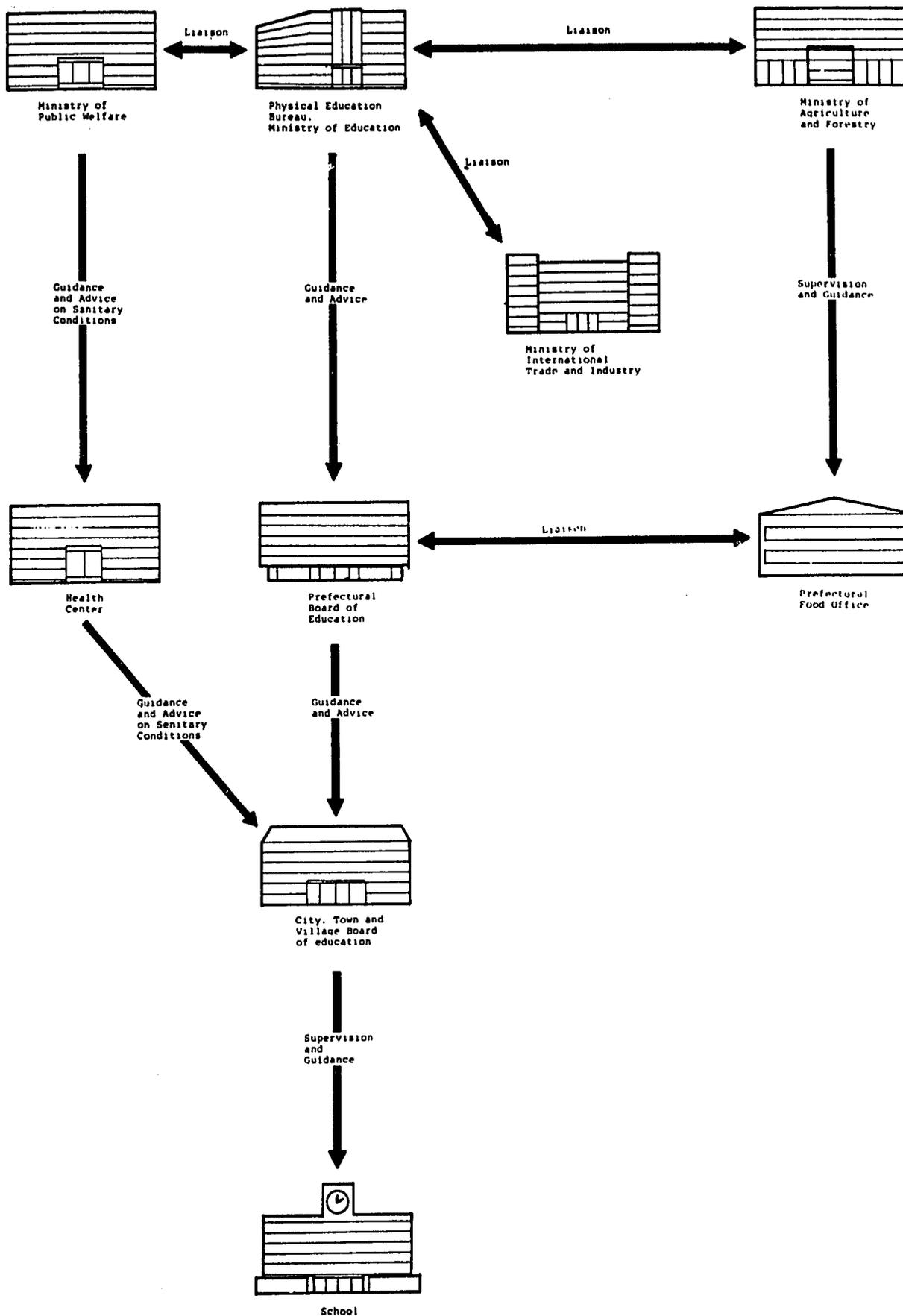


Figure 6 permitting differences according to schools, shows the general system of the school lunch program within the school.

Figure 6
School Lunch Program Administrative System



The National School Lunch Corporation of Japan

The National School Lunch Corporation of Japan, established as an agent of the government in accordance with the Law for the National School Lunch Corporation of Japan, has been entrusted with a pivotal role in the appropriate and efficient delivery of school lunch foodstuffs. In meeting these expectations, the corporation has been careful in the performance of its duties, the remarkable achievement of which is exemplified in a steady delivery of school lunch foodstuffs at reasonable prices to the remotest schools of the nation, especially in face of recent inflationary trends in the over-all economy.

The corporation is a semi-governmental organization founded on October 1, 1955, by virtue of the Law for the National School Lunch Corporation of Japan of August 8, 1955. The purpose of the corporation is set forth clearly in the explanatory statement given by the then Minister of Education Kenzo Matsumura when the law was introduced to the National Diet:

"School lunch has an extremely desirable educational effect in fostering a sound physical and mental development of pupils at stages of growth, and it also will help improve the dietary habit of the Japanese people in the long run. The provision of school lunch is therefore looked upon as a matter of national concern.

"The School Lunch Law, fundamental law for the implementation of the school lunch program, was enacted in 1954, providing for a legal framework of the national school lunch program. In order to secure a more effective and smooth operation of the program, however, it is necessary to examine and select an enormous quantity of foodstuffs for school lunch use and to supply them promptly and smoothly to meet the demand.

"For this reason, the government considers it a matter of urgent importance to create a corporation by law as a national agency to secure school lunch foodstuffs, as well as to popularize and improve the school lunch program. Here is the Law for the National School Lunch Corporation of Japan submitted for your consideration and approval."

The National School Lunch Corporation of Japan, thus established as an agent of the government for the purpose mentioned above, has since been carrying on a series of activities with a view to promoting the nationwide school lunch program in line with the governmental policies.

Character, Organization, and Budget

Matters concerning personnel, methods of operation, accounting, supervision, etc., are stipulated primarily in the Law for the National School Lunch Corporation of Japan and in more detail in the Ministry of Education Ordinances, the Ministry of Education Notifications, and a number of regulations of the corporation approved by the Minister of Education.

The National School Lunch Corporation of Japan is subject to the advisory and supervisory control of the Minister of Education. The Minister of Agriculture and Forestry also exercises advisory and supervisory control, if necessary, in respect to school lunch foodstuffs. Officers (the president, five directors, and two auditorial directors) and 15 councillors of the corporation are all appointed by the Minister of Education.

All the activities of the corporation are financed exclusively by the subsidy of the Ministry of Education. The corporation manages its accounting in two separate lines, one operational dealing with personnel, clerical, and business expenses, and the other a foodstuffs accounting dealing with transactions of school lunch foodstuffs. Personnel, clerical, and business expenses, in this regard, are all covered by government subsidy.

Activities

With a view to furthering sound development of the school lunch program in Japan, the corporation has been carrying on two types of activities, one for the appropriate and smooth supply of school lunch foodstuffs to elementary and secondary schools all over the country and the other for popularizing and improving the school lunch program as a whole.

The standard school lunch consists of bread or rice, milk, and some cooked food with the standard calories required per capita per meal prescribed by the notification of the Ministry of Education, Science, and Culture. In order to secure adequate foodstuffs for the three components mentioned above, the corporation exclusively supplies wheat flour, rice, skim milk, and beef to schools throughout the country, and also offers service by supplying a variety of foodstuffs to be used for cooked food, with the approval of the Minister of Education.

The corporation purchases wheat flour from dealers and supplies it, mostly in the form of bread, to all the schools in the country through the prefectural school lunch associations at a nationwide uniform price. Wheat flour is nonbleached and specially enriched in vitamins. With the government subsidy granted for the purchase of flour, the corporation can supply flour less expensively.

Although the standard school lunch consists of bread, milk, and a main dish, cooked rice has been added since fiscal 1976 in an effort to diversify school lunch menus and to help pupils acquire a good habit of nutritive rice eating. It is planned that cooked rice will be served twice a week, alternating with bread, in the future. The corporation purchases rice at a special rate from the Food Agency. Rice is supplied through the prefectural school lunch associations to all the schools of the country at a nationwide uniform price.

Since the school lunch program was inaugurated toward the end of 1946 after World War II, skim milk had been widely used as a basic foodstuff of school lunch and caused a remarkable improvement in physical standards of school children. With the increase of domestic milk available for school lunch, the use of skim milk has recently decreased. Because of its inexpensive price and rich level of nutrition, however, it continues to be used to a considerable extent in cooking and bread processing. The corporation imports skim milk from countries like New Zealand and Australia and supplies it to schools.

The corporation had helped schools to secure beef since fiscal 1970. Full scale supply of beef started with the advent of fiscal 1976, as beef was added to a list of government-designated foodstuffs. The corporation imports beef from Australia and, after processing it, supplies it to schools at a low price.

In addition to flour, rice, skim milk, and beef, the corporation is also dealing with other foodstuffs to meet demands from schools, with care to securing high quality foodstuffs supplied at reasonable prices. Among these items are cheese, canned food (vegetables, fruits, sea food), flour produce (macaroni, crackers, etc.), raisins, sugar, salad oil, shortening, rice produce (alpha rice), potato mix, frozen foods (codfish meat), strawberry jam, curry rye, soap, etc. Of these foodstuffs, cheese is imported from New Zealand at a discount price for school lunch use and is distributed to schools in the form of processed cheese. Raisins are imported from Australia.

Popularization and Improvement of the School Lunch Program

Another important function of the corporation is to carry out a series of activities for popularization and improvement of

the school lunch program and to achieve its sound development in accordance with government policies toward school lunch. With a view to spreading the school lunch program and improving the content of school meals, the corporation annually organizes a number of nationwide gatherings either under its own sponsorship or under co-sponsorship with the Ministry of Education, with a notable result of raising the standard of the school lunch program in Japan.

At the National Study Conference on the School Lunch Program study and discussions are carried on concerning all problems confronting the school lunch program in order to implement complete school lunch in all schools and to improve the content of the program. The conference is held for three days annually with some 2,300 participants from all parts of the country.

The School Lunch Study Conference is designed to study and discuss various issues regarding school lunch operations, controls, guidelines, and quality. Training Courses for Improvement of School Lunch are held at three places in Japan chiefly for school personnel in charge of foodstuff purchasing. The training courses aim at improving and rationalizing the distribution of foodstuffs for school lunch use.

Training Courses for Leaders in School Lunch Cooking bring together leading school lunch nutritionists to train in the theory and practice of cooking Chinese and Western dishes, milk produce, eggs, etc. The courses are organized for 10 days in three different places in the country, with the participation of approximately 150 leading nutritionists serving at the prefectural boards of education, schools, etc.

Training Courses in School Lunch Cooking are organized at the prefectural level to practice cooking school lunch dishes with milk and rice produce, frozen food, macaroni and spaghetti, etc., as main ingredients. The courses are organized for two days in 20 prefectures, with the participation of some 1,000 dietitians and cooks in each prefecture.

Training Courses in Baking of School Lunch Bread facilitate quality improvement and diversification of school lunch bread, and include lectures and practice to enable the participants to acquire basic knowledge of bread and to develop baking techniques and the ability to distinguish good bread from bad bread. The courses are organized for six days in three different places of the country, with the participation of approximately 150 technical staff members in nutrition from prefectural boards of education and school lunch associations.

Training Courses for Food Analysis Techniques are held in three places in the country for three days and are designed to teach trainees how to analyze foods in an attempt to improve their quality control over foodstuffs for school lunch use. School Lunch Cooking Competitions are held at 25 places throughout the country in order to improve and diversify the content of school lunch. Winning contestants are commended officially.

The *School Lunch Bulletin*, which carries a variety of practical information on the school lunch program, food market, cooking guidance, etc., is a monthly publication. Forty thousand copies are distributed free of charge to schools all over the country. In addition, the corporation compiles and publishes a *Collection of School Lunch Menus, Handbook for Selection of Foodstuffs for School Lunch, Reference Book for the School Lunch Program*, etc., with the cooperation of experts in various fields concerned.

Since 1973 the corporation has set up analysis facilities and training installations in order to improve the quality of foodstuffs for school lunch use and sanitary control and to meet the social demand for safe foods. Quality analysis of foods handled by the corporation is now being made at the training installation by four analyzers and will be further intensified in the future. The installation is also equipped with cooling and baking equipment which has been used for various training courses.

The corporation has been carrying out a research and development project designed to develop good foodstuffs desirable for school lunch. Foodstuffs developed by the corporation include frozen hamburger, soft curry rye, soft cracker, chinese noodle with milk, codfish meat, etc. Some of these items have been marketed under the brandname of the corporation and enjoy a good reputation.

The corporation has created a fund for securing the stable supply of foodstuffs for school lunch use based on governmental subsidy of ¥2,000 million received in fiscal 1975 and 1976. This fund is loaned to prefectural school lunch associations to purchase food or is used to finance a control fund for maintaining a stable food price. It has proved to be very effective to secure the stable supply of foodstuffs.

In an effort to improve and rationalize foodstuff purchasing by effectively using production and distribution information on foodstuffs for school lunch, the corporation has been making distribution surveys and publishing information on production and distribution of school lunch foodstuffs.

Future Prospects for the National School Lunch Corporation of Japan

The corporation will continue to serve as a pivotal organ of the national supply and demand network of school lunch foodstuffs and fulfill its function of procurement and distribution of high quality foodstuffs. Furthermore, the corporation is planning to carry out not only its role as a distribution agency but also its role as a comprehensive center for school lunch in Japan. For this purpose, the following activities are contemplated:

- to supply school lunch foodstuffs more smoothly and properly and to operate its fund for securing the stable supply of school lunch foodstuffs in close connection with each prefectural school lunch association, while diversifying and developing new foodstuffs to be incorporated into school lunch through its national supply and demand network.

- to strengthen its school lunch training facilities and to intensify its quality-checking mechanism, thereby facilitating the supply of high-quality and safe foods to pupils.

- to actively collect and transmit foodstuff distribution information in order to help the purchasing staff of schools secure the rationalized procurement of foodstuffs.

- to expand its training program for school nutritionists, cooking staff and other personnel in charge of school lunch in an effort to help them prepare more nutritive foods of high quality.

- to issue various publications and to sponsor exhibitions, seminars, and overseas training courses all aiming at expanding and improving school lunch.

School Foodservice and Education

School lunch used to be provided only to a limited number pupils as ill-fed or needy children. It was therefore labeled a charitable undertaking. At present, however, it covers all pupils of schools of compulsory education that offer school lunch.

The purpose and objective of school lunch are clearly described in the School Lunch Law, Article 1 and Article 2. In addition, the government's course of study sets a standard for the preparation of guidance programs and actual operations.

Study objectives at the elementary level include developing a desirable human relationship in the class for the health and safety of mind and body of the children and a sound attitude for living. Classroom guidance includes school meals, health and safety guidance, guidance in the use of the school library, and other educational activities centering around the classroom. In classroom guidance, it is necessary that there be a close relationship among subjects. Consideration must be given to the individual differences of the children.

In school lunch, it is necessary to help the children to experience the right way of eating a meal, to foster a desirable human relationship through meals, and to contribute to the sound development of children's bodies and minds. In preparation of a teaching program, it is important to give careful consideration to the children's stage of development and to achieve objectives even in the case of joint children's activities in the different grades.

Lower Secondary Schools

At the lower secondary level, the contents of class guidance should include individual adaptation, adaptation into group life, to studies, to the choice of a future course, and health and safety. In giving guidance on class contents, it is necessary for the teacher to keep in mind adaptation to a new school life, the dissolution of any individual suffering or anxiety, understanding about one's own individuality, adaptation to group activities, the establishment of desirable human relations, the formation of a sound living attitude, the dissolution of inadaptability in studies, the elevation of desire for study, the enhancement of interest in a future course, the clarification and scrutiny of the future course, choice of the appropriate future course, the promotion of mental and physical health, the adaptation to sexual growth, and habituation to safe behavior.

The teacher should strive to consider problems that arise in the pupils' school life as a whole, keeping each content of class guidance correlated and making practical application of as many specific data and examples as are available under the overall perspective of three years, thereby providing systematic and developmental guidance. In addition, guidance on the contents relating to the choice of a future course, in particular, should be given in all of the three grades.

The teacher should always endeavor to collect adequate data essential to understanding each pupil, such as individual records, family circumstances, regional environment, etc., so as to be able to provide the children with proper guidance. In addition, in order to provide ongoing guidance for individual pupils, it is desirable for the teacher to keep in close contact with the pupils' households and systematically conduct counselling concerning the pupil's education, including counselling on the pupil's future course.

During the lunch hour, the teacher should provide proper guidance on meals to contribute to the pupils' sound mental and physical growth, such as the formation of desirable eating habits, the fostering of desirable human relations, etc. School nutritionists assigned to each school strive to give nutritive guidance to children and to correct their unbalanced diet in cooperation with a teacher in charge of their classroom, while engaging in overall nutritive controls and in menu preparation for school lunch.

Evaluation

Some effects of school lunch are measurable and some are not. Those measurable include the economic effect of school lunch directly or indirectly increasing the disposable income of parents. Those not measurable are educational and social effects such as helping children to acquire desirable eating habits, cultivate desirable sociability, and improve dietary life in local society.

The following are some of the typical examples, although not up-to-date, showing the effect of school lunch. They are extracted from *The Effect of School Lunch*, 1962, compiled by Ministry of Education.

Effect on Bodily Strength, Constitution, and Health of Children

The height, weight, and chest size of those children provided with complete school lunch and the height and weight of those children provided with milk showed a higher growth, compared to those provided with nothing in Fukushima City. The higher the school grade, the more remarkable becomes the growth rate. It is evident that school lunch is responsible for this physical improvement.

Children's growth has been remarkably improved in Okinawa since milk supply started. The growth rate of those provided with milk is much higher than that of those not given milk. In the case of schoolboys aged 11 to 14, the difference is 2.4 cm in height and 1.7 kg in weight. School lunch may be the cause of this difference.

Leg curvature is found more often among lower secondary school children in Tokushima. Especially in the case of rural schools not executing school lunch. Second-year children having leg curvature account for 20.0 percent of the total. This percentage decreased to 10.1 percent in two years after the start of school lunch, to 7.6 percent in three years, and to 3.6 percent in nine years, evidently thanks to school lunch.

Vitamin intake of the children of Kawafune Elementary School in Iwate Prefecture went up considerably; namely vitamin A, by 50 percent, vitamin B1 by 160 percent and vitamin B2 by 150 percent, all compared to the level before the start of school lunch. With this increase in vitamin intake, bodily strength improved, the amount of nitrogen and creatinine in urine rose, the amount of vitamins A, B2, and C in the serum increased, and the percent of those having perleche decreased from 19 percent to 2 percent in eight months after the start of school lunch. It is noted that this percentage jumped from 20 percent to 29 percent in the case of those schools not offering school lunch.

In Sotoasahikawa Elementary and Lower Secondary School in Akita Prefecture, which did not have school lunch service, children were provided with 180 cc of milk four days every week for a year. As a result, their blood pressure, which had been too high, gradually declined. The discontinuance of the milk supply caused the pressure to go up again.

In Chiba Prefecture school lunch execution for three years improved children's physical growth, increased their nutritive intake, and reduced the rate of sick leave. Moreover, the number of late-comers and early-leavers decreased and the attendance rate improved greatly. In Ibaraki Prefecture, thanks to nutritive improvement as a result of school lunch, physical check-ups during the past three years found a remarkable decline in various diseases caused by under-nourishment.

Effect on Children's Eating Habits

Children in the higher grades of Yaguma Elementary School in Nagoyashi were found to be less unbalanced in their eating habits. The percentage of those having an unbalanced diet is 17 percent in the case of the first grade and only approximately 1 percent in the case of the sixth grade. As for children at the same age level, 15 percent showed an unbalanced diet and 3.5 percent were under-hourished at the first grade level. These percentages decreased to 1 percent and 0.6 percent respectively when children advanced to the sixth grade, thanks to school lunch.

Of the children of Nishi Elementary School in Tsushima-shi, Aichi Prefecture, 23 percent showed an unbalanced diet at home and only 6 percent showed the same habit at school lunch. Kiyone Elementary School in Okayama Prefecture found that only 41 percent of children ate at home what they disliked and a high 85 percent of them took it at school lunch. The percentage of those children who did not like vegetables or carrots in particular decreased to 22.9 percent in 1960 from 30 percent in 1948. Those not liking dried gourd shavings accounted for 10 percent in 1948 and only 0.3 percent in 1960, showing a decline of 9.7 percentage points.

Future Issues

The school lunch program in Japan is characterized by its educational future for promoting school children's health and improving their physical strength, and for correct understanding of desirable meal patterns and discipline in daily life. To substantialize and advance the school lunch program further, the following issues should be given first consideration:

- compulsory school lunch service
- allotment of expenses necessary for operation of the school lunch program
- improvement of dietary contents
- proper guidance for the school lunch
- better facilities and equipment for the school lunch system
- better adjustment of supply-demand situations for materials

Those school children who are given the right understanding of desirable meals under a school lunch system thus improved will undoubtedly live sound and happy social lives in the future.

M. Kato

REPUBLIC OF KOREA

The Republic of Korea has a territory of approximately 100,000 square kilometers and a population of about 35 million. The population, until recent years, had been increasing at a staggering rate; however, a vigorous and successful family planning program initiated in the early 1960s lowered the rate to 1.82 percent by 1972. Current goals call for a reduction of population growth rate to 1.5 percent by 1976.

The Korean economy has yet to achieve self-reliance. Steady effort, however, is being made to push the national economy toward that goal. When the Korean War ended in 1953, what remained was nothing but devastation. What fragile industrial basis that existed before 1950 was reduced to ashes. It was hard to expect economic reconstruction from a country whose territory was divided and whose resources were so poor. Moreover, Korea has to meet the ever-increasing demands of national security preparation. Nonetheless, because of highly successful achievements under three consecutive five-year economic development plans (from 1962 to 1976) the gross national product is steadily increasing and the consequent increase in per capita income reached from U.S. \$87 in 1962 to U.S. \$531 in 1975. Foremost among future tasks will be effective utilization of available resources with a highly trained and well educated labor force and through formulation of viable, long-term development plans.

Education

The school system in Korea follows the pattern of elementary school (six years), middle school (three years), high school (three years), and college or university (four years). Exceptions to this rule are two-year junior colleges and six-year medical colleges.

Compulsory education begins for all children at the age of six years in elementary school. The enrollment ratio which was 94.5 percent in 1966 rose to 97.2 percent in 1975, showing an increase of 2.7 percent in 10 years.

The educational background of teachers is mostly high school or junior teachers college. There are 15 junior teachers colleges in Korea. The teacher-student ratio is approximately 1:50.

The education budget is usually allocated by the Economic Planning Board under the authorization of the National Assembly. The percentage of education budget allocation to total government budget in 1975 was 16 percent. Of total education budget, which amounted 212,254 million won or U.S.\$ 438 million, the allocation in terms of percentage in different levels of government is: central level (Ministry of Education), 18.4 percent; provincial (11 Boards of Education), 16.3 percent; county/city (155 Offices of Education), 65.3 percent.

Food and Nutrition Status

A nutrition survey was conducted in farm, fishery, mountain, and urban areas in 1973 by Ewha Womens University survey team. Table 1 shows the calorie and protein intake in those areas. Korean caloric intake was characteristically high in carbohydrates, low in fat, and moderate in protein.

