

# Nutri*view* 2002/1

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### Editor/Design and layout

• Anthony Bowley, ABCcommunications, Hochwaldstrasse 37, CH-4143 Dornach, Switzerland.  
Fax: +4161/7030257; Email: a.bowley@bluewin.ch

### Scientific advisors

• Dr Alfred Sommer, Dean, School of Hygiene and Public Health, Johns Hopkins University, USA-Baltimore MD 21205  
• Dr Ricardo Uauy, Director, Institute of Nutrition and Food Technology, University of Chile, Casilla 138-11, Santiago, Chile  
• Dr Aree Valyasevi, Chairman of the Executive Board, National Health Foundation, Bangkok 10900, Thailand

### Coordinator

• Dr Max Blum, Scientific Expert, Roche Vitamins Europe Ltd, Postfach 3255, CH-4002 Basel, Switzerland

### Internet

• <http://www.nutrivit.org/vic/staple/index.htm>

## ■ Editorial:

### Thanks

As I see it, my role as editor of *Nutriview* is to keep up to date with what is happening in nutrition globally, and to pass on to readers the news most likely to help them in their own work. My aim is to provide key information in a minimum of words (to save reading time) and in language that is easy to understand (even for people who are not nutrition specialists or whose native tongue is not English). The greatest task is to identify the main problems and the most effective solutions. This means searching the nutrition journals, newsletters and the internet, and communicating regularly with specialists in the field.

To do this successfully, I rely heavily on the expert support provided by the *Nutriview* Scientific Advisory Board, the project coordinator and numerous other helpers around the world. This team provides valuable input on scientific, technical and ethical matters, maintains close relations with regional and local nutri-

tion authorities, researchers and development organizations, and guides my efforts in the right direction. I therefore take this opportunity to express my thanks to all of them.

One of the people who has supported *Nutriview* since its earliest days, and helped to ensure its contents meet international standards, is Professor Ratko Buzina. It is therefore with regret that I have to announce his retirement from the Scientific Advisory Board. I will miss his guidance and his useful comments, and wish him success and satisfaction in his future activities. It is, at least, comforting to know that he will continue as a critical reader of our newsletter.

My special thanks go to those highly motivated enthusiasts who contribute articles for publication in *Nutriview*. I highly appreciate the time and effort they put into preparing their manuscripts, and their kindness in accepting my editorial changes. Such articles from

independent sources are essential for credibility and prestige.

I also thank Roche, one of the world's leading companies in the fight against micronutrient malnutrition, for enabling *Nutriview* to be published, and distributed worldwide, free of charge. In the nine years that have passed since the project started, Roche has never once asked me to publish any advertising for its products or other form of sales promotion. So *Nutriview* can concentrate on its objectives, which are to update knowledge and eliminate misconceptions about micronutrients, to give practical tips on ways to improve nutrition, and to provide a global forum for discussion.

Finally, I thank all the readers of *Nutriview* who give feedback, and so help us to assess how well our efforts meet the needs of our target audience. I look forward to interacting with more of you in the future. – A. Bowley ■

## ■ Feature:

### Targeting fat-based foods to improve nutritional quality of diets

Deficiencies in micronutrients and energy are most likely to occur in people whose diets are low in animal protein and total fat<sup>1</sup>. Preschool children, schoolchildren, and pregnant and lactating women are the most vulnerable groups. Substantial lessons can be learned from the experience gained in Central America with efforts to improve nutritional adequacy of traditional diets through micronutrient-rich oils or fat-based spreads.

#### Drawbacks of traditional diets

Traditionally, the diets of most human societies consist of a starchy plant staple, such as a cereal (wheat, maize, rice) or a root or tuber (cassava, yam, potato) combined with herbs, vegetables and fruits (mainly gathered or self-grown). Sometimes, legumes serve as an additional staple. Only people with a good income or those who hunt, fish or keep

livestock themselves consume significant amounts of animal protein.

A feature of plant foods is their high content of water and fibre, and their low energy and micronutrient densities. Plant fibre can significantly impair absorption of some micronutrients. To fully meet nutritional requirements, people might therefore need to eat more than is normally possible.

Processing of plant foods (including cooking, germinating and fermenting) improves nutrient density and bioavailability of its micronutrients. On the other hand, it can have a negative impact on another health-related factor: the glycemic index. The glycemic index of a food indicates the rapidity with which glucose rises and insulin is secreted following ingestion<sup>2</sup>. This has recently been identified as an important factor affecting vascular health<sup>3</sup> and obesity<sup>4</sup>.

#### The fat potential

Traditional diets might be improved, without increasing the risks of energy excess, through appropriate use of micronutrient-rich oils and fats. Fatty acids are needed for the proper functioning of every system in the body. Fats and oils have a high energy density and are critical for ensuring proper absorption and utilization of the fat-soluble vitamins A, D, E and K, as well as carotenoids. They also add flavor to foods.

On the other hand, excessive fat intakes can lead to obesity, and increase the risk for coronary heart disease<sup>5</sup> and cancer<sup>6</sup>. A much-expressed concern about increasing children's fat intakes is that it will accustom their palates to a high-fat regimen. Butte has questioned the validity of this hypothesis<sup>7</sup>. Prentice and Paul go even further. They feel that traditional diets through the weaning

and preschool period may be both too low in energy density and too sparse in essential fatty acids to provide optimal growth and immunological/functional development<sup>8</sup>.

