

Plenary Session 7

FORTIFICATION OF CONDIMENTS

Overview

Although they have little inherent energy or natural nutritional value, condiments are used as fortification vehicles in many successful food fortification programs in developing countries. Condiments have many advantages as vehicles to deliver micronutrients: they are inexpensive and used widely among lower-income groups; they are consumed in relatively constant amounts in most social strata and age groups; and added fortificants are relatively stable in most condiments, such that packaging, storage, and distribution do not present major technical barriers.

Salt fortification has been the major micronutrient success story of the 1990s. In countries where sugar consumption is high, such as in Latin America, fortification with vitamin A has been proven both safe and efficacious. On a smaller scale, condiments such as curry powder and double fortified salt have been shown to be effective in improving micronutrient status.

The National Institute of Nutrition in Viet Nam and the Institute of Food and Hygiene in the PRC have emerged as leaders in the development of technologies for iron-fortified fish sauce and soy sauce. Use of these condiments reaches into all sectors of the population. In the PRC, soy sauce is consumed by more than 70 percent of the population and in Viet Nam, fish sauce is taken by more than 80 percent of the population.

In both Viet Nam and the PRC, scientists and nutritionists recognize that iron deficiency will be difficult to control within the context of a traditional rice-based and high-phytate diet—a diet that lowers iron absorption rates to less than 3 percent of intake. Soy and fish sauce fortification efforts have moved forward on a scientific basis, with bioavailability, efficacy, and effectiveness trials. In order to improve bioavailability and to ensure efficacy of fortification, both programs have pioneered the use of sodium-iron EDTA (NaFeEDTA), a relatively new fortificant that offers double and triple the iron bioavailability of traditional compounds, particularly in high-phytate diets. NaFeEDTA has had provisional Joint FAO/WHO Expert Committee on Food Additives (JECFA) approval for a number of years, and in 1999 its use was officially approved in fortification programs. NaEDTA has been used worldwide as a food additive for many years in a variety of food products. However, the PRC is among the first nations to approve the use of NaFeEDTA as a nutritional additive. NaFeEDTA has been successfully synthesized at the PRC's Institute of Nutrition and Food Hygiene and production has been initiated at a domestic pharmaceutical plant. Commercial distribution is expected in both countries within several years.

Plans for Soy Sauce Fortification in the People's Republic of China

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The prevalence of anemia in the PRC is about 20 percent of the total population and in certain rural areas as high as 40 percent among 6- to 10-year-old children and up to 42 percent for women of child-bearing age. Iron deficiency is difficult to control because the traditional Chinese diet is cereal based, lowering iron absorption rates to less than 3 percent. In 1997, the ILSI Focal Point in the PRC, in collaboration with the Institute of Nutrition and Food Hygiene (INFH) held a workshop to identify approaches to control iron deficiency. After reviewing coverage and technical feasibility in rice, wheat flour, and soy sauce, the workshop recommended iron fortification of soy sauce. Soy sauce is consumed by 70 percent of households with national average daily consumption of 12.6 grams per person. It is produced in 2,000 factories, with 200 larger factories accounting for 40 percent of production.

After communicating with the Ministry of Public Health and other appropriate authorities, the INFH began a feasibility study. A review of available literature indicated that NaFeEDTA would be more suitable than traditional iron compounds because it is highly bioavailable in a cereal-based diet, more stable during cooking and storage, and would not alter the color or taste of soy sauce. NaFeEDTA was then successfully synthesized at INFH, a toxicological study was completed, and medium-scale production was initiated in a pharmaceutical plant. Research confirmed that there was no change in color, pH, taste, or precipitation in the soy sauce. Comparative studies showed 10.5-percent absorption, more than twice that of ferrous sulfate. A larger-scale trial demonstrated that after three-months' consumption of fortified soy sauce, anemic

children could attain normal iron status as assessed by three indicators—hemoglobin, serum ferritin, and RBC protoporphyrin. The production process to add NaFeEDTA was introduced to two soy sauce factories and it was found to be simple, and easy to install and maintain.

Parallel to technical research, regulatory issues were addressed. In 1999, JECFA concluded that "NaFeEDTA could be used in supervised food fortification programs in response to a need for iron supplementation of the diet." In 1999, the National Committee on Food Additives Standardization approved NaFeEDTA as a permitted compound and the Ministry of Health officially approved NaFeEDTA as a nutrient fortificant. A large-scale two-year controlled efficacy trial is planned for populations of 10,000-20,000 in areas where anemia is prevalent. The trial will evaluate reduction of anemia prevalence, consumer acceptance, and commercial distribution. After one year, if results are positive, an interim report will be submitted to the Ministry of Health and other relevant ministries recommending upgrading of soy sauce factories for iron fortification. Initially, technical assistance will be proposed for 20 pilot factories. This number will be increased in the ensuing two years. In parallel, a mass-education program on food fortification, with special emphasis on iron-fortified soy sauce, will be launched.