Table 1
Korean Calorie Protein Intake in Farm, Fishery, Mountain, and Urban Areas per Person, per Day

Areas	Sex	Calorie	Protein (gm.)	Fat (gm.)	CHO (gm.)
Farm	Average	2,296	67	13	482
	Male	2,641	77	15	554
	Female	1,952	57	11	410
Fishery	Average	2,050	53	8	427
	Male	2,358	61	9	506
	Female	1,743	45	7	374
Mountain	Average	2,491	68	15	473
	Male	2,864	78	17	544
	Female	2,117	57	12	402
Urban	Average	2,228	79	42	383
	Male	2,600	87	49	452
	Female	1,856	70	31	324
Average	Average	2,266	67	19	441
	Male	2,606	76	22	507
	Female	1,926	56	16	375

Calorie intake was composed of carbohydrate 81 percent, protein 11 percent, and fat 8 percent respectively. Low fat consumption is a major difference in calorie composition from western diet. As economic standards improve, carbohydrate consumptions are reduced, and fat and animal protein consumptions increase.

The ratio between animal and total protein intake is the highest in urban areas, 23 percent, and the lowest in mountain areas, 9 percent.

Mineral and vitamin consumption also show regional differences. Most of the minerals and vitamin consumption did not reach RDA standards. Calcium and iron consumption in fishery areas is the lowest and in urban areas is the highest. The major reasons for differences in calcium intake is milk consumption.

Urban areas are increasing the milk consumption and rural areas are consuming very little milk. The most limited vitamin in the Korean diet is vitamin B2, because of the lower consumption of animal food. According to the clinical survey of fourth grade boys and girls in primary school, more than 10 percent of the children showed angular stomatitis, skin lesions around lips and jaw, and bleeding of gum.

The most simple method of estimating nutritional status of school children is the measuring of body weight and height. The relation between nutrient intake and physical development of Korean primary school children is shown in Table 2.

Table 2
Nutrient Intake of Primary School Children—Mid-day Meal

Schools	Sex	Calorie (Cal)	Carbohydrate (%)	Protein (%)	Fat (%)
Susong	M	629.42	77.45	12.09	11.37
	F	649.47	70.17	16.28	13.24
Buksung	M	590.34	82.71	11.41	6.94
	F	601.76	80.84	12.49	5.82
Changchun	M	802.08	82.24	11.93	6.50
	F	559.34	81.92	12.55	5.78
Sudong	M	794.11	82.34	10.87	6.07
	F	801.27	82.96	10.87	6.07
Kayang	M	570.00	80.29	11.54	7.12
	F	829.27	84.50	11.21	7.94

Susong, Buksung, Changchun primary schools are high, middle, and low level schools in the Seoul area. Sudong and Kayang primary schools are in the country. There was no difference in the calorie intake between the urban and country schools, but there was a difference in calorie components. Protein and fat proportions in the total calorie count were highest in the Seoul area, and the ratio of the animal protein intake to the total protein also was high. Children in the country consumed lower amounts of protein.

Meanwhile, there were no differences in body weights and height between male and female children. The children of Susong primary schools were best. When weight and height were compared between Seoul and the country, Seoul children were superior to the country children in both. It can be concluded, therefore, that nutritional status had close relationship to the physical development. (See Table 3).

Table 3
Comparison of Body Weight and Height of Primary School Children

Schools	Sex	Body Wt. (Kg)	Height (cm)
Susong	M	27.92	134.12
	F	30.30	140.66
Buksung	M	27.98	131.74
	F	28.34	133.87
Changchun	M	28.15	132.50
	F	27.64	132.75
Sudong	M	25.82	129.31
	F	25.73	126.37
Kayang	M	24.92	126.44
	F	24.38	124.13

School Foodservice

The Republic of Korea received food supplies from 1953 to 1973 from sources outside the country that were utilized in various ways for feeding school children. The school feeding programs thus far implemented have been only partially effective.

The program failed to reach desired levels of nutrition based on nutritional requirements of the children. Not all elementary schools of the country were included, while nutrition education and training components of the programs showed only limited development.

The discontinuation of foreign food supplies in 1973 brought about a huge decrease in the school lunch program. For budgetary reasons, the Ministry of Education is not yet able to compensate for this loss although government budgetary allocations have increased significantly since 1973.

For the purpose of experimentation and exploration with the objective of establishing the best and most economic method of developing a nationwide, community-supported feeding and nutrition education program, the Ministry of Education undertook pilot programs in 33 rural and 21 urban schools in 1972. The aim of these programs is to improve the status of the existing school feeding program whose initial objectives were to supply relief foods.

Although legislative enactments have not yet been made, the Ministry of Education has set forth the following as its program objectives: They are to improve health and physical development through a school feeding and nutritional education program; and to contribute to the national campaign for food production improvement and for a family pattern of food consumption.

The school feeding accomplishment for the past 20 years is shown in Figure 1 and Table 4.

Figure 1
Progress of School Feeding in Korea Over the Last 20 Years

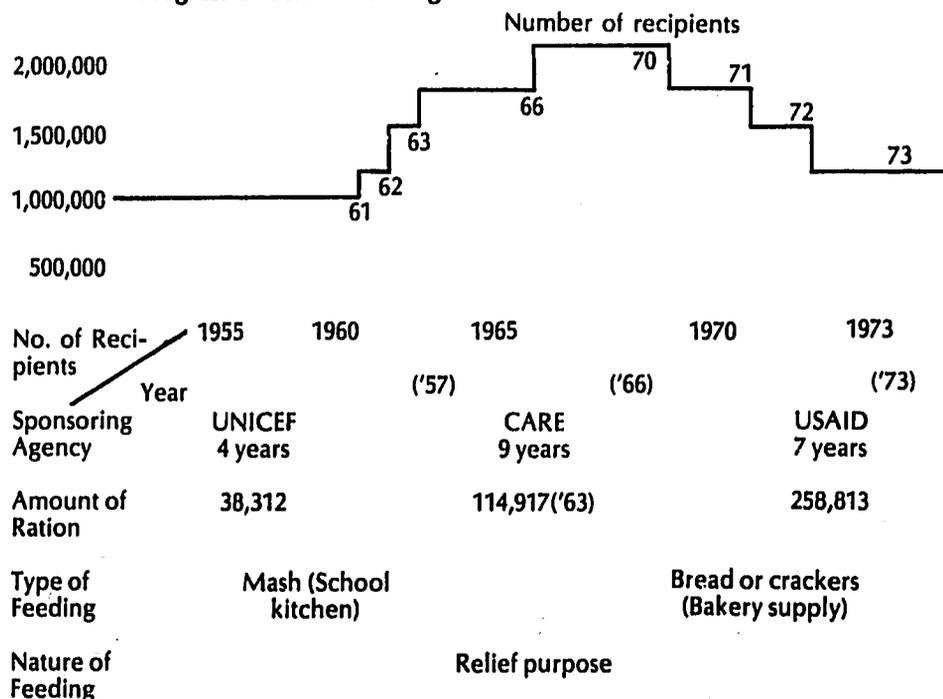


Table 4
School Feeding Program for 1976

Item/Type of Feeding	Region	No. of children	Type of meal	Meal cost	Shares
Self-sufficient pilot feeding program	Rural (55 pilot schools)	31,000 (total enrollment)	Staple and side dishes (5 times/week)	70-85	Facilities: State subsidy Food: State subsidy (for three years) and by productions activities and parents' contributions.
Semi self-sufficient feeding program	Offshore and remote (half)	159,000 (from 3rd grade)	Staple and side dishes (3 times/week)	55	Facilities and Foods: State subsidy
	City type (21 model school)	21,000 (3rd grade)	same	70-85	Facilities: State subsidy Foods: Parents' contribution
General feeding program	Offshore and remote (half)	159,000 (3rd grade)	Staple only (5 times/week)	35	State subsidy
	Rural and city areas	As wanted	Staple and side dishes (2 times/week)	35 25	

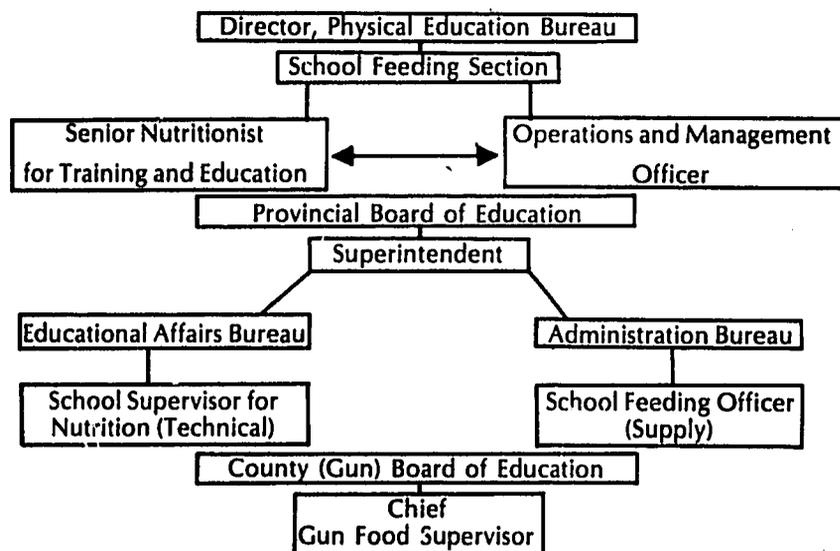
—State subsidy provided for 152,000 needy children in these areas.

Kitchen size and storage area are determined according to the number of students. The Ministry of Education sends out guidelines to establish these requirements. Sterilization and disinfecting of food containers and utensils are accomplished mostly through boiling in the countryside and steaming in the city. Water supply is from tap and spring well. In the countryside water is treated by boiling. In the city filtering and chlorination are used.

The school feeding program has been evaluated mostly for the pilot schools. The baseline, progress, and evaluation surveys will continue to be conducted. Program evaluation is related to its effectiveness in regard to students' growth and physical development as well as their nutritional improvement.

Figure 2 illustrates the administrative setup of Korea's school feeding program.

Figure 2
Administrative Hierarchy of Korean School Feeding Programs



Coordination and Training

Strengthening of coordination efforts has been undertaken with Ministries of Agriculture, particularly the Applied Nutrition Project of the Office of Rural Development; Health and Social Affairs; the faculties of home economics, agriculture, and medicine in the universities; and the National Institutes of Health in order to mobilize all possible resources for reaching the objectives of the school food and nutrition education program. These contacts have resulted in assistance in planning rural kitchens, in the conduct of various surveys, in some guidance for food production activities, and in lecturers for the training courses.

The Specialist Advisory Committee, which consists of five members—three professors, a representative from the Ministry of Agriculture, and one from the Office of Rural Development—has a few meetings every year to review and evaluate the program and to make recommendations to the Ministry of Education on the national policy of school food and nutrition education.

In cooperation with the Applied Nutrition Project and universities, a program of training and orientation in the principles and practices of food and nutrition education for the provincial officials, school headmasters, teachers, and local community leaders has been implemented. This has been done through seminars, short-term training courses, and practical field training. Since 1972, the Ministry of Education has conducted these seminars or workshops two to four times annually reaching a total of about 680 people who in turn carry out their own local training programs.

Problems

Difficulties encountered in the school feeding program, that the government has been trying to overcome include lack of enthusiasm of parents and local community, insufficient allocation of funds and personnel for the program, inappropriateness of curriculum, and inadequate local food production and food industry support to the program.

Nutrition Training and Education in School

Results of a survey carried out by the Ministry of Education in November 1971 to determine the effects of school feeding have proven that feeding contributes substantially to the over-all success of the school education program. Improved student enthusiasm for the teaching-learning environment, a higher percentage of school attendance, and a reduced rate of absenteeism due to poor health initiated by malnutrition have been observed. The survey also revealed an increasing acceptance of bread, thus furthering the government's policy of substituting wheat products for rice in the diet.

Feeding, however, must be accompanied by nutrition education for the students themselves and the community at large. Nutrition education has received insufficient attention so far. The training of teachers in nutrition education is essential for the attainment of a satisfactory school food and nutrition program.

Self-Supporting School Feeding

The Ministry of Education is placing a high priority on school feeding. A WFP food aid request has been formulated for the coming, fourth five-year Economic Plan. The Ministry of Education will try to establish a school feeding program within the capabilities of each local school community. The eventual aim of the project is for school feeding to be largely self-supporting and the responsibility of the communities themselves, with the Ministry of Education providing only for very needy children. In elementary school, the meal now served to a limited number of children depends chiefly on relief supplies of wheat flour. The goals are to reach a larger percentage of children to meet the nutritional requirements of the age group concerned through a more balanced meal, to develop nutritional awareness, and to promote local school/community food production for use in the school meals.

Since 1972, the Ministry of Education has been implementing a number of pilot school feeding and nutrition education projects, to be situated in representative rural areas of the country—such as rural, coastal, mountain, and remote and offshore areas—in order to study the most effective and economic method of establishing a countrywide program of feeding in the elementary schools and nutrition education throughout the school system.

Parents and the community are encouraged to participate actively in the program so that the educational elements of the program may be more effective. The Ministry of Education has sent out guidelines for the pilot project. These guidelines include:

- Food resources for the school meal must be developed according to self-help, hard work, and cooperation, as expressed in the Sammaul movement and its guiding spirit. These activities must be incorporated into the school curriculum and program.
- Foods to be produced should be selected from those high in nutritional value and suitable to conditions in the school and community. Priority will be given to those foods needed for the feeding program, and participation by the children in production activities will be encouraged.
- The school will provide feeding for all the children enrolled, and practical nutrition education will be linked with the meal and the food production activities.
- Basic facilities and equipment needed for feeding and food production will be provided from the government budget.
- Coordination and cooperation with the Applied Nutrition Project, local Office of Rural Development, Health Center, and other related government services must be strengthened.
- The school will conduct nutrition education programs for the community in connection with the feeding program in order to stimulate appreciation and cooperation in the program.

Nutrition Education

As yet, the Ministry of Education has not sufficiently strengthened nutrition instruction, but many of the pilot schools have plans to integrate nutrition with other subjects in their own curriculum. The Ministry of Education has developed and distributed posters, slides, and models showing the five basic foods and the alternate foods for exchange according to available foods in regions.

Many government officials and school teachers have limited knowledge of food and nutrition. Many experts feel the first step should be training these personnel through specific workshops and teachers college courses. A special study should be carried out to determine how to integrate nutrition education with other subjects in the regular curriculum in Korea. Many nutrition education materials should be made and distributed at each level of administration and to each school.

School Gardens

School gardens and livestock units can help to improve farming techniques, interest children in food production, encourage home gardens, and improve the image of farming, as well as provide better food for the children and their families. Most schools in rural areas have some land, but the size of the garden varies. The average size will be 500-1,000 pyung

(1,650-3,300 square meters).

The Ministry of Education sent out guidelines for food production activities. Children and teachers are encouraged to participate in food production activities as a part of their extra-curricular work. Produce from these activities are utilized in school feeding. Parents and community members are encouraged to participate.

In rural schools, emphasis is to be placed on the economic value of the garden. Vegetables and fruit trees planted should have high nutritional value and suit local taste. All available space around classrooms and playgrounds, and all open land in school compounds should be used for production of vegetables and fruits. In the selection of the crops to be grown, priority is given to crops high in nutritional value, particularly in those nutrients deficient in the local diet. The importance of the educational elements should be kept in mind. The most appropriate plants to be grown will vary with the soil and rainfall of the region, but usually should be local in origin, such as:

- soya beans (particularly if milk is scarce in the area), other beans, potatoes
- green and yellow vegetables—cabbage, green onions, carrots, spinach, tomatoes, green peppers, etc., to provide necessary vitamins and minerals
- fruits—peaches, plums, grapes, persimmons, apples, pears, etc.
- raising of small animals to provide protein in the diet also may be practiced, including poultry (for eggs and meat), rabbits, fish, and in a few instances, goats (for milk if school is small and has the necessary facilities), pigs (for income if facilities permit).

Scientific and improved methods of farming are to be progressively adopted in the production activities, thus contributing to overall improvement in farming practices of the community.

Food production activities inherently provide a practical teaching-learning opportunity in nutritional and agricultural techniques. In other words, through animal raising and growing crops in school gardens, the relationship between the method of producing more nutritious foods and the nutritional value of the foods produced can be recognized easily by the participants, particularly in the light of what they learn from diversifying animal/crop raising, fertilizing, and from seed selection practices. It is anticipated that, along with these effects, input-output calculations as undertaken by the school children may enable them to improve their arithmetical skill through practical exercises associated with the food production activities.

With both limited staff and land and limited knowledge of agriculture, it is difficult to reach the goals of providing foods for feeding activities and effective utilization of limited land. Many schools want to set up large animal raising projects to earn money for buying food ingredients for feeding and to provide money to meet other expenses of running the program. It would be helpful for the Ministry of Education to distribute information about the program by a regular newsletter to schools.

Future Plans

The government, now in its fifth year of the third five-year Economic Development Plan (1972-1976), has had to concentrate so far on economic and industrial development. The fourth Economic Development Plan has as its major goals the fields of rural and social development and the government expects to be able to greatly expand those activities that will increase the health and well-being of the people, including food and nutrition programs in the elementary schools.

During this period, the government plans to establish kitchens and facilities in rural and smaller urban schools and to seek technical aid for the establishment of central kitchens in urban areas to serve neighborhood schools. The government also plans to encourage the expansion and contribution from communities of locally produced foods high in nutritional value to make more balanced meals, and to produce them as an educational measure in the grounds of the rural schools. The government is also encouraging the dairy industry and is planning bilateral assistance to establish a number of cattle raising farms for meat and dairy production.

School gardens and nutrition activities will be expanded by establishing a hundred more pilot schools. The government plans gradually to abolish the different types of programs now in operation and to unify the school meal, providing a more complete menu to meet the nutritional needs of the children. The School Feeding Law will be presented to the National Assembly for consideration, outlining the responsibilities of each sector.

Programs of training and orientation for the provincial staff, school masters, teachers, parents, and local community leaders will be continued and intensified through seminars, short-term training courses, and practical field training. In-service training lectures on nutrition will be provided for teachers of elementary school during their yearly in-service training period. Such lectures have already been prepared. Modified instructions on new types of nutrition programs will be issued to all of the schools.

Nutrition education materials also will be introduced into the junior teachers college representing urban and rural areas for enhancing nutrition, science education, home economics, health, and agricultural teaching and practices within the present curriculum.

Y.C. Kōng

REPUBLIC OF CHINA

Taiwan, also known as Formosa, is a province of the Republic of China. It is an island situated off the southeastern coast of the Chinese mainland. The island has an area of 13,808 square miles, slightly larger than Massachusetts and Connecticut combined. When the Chinese Communists occupied the mainland in 1949, the Republic of China temporarily moved its government to Taiwan. Also under the government of the Republic of China are Kinmen (Quemoy) and Matsu, two island groups just off the Chinese mainland.

The population of Taiwan stood at 16.2 million in 1975, with a birth rate of 23.12 and growth rate of 18.28 per thousand. Taiwan has more people than Australia and New Zealand combined and nearly as many as Sweden, Norway, and Denmark combined. Less than 40 percent of the people live on farms. Taiwan has been enjoying one of the most rapid continuous economic growths for more than two decades. The average growth rate was 9.1 percent in 1953-1973. Per capita income or output now stands at U.S. \$700, one of the highest in Asia outside Japan. Electrification is nearing 100 percent and electric rice cookers, fans, and refrigerators are found in rural areas. Nine out of ten Taipei households had television as of the end of 1974. The figure for the rest of Taiwan was one set to every two families.

Education System

Taiwan's school system is 6-3-3-4: Six years of elementary education, three years of junior high school, three years of senior high school (academic or vocational), and four years of college. There are also five, two, and three-year junior colleges. Many universities have graduate schools, offering master's and doctorate degrees. The number of schools and students at different levels in 1975 are shown in Table 1.

Table 1
NUMBER OF SCHOOLS AND STUDENTS—1975

Level of Schools	Number of Schools		Number of Students	
		total	boys	girls
Universities & Colleges	101	289,435	183,054	106,381
Senior High Schools	195	185,181	110,322	74,859
Senior Vocational Schools	177	282,415	151,970	130,445
Junior High Schools	605	1,036,357	572,160	464,197
Primary Schools	2,376	2,364,961	1,215,712	1,149,249
Kindergartens	762	117,990	63,029	54,961

As of 1975, the adult illiteracy rate was less than 7 percent, and another 10 percent was semi-literate.

School age is 6 to 12 and all school-aged children are required to complete six years of elementary education. In 1974-1975, 99.28 percent of school-aged children were enrolled in school and more than 98 percent completed the six years of compulsory education. In 1968, the basic period of free education was extended to nine years, and 90.2 percent of elementary school graduates were enrolled in junior high schools. About 91 percent of these students completed the nine years of free education in 1974-1975.

Length of the school year is 285 days for elementary and junior high schools. The average number of students per class is 48 for elementary schools and 52 for junior high schools. Teacher/class ratio is 1.24 for elementary and 2.0 for junior high. The educational background of elementary and junior high school teachers is shown in Table 2.

Table 2
EDUCATIONAL BACKGROUND OF TEACHERS—1975

	Elementary School Teachers	Junior High School Teachers
Graduate School	—	0.53%
Teachers College and College of Education	0.58%	—
College and University	1.49%	63.72%
Junior Normal College and Normal School	78.77%	—
Junior College	—	23.46%
Others	19.1%	12.24%

For elementary school teacher preparation, there are nine five-year normal colleges, admitting graduates of junior high schools. For the training of junior high school teachers, there is one normal university, one four-year teachers college, and

one college of education, all admitting graduates of senior high schools. These are all public institutions. No tuition fee is charged, and room, board, uniforms, and books are provided for all students free of charge. Professional courses of education also are offered in other public universities and colleges to students wishing to become school teachers.

Public education expenditure constituted 14.19 percent of the total government expenditure in the fiscal year of 1975. The percentage for education was 6.3 at the national level, 27 at the provincial level and an average of 52 at the county or city level. Total educational expenditure constituted 3.9 percent of GNP.

Food and Nutritional Status

Taiwan is the most densely populated geographical and economical unit in the world with food self-sufficiency. Farming is among the most intensive and per hectare output among the highest in the world. Taiwan has always been known for its great food surplus and exports, although this situation could not be maintained in recent years. Agricultural production continues to grow at 2.6 percent a year, but this growth cannot meet local demands for food, partly due to fast growing population, but primarily due to on-rushing industrialization which uses a substantial amount of the food crops as industrial raw material.

The main crops grown in Taiwan are rice, sweet potatoes, and sugar cane. There is also an abundance of fruits and vegetables in great variety. Rice is still the staple of life. Fish, both fresh water and from the sea, has traditionally been the chief protein food and remains important today. The main meat animals are hogs, chickens, and ducks, with the number of cattle increasing rapidly both for meat and for milk. The nutritional effect of the fast rising living standard is most visible in animal protein intake. Meat consumption at 28.47 kilograms per capita (1974) is the highest in Asia, including Japan. Two decades ago, a resident of Taiwan consumed 2,078 calories and 49 grams of protein per day. He now enjoys 2,780 calories and 74 grams of protein.

The relatively good diet is distributed fairly evenly, both socially and regionally. Thorough land reform was accomplished in 1949-1953 and has since been a model for developing countries. The inland transportation system is one of the best in Asia. The people of Taiwan, however, do depend on food imports for a more balanced and varied diet. Main food imports are wheat, maize, soybean, and beef; main exports are sugar, rice, farm and orchard produce, and hogs.

As a rule, school children take three meals a day. They eat rice and bread, meats and fish, vegetables and fruits, and milk and milk products. Their height and weight are measured each month and physical examination is given every one or two years. Health records are kept by school nurses at school. There are no significant nutrition deficiency incidences except in some poor communities where animal protein intake is still unsatisfactory.

School Foodservice

In Taiwan, most school children and teachers bring their lunches to school. In 1957, it was found that some of the children in mountain areas either brought no lunch or brought very little food. A pilot school lunch project was initiated in five mountain schools. Since then, the project has been gradually extended to schools in salt, fishing, mining, and rural areas. During the initial period (1957-1964), donations of wheat flour and milk powder were received from external welfare foundations. From 1964 to 1969, non fat milk powder, wheat flour, bulgur wheat, and vegetable oil were provided by the USAID under the United States Public Law 480. Between 1969-1972, similar food aid was given by the World Food Program. Table 3 shows the number of schools and students participating in the program in 1975.