Presuming the two-year trial shows positive results, INFH will propose a national program to control IDA in the PRC. Two vice ministers of health and director generals of related departments have expressed their support of the project; thus, we anticipate approval and initiation of a national multiministerial effort. □

Condiment Fortification in Viet Nam: The Challenge Ahead

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Deficiencies such as VAD, IDA, and IDD have long been public health problems in Viet Nam. As iodized salt usage in Viet Nam rose from 24.9 percent in 1994 to 72.8 percent in 1998, low urinary iodine dropped by almost one half, from 84 percent to 43.5 percent. A national survey in 1988 showed that the rate of active form of xerophthalmia was 0.07 percent, seven times higher than the WHO level that indicates a national public health problem. With almost 99-percent coverage of high-dose vitamin A capsules, the rate of xerophthalmia has been reduced to 0.005 percent. This indicates that Viet Nam today is virtually xerophthalmia free. However, despite large-scale supplementation efforts and improvements in clinical indicators, subclinical VAD, as reflected by low serum retinol, continues to be a public health problem. This indicator has decreased only slightly from 14.7 percent in 1995 to 10.8 percent in 1998. The prevalence of mothers with low serum retinol and breast-milk retinol also remains high and increasing, from 41.1 percent in 1995 to 58.3 percent in 1998.

A 1995 national survey reported that IDA is a severe public health problem in Viet Nam. The levels of anemia are high among all age groups: 45.3 percent among under-5 children, 40.2 percent in nonpregnant women and 52.7 percent among pregnant women. Measures to lower the prevalence of IDA include breastfeeding promotion, improvement of complementary feeding practices, education about dietary diversification, and iron fortification. Recent national consumption data indicate that fish sauce is used by about 80 percent of the population with about 50 percent eating it on a daily basis. Therefore, fish sauce holds

great promise as a vehicle to deliver iron on a daily basis nationwide.

Product acceptance and iron absorption are critical to the success of iron fortification. After trials using elemental iron at both 5 and 10 mg per liter of fish sauce, it was determined that this iron form was organoleptically unsuitable. Moreover, within the rice-based high-phytate meal common in Viet Nam, the absorption of iron from traditional fortificants such as elemental iron, ferrous fumarate, or ferrous sulfate is very limited. Therefore, a relatively new iron fortificant, NaFeEDTA, was selected. In 1998, national expert workshops considered and recommended the use of NaFeEDTA in Viet Nam. Currently, these recommendations have been submitted to the Council of Food Safety/Hygiene of the Ministry of Health to legislate NaFeEDTA as a permitted food additive in Viet Nam.

Development of iron-fortified fish sauce is proceeding on a step-by-step basis. A bio-availability study in conjunction with ILSI's Project IDEA, the Swiss Federal Institute of Technology, the National Institute of Nutrition, and Institute for Research and Development, has been completed. Small-scale production of fortified fish sauce has been completed and over 300 bottles analyzed for iron content and acceptability. An efficacy trial is being formulated and a large-scale field trial is scheduled for 2000. Simultaneously, the technical capacity of the both the National Institute of Nutrition and provincial staff to monitor and assess the program is being improved. Laboratories are being strengthened at both national and provincial levels, and overseas training for key staff at the Centers for Disease Control and Prevention in Atlanta, USA, is planned. □

COUNTRY PERSPECTIVES: NEXT STEPS IN THE IMPLEMENTATION OF FORTIFICATION

PEOPLE'S REPUBLIC OF CHINA

Policy Development

In the PRC, advocacy is needed to push fortification ahead at the policy level. Success stories from other countries are needed as advocacy tools for policymakers. The Ministry of Public Health (MOPH), with the support of the core players identified below, needs to organize a meeting of all the players in a core group to get started. Regional support for this could possibly be provided by ADB, MI, ILSI, and UNICEF. A legislative framework for food fortification regulation will also be needed.

Advocacy, Communication, and Marketing

An advocacy strategy, led by groups such as the Women's Federation, is needed. An IDD advocacy meeting is planned for September 2000, led by the Food Fortification Core Group, and a meeting to promote soy sauce fortification with iron is suggested.

Food Vehicles, Fortificants, and Delivery Mechanisms

Flour and oil are being discussed as potential vehicles for fortification in the PRC, in addition to salt and soy sauce. The MOPH and Roche together will complete a systematic assessment report on the flour and oil industry before moving forward with these ideas.

Sharing and Applying Technology

Once the vehicle for fortification, the fortificant, and a qualified premix producer have been identified, the food industry will be responsible for ensuring that the fortified product remains stable during Chinese methods of cooking.

Economics and Funding

The Ministry of Finance and the State Development and Planning Commission, with United Nations support and funding, will explore the

possibility of establishing a loan policy for the industry and changes to the taxation policy.

Standards and Compliance

As specific carriers are identified, the MOPH, the food industry, and academic institutions will work together to establish food-specific standards. Standards for soy sauce may be available by the end of 2000.

Proof of Benefit

The proof of benefit will be that fortified soy sauce will be available by the end of 2000.

Players to Develop, Implement, and Support Food Fortification in the PRC

Core Players to Initiate and Take the Lead

- Ministry of Public Health
- Ministry of Finance
- Ministry of International Trade
- Ministry of Foreign Trade
- State Council of Light Industry
- Roche (flour)
- oil industry
- noodles industry
- ADB
- ILSI-PRC
- MI
- Chinese Cereals and Oils Association
- Women's Federation

Key Players to Involve

- Consumers Association
- State Development and Planning Commission
- rice millers
- UN organizations
- World Bank

Key Supporters to Inform and Keep Aware

- World Health Organization (WHO)
- United Nations Industrial Development Organization (UNIDO)
- United Nations Development Programme (UNDP)
- Food and Agriculture Organization of the United Nations (FAO)

FIJI

Policy Development

In Fiji, in order for flour fortification to move forward, a legislative framework must be put in place. The Ministry of Health, in collaboration with Fiji's Parliament, its Cabinet, and the Ministry of Commerce, hope to work together to submit a Cabinet paper for approval by mid-2000.

Advocacy, Communication, and Marketing

Advocacy, communication, and marketing are needed to promote the public health benefits of food fortification, not only to the consumer but also to government and industry leaders. To increase awareness on the severity of anemia in Fiji and flour fortification as a viable solution, the Ministry of Health and the Iron Fortification Task Force (IFTF) will work together to seek the support of influential figures, hold a national workshop on anemia, and lobby and inform the food industry. Netball and other sports heroes in the country could be enlisted as champions to promote and act as spokespersons for this campaign.

Food Vehicles, Fortificants, and Delivery Mechanisms

There is not yet full acceptance in Fiji that fortification of wheat flour with iron would be the best solution to IDA in the population. One of the initiatives needed is for the IFTF to work with the Flour Mills of Fiji (FMF) and the Punja and Sons Company to conduct trials on the organoleptic properties of the fortificants, as well as to determine the appropriate composition of the premix.

Sharing and Applying Technology

The main technology issue currently limiting the flour fortification effort in Fiji is assuring the supply of both the premix and the dosifier equipment required to adapt the existing flour mills. Working closely with the flour mills, the IFTF and FMF will lead the effort by engaging an industry consultant to provide technical assistance for this initiative, and once the equipment requirements are established and suppliers confirmed, the premix and dosifiers will be procured with the help of premix suppliers and UNICEF. Flour mill statistics will have to be collected as inputs to this activity.

Economics and Funding

Financial assistance will be needed as the first step. The second step is establishing a mechanism to sustain the premix funding. IFTF will lead the effort to submit proposals to potential donors such as UNICEF, ADB, MI, and CDC. IFTF will gather price quotations and conduct a cost analysis for this purpose.

Standards and Compliance

Mandatory legislation on flour fortification will need to be established. Using data on premix composition, a full review of flour standards will be made and a draft Act prepared. The IFTF and the Ministry of Health will lead the effort, in partnership with the Justice Department and the Ministry of Commerce. They will also seek the support of the South Pacific Forum Secretariat. Once the legislation is in place, WTO will be notified.

Proof of Benefit

Prevalence surveys, both baseline and follow-up data collection on iron status of the population, will be conducted by the Ministry of Health, with assistance from the CDC and academe, and with support from the South Pacific Commission.

To demonstrate the economic benefit, productivity surveys will be conducted by the National Food and Nutrition Centre (NFNC) in collaboration with UNICEF and local factories.