Table 3
LUNCH PROGRAM PARTICIPATION—1975

Number of Schools Participating		Percentage of the Total Number of Schools	
Public Elementary Schools	360	15.2%	
Public Junior High Schools	50	8.3%	
Number of Students Participating		Percentage of the Total Number of Students	
Elementary Schools	204,525	8.7%	
Junior High Schools	25,259	2.4%	

Good Components and Program Facilities

In schools without lunch programs, students bring their own lunch boxes and schools provide facilities to steam the food. In some schools, hot soup is provided. In schools participating in the lunch program, hot lunch is provided. The meal usually consists of baked or steamed bread (145 gms), soup, and one dish of meat, fish, eggs, soy beans or peanuts cooked with vegetables. The average nutrition content per meals is shown in Table 4.

Table 4
NUTRITION CONTENT PER MEAL

	Cal.	Protein	Fat	Calc.	Phos.	Iron	A	B	B	Nia.	C
	gm.	gm.	gm.	mg.	mg.	mg.	IU	IU	IU	mg.	mg.
Junior High Schools	950	35	25	280	280	6	2,000	0.56	0.6	7.2	30
Elementary Schools	820	30	18	280	280	5	1,800	0.44	0.5	5.6	25

Since 1974, two million 180cc-bottles of fresh whole milk have been distributed to school children each day with one-third of the cost subsidized by the government. All schools have cooperatives, supplying mid-day snacks, milk, soy bean milk, etc. at cost.

All schools have kitchens, water supply and treatment (filtering, chlorination, and boiling) systems, and storage facilities built to various specifications standardized by the government. There are also baking centers throughout the island for making and distributing bread to schools.

Costs and Evaluation

The cost to each student per day is NT\$5-7 (U.S. 15-20 cents). The neediest 10 percent of all students are provided free lunch through government funds.

All students in schools with lunch programs are participants. Periodical evaluation projects are undertaken by nutrition experts and physicians from medical colleges and the National Institute of Public Health. Surveys on the effects of school lunch program on absenteeism and dropout rate, etc., are conducted periodically by provincial and local education authorities. Principal findings are that nutritional status and height and weight of participating students are much more satisfactory than those of non program students in same area; absenteeism and drop-out rate have decreased significantly; and awareness and knowledge of nutrition and food habits are improved.

Administration, Supervision, and Community Involvement

The Ministry of Education at the national level is responsible for laying out policies, setting up standards, and negotiating with national and international agencies when necessary. The Provincial Department of Education is responsible for planning, budgeting, and supervising the program, while the county office of education is in charge of the administration of the program at the local level. For actual implementation of the program in the schools, each school has a lunch committee with members selected from among parents, teachers, and the community. Parents and community leaders actively participate by donating funds or goods and rendering voluntary services. All teachers participate by having lunch with their students and providing nutrition education to children and parents.

Three-day workshops are conducted for teachers, school principals, parents, and community leaders who are to manage the program. For in-service training, one-day workshops are held each semester at the county level. Several groups of education officials and school principals have been sent to study school foodservices in Japan, Korea, and the United States.

Among the difficulties facing school foodservice in Taiwan are the need for adequate funds to subsidize children from needy families and the need for a greater supply of animal protein at low cost.

Nutrition Training and Education in School

In schools with lunch programs, parents and community leaders are invited to visit before and during lunch time and to have meals with the children occasionally. In such meetings as well as at teacher-parent association and mothers-and-sisters meetings, lectures on nutrition are given and discussions follow. Each week, schools put up large posters displaying the menu for each meal of the week, the food components, and the nutritional value of each portion served (calories and nutrients). During lunch and in health education classes, teachers familiarize children with nutrition facts.

In schools where children bring their own lunch boxes, teacher-parent association and mothers-and-sisters meetings are held periodically to have lectures and discussions on nutrition. Demonstrations of the selection and cooking of nutritious food components for lunch boxes are constantly made in schools for parents, teachers, and children to observe.

Health education is a required course from grades one to seven in which instruction on the importance of nutrition and the basic nutritive needs for the healthy development of children are given. In the required course "Life and Ethics" the formation of good food habits is emphasized. Nutrition education is also carried on in music and physical education classes through songs and games.

Many booklets, posters, and children's readers with beautiful pictures on food and its nutritional value are prepared by experts with at least three copies per class distributed to schools free of charge.

Community leaders are invited to take part in planning and implementing the program, and lectures and discussions on nutrition are held with community participation. Nutrition education is emphasized in the activities of teacher-parent associations, mothers-and-sisters clubs, and mothers' classes. In addition, nutrition education programs are presented periodically on television. Despite these efforts, insufficient qualified manpower to provide counseling services to the community is a difficulty in general and a major difficulty in remote areas.

School Gardens

The objective of the school garden is to integrate nutrition education with science education; to emphasize "learning by doing"; to cultivate love of nature and of labor; and to help in providing food for school meals. In rural schools, most of the classes have their own pieces of land where they can grow fruits and vegetables according to their own choice. In urban schools where there is not enough open land, most classes still grow some kind of vegetables or fruits in whatever pieces of land they can find, or they grow spices in pots, cans, wooden boxes, etc. Some schools raise chickens, hogs, or cattle.

The average garden size is 500 to 1000 square meters. Vegetables and fruits commonly grown include bok choy, mustard green, tomato, carrot, guava, papaya, mango, banana, and pineapple. In schools having lunch programs, the school garden serves both as a source of food for school meals and as a means of nutrition education.

Future Plans

A five-year project will include building 1053 kitchens in 1976-1981, so that more schools will be able to provide children with full lunch. In schools where children bring their own lunch boxes, it is planned that hot nutritious soups will be provided. With the domestic production of milk increasing rapidly, it is hoped that the government will be able to increase its budget for milk subsidy to school children so that all can enjoy this benefit.

Efforts will be continued to strengthen nutrition education in schools at all levels. Special emphasis will be given to elementary and junior high schools and to teachers colleges. Projects will be continued or initiated on the production and

provision of more economical food of high nutritional value such as soybean, milk, dry fish and shrimp, food yeast, etc., for school lunch programs.

C.S.Y. Sheng

HONG KONG

Hong Kong lies just within the tropics—less than 100 miles south of the Tropic of Cancer. It is comprised of a small part of the Chinese mainland and a series of offshore islands. The capital and center of commerce Victoria is on Hong Kong Island, with the twin city of Kowloon on the mainland. Between them lies the magnificent natural harbor which is one of the busiest in the world.

Hong Kong's total land area is 404 square miles. Hong Kong Island covers 29.2 square miles, Kowloon another 4.3 square miles. The New Territories cover a total area of 370.5 square miles.

The total estimated population at the end of 1975 was 4,379,000, with the annual rate of increase at 2 percent. Hong Kong is one of the most densely populated places in the world. The population is still a very young one. More than 43 percent of the population in 1975 was below the age of 20.

In 1975, life expectations at birth were 75.5 and 67.94 years for females and males respectively. More than 98 percent of the population can be described as Chinese on the basis of language and place of origin.

Education in Hong Kong

The director of education is head of the Education Department. He directly controls all government schools, while all other schools with very few exceptions are required to be registered under the Education Ordinance.

The director of education is assisted by three deputy directors who are responsible for the administrative, professional, and technical aspects of education. The Education Department is comprised of eight divisions along with a technical education branch.

Kindergartens and Primary Schools

Voluntary organizations and private institutions provide education for children in the three to six age group. In September 1974, 146,965 children were enrolled in these kindergartens.

The six-year course in Chinese and Anglo-Chinese primary schools is normally begun at the age of six. The aim of the course is to provide a good general education. It is free in all government and in the great majority of subsidized primary schools. In September 1975, 640,933 children were enrolled in the Chinese and Anglo-Chinese primary day schools, 544,126 of whom were in government and aided schools. Another 16,730 pupils attended evening and night schools.

Secondary Schools

On completion of the primary course, suitable pupils are allocated places in government, aided and assisted-private, or private independent secondary schools on the results of a public examination, the Secondary School Entrance Examination. It is the government's declared aim to provide at least three years of aided secondary education for all children seeking it. The interim target of providing 50 percent of the 12 to 14 age group subsidized education for three years in a secondary school and 18 to 20 percent of the 12 to 16 age group fully aided secondary five-year courses leading to a certificate of education has been achieved.

In September 1975, about 55 percent of children leaving primary day schools were admitted to government and aided secondary schools. About 415,700 pupils were enrolled in various types of secondary schools in September 1975—26,000 in government schools; 88,900 in aided schools; and 300,800 in private schools.

Postsecondary Institutions and Adult Education

In September 1975, some 76,700 students were studying in colleges of education, technical institute classes organized by the adult education section, and in schools/colleges offering courses for adults.

Three colleges of education are wholly maintained and run by the government. The colleges aim to produce non-graduate teachers qualified to teach in primary schools and the lower forms of secondary schools. All three colleges offer full-time courses of two years duration. Third-year courses in the colleges have been expanded to cover several new subjects. This action is aimed at the anticipated demand for nongraduate teachers for teaching in secondary schools. Part-time in-service training courses for unqualified teachers are offered by the colleges. The total number of students taking courses in all three colleges is about 3,300. Both universities provide a one-year full-time postgraduate diploma course in education and two-year part-time postgraduate certificate course in education leading to the same certification.

A new Technical Teachers' College was established in September 1974 for the training of teachers of technical subjects. Total enrollment in September 1975 was 304.

Hong Kong Polytechnic provides for a wide variety of courses toward a higher diploma level. About 20,900 students attend its full-time day course, part-time day release courses, and evening courses. There are three technical institutes wholly maintained and run by the government. The main function of the technical institutes is to provide facilities for the training of craftsmen and lower level technicians. In addition to courses in business studies, there are courses available at the institutes that are fully vocational for students who have been unable to complete their secondary schooling. About 14,200

students attend their full-time day courses, part-time day release courses, and evening courses.

The adult education section of the Education Department offers courses of a formal academic, practical, and cultural nature, and organizes classes for about 15,600 students. Some 43,300 students find places in private schools for adults, postsecondary schools, and colleges. The schools vary a great deal in the nature of the courses and the quality of instruction.

In September 1975, 5,675 handicapped children were being educated in special schools and classes run by voluntary organizations, private individuals, and the government.

Food and Nutritional Status

The government's policy is to foster the growth of the agricultural industry in Hong Kong to make the territory as self-sufficient in foodstuffs as possible, bearing in mind priorities in land utilization and the economics of food production in the region. Common crops are vegetables, rice, fruit, and other field crops. Rice is the staple food of the southern Chinese. Two crops of rice a year can be grown on land where water is adequate. The normal yield from an acre of two-crop rice land is about two tons, or up to five tons with high fertilizer use and high yielding strains. The acreage of rice land has dropped from 23,353 acres in 1954 to 2,750 in 1975. Rice production continues to give way to intensive vegetable production, which gives a far higher return where there is adequate water and good road access.

The main vegetable crops are white cabbage, flowering cabbage, lettuce, Chinese kale, radish, watercress, leaf mustard, spring onion, and chive. They grow all the year round with peak production period in the cooler months. Considerable quantities of water spinach, string bean, Chinese spinach, green cucumber, and many other species of Chinese gourds are produced in summer, and a wide range of exotic temperate vegetables including tomato, sweet pepper, cabbage, celery, head lettuce, cauliflower, and carrot are grown in winter. Straw mushroom is also produced, using industrial cotton waste as the growing medium.

Various types of fruit are grown on the lower hill slopes. Principal crops are longan, lychee, wampei, tangerine, local lemon, banana, guava, and pineapple. Land under orchards in 1954 was 952 acres. By 1975 it was 1,600 acres. Other field crops such as sweet potato, taro, yam, and sugarcane are cultivated in the remote and drier areas where water and transport facilities are inadequate for growing vegetables or rice. Some 930 acres were under rainfed crops in 1975.

As there is insufficient land for extensive grazing, pigs and poultry are the principal animals reared for food. With an annual production value of \$160 million, the poultry industry—including ducks, pigeons, and quail—is continuing to develop on a more sophisticated basis. While local cattle and buffaloes are used mainly for work, imported Friesians are kept by dairies the largest of which is on Hong Kong Island with others in the New Territories. Marine fish form one of Hong Kong's most important primary products. The total quantity of fish and fishery products has increased from 121,500 metric tons (valued at \$316 million) in 1970 to 150,400 metric tons (valued at \$523 million) in 1975.

Although domestic supplies of agricultural produce and fish are substantial, imported foodstuffs amounting to \$6,283 million, or 19 percent of total imports, constituted the major part of food consumption in 1975. Hong Kong is almost entirely dependent on imported resources to meet the needs of its 4.4 million people. Principal items imported in 1975 were fruit and vegetables, live animals, rice and other cereals, fish and fish preparations, meat and meat preparations, dairy products, and eggs.

School Health and Foodservice

The School Medical Service is operated by the School Medical Service Board, an independent body incorporated by ordinance. Participation is voluntary and for \$5 a year school children receive medical treatment. The government contributes \$20 a year per enrolled pupil and covers the board's administrative expenses.

The School Health Service is a government responsibility and is concerned with the environmental health and sanitary conditions of school premises as well as control of communicable diseases in schools. Routine inspection of schools is undertaken by health inspectors, while immunization of school children against major infectious diseases is arranged by health offices.

School meals are not provided in the majority of schools in Hong Kong. Canteens run by outside caterers are found in the colleges of education and in a few boarding schools. Many schools in Hong Kong are bisessional. There is, therefore, no need to provide school lunch. In whole-day schools, pupils either go home for lunch or bring their packed lunches in vacuum flasks or plastic boxes. Some pupils go to nearby cafes or restaurants for simple lunches while others obtain lunch boxes from mobile units that stop just outside the schools during lunch breaks.

Malnutrition is not a problem in Hong Kong as it is in some parts of Asia and the Far East.

Home Economics and Nutrition Education Curricula

Home economics is a comparatively young subject in the school curriculum in Hong Kong and has developed only over the past 20 years. In terms of quality and quantity, its development during this time has been significant. Creative needlecraft is the aspect of home economics taught in primary schools, but aspects of food and nutrition are included in a simple form in the health education syllabus at this level. At secondary level, both home management and needlework are included in the home economics curriculum.

At present, over one-quarter of the secondary schools in Hong Kong have full facilities for practical work including a home management room with five to six work units, a home-living area plus storage, and a needlework room with a fitting/storage area. The facilities are based to suit local needs. In these secondary schools, home economics (theoretical and practical) is taught to all girls at junior secondary level, i.e. forms one to three. At upper secondary level the

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Hong Kong Certificate of Education Examination level in form five (grade 11). A few of the more progressive schools include home economics as a curriculum subject for both boys and girls, but the number of boys taking this subject is small.

Hong Kong has three colleges of education. In two of them, courses are available to train local teachers of home economics. The basic course is of two years duration and home economics (general) is an elective subject. A third year specialist home economics course is available (home management or needlework/dress) to provide a higher-caliber training for teachers wishing to teach to Hong Kong Certificate of Education Examination level. A small number of overseas trained home economics teachers are employed to teach upper classes in some of the secondary schools.

Nutrition education is an important part of the home economics curriculum at secondary school and college levels. In home economics lessons, the principles of nutrition are not only taught but practiced. It is through home economics that students learn about nutritive values of food, the effect of cooking on the nutritive value of food, the wise choice of food, the importance of a balanced diet, etc. Students are encouraged to form good food habits. With a better nutritional understanding students will be able to feed their own families properly, thus helping to improve the nutritional status of the community.

Some of the difficulties encountered in Hong Kong's nutrition education program include the lack of food composition tables from which to tabulate the nutritive value of local foods. There also are no standard nutritional requirements drawn up specifically for Hong Kong as well as no nutrition department at any of the universities or colleges from which to obtain information which may be used in a nutrition education program for Hong Kong schools.

School Gardens

Garden competitions are organized in support of the agricultural show. Evidence shows that participating schools make optimum use of the natural resources within their school environs and in the neighboring districts. In the last competition of this series, held in late 1972, there were more than 70 entries and most of them achieved a very high standard.

Vegetable planting competitions, organized with the financial support of the Co-operative for American Relief Everywhere and Lions International and with the technical assistance of the Agriculture and Fisheries Department, fit in very well with the aims of teaching nature study/rural studies in primary schools and with optimum land use. During the past eight years, an annual competition has been run for a group of 15 rural/urban primary schools. One of the characteristics of this series of competitions is that patches of waste ground are turned into useful vegetable plots. Thousands of pupils have taken part in this form of practical work and have learned through experience the value of vegetables in a proper diet and the nutrient qualities of various vegetables.

Evidence shows that many pupils have been able to translate the knowledge and interest gained from their vegetable planting experience to home vegetable plots. These pupils include those whose families are directly or indirectly connected with market gardening and those who have a few plots of land near their home. The usual size of school gardens is 1000 square feet/school. Popular vegetables grown include sweet corn, chinese white radish, brussels sprouts, tomato, bush bean, and chinese white cabbage.

J.C.K. Tam

Southeast Asia

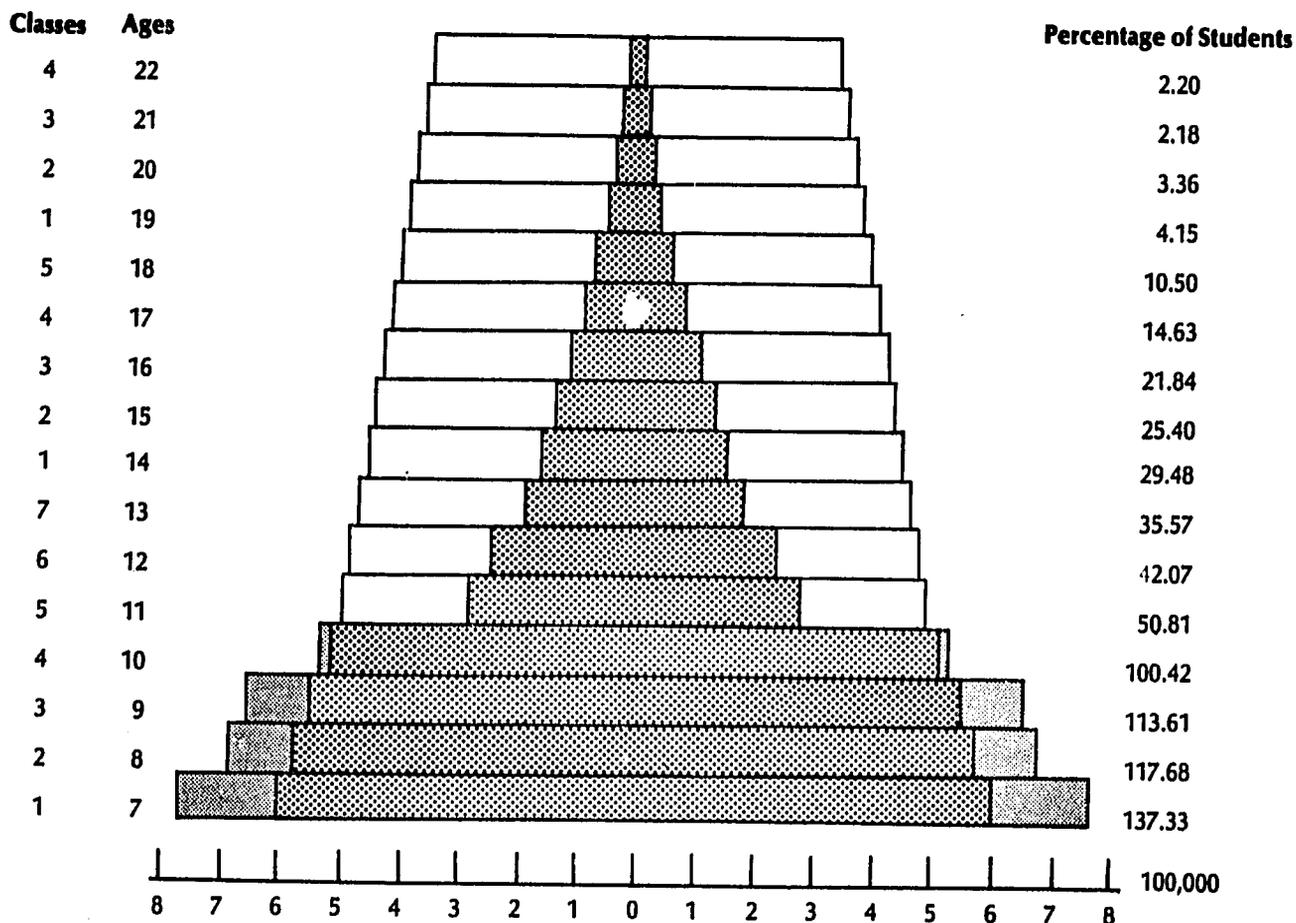
THAILAND

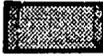
Thailand is one of the Southeast Asian countries. It is bounded on the west and north by Burma, on the north and east by Laos, on the east by Cambodia, and on the south by Malaysia. Thailand covers an area of about 198,455 square miles. According to the 1970 population census, the total population was approximately 34.4 million. Population density averaged 67 per square kilometer. The central area is known to have the highest density (102 per square kilometer), whereas the north has the lowest (44 per square kilometer). Average growth rate is estimated at 3 percent. In 1971, per capita income was approximately Baht 2,526.7 (U.S. \$253).

Education System

Elementary education is the most decisive part of the whole educational system. The majority of Thailand's population attends school for the first four grades which are compulsory. Throughout the 1960s, the government's overriding objective was the expansion of upper elementary education so that universal seven-year compulsory education could be achieved. Figure 1 shows the ratio of the total enrollment of all educational levels in Thailand.

Figure 1
Education Pyramid 1973



	Classes	Ages		Classes	Ages	
College level	4	22	Elementary education	7	13	 Percentage of students attending schools
	3	21		6	12	 Percentage of all eligible school age population
	2	20		5	11	 Students whose ages are not in the same group
	1	19	Compulsory Education	4	10	
High school	5	18		3	9	
	4	17		2	8	
Junior college	3	16		1	7	
	2	15				
	1	14				

From *Education Report*, Ministry of Education 1973

Food and Nutritional Status

Problems of undernourishment and malnutrition still exist in many parts of the country. The deficiency diseases found to be major nutritional problems are protein-calorie malnutrition among children of the lower economic group, iron-deficiency anemia, bladder stone, beri-beri, and others. These deficiency diseases, due to inadequate food intakes, will be more intensified if the economy, food production, and the rapid population growth rate problems are not solved.

Anthropometrical measurements have been done by the faculty of medicine at Ramathibodi Hospital and Srinakharinwirot University. The results are still in tabulation. Some school children prefer to buy desserts such as sweetened ice-cubes, bottles of carbonated water, candies, and other food low in nutritional value. School health records include only height and weight measurements and the extent to which this knowledge is interpreted is somewhat unknown.

School Foodservice

There are no substantial records on what has been done in the past as far as the school lunch service is concerned. It was observed that most school children at all levels manage to get something to eat during the lunch period. The usual ways in which children get their meals are either by returning home, bringing their own lunches, or buying food at school. School managers or principals have the authority to determine how the school should offer meal services in a fashion that best suits the school. Many schools take the easiest approach allowing vendors to sell food during lunch hours. Consequently, many food items that are not nutritionally acceptable are sold to the children. Yet, the aim of lunch service in most schools is to make a profit rather than to promote children's health.

The Ministry of Education and the Ministry of Interior, which control elementary education, seem to recognize the importance of school feeding as they tried to encourage the schools to set up lunch programs. The rules and regulations which the schools have to follow create problems with operational finances. Lack of freedom to operate the feeding program retards the will of the schools to carry on the program. The outcome is that many schools have given up and have turned the business over to the vendors.