Players to Develop, Implement, and Support Food Fortification in Fiji

Core Players to Initiate and Lead

- IFTF
- Iodine Deficiency Disorders Committee
- Vitamin A Task Force

Key Players to Involve:

- FMF
- Punja and Sons Company
- UNICEF
- WHO
- Ministry of Agriculture and its Codex Alimentarius Committee
- Ministry of Women and Social Welfare
- Ministry of Commerce and its Standards Committee
- Ministry of Information
- Ministry of Education
- Ministry of Finance
- Fiji School of Medicine
- University of the South Pacific
- Fiji Medical Association
- Fiji Nurses Association
- KANA (a nutrition committee for schools)

Key Supporters to Inform and Keep Aware:

- Fiji Employers Federation
- Fiji Manufacturers Association
- media
- Fiji Council of Social Services
- Fiji Trade Union Congress
- Inter Faith
- churches
- Cabinet
- Ministry of Finance
- Ministry of Justice
- Fiji Revenue Authority
- NFNC
- Fiji Trade and Investment Board
- United Nations Fund for Population Activities
- ADB
- MI
- CDC

- South Pacific Commission forum sectors (a world trade organization)
- South Pacific Forum Secretariat
- WTO

INDIA

Policy Development

A policy document using information about available and successful food fortification technologies is needed. Fiscal initiatives follow from that, and a taxation structure would then be required. A mechanism for monitoring and evaluation should be made at the policy level as well as during program implementation, and to achieve this, regional guidelines on standards are needed along with material on information, education, and communication.

Advocacy, Communication, and Marketing

A mass-awareness campaign about food fortification in India is needed. A consultant specializing in communications would be hired to develop a media plan. To support advocacy efforts, studies and surveys will need to be done and databases updated. Also, sensitization training is needed for all the relevant sectors as well as for the public. Sensitization will help in the development of infrastructure for market promotion of food fortification.

Food Vehicles, Fortificants, and Delivery Mechanisms

It is felt that multiple micronutrient fortification could be of great benefit in India, and double or even triple fortification of salt would be a good solution. Rice and pulses would also be good vehicles for fortification, especially due to the large population that consumes rice. The infrastructure for manufacturing, packaging, storage, and transport needs strengthening.

Sharing and Applying Technology

The technologies used for fortification must be low in cost and easily applicable. Higher priority should be given to applied research so that there are

advances in the field, not just in the research institutions. It is very important that the transfer of technology be free of cost. It is also crucial that south-south collaboration be encouraged. The technologies and advances made in food fortification in the PRC are more relevant to India than those in the USA.

Economics and Funding

Liberal private-sector (both formal and informal) loans should be made available from donors such as ADB and should have low interest.

Standards and Compliance

The standards, set by the Ministry of Health, along with the Ministry of Food Processing Industry, Department of Women and Child Development, Ministry of Industry, NIN, Central Food Technological Research Institute (CFTRI), private sector, and home science colleges, should ideally be self-regulatory, with the producers following a standard of ethics as well. This would ensure effective quality control by the producers.

Players to Develop, Implement, and Support Food Fortification in India

Core Players to Initiate and Lead

- Roller Flour Millers Federation of India
- Cooperative Sugar Mills Federation
- Oil Technologists Association
- Confederation of Indian Food Trade Industries
- consumer group NGOs
- eminent nutritionists
- Home Science Economic Group
- Department of Women and Child Development
- Department of Food Processing Industries
- Department of Health
- Ministry of Public Distribution and Consumers Affairs
- Ministry of Industry (Salt Commissioner)
- Department of Family Welfare
- planning commissions

- CFTRI
- National Institute of Nutrition
- National Institute of Public Cooperation and Child Development
- MI
- UNICEF
- ILSI

Key Players to Involve

- Rice Millers Association
- Pulse Millers Association
- Tea Processors Association
- regional/state consumers groups
- women's groups
- Ministry of Finance
- Ministry of Commerce
- Ministry of Agriculture
- Department of Education
- Ministry of Information and Broadcasting
- Department of Rural Development
- national finance institutions
- WHO
- UNFPA
- FAO
- ADB
- USAID
- CARE
- DFID
- European Commission
- Canadian International Development Agency

Key Supporters to Inform and Keep Aware

- major manufacturers of fortificants (national and international)
- local level food processors
- local NGOs
- local-level women's groups
- labor union representatives
- Ministry of Home Affairs
- Ministry of Welfare
- Ministry of Railways
- the public

INDONESIA

Policy Development

Fortification policy in Indonesia will involve a range of government players. The key to moving forward will be the development of simplified and streamlined bureaucratic procedures. There is a need for guidelines that clearly lay out goals, objectives, and strategies, as well as define roles and responsibilities of the various government players. This initiative should be headed by the Coordinating Minister for Economic, Financial and Industrial Affairs and closely involve the Ministry of Industry and Trade, Ministry of Health, relevant members of Parliament, and representatives of the food industry. These activities should be based on clear data indicating levels of consumption for the various food vehicles under consideration and stability of fortificants under Indonesian conditions. Responsibilities for nutrition surveillance and monitoring of efficacy should be an integral part of any proposed guidelines. Vice President Megawati may be an appropriate champion.