Many surveys on health and nutrition have been done in Thailand. School children were sometimes used as the subjects for the studies. It was found that many children were undernourished to various degrees. Deficiency disease symptoms, due to inadequate food consumption, were seen in some children. The Interdepartmental Committee on Nutrition which conducted surveys on the nutrition and health of civilians and military personnel in six towns during 1961, found the major nutritional problems in Thailand to be deficiencies of vitamins A, B¹, B², iron-deficiency anemia, endemic goiter, and protein-calorie malnutrition. These problems arise from various interrelated causes, chief among which were low purchasing power and insufficient knowledge of nutrition and health.

From the statistics collected in Bangkok by the Maternal and Child Health Center, various illnesses were recorded among pupils who attended government and private schools. These included gastroenteritis, malnutrition, and parasitic diseases. This indicates that even in the metropolitan areas where the availability of services and supplies was rather good, the problem of food and malnutrition still prevailed. It could thus be concluded that rural school children would be confronted with such problems to a larger degree.

Experiments and Feasibility Studies

In 1962, there was a study on the effect of lunches given to first graders at Pibul-Oubpathum school. The diet of the experimental group was designed to meet one-third of the daily requirement; the control group brought lunch from home. Clinical examinations, biochemical surveys of blood and urine, and height and weight measurements were taken before and after the experiment. After 99 days there were no great differences in the various parameters except the average value of carotene. General observation showed that for the experimental group, clinical signs of vitamin deficiency such as angular stomatitis had disappeared. These children were healthier, more eager to learn, and more active than before the experiment.

During 1970-71, the department of home economics at Srinakharinwirot University with co-operation of the Institute of Food and Product Development at Knasertsart University introduced a lunch service using soybean protein in the diet to secondary school students at Wat-Pra-Sri. The purpose was to observe the acceptability of soybean protein in replacing regular meat.

Between 1972-1974, a committee appointed by the Ministry of Education conducted a pilot program to study the feasibility of the types of feeding programs that might be introduced to schools in rural areas. The purpose of the study was to find the type of lunch program that could be best set up among elementary schools where problems are enormous. The project also aimed at again testing the acceptability of the soybean protein. Two new types of feeding services were introduced—the central kitchen and the partial supplement feeding service. Soybean protein was used in place of meat in both types of meal services. It was found that the control group who ate the food prepared by the control kitchen (soybean

meat) had better height and weight averages than those who ate the foods served in other fashions. The partial supplement feeding service was found to be more successful in the rural schools. The central kitchen service was superior to any other type because it provided adequate amount of food in both quality and quantity. Nevertheless, this type of service requires a great investment in order to be efficient, and it can serve only the pupils who have enough money to buy it. The central kitchen can not solve the problems for poorer children unless the government or another organization supports it.

Partial Supplement Feeding Program

The result of the above observation inspired the department of home economics at Srinakharinwirot University at Bangkok to extend the Partial Supplement Feeding Program. In 1974 this department set up a school lunch program in Prathunthani province which is about 59 kilometers north of Bangkok.

This program emphasized the promotion of school agriculture and nutrition education improvement. The purpose was to extend information to the surrounding community as much as possible. Many nutrition education activities were held for the public to demonstrate the right method of food preparation, food preservation, baby feeding, etc. The Partial Supplement Feeding Program was used for lunch service in the schools. Since this program was done on a voluntary basis at that time, training was omitted because there was no financial aid to support the program. The department of home economics did give close advice to most schools. Only five out of 30 schools were able to carry on the program successfully. These five schools were used for field study among college students who wanted to do some small projects concerning nutrition. The provincial Educational Organization not only gave remarkable cooperation but also allocated certain amounts of funds to support many schools following the program.

While the feeding service programs at Prathunthani province were proceeding, a committee called Home Economics Curriculum Development realized that home economics courses taught in the schools would be meaningless if the health conditions of the children are poor. There is also a need to improve teaching techniques for home economics subjects at the elementary levels. Nutrition education and agricultural courses must be related. These goals could be attained through the school foodservice as it also could be used as a means of carrying the home economics extension work to the surrounding community. In October 1974, the Ministry of Education appointed a committee called the School Feeding Committee which actually grew out of the former Home Economics Curriculum Development Committee as the members were mostly of the same group of people. The main purposes of the School Feeding Committee were to raise funds and help set up a feeding program in a school of each province all over the country. The program is expected to be a model sample of the lunch service for other schools in the province. The committee also collected information necessary to convince the government to allocate funds for school lunch programs.

The committee, which is composed of a group of people from various institutions, agreed on raising funds that would be done in various ways, such as donations, selling book markers, etc. The total amount of money collected by the committee was about BAHT 370,000, enough to distribute BAHT 5,000 per school in all 72 provinces of Thailand. The first training was done in August 1975 with four training conferences being held in each area of the country—central, north, northeast, and south. There were five days in each training period. The content of the training mostly emphasized problem solving and the service organization methods. Practical food preparation also was included. The 120 trainees consisted of school principals, home economics teachers, and the supervisors of each selected school from the provinces. The second and most recent training was done between March 22-26, 1976. This training took place in the central Bangkok area and consisted of 90 trainees.

Meals in Thai schools are mostly served at noon, except in boarding schools. Portions are estimated smaller than one-third of the children's daily requirement (protein). The elementary schools do not have kitchens. Some schools have a dining hall, a small part of which is used for food preparation. Cooking facilities are not uniform throughout the schools.

The cost of one meal dish is from U.S. 5 to 15 cents. The schools gain about U.S. 10 to 50 cents profit per day in the elementary schools. The profit is varied from U.S. \$3 to \$5 per day at the secondary levels, depending on the size of the school. Certain numbers of needy children were selected to get free lunch in many elementary schools. Usually the needy children go without food at noon time. They become used to not having something to eat during the lunch period.

Evaluation programs are under the health record program. Some schools have height and weight records. Physical examinations by physicians are rarely done. As far as the program evaluation is concerned, there is no report on this matter. Nutrition education through school lunch programs has not been practiced and it is too early to be evaluated in the schools who have just received training.

Community involvement in the feeding program in the schools comes in many forms. In some places, people donate certain kinds of foods such as rice and fruits. Many schools share cooking facilities with the Wat (temples). Some school eating places are donated by the people in the school areas. Monks in many areas give some sort of funding to the schools, including food to the children.

Personal training is very new to Thai schools lunch service programs. However, the supervisory unit of the General Education Department and the Vocational Education Department in the Ministry of Education have given occasional training to groups of people who work in secondary schools. Previous training has included preparation of school lunches, home economics and agriculture, and the overall administration of a school lunch program. Difficulties encountered in school feeding programs are lack of adequate funding, and school children's economic status. They cannot afford to buy lunch at school. Often there are inadequate numbers of prepared teachers to work in the program. The market place is too far and difficulty in transportation makes it impossible to buy raw materials. In addition, there often is no water.

Nutrition Training and Education

The department of home economics at Srinakharinwirot University at Bangkok brought students to many schools and public fairs to demonstrate how to select the right kinds of food for family consumption. They used various kinds teaching materials for elementary school children. Some supervisors of the General Education Department in Ministry of Education, with cooperation from the department of home economics have had exhibits on health and nutrition at many local fairs. In the program, there were nutritional games for children such as drawing contests, question-answers on nutrition knowledge appropriate for the age group, etc. Unfortunately evaluation was not made in any of these programs. Children enjoyed the

game playing and could sing various nutrition songs. Whenever there were such programs, many adults participated. They were given some vegetable seeds and food samples. Difficulties encountered in the nutrition education program were that the programs were done on a voluntary basis and, therefore, funding was inadequate.

School Gardens

Schools that cooperate with the department of home economics always have school gardens and animal raising. Some of the products are used directly for lunch preparation. Other parts are sold and the profits divided among children who grow the plants. Difficulties encountered include products being taken away due to improper protection, lack of water in some areas and some seasons and floods in some seasons.

Future Plan

School foodservice must be extended to all schools by using the supplementary feeding method. Children may not get adequate nutrient intake as required, but it is better than nothing at all for those who are in the rural schools. Supplementary meals, even only a good snack, could be introduced in many locations. One big school could set up a machine to make soybean milk and distribute it to smaller schools who cannot provide lunch service in any other form.

School gardens, animal raising, and marketing must be supported through the local Agriculture Promotion Office. Improving methods of teaching nutrition in the schools is needed. Teaching aids, utilizing mass media must be emphasized, and practical laboratories could be done in various ways. Curriculum should be revised to suit the local environment.

Dietitians should be required to work in each school to offer advice in school nutrition programs. Schools and local health departments must cooperate to promote nutrition education in the schools and for the public. It is necessary to work at the national level to convince the government to allocate funds to aid the school lunch programs all over the country.

U. Leeyavanij

MALAYSIA

Malaysia is a federation of 13 states. Eleven states are in Peninsula Malaysia; Sarawak and Sabah are in the island of Borneo. Malaysia lies in a crescent close to the equator. Peninsula Malaysia and the states of Sarawak and Sabah are separated by 400 miles of the South China Sea. Peninsula Malaysia shares a land frontier with Thailand in the north, and with the Republic of Singapore in the south. To the west across the Straits of Malacca lies the Indonesian island of Sumatra. Sarawak and Sabah share a land frontier with Kalimantan, Indonesia, and to its northeast lie the Philippine Islands.

Malaysia covers an area of 127,581 square miles. Peninsula Malaysia has an area of about 50,806 square miles and both Sarawak and Sabah have an area of approximately 76,775 square miles.

Malaysia is subjected to maritime influences and to the interplay of wind systems that originate in the Indian Ocean and the South China Sea. The average annual rainfall varies from 60 to 160 inches. Daily average temperature varies from 70 degrees F to 90 degrees F. Relative humidity everywhere is generally high, although the night temperature in most places is comparatively low.

In accordance with the 1970 census, Malaysia has a total population of 10.5 million. Of this figure, 8.9 million are in Peninsular Malaysia, one million in Sarawak, and 628,269 in Sabah. The annual population growth in 1971 was 2.6 percent.

Community composition in Peninsula Malaysia in 1970 was Malays 53.2 percent, Chinese 35.4 percent, Indians 10.6 percent, and others .8 percent.

In spite of a 2.6 percent rate of population increase, the nation seems to be doing well in terms of its economic performance. The GNP increased at an average annual rate of about 8 percent between 1970 and 1975. Per capita income, however, increased only by 2.2 percent from \$1,200 to \$1,400.

Education System

Education in Malaysia is in four stages: primary, lower secondary, upper secondary, and post secondary. The minimum age of entry into school is six years. Pupils are given six years of primary education. Pupils receive instruction through one of three languages: Bahasa Malaysia, Chinese, or Tamil. Progress of the pupils from one standard to another is automatic and is by calendar year. Enrollment for 1975 was 1.8 million.

On completion of primary education at the age of 11, pupils are promoted to lower secondary schools for three years of comprehensive education. The language of instruction is either Bahasa Malaysia or English, but English as a medium of instruction is gradually being phased out. Between primary school and lower secondary school, a year of language training is provided for students desiring a change in the medium of instruction at the lower secondary level.

At the end of lower secondary school, pupils take the Lower Certificate of Education Examination which is a certification as well as a selection examination. Enrollment for 1975 was 649,706.

Two years of upper secondary education is provided for pupils selected on the basis of the results of the Lower Certificate Examination. These pupils go to either academic or vocational schools. The former is larger in number. Pupils in academic schools are divided into a number of curricula: arts, science, and technical. Pupils in the Vocational Schools have a choice of various trade and vocational subjects.

Pupils in academic schools are prepared for the Malaysian Certificate of Education (MCE) Examination and those in the vocational schools for the Malaysian Vocational Certificate of Education Examination. Enrollment for 1975 was 181,391.

Two years of post secondary education are offered to pupils who reach a required standard of excellence in the MCE examination. Pupils are divided into arts, science, and technical curricula. At the end of post secondary school, pupils present themselves for the Higher School Certificate Examination which is a certification as well as selection examination for tertiary education. Enrollment for 1975 was 17,988.

Malaysia has not actually instituted compulsory education into its education system; nevertheless, free education is provided for all school-age children at the primary as well as lower secondary levels. Students will leave schools only on completing the third year of secondary education. In 1973, at least 90.9 percent of pupils in the primary age group enrolled in the primary schools. Normally, the number of students per class varies, but in the secondary school the number is 45 which is rather high. The pupil-teacher ratio also varies; for example, in the primary school the ratio is 31:1; in the lower and upper secondary school (arts and science) the ratio is 26:1; upper post secondary (technical) the ratio is 18:1; and in the upper secondary (vocational) the ratio is 13:1.

Malaysia still faces the problem of adult illiteracy from the lack of compulsory education at the primary level in the past. The rate of literacy in 1970 stood at 60.8 percent as compared to 50.8 percent in 1957. While the illiteracy rate is falling due to the adult and national unity education programs, the problem of vocational training among adults and youth who are out of school and unemployed is still serious.

Teacher Training

For the most part, teachers are qualified with minimum basic academic qualification of MCE, plus two to three years of full-time course work in the teacher training institution. Such teachers are mostly teaching in the primary and lower secondary schools. Teachers in the upper secondary schools are basically university graduates who have a Diploma of Education as a professional qualification.

Education Budget

One of the most demanding social problems arising from rapid population growth in Malaysia is providing education for the young. About 21 percent of the federal budget in Malaysia is devoted to education, the highest single item of expenditure. While the budget allocation for education in 1970 was \$542.3 million, it rose to \$1,287.4 million in 1975, registering an average annual growth of 19.9 percent. For 1976-1980 (Third Malaysia Plan), the budget allocation is \$1,671,320 million to be spent during the next five years. The allocation is \$1,282,593 for Peninsular Malaysia, \$201,827 for Sabah, and \$168,900 for Sarawak.

The total number of full assisted primary schools is 4,334 while that of the secondary schools is 833 (excluding the technical and vocational schools). There are about 47 private primary schools and 140 private secondary schools that also provide school education to children who do not go to the government schools.

Food and Nutritional Status

Improvement in the standard of nutrition in Malaysia can be gauged by the substantial decline in the toddler mortality rate (TMR) in the country. In Peninsular Malaysia, the TMR for both sexes has dropped considerably from 10.72 to 10.57 for boys and girls respectively in 1957, to 3.45 and 3.28 respectively in 1972. The TMR of all races has improved significantly. Rates for Malay, Chinese, and Indian communities in 1972 were 4.33, 1.76, and 3.54 respectively as compared to 14.11, 6.59, and 9.0 respectively in 1957.

Availability of food per head per day in the national food balance sheet for Peninsular Malaysia shows an increasing trend. Over the period 1965-1971, the daily availability of calories per head increased at an annual rate of about 8 percent from 1,410 calories in 1965 to 2,250 calories in 1971. Since 1970, the figures have been higher than the recommended allowance of 2,070 calories by the FAO/WHO Expert Committee for population having adults between the mean ages of 20 to 30 years, male and female weights of 55 kg. and 50 kg. respectively. The availability of protein per head per day also has increased at an annual rate of about 8 percent over the period 1965-1971 in Peninsular Malaysia and rose to 53.9 gms in 1971 as compared to 42.5 gms recommended by the FAO/WHO Expert Committee in 1970.

In Sabah and Sarawak, however, the diet falls short of the FAO/WHO recommended level, with the daily availability of calories in 1970 being at about 2,020 calories as compared to the recommended level of 2,070 calories. However, the availability of protein for consumption at 46.4 gms per head per day exceeded the FAO/WHO recommended level of 42.5 gms per head per day. By regional comparison, this national per head availability of food indicates that Malaysia has one of the best diets available in Southeast Asia.

From a number of pilot studies it was found that some malnutrition is prevalent among lower income groups. A survey on preschool children (1969-1972) shows that the children from the upper income group have the best growth achievement, with the children from the low income region having the lowest rate of growth. On the basis of weight-for-age, weight-for-height, and height-for-age, it was found the children below one year from all the groups in the survey, i.e. upper income group and children in the districts of Kuala Langat, Kuala Trengganu, and Ulu Trengganu, were the least affected by malnutrition. Malnutrition was more serious in the two to four year age group. This is attributed to unbalanced or poor diets.

Applied Food and Nutrition Program

To reduce pockets of malnutrition, especially in the rural areas, the government introduced the Applied Food and Nutrition Program (AFNP) in 1960 which is a coordinated and intensified program to improve health through food and nutrition activities. The activities of the projects are based on increasing the local production of nutritious food, giving education on nutrition, improving the nutritional status of vulnerable groups through supplementary feeding schemes, and improving health and environmental sanitation. Benefits of these services could be enhanced by follow up machinery for mothers and children in their own residential environment. The project gained impetus in 1966 following the launching of *Gerakan Maju* (Operation Progress) which emphasized self-help, especially in the production of food at the village level. International

agencies such as WHO, FAO, and UNICEF provide advisory services, fellowships, equipment, and supplies to support the project.

Priority in the project has been given to the areas where the toddler mortality rate is highest. The shortage of trained personnel, however, has hampered the planned implementation of the project. Thus, by the end of 1975 the project is expected to benefit 1.3 million people.

The AFNP will be continued during the Third Malaysia Plan (TMP) with added momentum. Its current target is to cover 2.5 million people in 37 districts in Peninsular Malaysia by 1977. The Supplementary Feeding Program for the more vulnerable groups will be extended and will benefit not only the areas covered by the program but also areas not within the original project scope. By the end of TMP, the program expects to benefit about 64,495 pregnant and lactating women and about 125,319 preschool children. The number of school children who will benefit from this program will be greater as well. Every measure possible will be employed in order to improve the standard of nutrition in Malaysia, especially in areas where the standard of nutrition is at present very low.

School Foodservice

In Malaysia, school foodservice is more in the form of supplementary feeding given to the school children while they are at school, in the morning or afternoon. The objective is to give food as a supplement which contains certain nutrients, proteins, or vitamins that are really lacking in the children's diet. The target group is poor children; nevertheless, other children who come to school hungry due to certain unavoidable circumstances, could be considered as well. Priority is given to the poor children from the rural areas, children in new villages, and children in the depressed urban areas.

The Supplementary Feeding Program is being implemented actively in the AFNP districts. Since the AFNP is at its initial stage of expansion, coverage of schools with school feeding and the number of participants is rather small as compared to the total number of schools and pupils in this country.

The type of meal served in school is more in the form of breakfast or mid-day snack. Normally, students will be given a glass of milk and some biscuits, a bowl of porridge, a plate of fried noodles, or a bowl of soup. Food components vary according to the financial situation of the respective schools. The food commodities available are usually milk (skimmed or fresh); green grams; noodles; some products of the school gardens such as sweet potatoes, vegetables, and maize; and fruits such as papayas, guavas, starfruits, passion fruits, and some other local nutritious fruits. In schools where poultry rearing is taught to the students, eggs and chicken meat are sometimes used in the feeding scheme.

Some of the food commodities have to be purchased, while others are produced in the school garden in conjunction with the food production aspect of the AFNP. Food commodities recommended are usually of high nutritional value.

Feeding Program

The feeding program being carried out in schools in the AFNP areas is more of a stopgap measure. It is hoped that at one time in the future the problems of food and nutrition among the school children will be overcome through the AFNP. The objective of the AFNP is to improve the health status of the community through nutrition and proper health practices. This will in return increase the earning ability of the adults, thus making them more productive economically. As mentioned earlier, breakfasts or mid-day snacks are given to school children at least two times a week. Some schools do provide daily meals depending on their resources and capability.

The feeding program is one of a self-help. The government no doubt subsidizes the program, and this varies from state to state. There are no set physical facilities in the schools to enable the program to run smoothly as desired. In the rural areas the problems are more acute. There are no kitchen facilities, and there are improper cooking utensils and sometimes poor water supply. In the urban or suburban areas amenities and facilities are available, but are not in ideal condition yet.

In addition to the subsidy and the food commodities from the school garden, the particular school will collect a very small amount of money (U.S. 25 cents) a month from each student in order to provide better service. Sometimes, private and voluntary agencies do come in to help a project they are convinced will help the children in the long run. Teacher-parent associations, Rotary Clubs, Red Crescent, Welfare Councils, and others do contribute whatever kind of support possible to ensure the success of this program.

Due to certain constraints faced by the individual schools, either in the form of finance, resources, or personnel, it is not possible to give coverage to all students. In rural and other depressed areas, most of the students come to school with an empty stomach or with just a cup of coffee. It is necessary to give them some food to enable them to concentrate on their studies till the end of the school day. In this program, top priority is given to students in primary one, followed by the other classes. Usually, the program is envisaged to cover at least one-third of the school enrollment. Selection of recipients is based on family background and poor nutritional status which will be determined by family survey and physical examination. Ability to pay for the meal is not a criterion for eligibility.

Through subjective evaluations carried out by several sources, it is found that the students do benefit from the program. The response was very good and communities have requested that the program be extended to other schools and to more children. There was a marked increase in school attendance and a remarkable performance in sports and games in schools where the feeding program was implemented. Children also are becoming more active in their classroom work.

Personnel

As far as training is concerned, the emphasis is not on preparation of food for mass feeding; it is more on nutrition and nutrition education. Teachers are sent for in-service training in health and nutrition education at local teacher centers during weekends for a specific period. In these courses, teachers are exposed to the health and nutrition problems faced by school children. They also are taught various aspects of nutrition and nutrition education, including food production. Trainers are doctors, health educators, agriculturalists, etc., from various local departments. Seminars and workshops at local, state, and national levels are held from time to time to discuss problems pertaining to health and nutrition.

At present, meals are prepared by certain senior students under the supervision of the health education teacher. At times, services of the school workers also are needed in preparing the meals. This varies from school to school, and usually is on voluntary basis. There also are instances in which the teacher-parent association and local youth clubs participate in the preparation of meals as part of community involvement. Distribution of food to the children is done by the students under

strict supervision of the class teachers. It is the responsibility of the individual student to clean the food containers and feeding utensils. In fact, throughout the whole process of the feeding program, aspects of health and nutrition education are always emphasized.

The supplementary feeding program encountered many difficulties in the inception stage, but some of them were solved along the way. The major problem is the constant supply of food commodities. There is no specific grant for the purchase of food staff and for other services. There also is a problem of facilities, that is, appropriate kitchens and cooking and feeding utensils in the schools. There is no full-time personnel involved in operating the program. Teachers, parents, school workers, and students all contribute their services voluntarily.

Nutrition Training and Education in School

It has always been the aim of the Supplementary Feeding Program to relate feeding to nutrition education of students and parents. Since the parents are involved through the teacher-parent association in food preparation, they are exposed to certain aspects of nutrition and nutrition education. It is hoped that the knowledge they get will be of great use to them at home, thus influencing their food patterns and habits to the better.

As far as students are concerned, they are formally taught various aspects of nutrition in health education class. This is reinforced by what they experience during the proper feeding. What the teacher teaches in the classroom during health education lessons always can be reiterated during the meal time by the teacher or health education teacher. In the health education curriculum at all stages, special attention is given nutrients, food sanitation, nutritional problems, food production, food taboos, etc., to complement the experience in the feeding schemes and school garden activities. Nutrition education starts from primary one and continues up to the secondary classes.

Teachers are taught how to prepare nutrition education materials in the form of charts, models, slides, and other materials to facilitate instruction. Whatever nutrition education given to the student is expected to reach the homes and the community. Students are encouraged to influence their parents and community as far as nutrition is concerned. Students also are encouraged to start their own home vegetable garden where nutritious foods can be grown for home consumption. The extension workers of the Department of Agriculture and the public health nurses of the Health Department also are involved in the nutrition education of the community.

The major difficulty encountered at the school level is the shortage of teachers trained in nutrition and nutrition education. Adequate numbers of teacher trainers trained in various aspects of nutrition are not available at the training institutions and training facilities are not available locally. The government is now in the process of setting up a health and nutrition education teacher training college locally and a three month in-service course is due to start to train more teachers in this subject. It is hoped that the college will be fully equipped with research and training facilities in the near future.

School Gardens

School gardens are an extra-curricular activity of school children in the rural areas in particular and in the urban areas in general. This activity is being implemented in conjunction with the AFNP under the Green Book Plan of the government. The objective of the school garden is to encourage children to produce nutritious local foods, particularly for home consumption. Activities involved are vegetable gardening, planting of fruit trees, poultry rearing, and fresh water fish rearing. At this juncture, it is not possible to have these activities at one and the same time in any particular school due to certain constraints. Generally, it is much more feasible for these projects to be carried out in the rural schools than in urban schools.

Size of the gardens again vary according to available land space that can be found in or around the school compound. The six common types of vegetables grown in the school gardens are long beans, angled-beans, mustards, spinach, tomatoes, and maize. Common local fruits are papayas, guavas, starfruits, mangoes, rambutans, and passion fruits. As mentioned earlier, the produce of the school garden is used as source of food for school feeding. In addition, students involved in preparing and looking after the gardens learn a great deal about nutrition. Teachers in charge usually discuss with students the various aspects of nutrition at all levels.

It is hoped that the school gardens will have an impact on the community and will foster home gardens. Students can take home whatever knowledge they gain and try to disseminate it to their parents and the community. Some students have started their own home gardens following the pattern of the school gardens.

Schools face many difficulties in their effort to implement the projects. The main problem is lack of garden space, especially for schools in the urban areas. There also is the problem of financing to start off the project, followed by shortage of technical knowledge on gardening and poultry/fish rearing among teachers. Steps are being taken to alleviate this problem.

Future Plans

The government is taking various measures to make the Supplementary Feeding Program a success for the benefit of the younger generation. But there is no plan as yet to have a full scale school foodservice as has been implemented in other advanced countries. As far as nutrition training and education in school is concerned, the Ministry of Education is at present putting emphasis on the curricular aspects. Nutrition is taught in health education, domestic science, and agricultural science classes at all levels. Specialized training in nutrition and nutrition education among teachers is taking shape. School garden activities will be intensified and more schools will be involved, systematically following the expansion of the AFNP under the Second Phase of the Green Book Plan during the Third Malaysia Plan of 1976 to 1980. This is in line with developing the food resources of the country.

A. Bakri and S. Jaysuria

REPUBLIC OF SINGAPORE

The Republic of Singapore is situated at the tip of the Malayan Peninsula, in the center of the Malayan Archipelago. It consists of the main island of Singapore with a number of islets scattered off the northeast and south of the main island. The total land area is approximately 597 square kilometers. Two and one-fourth million people live on this small island area. In 1975, the population density was 3,769 persons per square kilometer.

The people of Singapore are multiethnic—76.1 percent are Chinese, 15.1 percent Malays, 6.9 percent Indians, Pakistanis, and Sri Lankans, and 1.9 percent are of other ethnic groups including Europeans, Eurasians, and Arabs.

The population is young. Young dependents, those aged less than 15 years, constituted 32.9 percent of the total population in 1975. Older dependents, those persons aged 60 years and over, constituted 6.6 percent. The middle category of working adult population aged 15 to 59 years made up 60.5 percent of the population. The dependency burden—the number of old and young dependents to every hundred persons of working age (15-59 years)—is 65.5 percent. Life expectancy from the last census in 1970 was 65.1 years for males and 70 years for females.

The three main causes of death are diseases of the circulatory system, death from malignant neoplasms, and diseases of the respiratory system. Death from heart and hypertensive diseases alone make up 17.47 percent of total deaths.

Education System

The education system in Singapore consists of two years of preschool, six to nine years primary school, four years of secondary school and two years of preuniversity education. Students may spend three to six years in universities, technical colleges, and other tertiary institutions.

Kindergartens are privately managed, while primary and secondary schools and junior colleges are either government or government-aided institutions. All institutions of higher education are autonomous bodies financed mainly by state grants. In 1975, there were 281 government schools, of which 193 were primary schools and 88 were secondary schools. There were 221 government-aided schools (173 primary and 48 secondary) and 12 private schools.

About 25 percent of the total population of Singapore are in schools. Education in Singapore, although not compulsory, is available to all irrespective of race, religion, sex, or socio-economic background. All citizens receive a free primary education. A large number of free places in secondary schools are made available to citizens. Others pay only nominal fees.

Food and Nutritional Status

In Singapore, the commonest type of malnutrition among children is protein-calorie malnutrition (PCM). Severe forms are rare, but the milder forms are quite prevalent. A study in 1968 showed that about 25 percent of preschool children attending Maternal and Child Health (MCH) Clinics showed signs of being underweight for their age. An anthropometric study in 1970 found that 20 percent of Singapore children aged zero to two years suffered from mild to moderate malnutrition. Anemia due to iron deficiency is also prevalent especially among preschool children as well as pregnant women. It has been observed that anemia due to folic acid deficiency is on the increase.

A survey of primary school children done in 1973 showed that 5.8 percent of these children were underweight for their height. Using a different criteria for assessment in 1975, the School Health Services obtained a higher percentage of 6.5 percent. Recent observations indicate that the incidence of obesity is on the increase and is becoming a problem particularly among children from the more affluent families. In 1975, the School Health Services detected 902 boys (1.85 percent) and 501 girls (1.14 percent) of those who underwent routine medical examination to be obese (more than 20 percent of expected weight for age). Those found to be undernourished or having other defects are followed up regularly either at a clinic or at school.

Primary school entrants and primary school leavers are examined once a year by school health doctors. The children are assessed clinically and anthropometrically.

School Foodservice

Schools in Singapore are in two sessions, morning or afternoon. Children either attend morning school from 7:30 a.m. to 12:30 p.m. or afternoon school from 1:00 p.m. to 6:00 p.m. Because of this, Singapore schools do not provide foodservice in the form of school lunches since the meal would be eaten at home either before or after school.

Within the five hours at school, there is a recess of 20 minutes. During this break, school children may buy food and drinks at the school tuck-shop. A variety of food and drinks are sold.

Under the World Food Program Project 725, undernourished primary school children in Singapore are provided with a high protein, vitamin-enriched food called wheat-soy-blend (WSB). This is mixed with dried, skimmed milk and sugar and is given as a beverage at recess time. Flavoring may be added. This drink will provide 10 percent of calories, 25.1 percent of protein, and 104 percent of iron required daily by a seven to nine-year-old school child. Thirty thousand school children benefit from this feeding scheme.

Needy, undernourished school children also are supplied with fortnightly food rations by the School Health Services, each ration consisting of 500 g. full cream milk powder, 110 g. ovaltine, 500 g. sugar, 500 g. groundnuts, and 10 eggs. In 1975, a total of 6,528 rations were distributed to 1,297 such children. After six months of receiving such rations, the children are reassessed and, if necessary, transferred to monthly supplies of WSB supplements, which consist of 1 kg. WSB and 150 gm. dried skimmed milk per packet. 35,274 packets were issued to 5102 recipients in 1975.

The Ministry of Education has a milk scheme to improve and upgrade the nutritional intake of primary school children. Pupils who participate in this scheme buy flavored milk drinks at low cost. Needy pupils are provided with the milk free. Funds for the needy pupils are obtained from the individual school advisory committee.

Nutrition Training and Education in School

Primary school pupils receive some training in nutrition. Education for Living, which is taught in the mother tongue, i.e. Chinese, Malay or Tamil, was introduced into the primary school curriculum in 1973. Included in the syllabus of this subject are lessons on the staple foods of Singapore, diet, and food hygiene. Health Education at the primary level includes in its syllabus lessons on food values and the importance of a proper diet. The topics of food and nutrition are covered, with special emphasis on the five main nutrients and their chief sources. Pupils also are taught how to plan simple meals that include all the main nutrients. Digestion and excretion are also dealt with in the syllabus.

Secondary school pupils receive more comprehensive training in nutrition, depending on the subjects they choose to study. All secondary one and two schoolgirls receive some nutrition education in their home economics lessons. They are taught the basic food groups; food values, their functions and sources; and how to plan, prepare, and cook simple balanced meals using cheap, local foods. More advanced nutrition education is taught to those students who elect to study cookery as one of their ordinary school leaving certificate examination subjects.

Secondary three and four pupils who study biology receive some training in nutrition through lessons on food and diet in man; the calorific value of food; classes of food; food values; a balanced diet; and digestion. Preuniversity students who opt for this subject are required to know nutrition—constituents of a balanced diet, and intake, digestion, absorption, and assimilation of food, including transport and storage.

Students of human and social biology receive more detailed training in nutrition. The following topics are included in the syllabus:

- the activities of living organisms, including nutrition, growth, and excretion
- food and diet, classes of food, cooking and preserving food, and hygiene in the kitchen
- source and supply of food
- the alimentary canal and digestion.

Other Nutrition Education Programs

Since 90 percent of all infants are seen at the Maternal and Child Health (MCH)/Family Planning (FP) Clinics, nutrition education on supplementary feeding during weaning is best conducted through the MCH Services. Since May 1972, after specific training of the clinic staff by the Nutrition Unit, practical nutrition demonstrations are being conducted at these clinics on a regular basis. These demonstrations are held in the different languages once or twice a week in all the MCH/FP clinics.

During these sessions, mothers with infants are taught to use nutritious, inexpensive, locally available foods and to prepare them in a form suitable for infants using utensils commonly used in the home. At the end of the sessions, infants also are given a few spoonfuls of the prepared food to show to the mothers that the food preparations are acceptable to the infants. Sessions for mothers with toddlers also are held.

In order to prepare the expectant mother for her coming delivery and future role, health education talks and demonstrations are conducted regularly for mothers attending antenatal sessions at the MCH/FP clinics. The topics discussed include a proper diet for pregnant women. Again, emphasis is on the use of local foods; the importance of breast-feeding and the technique of breast-feeding are also emphasized. For those who are unable to breast-feed or who refuse to breast-feed, talks and demonstrations are held to show them the correct preparation of milk feeds. Because of the close association between large families and malnutrition, mothers are also urged to keep their families small.

Publicity and education programs also are carried out via the mass media. In order to create an awareness of the importance of nutritious, wholesome food, the theme for the 1975 National Health Campaign was "Better Food for Better Health." The campaign focused on three aspects of food—namely, nutrition, food hygiene, and food standards. The highlight of the campaign was an exhibition showing various aspects of food and health. Supportive coverage was given by the press, radio, and television.

Nutrition is featured regularly in exhibitions on infant and child care, family planning, and other health-related topics. Newspapers and magazines often carry articles on different aspects of nutrition. Nutrition education materials produced have included pamphlets, photographs, slides, and a film.

Besides these, nutrition is integrated into the curriculum of the training courses for medical students, nurses, public health inspectors, and trainee teachers.

In order to improve the teaching of nutrition, some home economics teachers were sent on attachment to the Nutrition Unit of the Ministry of Health to gain some practical experience. The Home Economics Unit has formed a Low Budget Foods Committee which prepares notes, recipes, color slides, and photographs for distribution to schools. These materials are intended to encourage teachers to emphasize the preparation of low-cost, balanced meals.

A Resource Center has been set up to promote the professional development of home economics teachers. Among the activities conducted by the Resource Center are talks by experts on nutrition. A more comprehensive syllabus on nutrition education is to be produced by the Home Economics Unit through close liaison with the Nutrition Unit of the Ministry of Health. It is planned to increase the curriculum time of health education to enable teachers to plan and carry out a more comprehensive program of instruction in nutrition.

B.L. Woo

PHILIPPINES

Studies have shown that on the average, the daily calorie intake of Filipinos is 1700. This is 300 calories short from the standard calorie requirement of every Filipino. Many primary school children are undernourished because of poverty, others because of ignorance.

The Department of Education and Culture (DEC) is trying to solve both problems. Thus, nutrition education is a curricular requirement in all schools and is a part of home economics. It is also integrated in other required subjects. Nutrition education plays an important role in the green revolution, a program that seeks to increase selective food production. School gardens and supplementary feeding, therefore, have to supplement one another. It is in the above activities that the applied nutrition section of the School Health Program Unit plays a major role.

Because the government cannot fully support the school supplementary feeding program, it welcomes foreign food assistance, but does not aim to perpetuate dependence on foreign assistance and foreign food.

School feeding has always been an integral part of the ancillary services in the Philippine school system, receiving considerable input in terms of time, effort, and money. The school foodservice program has three objectives: to provide improved nutrition to school children and students, to serve as a teaching laboratory for nutrition, and to encourage selective food production.

For children, nutrition education, and selective food production, plans for the school foodservice program include the following:

- nutritious snacks and/or mid-day meals for every child/student to promote improved health
- sound education experiences for the development of good eating and health habits
- opportunities to learn about new foods and training to accept unfamiliar foods
- social experiences of eating together, sharing, and developing good manners and courteous behavior
- development of proper attitudes and skills relating to selective food production
- rehabilitation of underweight school children
- an educational activity center for the school—a laboratory for learning and relating nutrition teaching to everyday living
- an opportunity to integrate nutrition in the kindergarten, elementary, secondary and teacher-training curricula
- an opportunity to make work education truly functional
- careful selective planting in school vegetable gardens in close coordination with the nutrition program of the school
- increase in selective food production

School Feeding Schemes

Several feeding schemes are used in the schools. A daily snack-feeding program consists mainly of nutribuns baked from flour donated by Cooperatives for American Relief Everywhere (CARE) and the Catholic Relief Services (CRS). Priority is given to underweight children. Each nutribun used in this scheme supplies 300 calories.

A modification of this scheme now gaining popularity is the serving of mid-morning or afternoon snacks consisting of locally produced food and CARE/CRS commodities. Examples of this type are: cream of mungo soup utilizing mungo harvested from the school and/or home gardens together with a 250-calorie nutribuns baked from flour, a donated food commodity; *pansit* using noodles made by the teacher and parents from flour and leafy vegetables from the school and/or home gardens and a small amount of meat or dried shrimps bought from the market with cash contributions of parents, or at times donated by meat and/or fish vendors; and *guinatan* utilizing root vegetables from the gardens eaten with nutribuns donated by CARE or CRS.

Another type of mid-morning or afternoon snack consists generally of boiled camote or other root crops, boiled banana, or mixed vegetable dishes served to pupils at least two or three times a week gradually increasing the frequency of feeding to five times a week and increasing the number of beneficiaries until such time when all pupils are served.

Mid-morning or afternoon snacks can be served daily — feeding consisting purely of CARE or CRS commodities four days a week and one feeding consisting of dishes made from locally produced vegetables or fruits. Hot lunch supplements consist mainly of hot soups or vegetable dishes with a small amount of fish, shrimps, or meat to supplement the packed lunch brought to school by the pupils which consists generally of rice and fish or sometimes a small piece of meat.

Hot lunch also may be a complete nutritious meal served to children and students who remain in school during the noon break. These hot lunches are sold at the school cafeteria and/or hot lunch kitchenette at nominal cost. CARE assists in the construction of hot lunch kitchenettes; the local government takes care of the maintenance.

Organizational Setup

The School Health Program Unit of the Department of Education and Culture has overall supervision of the school feeding program. It has four major sections: Supplementary Feeding Program assisted by CARE and CRS; Applied Nutrition Project assisted by UNICEF; Deworming; and School Health Services. All these work together and coordinate activities in order to insure the normal, healthy development of the growing school children. There are also DEC regional nutrition centers that supervise nutrition education and school feeding.

The efficient and smooth management of the school foodservice is largely dependent upon the personnel managing it. Personnel involved in the foodservice are selected on the basis of their educational background in home economics and/or nutrition experiences in food related fields such as nutrition education training, quantity food cookery service, and institutional management; their ability to relate harmoniously with other school personnel; and their interests and attitudes towards the program. Personnel involved in the foodservice of the secondary level scheme generally need to undergo training in service cooperatives.

Although the responsibility for the planning and implementing of the foodservice scheme is shouldered in a cooperative

effort by all the personnel involved, the duties of each are already defined or delineated to avoid confusion, overlapping of efforts, and obscuring of responsibilities.

City / Provincial School Divisions Organizational Setup

City/Division Office

1. Chairman
ANP/H.E. and ANP Division Supervisor
2. Members
 - Barangay/municipal/provincial high schools
 - Designated division secondary schools supervisor
 - Designated subject area division supervisor
 - Private schools
 - Private area supervisor I
 - Head of secondary department
 - Head of girls vocational department
 - Vocational Schools
 - Vocational education supervisor I
 - Head of the school
 - Head of the girls vocational education department

Elementary Level

At the elementary school level, the foodservice teacher assumes leadership in carrying out the foodservices in the school. If the foodservice teacher is at the same time teaching home economics subjects, his teaching load and cocurricular assignments are reduced in proportion to the amount of the foodservice related work and activities required of him. Whenever possible, there is a full-time foodservice teacher. In schools where there are two or more foodservice teachers, one takes charge of the foodservice and is called the foodservice manager. His duties include coordinating with school administrators and other food service teachers as well as with the School Nutrition Committee for the smooth operation of the school foodservice; maintaining proper and adequate standards of food selection, preparation, serving, storage, and sanitation; developing new recipes using indigenous foods for school feeding; keeping records of and reports on the evaluation of recipes, financial records, records of daily recipes prepared, records of purchases, care and maintenance of equipment, and other facilities; and preparing the schedule of the school feeding. In schools where there are two or more foodservice teachers, the foodservice manager performs all the above-mentioned duties and, in addition, manages and supervises all the activities. For a part-time foodservice teacher, the service is considered a regular teaching load.

The elementary agriculture teacher provides leadership in the selective food production activities in the school to ensure adequate and continuous supply of nutritious foodstuffs. Where the school garden cannot supply the needed requirements, as may often happen, he coordinates with the foodservice teacher in the procurement of such nutritious foodstuffs. The industrial arts teacher leads in putting up and maintaining foodservice facilities.

All teachers in the school are involved in the school foodservice program. Teachers in charge of classes are responsible for all feeding activities in their respective classrooms and for the procurement of the necessary feeding, drinking, and storage facilities. They maintain a well-kept and up-to-date record of the height and weight of the pupils. In addition, teachers-in-charge of classes assist the foodservice teacher in soliciting the help of parents in the foodservice program and in channeling the produce of the vegetable gardens to the foodservice centers.

Parents and out-of-school youths are encouraged to assist in food preparation and distribution. Pupils take turns in assisting the foodservice in the nutrition center. Paid helper(s), if available, assist in food preparation activities in the nutrition center. Janitors help in the foodservice center.

Secondary Level

At the secondary level, the foodservice teacher in charge of the food nutrition center is the foodservice manager. He is also vice-chairman of the School Nutrition Committee and is assisted by other foodservice teachers and the subject teachers concerned. There is one full-time foodservice manager for a school with enrollment of 1,000 to 2,000 students. For a school population of less than 1,000, a part-time foodservice manager may be assigned and this service is considered a regular teaching load. The foodservice manager coordinates with school administrators and other food service teachers as well as with the School Nutrition Committee on the smooth operation of the foodservice program; maintains proper and adequate standard of food purchasing, preparation, storage and production service, and sanitation as well as other food-related activities in the development of the nutrition program; supervises all personnel in food-related activities including those of the student trainees; conducts on-the-job training of students which makes possible the application of the theories they learn in subjects like food and nutrition, health education, food production, cooperative education and social studies in actual individual participation in the overall operation of the foodservice center as well as in its evaluation; and keeps records of and reports on the evaluation of student-trainees, financial records, and records of purchases, care, and maintenance of equipment and other facilities.

Subject area teachers coordinate with the foodservice manager in the preparation of routine assignments or training schedules of the students in the foodservice center. Student trainees participate in the food service scheme in a practicum or on-the-job application of the theories and practice of the limited skills they acquire in their respective major courses or other related subjects.

The president of the school teacher-parent association and the barangay captain, who are members of the School Nutrition Committee, also are involved in the foodservice scheme.

Facilities and Funding

The facilities for the school foodservice include the foodservice center which has food preparation, food serving, storage, washing, and distributing area. It may be an extension of the home economics building or a separate building. If funds per-

mit, a dining area is provided; otherwise, food is served in the individual classrooms.

The school foodservice program is a nonprofit enterprise. Funds necessary for the maintenance of the foodservice scheme and the improvement of the foodservice center are raised through teacher-parent association-school personnel contributions in cash or in kind, donations from civic/religious organizations, partial government subsidy whenever feasible, and proceeds from the children's counterpart.

An accurate accounting of funds is necessary for the successful operation of the foodservice scheme. All funds, in cash or in kind, are subjected to periodic auditing following strictly existing legal procedures and regulations practiced by the school.

Sharing of the profits, however, is on the net profit, 25 percent of which is for administration and 75 percent for the improvement and maintenance of the nutrition center. At the secondary school level, funding utilizes the fundamental principles and practices of a service-cooperative type. This is the responsibility of the foodservice committee which formulates a local school policy on the matter and the implementing details of that policy.

Record Keeping and Reporting

Three kinds of records are maintained: those on the control of money like the records of purchases, expenditures, and the monthly summary of profit and loss; those on the control of food like food records on stock inventory, actual foodservice, food left each day, food purchase record or market list, and recipes and menus; those on the control of time and labor like work or time schedules and job listings or personnel.

The record keeping and reporting of the operation of the school foodservice is given careful attention. Records are simple, accurate, concise, and up-to-date. Forms are prepared locally, mimeographed, and filed in folders or loose-leaf notebooks to facilitate quick reference and for easy perusal by any persons or agency concerned. This is the responsibility of the foodservice manager.

The foodservice manager of the "cafeteria service" makes certain that money control does not run counter to the usual auditing and accounting rules of the school. Money control records include cash records, income spending, budget, labor costs, and other overhead expenses. The profit and loss statement is done daily.

In the secondary schools, the formulation of guidelines for control of personnel is left to the foodservice manager and the teachers of food related subjects. Records include personnel data, sheets of student trainees, their health records, accomplishment record, job experiences, rating sheets, and attendance and personnel assignments. The submission of records to the proper authorities is the responsibility of the foodservice manager. A periodic evaluation of the school foodservice as a whole is made by the school administrator and the members of the School Nutrition Committee (see Figure 1).

On the whole, the school foodservice program in the Philippines is an excellent venue for achieving the improved nutritional status of children and students. To provide a year-round feeding, the program is essentially a joint school-community venture. It also counts on interagency cooperation and collaboration and relies on the support of parents, school administrators, teachers, and the children/students for whom the program is intended. The recent move to integrate all feeding programs in the Department of Education and Culture under one coordinating body is indeed a happy solution to the long-standing problem of overlapping and duplicating of activities.

Figure 1 Suggested Criteria for Evaluating School Foodservice at the Elementary and Secondary Levels

Aspects to be evaluated

1. Nutrition Center - (20 points)

- The Nutrition Center is convenient, safe, clean and orderly.
- Building and surroundings show evidence of daily upkeep.
- Sanitary drainage, garbage disposal, and other food health practices are adequate.
- Safe, adequate, and accessible water supply.
- Convenient work areas (location, height, adequacy) with evidence of proper use and care.
- Safe, clean, well-ventilated, lighted storeroom.
- Proper storage and orderly arrangement of foodstuffs.
- Adequacy of kitchen equipment and facilities for school population served.
- Proper care, use, and storage of equipment and utensils.
- Appropriate display of visual aids giving correct nutrition concepts and personnel organization charts.