Advocacy, Communication, and Marketing

A national mass-media campaign on food fortification should involve both leaders from Government and Parliament, and informal leaders such as religious authorities and civic leaders. This campaign should be grounded in an overall social marketing strategy for food fortification. The campaign could be championed by Ranokarno and feature official hearings in Parliament as well as the establishment of an official food fortification committee. Campaign messages should focus on the prevalence of micronutrient deficiencies as well as the efficacy and feasibility of fortification. Grants from donor agencies might finance this effort.

Food Vehicles, Fortificants, and Delivery Mechanisms

Under the leadership of the Ministry of Industry and Trade, the Government must create a conducive business environment for investment in food fortification. This would include financial incentives and enhancements to existing distribution networks. Stakeholders need clear data on the

factors that impact upon the cost structure of fortified foods as well as the impact of national and regional taxes and tariffs. Possibly, research to gather this data could be supported by fortificant suppliers.

Sharing and Applying Technology

Implementing a national food fortification program will entail application of two levels of technology. First, there is a need to utilize information technologies to disseminate relevant information as quickly and widely as possible, perhaps via a site on the World Wide Web. Second, there is a need for technical assistance in transferring and applying fortification-related technologies including food science, nutrition, food control, and public health monitoring and surveillance. Under the leadership of the National Food Fortification Committee (NFFC) this effort would involve academe, NGOs, professional and research organizations, and the National Standards Agency. ILSI, ADB, and MI are appropriate sources of funding for these efforts.

Economics and Funding

Gathering commitments for financial resources would be greatly facilitated by ongoing and consistent communications directly among donor organizations and private industry. UN Agencies such as WHO and UNICEF should coordinate regular meetings of a range of partners including the banking and finance communities, government, private industry, and international donors. Such an activity should be based on data derived from an economic feasibility study that details potential benefits as well as costs.

Standards and Compliance

Activities to develop an effective inspection and enforcement system should be led and coordinated by the Ministry of Health with input from the Ministry of Industry and Trade as well as academe. Steps toward a more efficient inspection system include the development of a performance compliance audit as well as improved monitoring through accredited laboratories using harmonized and validated methodology and training.

Proof of Benefit

National surveys providing both baseline and follow-up data are critical for demonstrating the benefit of fortification. These should be conducted by the Ministry of Health with input from UNICEF and the Central Bureau of Statistics. Financial resources may be available from ADB, ILSI, MI, or bilateral and multilateral donors.

Players to Develop, Implement, and Support Food Fortification in Indonesia

Core Players to Initiate and Lead

- Coordinating Minister for Economic, Financial and Industrial Affairs
- Ministry of Health
- Ministry of Industry and Trade
- food industry
- Parliament
- NFFC

Key Players to Involve

- National Standards Agency
- National Scientific and Industrial Research Organisation
- Ministry of Agriculture
- Ministry of Home Affairs
- Ministry of Finance
- National Research Council
- local governments
- CBS
- academe
- professional organizations
- media personalities
- UN agencies
- international NGOs
- donor agencies

Key Supporters to Inform and Keep Aware

- informal leaders
- consumer association
- food associations

KYRGYZ REPUBLIC

Policy Development

An important policy development would be the passing of a food additives law, which has already had amendments proposed to it and has passed the first reading of Parliament. The Ministry of Health, in partnership with certain members of Parliament, would be responsible for getting this law passed.

Advocacy, Communications, and Marketing

A breakthrough in the area of advocacy and communications could be a series of newspaper articles or television interviews done by medical associations. In addition, brochures could be produced for distribution; this is a successful method for getting messages out to the public in the Kyrgyz Republic.

Food Vehicles, Fortificants, and Delivery Mechanisms

Iodized salt and iron fortified wheat flour are available. To ensure that these products go to a larger scale of production, equipment and premix will be needed.

Sharing and Applying Technology

UNICEF has agreed to assist the Kyrgyz Republic to acquire the technology for fortification. What is needed is information about the types of equipment being produced around the world, the availability of such equipment, and a list of the manufacturers.

Economics and Funding

The main issue, and the most urgent, is funding, either by grants or concessional loans.

Standards and Compliance

Development of national standards for fortification is underway.

Proof of Benefit

The proof of benefit will be a reduction of micronutrient malnutrition in the country. The rate of affliction has risen seven-fold in the Kyrgyz

Republic over the last few years. The goal is to reduce these rates by 2002.

Players to Develop, Implement, and Support Food Fortification in the Kyrgyz Republic

Core Players to Initiate and Lead

- Secretary of State
- Kyrgyz Danazyk, Association of Grain Producers
- Association of Consumers' Rights
- WHO
- UNICEF

Key Players to Involve

- Ministry of Health
- Kyrgyz State Standard Department
- State Tax and Customs Service
- Ministry of Education
- Ministry of Science
- Ministry of Culture
- main producers and importers of flour, salt, and sugar
- Kyrgyz Association of Hygienists
- Kyrgyz Medical Association
- Children's Benevolent Fund (chairperson is First Lady)
- National Cardio-Therapeutic Center
- academe
- media
- world boxing champion (Nesabek Nazaroff)
- village elders (Aksakals)
- kick-boxing team

Key Supporters to Inform and Keep Aware

- local authorities (local, municipal, or state authorities)
- local food business associations
- union associations

PHILIPPINES

Policy Development

Formulation of fortification policy in the Philippines will involve advocacy for national legislation to mandate the fortification of all staples. These include oil and sugar with vitamin A, and flour and rice with vitamin A and iron. An integral part of this advocacy will be defining potential financial incentives such as reduction of value-added tax (VAT) on flour sales. The central activity will be lobbying relevant houses of Congress, which will be most effective by seeking endorsement of some senators. This activity will also be facilitated by the development of clear baseline data on food consumption as well as on the prevalence of micronutrient deficiencies. Given the devolution of many health functions to the local government units (LGUs), data should be disaggregated to the municipal level. The advocacy effort should be a partnership of the Department of Health and the Department of Finance. Partners should elicit support for this effort from NGOs and regional pressure groups such as the ADB, UNICEF, and Helen Keller International, as well as the Nutrition Center of the Philippines.

Advocacy, Communication, and Marketing

A coordinated campaign is needed to raise interest in and support for the proposed fortification legislation. Specific activities may include a World Wide Web (WWW) site, a speakers' bureau and a tri-media marketing campaign. The Department of Health and key NGOs will be the central partners in this campaign. Support by regional organizations such as ADB and UNICEF will be important. Involvement of significant and respected personalities such as Secretary Suzie Pineda Mercado and Dr. Florentino Solon will be critical. The campaign should be included in a number of available media programs such as Sight & Life and the WWW sites of relevant NGOs.

Food Vehicles, Fortificants, and Delivery Mechanisms

Food vehicles for a national fortification program have been identified in past legislation on

mandatory USI as well as in the pending legislation for oil, sugar, rice, and flour. A major communications and marketing challenge is the *Sangkap Pinoy* Seal Program. It will be critical to strengthen the operations of this Program. An important first step will be the revision of the *Sangkap Pinoy* Seal Manual of Operations, which is scheduled for completion in June 2000. Key partners are the Department of Health's Bureau of Food and Drugs and the food industry, represented by the Philippine Chamber of Food Manufacturers.

Sharing and Applying Technology

Developing a sustainable and effective technology for the fortification of rice with iron presents a major applications hurdle for the nation's proposed fortification program. It is hoped that turn-key research, funded by organizations such as ILSI, MI, or ADB, will enable pilot-scale evaluation and assist in linking up with other industries with experience in coating technology. A key strategy in the Philippines will be the adoption of fortified rice by the National Food Authority (NFA). NFA and the Food and Nutrition Research Institute (FNRI) are key implementers of this activity.

Economics and Funding

A significant breakthrough in the financing of fortification in the Philippines can be achieved by the extension of Executive Order 133, which covers fortificants. This will require some intensive lobbying as well as support from pressure groups such as ADB, the World Bank, and IMF. Advocacy for this financial incentive should be based on clear data elaborating the costs and benefits of food fortification. The Department of Finance and Bureau of Food and Drugs (BFAD) are the central agencies involved in this activity, along with Under Secretary Margaret Galon and Mar Roxas.

Standards and Compliance

The current challenges are full implementation and enforcement of USI through the Act on Salt Iodization Nationwide (ASIN) law. This will involve leadership at the national level by BFAD, by DOH regional directors, and by LGU leaders. In particular, it will involve a reeducation of LGU

and regional directors on the rationale for the ASIN Law. This group will need to develop strategies to intensify monitoring at all levels. A key strategy for full compliance with ASIN will be a national congress of salt producers.