2. Feeding Schemes - (50 points)

- Feeding schemes meet standards set for the program.
- Snacks served meet minimum required daily allowances for calories, protein, vitamin A for student groups served.
- Snacks/hot lunch regularly include a combination of leafy green/yellow vegetables, legumes, rice and/or other cereals; a little fish and meat may be added to improve quality and quantity of protein.
- Stable source of indigenous food commodities (school/home gardens and parents financial contributions).
- Records of recipes and feeding activities up-to-date and systematically kept.
- Feeding in the center or classroom or shop laboratories systematic and sanitary.
- All pupils are beneficiaries (simultaneous) or there is staggered feeding of all pupils.
- Beneficiaries of free feeding are based on grade level and on degree of malnutrition as shown by physical growth, clinical signs, etc.
- Feeding is conducted at least twice a week for all pupils, with increasing frequency as program proceeds; pupil goal of daily feeding is reached.
- Snacks/hot lunch do not meet recommended allowances; lack one or more food items in the combination mentioned

above.

- Dependence on doleouts and partially on school gardens for food commodities.
- Few beneficiaries, selected at random with no set schedule of feeding and depending solely on CARE commodities and other doleouts.
- Foodservice center's customers mostly school children and school personnel.

3. Food Service Management - (30 points)

- Managed by qualified personnel.
- Evidence of over-all community-school cooperation.
- Smooth management of food preparation, distribution, and servicing.
- Wide coverage of pupils/student school personnel and community patronage.
- Systematic management of foodservice personnel including participating mothers and student trainees.
- Evidence of adequate, nutritious, and sanitary food supply in the center.
- Orderly keeping of foodservice records (money, food, and personnel) and reports of same.

S. Laya

INDONESIA

Indonesia is the largest archipelago in the world, consisting of five main islands and thousands of small islands totaling 13,677. About 6000 of the islands are inhabited.

The name Indonesia is composed of two Greek words—"indos" meaning East Indian and "nesos" meaning islands. Literally, Indonesia means East Indian Island.

The Indonesian archipelago forms a highway between the Pacific and Indian Oceans and is a bridge between Asia and Australia. Because of this strategic position, Indonesia's historical, political, and economic situations have always been conditioned by geography.

Indonesia's land area is about 735,000 square miles and its sea area is about four times as large. The whole territory extends about 3,200 miles from east to west and about 1,100 miles from north to south. Indonesia has a total population of 132 million scattered through the five main islands. Java island is the most densely populated, in fact it is the most densely populated area in the world with 1,486 people per square mile.

Jakarta Raya, the capital of Indonesia, has a population of approximately 5.8 million and an annual growth rate of about 4.6 percent. At present, the approximate birth rate is 45 per 1,000 per year, and the death rate is approximately 20 per 1,000. Income per capita is estimated at U.S. \$140 per year. Agriculture provides a living to 70 percent of the population.

Education System

The Indonesian education system is depicted in Figure 1 and Table 1 below.

Figure 1
School System in Thailand

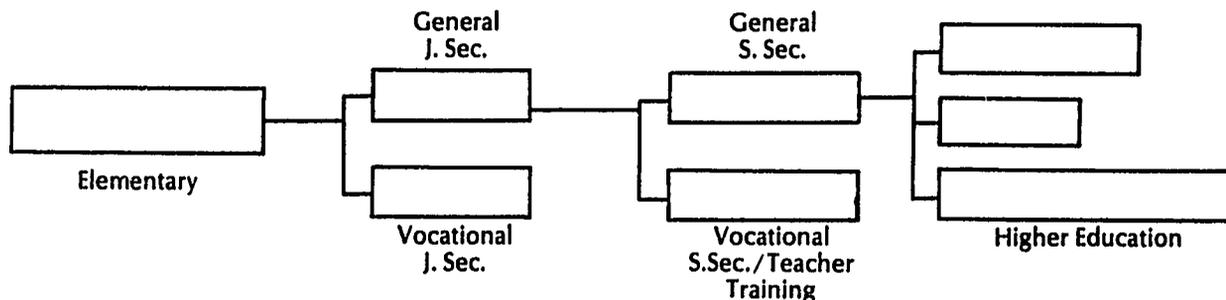


Table 1
Number of Schools, Students, and Teachers at the End of 1975

SCHOOL LEVEL	Schools	Total Number of Pupils	Teachers	Covered by School Health Service		
				Schools	Pupils	Teachers
Elementary Schools						
- Government	61,255	13,340,159	383,537	27,983	6,310,283	173,056
- Private	19,771	2,946,301	85,210	4,830	944,643	29,826
- Moslem	358	56,979	1,508	127	28,134	630
Junior High School	5,210	1,022,548	56,698	734	162,930	9,814
Senior High School	1,893	404,738	25,153	258	61,127	4,187

Data: Ministry of Health School Health Division.

In 1961, more than 55 percent of the population of the age group 10 to 19 years had had some formal education; 17 percent of the age group 45 to 54 years had; and less than 10 percent of the age group 55 years and up had. According to the 1971 census, illiteracy in urban areas was estimated at 3.8 percent and in rural areas 36.6 percent. The literacy program is directed towards the 10 to 40 year age group.

A compulsory education system does not exist at present, but 71 percent of children aged 7 to 12 are attending elementary schools. By the end of Repelita II (1979), it is planned that this proportion will be increased to 85 percent. In order to achieve this, some 32,000 elementary schools have already been built.

The length of school year is 265 days, 28 hours a week at the elementary level and 25 to 40 hours a week at the secondary level. The number of teacher training schools is 202 with an enrollment are 60,235 students.

Food and Nutritional Status

Height and weight are the most convenient and useful indicators of growth and are sensitive both to adverse and favorable dietary and health changes. Twice a year, children in schools covered by school health services, are weighed and their height measured. These measurements are recorded in their charts and matched with standardized measurements. This is done not only to identify children whose nutritional status is adequate but also to serve as a channel for nutrition education. There is no available data yet on anthropometric parameters among school children. It is in process based on scattered surveys done in the provinces.

Health

Realizing the importance of nutrition, the President of the Republic of Indonesia issued Presidential Instruction No. 14 in 1974 regarding food and nutritional improvement, to 10 ministries that are concerned with the improvement of nutritional status of the people. These ten ministries are coordinated by the State Minister of Social Welfare.

The government has as a fundamental aim the promotion of the health of the people through the strengthening and distribution of integrated health service at all levels to the greatest number of persons as part of the socio-economic plan of the country. On the basis of the defined problems, the following goals have been established:

- to make health care facilities and health manpower available, which, as far as possible, will meet community demand
- to reduce the number of cases of communicable disease and to suppress the incidence of epidemics to the lowest possible level
- to improve the nutritional status of the community
- to make sanitation facilities available and develop an awareness among the people of the value of health

In Indonesia, major nutrition-problems are protein-calorie malnutrition, vitamin A deficiency, endemic goiter, and nutritional anemia. While vitamin A deficiency and protein calorie malnutrition usually occur among preschool children, nutrition anemia is a major health problem at all age levels of lower socio-economic groups.

Children in some mountain areas have iodine deficiencies that lead to a danger of mental and physical retardation. A survey on school children in North and West Sumatra, East Java, and Bali indicated that it is an endemic area, with a prevalence toward goiter for children aged 7 to 16 estimated between 60 and 90 percent.

As a consequence, each governor has been instructed to coordinate a body consisting of the provincial offices of these 10 departments which is called the Provincial Nutritional Improvement Board. The main purpose of the Presidential Instruction is to accelerate the development of the nutritional status of the people of Indonesia.

School Foodservice

School feeding had never been tried in Indonesia until 1969 when CARE started a School Snacks program for children in nursery and elementary schools. The project was implemented in Jakarta and the provinces of West and Central Java covering three regencies each, with 181,000 school children. The school snack consisted of imported food, corn-soy-milk, and ran for two to three years, but had to be discontinued for lack of control.

In Indonesia, it is not easy to plan for a school feeding program because there are too many children in the school age group. Of the 132 million inhabitants, 42.2 percent belong to the school age group. Only part of the children are able to go to school (57 percent). Twelve percent are in kindergarten; 55 percent are in elementary school; 29 percent are in junior high school; 3 percent are in senior high school; .15 percent are in university.

Schools are run in two or even three shifts. Under these present circumstances, although school feeding programs are desirable, it would be beyond the capacity of the government to fund such programs. Support by way of encouragement, however, for community participation training and technical guidance may well be provided.

Nutrition Education in School

Through the school health programs in every elementary school, one teacher has been trained in school health and also provides information on nutrition. In-service training of elementary school teachers is organized by both the Ministry of Health and the Ministry of Education and Culture. The course lasts 10 days and consists of 100 hours of attendance, divided into 76 hours for theoretical and 24 hours for practical studies. The course is repeated three to four times annually and approximately 30 teachers attend each course. By 1975, the number of teachers who had received this training totaled 29,968. The estimated need up to the end of Repelita II, if 100 percent coverage of elementary schools is to be achieved, is put at 90,000 teachers.

School cafeterias, are called *warung sekolah* and are supervised by these trained teachers. They are planned by the Parent Teachers Association or cafeteria owners. Of the 18,689 schools covered by school health in 1971, more than 2,151 had school cafeterias. At the end of 1975, of the 27,583 elementary schools covered, 6,917 had school cafeterias. The cafeterias are used as means of education and also serve as a medium of spreading nutrition education. Moreover, they provide a linkage between the school and the community.

Curriculum development

To strengthen the progress of nutrition instruction, the subject will be incorporated as part of general school health teaching into the curriculum of teacher training. This implies that nutrition will automatically become a compulsory subject in each grade. At the moment, nutrition is taught to children in elementary schools as well as in junior high school through a physical sciences program. In the year 1977 a school is scheduled to open to train teachers to become physical and health educators for elementary schools.

School Gardens

School gardens were started through school health programs in 1969 in close relationship with the ANP (Applied Nutrition Program). In 1971, of 18,689 schools covered by school health program, more than 3,875 had school gardens. At the beginning of 1976, of the 27,983 schools covered, 11,271 had school gardens. Since most dropouts are from elementary schools, the school garden program in these schools helps to fulfill the vocational needs of the unfortunate children. The average size of gardens is small, but occasionally local governments provide land for cultivation.

The yield is intended to be used for education (food preparation cooking) and also to be consumed by the children. Seeds are supplied by the Agriculture Department. The gardens are usually planted with vegetables and fruits which do not take long to grow like spinach, cabbage, carrot, beans, casava, sweet potatoes, bananas, papayas, etc. One of the results of the school/garden program is that children tend to make home gardens themselves and plant them with the same crops as in school.

Depending on local conditions, in addition to school gardens, the school nutrition program also can include fishponds and poultry farming in schools. In 1971, there were 1,160 fishponds and 519 poultry farms and in 1976 there were 4,265 fishponds and 3,040 poultry farms. It is recognized that school health activities like school cafeterias, school gardens, fishponds, poultry farms, etc., could not be shouldered by the Department of Health alone. This is why school health coordinating bodies are being established for school health in every province and regency.

The coordinating bodies, embracing all related government departments such as health, education and culture, agriculture, etc., are coordinated by the governor in the province or *bupati* at the regency level, which also helps to assure an integrated and well-balanced program. The Health Department, however, plays a key role in long-range planning, since it is largely responsible for the implementation of the program.

Future Plans

In order to improve the nutritional status of school children, emphasis should be placed on nutrition training and education in schools. Starting in 1977, all over Indonesia high schools will be opened by the Ministry of Education and Culture in which elementary school teachers will be trained to become physical and health educators. In this curriculum emphasis will be placed on nutrition and will include topics such as: the function of food and its relation to growth and development of the child, nutritional deficiencies and their prevention, a balanced diet, and school snacks/supplementary food for vulnerable groups. Nutrition education in schools is conveyed by using the "learning by doing" method through school cafeterias, school gardens, fishponds, and poultry farms.

With the collaboration of the 10 Ministries as instructed by the President of the Republic of Indonesia, by the end of Repelita II/1979 it is hoped that all governmental elementary schools will be covered by School Health Service with health centers as a base. At the end of Repelita II there will be approximately 90,000 elementary schools. The present percentage of government elementary schools covered by School Health Service is 45.6 percent.

According to the plan, at every government elementary school one teacher will have been trained in school health including nutrition education. A manual on guidance for teachers in school health will be distributed to teachers responsible for school health. Transportation (motorcycles and bicycles), School Health Kits, and Nursing Kits, will be available in order to run the School Health Program.

One way of attaining a higher nutritional status of the population is through nutrition education in schools. This is because school children are potent agents of change, and the impact of this type of education would certainly be extended to future generations.

S. Tjokrowiriono

Oceania

AUSTRALIA

Australia, an island continent, is a federation of six states and two territories with a total area of 7,686,884 km² (almost three million square miles), an area about as large as the United States excluding Alaska and Hawaii and about twice as big as India and Pakistan together.

Australia is the flattest and most arid continent; one-third is desert, another one-third arid. Sixty percent of the land has less than 380 mm. (15 in.) of rain per year, and the whole country average annual rainfall is 470 mm. (18 in.), as opposed 720 mm. (28 in.) average for world land masses.

Because of the continent's arid interior, population is distributed mostly in the fertile coastal plains, and even there is mostly congregated into cities. The total population as of June 1975 was 13.5 million. The annual increase to June 1975 was 1.3 percent, comprising 0.9 percent natural increase and 0.3 percent net migration. Thirty-nine percent of the population is under 21 years of age. Eighty-five percent of the population is concentrated in urban areas with 65 percent in cities of over 100,000 and less than 15 percent in rural areas. The expected life span of males is 68 years and of females 74 years. Deaths under one year were 16.49 per 1000 (1973), compared to the United States' rate of 18.5 per 1000 (1972).

Education System

Constitutional authority for educational systems is the responsibility of state governments, except for the Northern Territory and Australian Capital Territory, which are administered by the Australian government.

Schooling is compulsory between the ages of 6 and 15 years (16 in Tasmania), although children customarily attend primary school in some states at the beginning of the school year after their fifth birthday.

Tuition in state preschools, primary, and secondary schools is free, with parents paying for some textbooks and school uniforms and contributing towards libraries, sports equipment, etc., through parent and citizen organizations. Parents of children at nongovernment schools pay for textbooks and equipment, etc., and pay large school fees as well. Seventy-five percent of Australia's pupils attend state schools, 20 percent attend Roman Catholic schools, and 5 percent attend private, mainly secondary, denominational, highly socially prestigious schools. Enrollment in 1973 in 7,311 government schools numbered 2.2 million pupils with 104,816 teachers including part-time teachers. Student/teacher ratio was 1:25. The 2,176 nongovernment schools have 612,769 pupils and 24,843 teachers; 491,775 pupils and 17,490 teachers are in Roman Catholic schools at a student/teacher ratio of 1:28. In other private schools this ratio is 1:16.

Preschools and kindergartens, both government (free) and private (with fees), exist for children three to five years of age. Both radio and television have important input into preschool and primary education. The Australian Broadcasting Commission (ABC), with stations in each state and with no advertising, runs the Australian programs "Kindergarten of the Air" and "Play School" each weekday throughout Australian capital cities and in many country areas. The network also shows the American "Sesame Street." Special primary school programs are aired on both radio and television.

Primary and secondary schools include 12 years of education. In the case of government schools, the two levels are usually in separate school systems. Most schools now have improved library facilities and science-teaching facilities because of an increase in Australian government aid to both state and private schools in recent years. In 1972, secondary school students remaining beyond the minimum leaving age to the completion of the final year of school were: government schools 28 percent and nongovernment schools 49 percent (reflecting the socioeconomic background of parents). The number of students completing school as related to socioeconomic status of parents was: high status 76.4 percent, average status 40.5 percent, and low status 14.5 percent.

Teacher-training occurs at 40 state-run teachers colleges and 13 private colleges or via a university degree and postgraduate Diploma of Education.

Since 1974, all tertiary education has been free. There are no tuition fees at universities, colleges of advanced education, or technical colleges. Students pay for textbooks and pay an activities fee. The state governments provide free health and dental services in state schools. Insurance is often arranged at little cost.

School Foodservice

There is no general, free school foodservice in Australia. In isolated instances, there are some free meals supplied. For example, a free mid-day meal is supplied to aboriginal kindergarten children as an experiment in enhancing nutrition of these pupils in a particular set of circumstances. Generally, inexpensive lunches are supplied through school tuck-shops, equivalent to school canteens. The state schools incorporate and pay for the design and building of these tuck-shops when new schools are erected. Private schools have tuck-shops for day pupils as well as dining rooms for boarders. In almost all schools, both government and private, tuck-shops are manned by volunteer parents, thus identifying school lunch with the family situation for young children. Most children look forward to their parents' turn at the tuck-shop.

An attempt is made to offer nutritious food and drink at as low a cost as possible. Tuck-shops usually aim to make some profit, which goes towards specific items required for the particular school. Profits are not pooled or placed in a government fund, but profits made by one school are spent (and often government subsidized) by that school's Parents and Citizens Committee on library additions, sporting equipment, extra classroom aids, or towards a swimming pool, etc.

The Australian Government helps with printed guides for tuck-shop foods, supply of equipment at very low cost, supply

of nutrition posters, and replies to specific inquiries about foods and drinks. The government has recommended that "it is often desirable to subsidize essential foods and weight the prices charged for extras." The Australian National Health and Medical Research Council (NHMRC) has published "A Guide for School Tuck-Shops" (1974) that discusses ways of using the school tuck-shop as an agent for nutrition education and of giving helpful advice on standard lunches and "specials." The guide also lists recommended and undesirable foods and hygiene standards.

An attempt is usually made to offer nutritious lunches. Often, given a quite wide choice, children actually select the better quality foods. A survey of Australian Capitol Territory schools showed that the order of popularity of sandwich fillings was salad, meat and salad, meat, banana, Vegemite (a yeast extract high in B-complex vitamins), egg, tuna, and cheese and salad. Generally, the most popular fillings appear to be meat, salad, and cheese. Many tuck-shops concentrate on serving "salad rolls" (buns with filling of meat, lettuce, tomato, and cheese). In some schools, no candy, soft drinks, cakes, biscuits, or ice creams are sold, while in others these extras are not sold until later in the lunch period, when the more nutritious items already have been eaten by the children.

The only financial contribution to school feeding programs by the Australian Government (other than building tuck-shops in state schools) is the free milk scheme. The "States Grant Act 1950" (milk for school children) aimed at supplementing the diet of all school children under 13 years of age with one-third of a pint of milk daily. The cost of the milk and half the capital and incidental expenses were reimbursed by the federal government to the states. In 1972, \$11,894,000 was reimbursed to the states for this program.

Generally, the nutrition level of the Australian people is high, and it has not been thought necessary to introduce government-funded school lunches. The recent report on pockets of poverty in Australia, however, implies that such thinking may be erroneous!

Nutrition Education in Primary and Secondary School

Nutrition education was formerly included under home economics and was taught only to girls. Now nutrition is part of the curriculum for all boys and girls throughout their schooling. For example, in the state of Queensland, nutrition education ranges from coloring simple posters relating to foods in grade one, through concepts of elementary biochemistry of foods (e.g., food groups, composition of foods, vitamins, etc.), to nutrition as a behavioral science in grades 11 and 12. "Food and Man" units are designed to deal with:

- Nutritional requirements of man and alternative ways of meeting them
- Factors affecting man's selection and utilization of food
- Relationship of food selection and utilization to nutritional status
- Nutritional problems of undernourished and overnourished communities in Australian and other cultures
- Principles of food preparation methods
- Management of resources for the provision of food

The provision of school tuck-shops and improved nutrition syllabi satisfactorily cover the majority of Australian school children. There are special at-risk groups, however, for which this system is not sufficient and in which children are both malnourished and poor achievers at school. Both parents and children need to utilize available (mostly free) services for promoting better health and nutrition. Perhaps more importantly, services need to be changed in response to the needs of minorities, such as the aboriginals, elderly, and particular migrant groups.

M. Gilliland

NEW ZEALAND

New Zealand lies in the southwest section of the Pacific Ocean. To the west beyond the Tasman Sea is Australia and to the east, 4,000 miles away, is the coast of South America. This nation has three main islands—North Island, South Island, and Stewart Island. The total land area is 103,736 square miles, slightly larger than Great Britain (England, Ireland, and Scotland).

On South Island there are spectacular mountains, deep narrow valleys, swift rivers, large lakes, and phenomenal glaciers that contrast with the neighboring fertile plains of two of its large provinces, Canterbury and Southland.

The North Island is mainly fertile hill country with a mountain chain of active volcanoes and rugged country running through the middle of a section of the island. Geysers and hot springs abound in the center of the island and are a unique tourist feature.

The total population of New Zealand is approximately 3 million. Two-thirds of the population lives in cities and one-third in the rural areas.

New Zealand is an independent member of the British Commonwealth with advanced manufacturing and tertiary industries apart from its agricultural pursuits. It has an economy based on the efficient production and marketing of primary produce—milk and milk products, butter, cheese, meat, wool, etc. New Zealand is governed by a democratically elected group of 86 men, collectively known as Parliament. This group enacts legislation and governs for a period of three years, watched over by the nominal head of state—Queen Elizabeth II (through the Governor General).

New Zealanders enjoy a high standard of living, exceptional recreational facilities, a relatively pollution-free environment, and an unhurried way of life.

Education in New Zealand starts for most boys and girls at the age of three to four years at which time they enter

kindergarten. At five years of age they must enter primary school where they stay until the age of approximately 10 or 11 years. In most areas, they then enter an intermediate school where they begin a more specialized education. (Some stay on at their primary schools until 13 years of age.) Most children enter secondary school at the age of 13 years. They must remain at school until the age of 15 years. Most New Zealand students choose to continue their education at tertiary level in some way by either attending full or part-time a university or other tertiary education institute such as a polytechnical or technical institute. Education continues for the adult in the community through adult education classes and similar night classes. Adults can continue further education on a full or part-time basis at any time in their lives.

Health Care

In most cases, health care is free in New Zealand. Prescription pills and medicine also are provided free of charge. Dental care is provided until children reach the age of 15 years or leave school to work or attend tertiary training.

School foodservice does not exist in New Zealand on government subsidy. In some cases, parents have organized a meal service on a voluntary basis, and it is not compulsory for the children to patronize this. Most schools run efficient and practical cafeterias, canteens, or tuck-shops. These are usually manned by voluntary labor, e.g., parent-teacher representatives or senior pupils. The profits go toward amenities for the school such as extra sports equipment, library books, finances for school field visits, etc. The emphasis is on improvement of nutritional standards although, in most cases, food of suitable nutritional value is available—hamburgers, meat pies and pastries, fruit pies, sandwiches, fish and chips, salad rolls, fruit, milk, yogurt, cheese segments, ice cream, etc. Most schools have a rule that sweets and soft drinks are not available until the main lunch items of good nutritional value are sold.

Nutritional standards throughout the country are generally satisfactory although problem areas are beginning to occur with the drift to the city of the Maori sector of the population and the Polynesian people of the Pacific Islands. There is little evidence in the way of "meal need" for food in New Zealand.

Up to the age of 10 years, children receive nutrition education from classroom teachers in health education time and by school dental nurses. At age 10 to 11, all girls and boys attend either intermediate schools or manual training centers where specialist home economics teachers are available to continue and introduce a more comprehensive program of nutrition, meal planning, and food preparation for one and one half hours each week.

At age 12 to 13, children enter secondary schools and here nutrition education is continued in both integrated and specialized programs for two years.

Nutrition education is also given in prenatal clinics to both expectant mothers and their husbands. Postnatal work is done by the Plunket Society whose main objective is the care of babies and young children. Almost all mothers attend "Plunket" for several years. The Plunket Society also provides tutor nurses who visit schools and run 12-week courses in mothercraft for many boys and girls aged from 12 to 18 years of age.

The New Zealand Health Department provides excellent service to schools in the form of colorful nutrition and health posters, leaflets on nutrition, and films and film strips. Dieticians are available for lecturing to secondary pupils. The Health Department also produces a quarterly booklet *Health* that is widely distributed, free of charge, throughout the community. Articles on nutrition appear in this publication. Radio and television sessions regularly feature programs in this area, and advertising is strictly controlled to prevent extravagant, negative statements about the nutritional content of certain foods.