Players to Develop, Implement, and Support Food Fortification in the Philippines

Core Players to Initiate and Lead

- National Nutrition Council
- Department of Health, BFAD
- Department of Education (School Health Program)
- Department of Agriculture
- Department of Science and Technology/ FNRI
- NFA/Food Development Center
- The Philippine Chamber of Food Manufacturers

Key Players to Involve

- expert groups on micronutrients
- international consultants (UNICEF and WHO)
- Department of Agriculture (BAPPS)
- Department of Science and Technology (PCHRD)
- League of Municipal Governors
- Department of Finance
- private food industry associations (TPCMI)

Key Supporters to Inform and Keep Aware

- consumer groups
- Senate, Congress
- social and civic clubs
- medical societies
- labor groups

THAILAND

Policy Development

Development of increased awareness and support of key decision makers will mark the next breakthrough for food fortification policy in Thailand. This effort should be championed by the Ministry of Health, with support from a range of partners including the Bureau of Budget, National Economic and Social Development Board (NESDB), and the Ministry of Industry. A comprehensive food fortification program proposal should be developed and submitted to a national forum to include all relevant parties. Presuming financial support is identified, such a national forum should be convened by the end of 2000.

Advocacy, Communication, and Marketing

Defining the right "selling point" for each micro-nutrient is a key step. This "selling point" must be persuasive and powerful to hold public interest. At the same time it must be solidly grounded in science and have the full support of the scientific community. Messages based on these points should be communicated through well-known education and scientific experts utilizing all mass-media channels. With this preparation in hand, a campaign should be planned for 2001.

Food Vehicles, Fortificants, and Delivery Mechanisms

Fortification of fish sauce with iodine and iron as well as fortification of milk products used in school programs are opportunities to expand fortification. Along with the Thai Fish Sauce Association and the UHT milk producers, Thailand's multisectoral Committee on Cooperation of Government and Private Sectors in Solving Food and Nutrition Problems will provide coordination and leadership. The current strategy for fish sauce involves key Committee members approaching the Fish Sauce Association to solicit their support and involve them in the technology transfer activities. A plan for a fortified school milk program must also originate from the Committee. Key technical inputs include determining the most appropriate technology and processes, defining quality assurance

systems, and setting the correct dosage levels. Current estimates for implementation are that fish sauce fortification with iodine will take place by September 2000; school milk fortification by June 2001; and fish sauce with iron by September 2002.

Sharing and Applying Technology

The Committee on Cooperation of Government and Private Sectors in Solving Food and Nutrition Problems should move forward to establish a WWW site and/or hotline to share technical and other relevant data within the country and within the region. This activity could be a collaboration with regional and international groups such as ADB, ILSI, and MI along with other countries of the region. If funding is identified, the WWW site could be established by the end of 2000.

Economics and Funding

Financing for national fortification programs will depend on identifying and creating the proper incentives for the private sector. This may include reduction on duty for fortificants and fortification-related technology, tax reimbursements, VAT exemptions, and low-interest loans. To design effective incentives for private-sector investment in fortification, data are needed on programs that have been used successfully in other countries. The Committee on Cooperation of Government and Private Sectors in Solving Food and Nutrition Problems is in a position to take the initiative, in partnership with the Ministry of Finance and the Office of the Prime Minister. With support of regional agencies such as ADB, these incentives could be considered as early as January 2001.

Standards and Compliance

The next key step is submission of practical, realistic, and enforceable legislation. This should be championed by the Food and Drug Administration in partnership with Codex/TISI and the Federation of Thai Industries. A consultation with all relevant parties should be convened in mid-2000.

Proof of Benefit

An efficacy study demonstrating that fortification does deliver the promised benefits is crucial to

persuasive advocacy. It is proposed that the Ministry of Public Health in conjunction with key academic institutions develop a protocol and identify resources for such an efficacy study which could focus on a model group such as school children. While some technical support is needed, such a study could be initiated by January 2001.

Players to Develop, Implement, and Support Food Fortification in Thailand

Core Players to Initiate and Lead

- Department of Public Health
- Food and Drug Administration
- Institute of Nutrition at Mahidol University

Key Players to Involve

- Ministry of Industry
- Ministry of Finance
- Ministry of Education
- Ministry of Communication
- NESDB
- Federation of Thai Industries
- relevant trade association
- nutrition association
- FoSTAT

Key Supporters to Inform and Keep Aware

- chamber of commerce
- health care centers
- community organizations

VIET NAM

Policy Development

At the policy level, legal registration of fortified products with the Government is required. Registration is based on licensing guidelines that ensure food safety and consumers' health. Existing scientific literature will be used to develop standards and regulations, which, once developed, will be used to advocate their implementation as policy. For sugar fortification, the entity to take the lead is the Ministry of Food Administration, in partnership with the National Institute of Nutrition

(NIN), Ministry of Health, and the provincial departments of health. For fortification of fish sauce with iron, the Ministry of Food Administration, with the assistance of NIN, Cat Hai Fish Sauce Company, and ILSI, will work together to develop a policy for labeling and registration.

Advocacy, Communication, and Marketing

Because advocacy for such efforts is very important for consumer acceptance of the product, an awareness campaign for fortified staples will need to be developed. For fortified sugar, NIN and UNICEF, with the help of Roche and Bien Hoa Sugar Company, plan to hold an advocacy workshop in March 2000 for the government departments that need to be involved. In addition to this, commercial marketing by the Bien Hoa Company using the media will be needed. For fortified fish sauce, NIN, with ILSI support, plans to develop advocacy material by September 2000.

Food Vehicles, Fortificants, and Delivery Mechanisms

Before the sugar fortification pilot program can be implemented, the Bien Hoa Sugar Company will receive funding for a 6-month efficacy study of the fortified sugar, with the help of NIN, UNICEF, Ministry of Food and Drug Administration, and Roche. Results of the study are expected by November 2000. For fortified fish sauce, efficacy and bioavailability studies on NaFeEDTA will be carried out by the Cat Hai Fish Sauce Company in collaboration with ILSI, NIN, and the Ministry of Food Administration. The results are expected by October 2000.

Sharing and Applying Technology

A team consisting of representatives of the Bien Hoa Sugar Company and NIN plan to visit a sugar company in Guatemala that has been successfully fortifying sugar with vitamin A. The visit will require some additional funding and involve collaboration with INCAP, Roche Viet Nam, and Roche Guatemala. The necessary scale-up and technology transfer will be accelerated by holding a sugar industry workshop in January 2001. To share the iron fortification technology with other fish sauce

companies in Viet Nam, NIN, the Ministry of Finance, and Cat Hai Fish Sauce Company, with financial support from ILSI, will conduct workshops and produce fortified fish sauce at a pilot plant within the Cat Hai company.

Economics and Funding

By mid-2001, the economics and funding issues are expected to be worked out. Fortification may become mandatory for all sugar producers. The main concern is to ensure a level playing field for the producers and affordability of the product to the consumers. The Government is considering applying a VAT. This effort will be led by the Ministry of Food Administration, NIN, Ministry of Health, and Ministry of Traffic, in collaboration with the Bien Hoa Sugar Company. To determine whether the fortification of fish sauce is affordable and sustainable, the Cat Hai Fish Sauce Company, in partnership with NIN and ILSI, will examine financial aspects of the process, step by step.

Standards and Compliance

As mentioned above, scientific information will be used to develop the standards and regulations. A means of monitoring compliance is also required. For sugar fortification, the Ministry of Food Administration, in partnership with NIN and Roche, plans to develop models for approval between April and June 2000. For fish sauce, the Ministry of Food Administration, in partnership with NIN and ILSI, plans to develop the standards and design a surveillance system and method to measure compliance. This requires funding, but is planned to be completed by August 2000.

Proof of Benefit

NIN, in collaboration with UNICEF, MI, ILSI, and Roche, will conduct in November 2000 an efficacy study of the proposed fortification program and a food consumption survey to confirm the range and pattern of sugar intake. To prove the benefit of iron fortification of fish sauce, the Government intends to conduct efficacy and effectiveness studies in October 2001.

Players to Develop, Implement, and Support Food Fortification in Viet Nam

Core Players to Initiate and Lead

- NIN
- Ministry of Food Administration
- UNICEF
- a champion from the food industry sector

Key Players to Involve

- Ministry of Health
- departments of health (from all 11 provinces)
- nutrition centers
- Public Health Institute
- Ministry of Fisheries
- Ministry of Agriculture and Rural Development
- Ministry of Traffic
- vitamin and premix suppliers such as the Roche company
- international NGOs such as Groupe de recherche et d'échanges)
- Institut de recherche pour le développement
- MI
- ILSI
- ADB

Key Supporters to Inform and Keep Aware

- Ministry of Finance
- Ministry of Planning and Investment
- Ministry of Education and Training
- women's associations
- commune health centers
- people's committees
- industry members of the target food vehicle
- VINA STRAST (Consumers' Association)
- media