Consumer education is strong in New Zealand, and the quarterly magazine *Consumer* keeps a sharp eye on spectacular advertising. The Consumer Association has special notes on "nutrition teaching"—methods, suggestions, and topics for teachers' use. Other valuable sources of resource material on this subject are supplied by food organizations such as New Zealand Dairy and Milk Board, New Zealand Apple and Pear Board, New Zealand Fishing Industries, New Zealand Fruit Growers Federation, New Zealand Refrigerating Meat Company, and New Zealand Egg Flour. These organizations also plan, organize, and run seminars for teachers.

Frequent in-service courses are held for teachers and other courses in nutrition education and institutional management are run by departments of university extension. Teachers also have on hand WHO, UNESCO, FAO, and other world organizations issuing up-to-date literature on the subject.

N. Simpson

FIJI

The Fiji archipelago lies in a central position among the island groups of the southwest Pacific, midway between the Kingdom of Tonga and the New Hebrides. It comprises a group of islands more than 300 in number. Approximately 100 of these are inhabited, most of the remainder being used for temporary residence and for planting. Fiji covers an area of some 7,000 square miles. The two main islands, Viti Levu and Vanua Levu, cover an area of 6,148 square miles—87 percent of the total area.

Fiji is on the crossroads of the South Pacific. It is the focal point for travel between the island territories of the region. Traveling within the Fiji island group is by air to the more developed islands and also by sea. Some of the remoter islands have rather irregular communication facilities with the capital, Suva. The mid-1975 population was estimated as 569,000.

The population of Fiji has been growing at an average annual rate of 2.2 percent since the last census in 1966. Distribution of population is closely related to the economic activities of different regions. Coastal areas and river valleys have larger concentrations, whereas the interior parts of the main islands, being mountainous, have relatively fewer people. Internal

migration is mainly toward the main island of Viti Levu, and in particular to its urban areas.

Economically, Fiji is a developing country. It has a large agricultural base with sugarcane and copra as its main products. The manufacturing sector is growing mainly to meet local requirements; however, attempts are also being made to serve other territories in the South Pacific with a limited range of manufactured goods. Tourism, as an industry, has grown rapidly during the last decade.

Education System

The Ministry of Education, Youth, and Sport formulates and implements educational policy in the country. It has a team of administrators and professional staff led by the Permanent Secretary in the Ministry. Apart from normal administrative functions relating to staffing and buildings, the ministry has within it sections concentrating on curriculum development and advisory services, production and distribution of educational resource materials, school broadcasts, technical and vocational education, youth programs, and examinations.

The kindergarten level of the school system includes play centers. There are 108 kindergartens serving 3,256 students. The primary school level includes classes one through six, one through eight, and also five special schools. There are 664 schools at the primary level, serving 133,989 students. Secondary schools can include junior secondary as well as forms one through four. There are 28,382 students in 112 secondary schools.

Education in Fiji is not compulsory; however, a system of providing education at no fee was introduced in 1975. The first four years of primary education are now at no fee, while a set percentage of pupils in secondary schools are given free or partially free education as well. Some 43 percent of school-aged children are currently receiving education at no fee.

Approximately 86 percent of pupils complete class one through form four—i.e., ten years of education. There are two teachers colleges with an output of about 300 per year. A third teachers college is scheduled to open in 1977. There are at present 5,332 teachers in the country. Most of the teachers working in primary schools have primary and secondary educations, while those in secondary schools have secondary and university educations.

Of the total operating budget for Fiji for 1976, education was allocated \$27,989,880 out of \$126,971,300 or 22 percent of national budget.

School Foodservice

In most Fiji schools, children bring packed lunches in plastic lunch boxes or parcelled in lunch wrappers. School lunches are supervised by teachers and the values of bringing a "balanced" meal and practicing good eating habits are emphasized. Teachers endeavor to link the school lunch program closely to formal health lessons given during teaching time. Tooth brushing is an important feature of the lunch program; it is hoped that by correlating this activity with the formal classroom discussions teachers can promote dental health as well as the habit of selecting foods wisely.

In some Fiji schools, however, some children go home for lunch, especially when they live at a walking distance from school. Some children have lunch brought to them by mothers. Fijian mothers in villages find it convenient to take children's lunch to school during the lunch hour instead of preparing packed lunches in the morning. Some children buy meals at school and such meals are generally organized by mothers' clubs along with the head school teacher.

The Nutrition Section of the Health Department is helping to organize a scheme in five of the Suva schools at which lunch is cooked by mothers. In this scheme, support of a strong Mothers' Club is essential. The chairman of the club arranges for groups of four to five mothers come to school everyday for a week to prepare food. Each group is responsible for purchasing, preparing, and serving the food. Meals are sold at as low a price as possible. The menu is prepared with consideration given to variety and nutrition values of foods. School canteens and mobile canteens are prevalent in urban schools and sometimes children do buy prepacked lunches from these sources as well.

Nutrition Education

At the primary school level, nutrition education permeates a number of subject areas—health, social studies, arts and crafts. It features prominently, however, in the health syllabus which incorporates six major themes—sanitation, first aid, infectious diseases, nutrition, growth, and healthy living. Like the other six themes, nutrition is dealt with in all classes from one to eight progressively.

At the junior secondary and secondary levels, home economics takes in nutrition education. The scheme of work in nutrition introduces pupils to the fundamentals at form one and builds on these stage by stage up to the upper secondary level. For example, the pupils begin by getting to know the kitchen, economy in the kitchen, basic methods of food preparation, and presentation at form one and go on to discuss nutritional problems in Fiji and nutritional aspects of meal planning at the form four level. The main emphasis in form one through four is on practical work. To facilitate this goal, most secondary schools now have home economics rooms and necessary equipment. The subject is taught by specialist teachers who have undergone a special course of study at the Teachers College or at the University of the South Pacific.

There are two other subjects that supplement the teaching of nutrition education at the secondary level: basic science (which develops into biological and physical sciences at the upper secondary level) and a two-year program for forms two and four in modern studies. The latter aims to introduce principles of commerce and business and to promote scientific principles in agriculture through projects on relevant topics such as vegetables, bananas, and chickens. The practical approach utilized in this program is proving fairly challenging and rewarding.

Primary schools maintain school gardens and children grow common vegetables and fruit in their individual or class plots. The teaching of natural science is closely related to children's activities in school gardens. In most cases, with the encouragement from teachers, children extend their gardening interest to home.

Nutrition education in Fiji is seen by the Ministry of Education as an essential part of the overall school curriculum; however, on a wider front there are various other organizations and government departments such as the South Pacific Commission, the Consumer Council, and special sections of the Ministry for Health and the Ministry for Rural Development that also are involved in promoting nutrition education in the community as a whole.

WESTERN SAMOA

Seventy-one percent of the Samoan people derive their livelihood from the land. Most of the exports are agricultural products. It follows that in its current development project, the government plans not only to increase production for exports to earn money overseas but also plans to improve the standard of living in rural areas, generally by raising farm income and specifically by improving the diet of the people.

There is malnutrition in Western Samoa, especially protein calorie malnutrition among the preschool children notably in the weaning period. In a country where there is still plenty of land to cultivate, there is no excuse for malnutrition.

While not all cases of malnutrition are reported to hospitals, statistics collected in the main hospital indicated that 11.9 percent of children admitted below the age of six years involved kwashiorkor and other forms of malnutrition and anemia. The more commercialized island of Upolu has more cases of malnutrition than does any other island of Samoa.

From the discussions with mothers in the village clinics, it was found that they suffer from a gross misunderstanding that if a child is having milk (breast or artificial) he needs very little or other food. It is usual that when a child is weaned, he is put on the adult diet of starchy food like taro, breadfruit, and bananas. Very often, when mother is attentive to her newly-weaned child, it is mistakenly put on a diet of rice pudding or a dish made from flour or bread.

The circumstances that have helped to bring about the present situation should be noted. Under the old subsistence type of economy, meals were more balanced since the typical meal had greens, fish, and meat. Every member in the household was an economic help and each extended family had its pigs and fowls, and certainly there was plenty of fish and shellfish in the seas.

The present changes in Samoa's once self-supporting and subsistence type of economy have brought about changes in life-styles creating both a desire for and reliance on imported foodstuffs, especially in the Apia area. Most Samoans cannot afford the important foodstuffs that make a balanced diet. Apart from low wages, one reason is that while Samoans are gradually changing to a money economy, the social system has not undergone comparable changes to make all adult members of the household or family (which still includes the extended relatives) contributing members to the family larder as it was in the old system.

In the present setup, it is possible that a family of 20 might have two wage earners or even one, who would bear the brunt of supporting the whole family. Inevitably, Samoans are forced to buy quantities and not quality.

Remedial Programs

Attempts to improve the incidence of malnutrition have been made by the Health Department for many years, but only with preschool children. Run by district nurses, the program is only demonstrative and advisory. The New Zealand Bank Trust was set up in 1967 and its council was made up of representatives of aid organizations and of the New Zealand Dairy Board to help children with milk biscuits. Independent applications from teachers, nurses, and doctors are received by the Food Bank which sends out the biscuits. It pays for the purchase of the biscuits and transport. Biscuits are sent on request to the health department which in turn distributes them to beneficiaries.

In an effort to further alleviate the problem, the Agriculture and the Health Departments have recently joined in a program to develop a weaning food based on foods grown in Samoa for feeding young children. Research and development of the baby weaning food is being conducted jointly by the Health Department, Agriculture Department, South Pacific Commission, and the University of Hawaii.

The Food Processing Laboratory at Ala Cua Agriculture College is carrying out the processing formulation and storage trials of the food. The University of Hawaii is to determine the chemical and biological value of the food. The Health Department will distribute the weaning food to the district nursing centers and at the same time the nutritionist will monitor the program.

Both programs mentioned above have involved and will involve only preschool children. The government is very much aware of the need to improve the nutrition of the general population and it is now embarking on fishery, poultry, pig, and cattle farming on a larger scale.

World Food Project 741

Pending fruition of these plans, the World Food Project 741 (WFP) has been requested to assist for the next three years. It was initially thought that by July 1976 this project would get off the ground. When the WFP is in operation, it will involve these three departments including that of education. For the first time, the Education Department will be associated with foodservice because the school children will be affected.

Under WFP 741, a midday meal will be given to school children, some of whom travel considerable distances away from their homes. This group of children generally have to wait until evening for their second and last meal of the day. There are some 125 government primary village schools and 19 government junior high schools with about 32,000 students. Mission schools have about 8,000 children. In view of the present lack of utensils and other facilities for the preparation of meals in most schools, the government has requested New Zealand wholemilk biscuits to be supplied.

It is envisaged that a center will be first established at Apia. Similar centers will be established in some of the health districts if the Apia center proves successful. Mothers will take their children to the centers for nutritional supplements and will take turns in the preparation of meals. At the center, the children selected for participation will be those found, through the health services, to be significantly underweight for age and those convalescing following an acute stage of malnutrition. The nutritional supplementation will be continued for about three months after which the mothers will be expected to apply what they have learned in the regular family feeding.

Mothers will be instructed in the improved methods of child feeding by some 42 district health nurses and the 14 district medical officers in association with the women's committees. In the schools, children will receive elementary nutrition

education from their teachers and from the district nurses who will pay periodic visits to the schools and home. At the same time the Education Department will examine the nutrition aspects of home economics curricula for in-service and preservice teachers training with the intention of making the training more relevant to the nutrition needs and possibilities in Western Samoa. The dietitian of the Health Department will provide the necessary nutrition education. It is also hoped that, if necessary, the government will seek the assistance of one other qualified person in nutrition and home economics from outside and the WHO Medical Nutritionist attached to the UNDP/WHO Public Health Administration, Advisory Service Project in the South Pacific.

It is expected that as a result of nutrition education and any visible health benefits, the Western Samoa women (who have traditionally played an important role in family life and society) will become more aware of the value of nutrition and will gradually learn to prepare a more balanced diet for the families with special attention to preschool children.

The Department of Health will be responsible for the execution of the project through 14 district hospitals comprising 14 medical officers and 42 district nurses on behalf of the preschool children. The Prime Minister's Department will assume overall responsibility for the project and will be the channel of communication with WFP in all matters.

Food Calculation Mode

WFP food is intended to be used in the following manner. A daily per capita ration of 30 grams of dry skim milk will be distributed to pregnant mothers for a period of six months before parturition and to nursing mothers for six months after parturition. The average number of mothers who will receive the above rations is estimated to be 7,000 annually. A daily per capita ration of 30 grams of dry skim milk will be distributed to preschool children between the ages of nine months and five years. The number of children receiving the above rations is estimated to be 20,000 annually.

One milk biscuit of approximately 21.5 grams in weight will be distributed daily for a period of 200 days in each year, to 25,000 school children annually. For simplification of distribution, biscuits are primarily distributed to the lower grades, for instance from primer one to standard three (5½ to 11½ years). A daily per capita ration of 100 grams of rice, 20 grams of vegetable oil, and 30 grams of dry skim milk will be supplied for the use of about 60 preschool children attending the nutrition rehabilitation centers. A daily per capita ration of 30 grams of dry skim milk will be supplied for the use of about 100 children in hospitals.

Distribution Mode

WFP food will be shipped to the port of Apia and stored in the government store house. From the central storehouse in Apia, WFP food will be issued to the Department of Health which has its own road transport for distribution to the hospitals for storage and further distribution to beneficiary institutions. The most remote district hospitals are 50 miles away on the island of Savaii to which there is a regular inter-island ferry service. Adequate storage space is available at the district hospitals, village clinics, and the nutrition rehabilitation centers.

WFP food will be distributed fortnightly to mothers and preschool children by the hospital authorities through the Women's Committees working with 14 district hospitals. In the case of children in hospitals and in nutrition rehabilitation centers, authorities will use WFP food along with the local foods for the preparation of meals. Each nutrition rehabilitation center is manned by volunteers who are supervised by a nurse and medical officer. Each center will have cooking facilities and sufficient space for the storage of WFP commodities.

Concluding Remarks

School foodservice is a new idea to Samoa. Until the advent of the World Food Project, the Education Department has never been involved in the distribution or supervision of food to school children. Health matters were and still are the exclusive responsibility of the Health Department. The Education Department's only contribution to the idea of a "healthy body" has been giving the children physical exercises.

As Samoans become more and more health conscious, it is not difficult to blur the boundaries between the physical sciences—such as biology and chemistry—and nutrition. As education in nutrition is a prerequisite for the success of any nutrition program, nutrition will have to become a subject worthy of place in the curriculum.

N. Schmidt

United States

MAINLAND U.S.A.

It is a privilege to be here and to address this distinguished audience. What should I tell you about school foodservice in the United States? I could start by listing the many problems that cause us to be frustrated and feel pessimistic. These problems include the government telling us what we can and cannot do, the reality that school foodservice has a big selling job to do to be accepted by the American public, and the fact that we are still trying to find a way to teach good nutrition. After 30 years there is still no organized, effective, widely used approach to teaching nutrition in our elementary or secondary schools.

I could tell you how good we are and talk about the successes and the accomplishments we have enjoyed during the past 30 years in school foodservice: the number of meals served has increased; the number of programs across the United States has increased; the kinds of programs have changed and become more numerous including breakfast programs, elderly feeding, and feeding preschoolers; dining rooms are attractive; employees today are treated with dignity and are recognized for their professional skills—a result of training programs; new methods of producing foods and new food delivery systems are being accepted; and school foodservice has become one of the biggest segments of the foodservice industry in the United States today. The list could go on.

I could tell you there are areas where we have failed but are now seeking ways to remove the obstacles that caused the failures. School foodservice in the United States is a program with problems, successes, and failures, and that's what I have come to share with you. I have come to look back over the past 30 years and tell you about government and government aid, food and local management and distribution, and nutrition education.

But I also come to look ahead, to talk about what can be done as a result of this conference: establishing nutritional goals, establishing a foodservice program in which everyone will be equal regardless of money. Rich or poor, every school child will be fed.

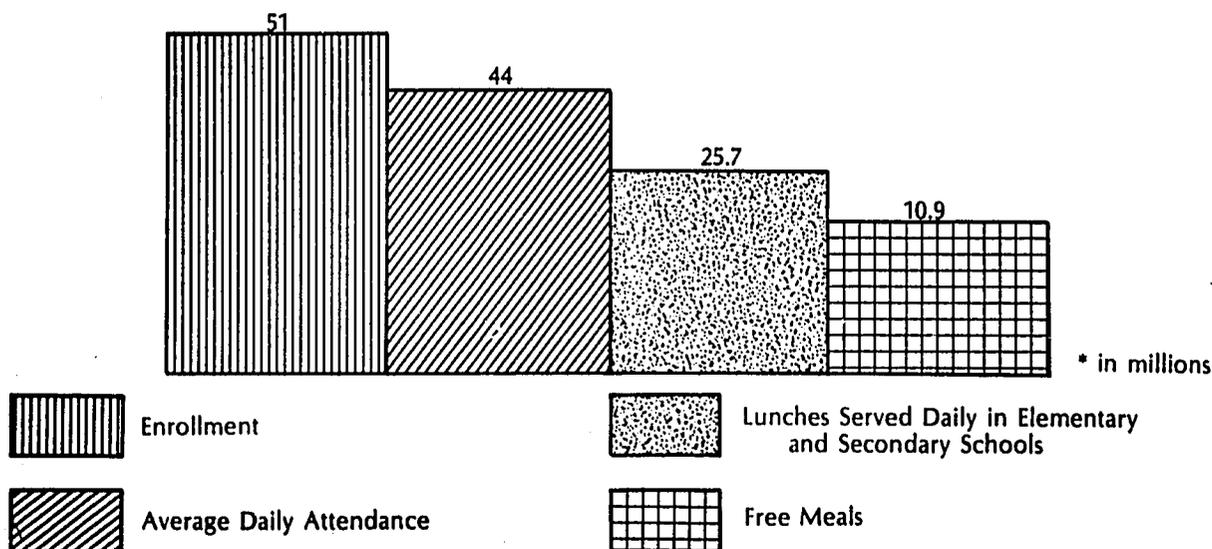
Before I talk about school foodservice in the United States, let me take a few moments to talk about this seminar. We are a heterogeneous group with homogeneous thoughts—thoughts of removing all obstacles that stand in the way of improving the nutritional status of the school child in our countries and raising the standards of health generally, and closing the gap between the foodservice programs in the school, the community, and the home. We speak as one people for a common good. There are 13 nations gathered here, and I believe there is no nation that has or ever has had a monopoly on creativity or inventiveness.

Ideas are like natural resources, and, like natural resources, are of little value unless or until something is done with them. There has to be a transfer of thoughts to action. The greatest system I know of to transfer thoughts to action is this kind of seminar, bringing leaders together to generate ideas, go home, and put them to use.

First, let me share with you the size and numbers of programs in the United States, and then I will tell you how government is involved in managing those programs. School foodservice in the United States of America, in the year 1976 is 15,000 school districts operating 90,000 kitchens serving 25,700,000 lunches per day for 180 days. Free or reduced price meals comprise 10.9 million of this total. School foodservice is also over two million breakfasts per day, 1,800,000 served free or reduced-price, plus senior citizens' feeding programs, plus preschool feeding programs.

This appears to be a lot of meals, but is it? Consider Figure 1 showing the ratio of the lunch program in the United States.

Figure 1
Ratio of the Lunch Program in the United States



There are several real concerns about the lunch program in the United States that cause frustration and a feeling of pessimism. They include a low percentage of free or reduced-price meals and a low percentage of students participating in the lunch program. The reasons for these low percentages are that students do not like the food, cost to the paying student is too high, a negative attitude toward foodservice exists on the part of school administrators, and approximately one million students attend schools not having a lunch program.

The United States government establishes laws telling foodservice programs what they can do and what they cannot do. Some of the laws that determine how the foodservice programs shall operate are regulations concerning salaries paid employees and conditions under which they work (wage and hour minimum wage a worker can be paid is \$2.42 per hour), regulations determining who shall receive a free meal or reduced-price meal, regulations concerning the kind of lunch served and the quality. The government shapes the way school foodservice programs operate. But, the government does not tell local school districts how they should manage their programs. The government does not say who to hire, which accounting system to use, how programs should be supervised, the kinds of training programs to carry on, or the foodstuffs to buy.

History of School Foodservice

As early as 1890 school feeding of a kind has been recorded, but the modern movement of school foodservice as we know it today was born in 1946. The drama that led up to the passage of the National School Lunch Act in 1946 was the report by General Hershey, then director of selective service, that one-third of the men rejected during World War II for physical unfitness were turned away because of difficulties traceable either directly or indirectly to nutritional deficiencies. It was obvious that poor food habits, begun at an early age, and continued throughout life, had a major bearing on the development of the individual. Alarmed officials realized that the most effective way of improving the health and eating habits of the nation was through the school lunch program. Only through school lunch could the largest number of individuals be reached at an early teachable age in a natural atmosphere of learning.

There was also a second reason in those days; there were farm surpluses, and it looked like a school lunch program would be helpful to the farmer. On June 4, 1946, congress passed Public Law 79-396, known as the National School Lunch Act, to "...safeguard the health and well-being of the nation's children and to encourage the domestic consumption of nutritious agricultural commodities and other foods." This act is the basic authority for the present national school lunch program and provides assistance in the form of cash and food.

Then as now, the three requirements for program participation are to: operate a nonprofit lunch program; serve lunches that meet the nutritional standards established by the Department of Agriculture (the "Type A" lunch); provide free or reduced-cost lunches to students. Until 1970, no specific guidelines or funding legislation was enacted.

While the requirements for participation are essentially the same, the cash reimbursements are far different (see Table 1).

Table 1
School Lunch Program Cash Reimbursements

CASH ASSISTANCE	1946	1976	1946	1976
			Commodities	
Free Meals	.05	.6925		
Reduced-Price Meals	.05	.5925		
Paid Meals	.05	.1250		

Legislation Enacted to Strengthen Child Nutrition Programs

The National School Lunch Act (Public Law 79-396) permanently authorized the school lunch program in 1946. It established cash grants to states to aid nonprofit school lunch programs in public and nonpublic schools. Payments to states were made on a three-to-one matching basis. On October 1, 1946, rules and regulations governing the distribution and use of commodities to the state for school lunch programs by the federal government were set forth in the agreements on donated commodities between the state board of education and the U.S. Department of Agriculture (U.S.D.A.)

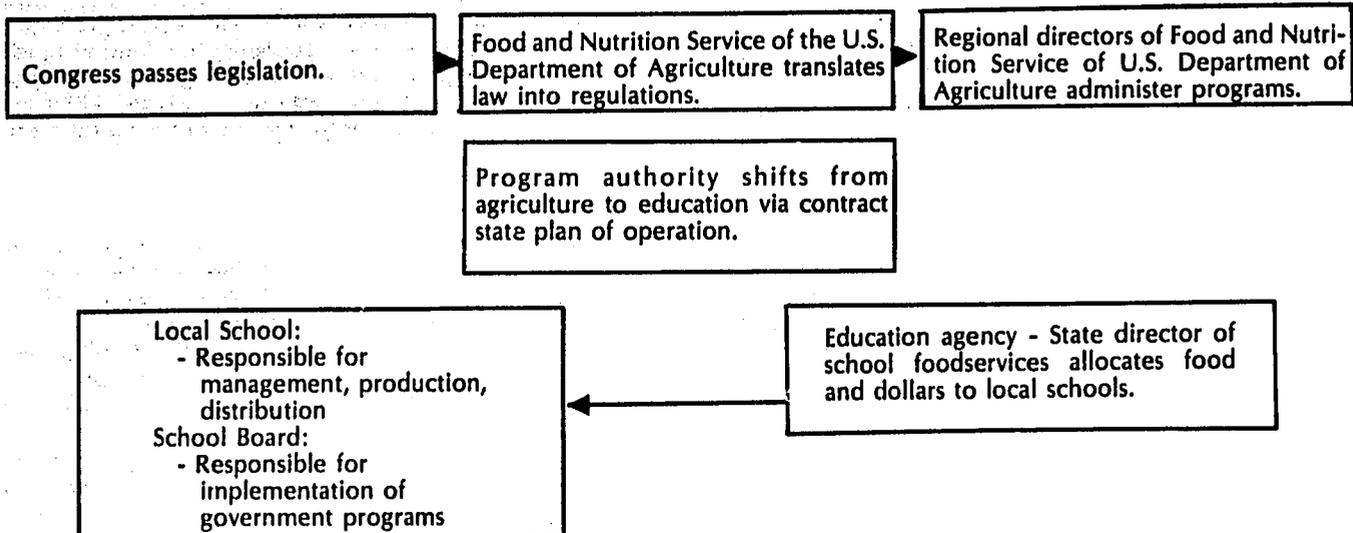
In 1954, the special milk program granted cash subsidies for milk served in schools and child care institutions. In 1962, legislation enabled funds to be based on rate of participation along with need for assistance. Also, a special assistance program was established to aid schools in providing free and reduced-price lunches to needy children (first funded in 1966). The Child Nutrition Act of 1966 established the school breakfast program; extended and expanded the special milk and nonfood (equipment) assistance programs; provided federal aid to feed preschool children through schools; provided funds to pay certain state administrative expenses; and appropriated funds for the first time for special assistance for free and reduced-price meals.

Public Law 91-248 clarified the intent of Congress that needy children receive free or reduced-price lunches by adding specific guidelines for determining eligibility for free and reduced-price lunches. A series of enactments in 1971-1972 extended and expanded the existing programs; established a new program—Special Supplemental Feeding Program for Women, Infants, and Children (WIC)—administered by the state; and guaranteed a minimum federal subsidy for each lunch served. Another series of laws in 1973-1974 guaranteed minimum subsidies for school lunches and breakfasts, and the U.S. Department of Agriculture was mandated to adjust them every six months to reflect changes in the index of cost of food away from home. Commodities (or cash in lieu of commodities) were guaranteed by setting a minimum level and granting special purchasing authority to the U.S. Department of Agriculture. Public Law 94-105, passed in 1976, continues the Breakfast, WIC, Special Milk, and Special Services for Children Programs. The legislation provides for mandatory reduced-price meals at 195 percent above the income poverty guidelines.

National School Lunch Program

The national school lunch program is the largest of the school feeding programs. Figure 2 shows how legislation is enacted at the local level.

Figure 2
How Legislation Reaches Local Schools



Schools participating in the program are required to execute agreements with the state education agencies. These agreements provide that the sponsoring agency for the school will be responsible for the three program requirements discussed earlier.

The Type A lunch meets one-third of the child's minimum daily requirements for nutrition and includes a food from each of the basic four food groups. It is the responsibility of each school district to plan menus which conform to the Type A pattern. Requirements for Type A school lunch are:

- Meat and Meat Alternate—two ounces (edible portion as served) of lean meat, poultry, or fish; or two ounces of cheese; or one egg; or one-half cup cooked dry beans or peas; or four tablespoons of peanut butter; or an equivalent quantity of any combination of the above listed foods. To be counted in meeting this requirement, these foods must be served as a main dish or in a main dish and one other menu item.

- Vegetables and Fruits—a three-fourth cup serving consisting of two or more vegetables or fruits or both, in raw or cooked form. A serving (one-fourth cup or more) of full-strength vegetable or fruit juice may be counted to meet not more than one-fourth cup of this requirement.

- Bread—one slice of whole-grain or enriched bread; or a serving of other breads such as corn bread, biscuits, rolls, muffins, etc., made with whole grain or enriched meal or flour.

- Milk—one-half pint milk as a beverage (whole, lowfat, skim, buttermilk or flavored).

- Vegetables and Fruits—a three-fourth cup serving consisting of two or more vegetables or fruits or both, in raw or cooked form. A serving (one-fourth cup or more) of full-strength vegetable or fruit juice may be counted to meet not more than one-fourth cup of this requirement.

- Bread—one slice of whole-grain or enriched bread; or a serving of other breads such as corn bread, biscuits, rolls, muffins, etc., made with whole grain or enriched meal or flour.

- Milk—one-half pint milk as a beverage (whole, lowfat, skim, buttermilk or flavored).

Over the years, the Type A pattern has been very useful in menu planning in the schools. Since the latter part of the 60s, however, there has been a great push to look for an improved way to plan menus that would provide for greater assurance that needed nutrients were actually being served; increased flexibility in menu planning; increased acceptability; decreased waste; and easier use of fortified food.

The nutrient standard menu planning technique was developed as an alternate way to plan school menus. The method called for the use of an abacus-like device to sum a menu planner's choice of nutritionally analyzed menus. The nutrient standard method is a very efficient and good way to plan menus, but far too difficult for the average school lunch manager to use. Furthermore, only analyzed recipes can be used. This inhibits creativity in menu planning. In the future, a revised nutrient standard system might be used, but for the present time, Type A remains the system for menu planning.

In a recent conference held in the United States, the problem of student participation and satisfaction was studied, and there was much talk on possible solutions. Are students satisfied with the meals at school? The statistics show they are not. In the early days of the program, adults felt they knew best about what children should eat. Menus were planned accordingly, with student preferences left out. The result was students either did not come in to eat, or if they did, what they did not like they left on the plate. Foodservice directors ask themselves, "Why can't we get students to eat a well-balanced lunch? Why won't they eat?"

Possible solutions offered to the problems were formation of youth advisory councils; improved nutrition education in the schools; lower lunch prices made possible through increased federal, state, and local support; improved management

techniques; improved food quality; and understanding student preferences.

The national school lunch program and the other child nutrition feeding programs over the past quarter of a century have scored many achievements in the U.S.A. There are still many problems, however, that deserve our attention. Many schools are lacking lunchroom facilities. Approximately one million needy school children are still going hungry at lunchtime. Nutrition education is not a required part of teacher training, nor is it part of the school curriculum. In-service training is sporadic and indifferent for school foodservice personnel.

Due to the high cost of school lunch in many districts, there is a decrease in the number of paying children. In some cases, the children are eating free, but some are simply lost from the lunch program. Although inflation has caused food prices and nonfood prices to escalate and the minimum wage of employees has increased, the price of lunches in the Corpus Christi (Texas) school district has remained the same since 1966.

Other Child Feeding Programs

The School Breakfast Program is designed to provide a nutritional breakfast to school children. Although originally intended to concentrate on schools in low-income areas, the program is now available to all schools as a result of Public Law 92-433. U.S.D.A. donated foods are also provided for the programs. To participate in the breakfast program, schools must meet U.S.D.A. nutritional standards, which means schools must provide fruit or juice, milk, bread or cereal. The 1972 revisions authorize future funding of the breakfast program on a "performance basis" similar to that now being used for funding the lunch program. Requirements for school breakfast are: milk—one-half pint of milk as a beverage (whole, lowfat and skim, buttermilk or flavored) or on cereal or use it in part for each purpose; vegetable/fruit—one-half cup serving of fruit or vegetable, or one-half cup full strength fruit or vegetable juice; bread—one slice of whole-grain or enriched bread, or a serving of cornbread, biscuits, rolls, muffins, etc., made of whole grain or enriched meal of flour, or three-fourth cup serving of whole-grain, enriched, or fortified cereal. Protein-rich foods are optional but recommended to be served as often as practicable. Protein-rich foods include one egg, or one ounce serving of meat, poultry, or fish or one ounce of cheese, or two tablespoons of peanut butter, or an equivalent quantity of any combination of these foods.

Special Milk Program

The Special Milk Program is aimed at encouraging children to drink more milk by reimbursing schools, child care centers, and camps for part of the cost of the milk served. Thus, participating schools and child care institutions can provide children with milk at a reduced price. Schools that provide milk as part of their food program may be eligible to participate in the special milk program if they develop a plan for increasing milk consumption. Schools serving a substantial number of needy children may be eligible to receive full reimbursement for the cost of milk if it is served free to the needy children. The milk program has been particularly significant where there has been no regular foodservice.

Special Foodservice Program

The Special Foodservice Program for children is designed to aid states in providing foodservices for both preschool and school-age children in both public and nonprofit private institutions. These institutions include day care centers, settlement houses, recreation centers, and summer day camps. The institution must serve low-income areas or areas with many working mothers.

Today in School Foodservice

Every day in the United States at noon time, 25,700,000 students come to eat a Type A lunch. What kinds of food systems are used to feed this gigantic number? Today, there are new systems of feeding our youth in America that are challenging the traditional systems. I believe before we can know and understand the impetus that gave rise to them, we need to examine the changes that have taken place in the world we live in, as well as changes in the national school lunch program since it came into existence just three short decades ago.

In the thirty years since the national school lunch program was born, school dining rooms have moved from basement afterthoughts nestled next to the furnace to attractive quarters on the ground level. Frightened, bewildered amateurs in house dresses, through education and training, have become the confident professionals of today. There has been an upgrading image resulting in public awareness of the school lunch program. There has been an acceptance of new operating methods, modern technology, and a grasp of new techniques by school lunch people. Important food and equipment buyers, school foodservice is one of the largest food operations in the U.S.A. and a market for farm products.

The year 1970 for school foodservice was not just the beginning of another decade, but the most significant year to date. In the year 1970, we were told to get ready to feed all poor children who qualified for the free lunch program and the program would receive federal funding. We were told hunger and malnutrition exist and to do something about it and that schools without foodservice programs needed to develop systems to feed students.

The year 1971 dawned and the numbers fed swelled. It began to look like everyone came to lunch. It was that year the big push for finding ways to feed large numbers gave the impetus for the present systems. Meanwhile, what was happening to the socio-economic world in which we live that would affect the school lunch program?

The past three decades have been a period of change in almost all areas of activity and thought. There have been startling changes in income, education, and living styles. All have had a significant impact on food patterns in preparing and in serving. Considering that school lunch is an extension of the home, it is important to know and understand the changes.

There has been an increase in working mothers. There has been a stretchout in food. Foreign foods are more readily accepted. Frozen foods have expanded greatly, notably frozen baked desserts, entrees, and vegetables. There is more snacking and less traditional meals—especially breakfast. Inflation has had its impact on changing systems in school feeding. Inflation has caused high food costs; increased labor costs, and spiraling equipment costs, not to mention energy costs.

School foodservice in the United States is caught up in a squeeze of high costs in food, labor, and equipment. School districts want food service departments to be self-supporting and they hesitate to make up deficits. Parents with paying children are reluctant to pay increased school lunch prices. All this adds up to a need for the most productive and efficient systems possible to feed the school students in the United States. Old concepts and methods must be abandoned and new and better ways must be found.

Systems for School Foodservice in the U.S.A.

In reviewing food systems, there is almost an endless variation of combinations, but currently five basic foodservice systems are used in school feeding: the on-site system; the central kitchen—preplated lunch distribution system; the central kitchen—bulk pack lunch distribution system; cold-packaged lunch system; and cup-can system.

The On-Site System

The on-site kitchen is the oldest and still the most widely used of all the systems. This conventional system has a kitchen with production, service, and clean-up personnel. Food of all types is received: raw food, convenience food, canned food and frozen food. The food is prepared or processed on the premises and served. The service may either be permanent ware, in which case a dishwasher is needed, or it may be disposables. This kind of system has to have the facilities built into the schools. The cost to equip an on-site kitchen is expensive. In addition, the space cost required is enormous. The on-site kitchen is not only expensive to equip and build, it is the most expensive to operate. Labor costs are greater, as are maintenance costs. The quality of the food depends upon the standards set by the staff in that school and the training of the personnel.

On-site kitchens may be managed by school districts or food management companies. The services of a food management company may be needed when a trained school foodservice supervisor is not available, the current management has failed, the district or school is too small to afford the salary of a trained school foodservice supervisor, or student demands require changes that cannot be brought about by the present operation.

The Central Kitchen

The central kitchen is known by many names, such as processing kitchen and production kitchen. It is defined as any centrally located kitchen where preparation of food is done for serving other locations. A school that serves other schools can be defined as a central kitchen, or it can be a kitchen designed for the primary purpose of producing food to be served elsewhere.

In Corpus Christi, the system I direct, the central kitchen prepares 18,000 Type A meals daily. The central kitchen is one of the most exciting places to watch in operation. It is a completely mobile, flexible kitchen, and the appearance and mood of the kitchen changes depending upon two things—the shift and the product or products being produced. The employees work around the clock in three shifts. As shift follows shift, the work flow is simplified and jobs move to completion without interruption. This speeds up production and helps materially in the control of labor costs. All food entering the kitchen is delivered from the warehouse or meat plant. It is checked for quality and quantity and shunted to the proper department for processing. The processed food is shipped to the schools by one of two methods—preplated lunch distribution system or bulk pack lunch distribution system.

Before I discuss these distribution systems, I would like to acquaint you with the pros and cons of the central kitchen.

Pros. The central kitchen eliminates small, repetitious businesses within one organization and there is better control in one unit as compared with a number of units. The cooking procedures are concentrated in one place. Savings are achieved in labor cost due to the serving of more meals per man hour. Labor is saved through the use of labor saving equipment which is not feasible to install in on-site kitchens. The central kitchen provides maximum supervision with minimum supervisors. Organizing and training one staff for the central kitchen is easier than training several staffs for individual cafeterias. The central kitchen combines functions and procedures. Through the use of tested recipes food will be uniform in quality and appearance if controlled and supervised. In on-site kitchens, the end product is only as good as the top manager or cook in each location.

The central kitchen is more flexible and can adjust more easily to change and new ideas. Research in new dishes and technological advantages in equipment are more feasible. Simplified ordering and bookkeeping are possible. There are fewer left-overs and waste, resulting in lower food cost. The central kitchen requires smaller inventories and more frequent and larger quantity deliveries to one location, resulting in on-site food cost control which is reflected in lower food costs. Recipes and menus are precosted. Savings are effected in space and equipment when the central kitchen is properly planned. Less equipment stands idle during summer. With fewer pieces of equipment, there is less maintenance required. The Corpus Christi system continues to be self-supporting because of the central kitchen system. Lunch prices to the paying student have not been increased since 1966, and the program continues to operate in the black.

Cons. Central kitchens are not suitable for locations with variety type menu and are not suitable for large operations—1500 or over. The cost of the central kitchen is more than the total sum of individual kitchens. Selling the program to the community also can be a problem.

Preplated Lunch

From one central kitchen, hot and cold packs are prepared. The hot packs—entree and vegetables—are packaged in foil or paper ovenware containers and covered with aluminum foil or polyfilm. The cold packs—salad, fruit, dessert, buttered bread, napkin and utensils—are packaged in clear plastic trays or cold pack trays and overwrapped with clear film. All containers and utensils are completely disposable. Permanent ware is not used in this system.

The system consists of six basic operations: preparation, packaging, distribution, heating, serving, and disposing. Preparation of food can take place in a central kitchen. The prepared food is then refrigerated and stored in bulk containers until time for packaging. Packaging of both hot and cold portions follows. Food is portioned into containers, and each container is covered and placed in a basket. Each basket, holding 10 hot or cold lunch packs, is placed on a dolly. The loaded dollies can then be held under refrigeration until time for shipment, can be frozen, or can be covered with insulated blankets and placed on trucks for immediate distribution to satellite schools. A driver delivers the lunches to each school.

At each satellite school, the baskets containing hot packs are placed in a convection oven for heating. One load of hot packs (140-300 lunches) will heat in 12 to 18 minutes. After heating, the baskets are replaced on the dollies and wheeled to the serving area. At the serving area, both hot and cold packs are given to each child as he passes through the line. When finished with lunch, the students dispose of containers.

Preplated meals may be purchased commercially, in which case a system must be established to evaluate the quality and quantity of the meals. The preparation of preplated meals, whether by school personnel, under the direction of a food

management company, or through commercial purchase, must meet the federal regulations for a Type A lunch.

Pros. With preplated meals, fewer trained or experienced employees can carry out the job, less equipment and space is needed, temperature is carefully controlled, and sanitation may be more controlled. Conservation of nutrients may be better than if untrained employees with poor preparation techniques have been preparing the meals and quantity is controlled with more uniform services.

Cons. With the preplated system there may be a lack of pride on the part of the employees in their work because of the feeling that anybody could do it. Preplated meals may lack the personal preference of seasonings. There is limited variety and quality is dependent upon oven and heating time. This is the greatest disadvantage. Quality of meals is often less than good after heating. The cost of disposables makes this preplate system expensive. Supplies are bulky to store. Trash and ecology are a problem as is acceptance of meals by students. Before this system proves itself, much more work is needed in programming the food before it goes into the oven as well as improving the ovens used in heating.

Bulk Pack Lunch

The bulk pack lunch system is predicated on food being produced in a central kitchen and being shipped to schools in bulk. The portioning of the food is done on the serving line in the receiving school. The food may be sent either hot or cold. If it is sent cold, the food may be prepared in advance and shipped at whatever schedule is desired. This is not possible with hot food. In the receiving school equipment requirements are a refrigerator, oven, and serving counter. The shipping equipment needed for the bulk system includes vacuum cans to transport liquids, upright closed carts for bread and pastries, and hot and cold food carts for other foods.

Pros. The bulk pack system maintains the personal atmosphere in the serving of food characteristic of on-site preparation and serving and portions can be adjusted to the size of the student. Quality and nutritive value of the food will be affected very little by this method if extreme care is taken in limiting holding time and temperatures. Disposables may be used in the serving of the food, or reusable dishes and silverware can be used when dishwashing facilities are available.

Cons. Transporting the food may present problems. The food containers may be heavy and require lifting. A loading dock at the feeder kitchen and the satellite school needs to be level with the transporting vehicle. A truck, bus, or large station wagon is needed. The serving time at the satellite school may require more labor hours than is economically practical.

Cold-Packaged Lunch

The cold-pack lunch system may be known as the brown bag lunch, vit-a-lunch, vita pak, astro-pak, etc. When the cold packaged method is used institutionally to provide lunches for students, sanitation aspects will limit what can go into the lunch, how long it can be held, and at what temperature it must be held. The lunch consists of a sandwich, raw vegetables, fruit, and milk.

Pros. The cold-packaged system is an interim solution. It is a way of getting a nutritious lunch to children where there are no facilities. It is possible to serve the lunch in the classroom, or at any other location without any equipment.

Cons. The cold-packaged system offers a limited variety in menus and lacks hot food. The factory approach removes the atmosphere of the social aspect of eating. Timing is a huge factor and speed is essential. The food cost may run higher than for on-site preparation of the hot lunch, but the labor will be considerably less. U.S.D.A. commodities do not lend themselves to utilization in this method.

Cup-Can Lunch

The cup-can or econo-lunch system is a hot lunch program where individual service-size canned food is used. The Academy of Food Marketing at St. Joseph's College in Philadelphia and the Campbell Soup Company came up with the idea as a means of solving the immediate need for nutritious food in schools where facilities were limited.

Pros. The cup-can lunch offers low cost per meal and is easy in operation with minimum of labor. It requires little space to prepare and children can eat at their desks, if need be. Part of the lunch is hot.

Cons. Menus are limited. A milk cooler will be needed for storing milk, and storage space will be needed for the canned food. It is desirable to supplement the cup-can with bread, butter, fruit or vegetable, and one-half pint of milk.

We know where we want to go in the United States; but we are a long way from getting there. I could cite a few small successes on the local level but until the federal government recognizes the importance of school nutrition programs and demands coordination at the national level among authorities in the field of nutrition, health, education, and agriculture, nutrition education will continue to toddle around. We are a people in search of a national nutrition policy.

Gertrude Applebaum

HAWAII

Foodservice for students in the public schools of Hawaii has been a reality for nearly 70 years. Today, school lunch is offered in all 220 schools, and breakfast in more than 30 schools.

Hawaii has a single statewide school district. School foodservices, a branch of the Office of Business Services, Department of Education, directs the school foodservice programs for all public schools. The state director and six SFS supervisors assist

district and school administrators in providing guidance to school foodservice managers and their staffs.

SFS responsibilities include budget preparation; specification for central purchasing of food, supplies and equipment; planning new facilities; monitoring compliance with federal regulations; in-service training; and supervisory assistance to school level personnel.

Lunch and Breakfast Programs

Daily, 140,000 students (87 percent of average daily attendance) participate in the lunch program. The student charge is 25 cents. Students eligible to receive free or reduced price lunch are served without charge. Seventy-six percent of the students pay for lunch; 18 percent receive free lunch; 6 percent reduced price lunch at no charge. Lunch menus in Hawaii are quite similar to those served on the mainland. Pizza, tacos, and hamburgers are popular. The main differences from mainland menus are probably wider use of some fresh fruits (pineapple and papaya) and vegetables (watercress and won bok).

Wiki-wiki means quick in Hawaiian. To cope with crowded cafeterias and short lunch periods, many principals of secondary schools have redesigned mid-morning recess as a lunch period. Menus designed for quick preparation and quick service (two tacos, french fries, and milk) permit thousands of secondary school students to eat a nutritious lunch in a short period of time. The popularity of the wiki-wiki lunch has helped increase participation in many secondary schools to well over 80 percent.

The 31 schools offering breakfast have a combined average daily attendance of 16,000. Daily, 4,500 students (28 percent of average daily attendance) are served breakfast. The percentage of students paying for breakfast is 27 percent; the balance are served at no charge.

Meals for the Elderly and Child Care Services

Title VII of the Older Americans Act provides funds and standards for elderly meals to be served without charge at congregate dining centers. In Hawaii, 15 public schools prepare 1,700 lunches daily for Title VII programs, some of which are fully funded by the counties of Honolulu and Maui and some of which are funded by the Older Americans Act. In each instance, the meals are served at congregate dining sites with no charge to the participants.

In the spring of 1976, 83 public schools began to permit elderly retired persons to come to school for lunch, paying the regular adult charge. Although this program is new with only a few hundred elderly participating, there is reason to anticipate its growth to several thousand elderly lunches per day.

Although the Child Care Food Program and Summer Special Food Program are administered in Hawaii by the USDA Regional Office, many public schools prepare lunches for child care centers participating in the CCFP.

Centralized Foodservices

Currently, 22 schools have preparation kitchens that prepare foods for those schools and 36 schools equipped with service kitchens. Thirty-three percent of all lunches served in the state are prepared in preparation kitchens. All food sent to service kitchens is transported in bulk and served from conventional serving counters.

School Foodservice Personnel

One hundred and ninety school foodservice managers and over 800 cafeteria cooks, helpers, and van drivers provide the services for students and staff. All school foodservice personnel are state civil servants and all are covered by one of three collective bargaining contracts. School foodservice managers, most of whom have completed two years of training in foodservice management at the community college level, work a teacher's work year; other school foodservice personnel are 12-month employees.

The budget (including federal commodities) for Hawaii school foodservices exceeds \$24.4 million annually. Of this sum, 37 percent is federal funding, 29 percent represents student payments, and the balance required, 34 percent, is provided by state legislative appropriation.

Nutritious, attractive meals served quickly and pleasantly to the maximum number of students at the minimum charge is the goal of all school foodservice programs. In Hawaii, the contributions by competent school foodservice managers, the high productivity of cafeteria cooks, helpers, and van drivers, and the generous support by the state legislature, combine to make Hawaii's program one of the most successful in the nation.

S. Doucette

Seminar Program

Tuesday, July 27, 1976

Registration and Orientation

Wednesday, July 28, 1976

Keynote Address

Country Reports

School Foodservice and Nutritional Improvement of Children
Nutrition Education in School and Community

Thursday, July 29, 1976

Multiple Approaches To Nutritional Improvement of Children

Friday, July 30, 1976

Adaptive Research and Development of Appropriate New Methods
Recommendations for Appropriate National and International Follow-up Activities

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