As possible tools in the campaign to alleviate micronutrient malnutrition around the world, we propose the targeted use of nutrient-rich oils (such as red palm oil with its intrinsically high content of provitamin A and vitamin E, but with other micronutrients added) or the recently developed, fat-based ready-to-use-food (RTUF)<sup>9</sup>.

### Targeting interventions

Since it would not be wise to encourage unbridled use of edible oils and fat through all sectors of society, it is important to target their use to those specific subsegments of the population who will gain most benefit. Commercial infant formulas and weaning foods are the clearest example of targeting. Although such foods are occasionally used by toothless elders, they primarily reach the target group.

Targeting by social class through social marketing has met with a widespread lack of success. By promoting a product as something for the poor and underprivileged, those who use it feel socially degraded. People may be poor, but they do not want to accept the stigma associated with eating "lower-class" food. Only if a product has the prestige factor of acceptance by the social elite will it be appreciated by the true targets.

Guatemala provides a good lesson in this social-class phenomenon in its promotion of the high-protein vegetable mixture INCAPARINA<sup>10</sup>. Developed in the 1950s at the Institute of Nutrition of Central America and Panama for rehabilitation of malnourished children, it was later marketed to support the protein nutrition of the poor. The product has been accepted by the whole society, including the working- and middle-classes. Because of demand, however, the price is beyond the household budget comfort zone for those in greatest need. This shows the importance of promoting a product across all classes, while keeping the price low enough so that even the poorest (the main target group) can still afford to buy it.

Targeting through institutional con-

tacts is worth consideration. To reach pregnant women, for example, the ideal place for food distribution or education would be centers for prenatal consultations. Similarly, lactating women might be contacted at well-baby clinics. To reach school-aged children, the public school system is the avenue of access.

The advantage of institutional targeting is a lower cost for delivering resources. A disadvantage is that the neediest of individuals may be excluded. Not all targeted members of the community are seen at the health posts, churches or social clubs; not all school-aged children attend school. Most institutions chosen for contact points will be government institutions. For the best chances of success, decentralization, local control and private partnerships should be aimed for.

To the extent that nongovernmental organizations (NGOs) and private voluntary organizations (PVOs) are active in giving assistance, their efforts are intrinsically targeted. This has been demonstrated in Nicaragua, where NGOs and PVOs are active in the interior. A recent national nutrition survey revealed that micronutrient status in the countryside is generally better than in the capital city of Managua (O. Dary, personal communication). This is clearly the result of the targeted nutrition and micronutrient supplementation programs.

In Guatemala, public health efforts to deliver individualized interventions to the home are rare. CeSSIAM has tested direct home delivery of a standardized basket of green herbs, carrots and sweet potato. Acceptance was high and consumption was complete, immediate and universal across the household members. However, such labor-intensive, direct-delivery schemes are not cost-efficient and poorly sustainable beyond the research setting.

Targeting of individuals within specific families is the most sophisticated of all measures. Since preschool children represent the most vulnerable segment of society, this concept is sound. The product development discussed below may provide a situation for within-household targeting to the most vulnerable generation.

### Experience with ready-to-use-food

Ready-to-use-food (RTUF) is an energy-

dense product based on fat. It was originally developed for rehabilitation of malnourished children in tropical regions to overcome problems caused by rapid spoilage of milk-based rehabilitation formulas. It has a standard, balanced content of micronutrients, but may be fortified with specific nutrients as required. The concept of RTUF merges nicely with the use of oils for food-to-food fortification<sup>9</sup>.

RTUF is basically a semi-solid paste. Because the lipid matrix is inhospitable to bacteria, spoilage of the food and spread of food-borne infections is avoided. As currently constituted, the flavor is either that of ground nuts (like a mild peanut butter), or of chocolate. From studies in malnourished African children, RTUF appears to offer advantages over the WHO rehabilitation formulas. The concept of RTUF extends beyond application in young children to targeted and specific uses across various population segments. An iron-enriched RTUF is being used in Northern Africa to prevent anemia<sup>11</sup>.

In countries where household electricity and facilities for refrigeration are a luxury for most people, a product with a long shelf-life at ambient tropical temperatures is a valuable innovation. Maria-Eugenia Romero-Abal and Monica Orozco, of our group at CeSSIAM, have conducted preliminary focus group presentations of RTUF to mothers and their children in periurban Guatemala City, and found the chocolate flavor to be more familiar and acceptable to both age groups than the nut-flavored variety. (unpublished observations).

When designing RTUF, food technologists could consider the balanced inclusion of an array of other nutrients<sup>12</sup>. Beyond the fat-soluble vitamins, this might include water-soluble vitamins and minerals of nutritional interest.

### Conclusions

The need to consolidate on efforts to assure protection of populations from micronutrient deficiencies is great. Only continued, careful and generalized compilation of evidence allows us to make conclusions on efficacy and effectiveness of intervention strategies. The present era is a propitious historical moment for such evaluations. This is due to recent advances in conceptual and technical

approaches to nutritional diagnosis.

Targeting the use of energy-dense, micronutrient-rich, fat-based foods to nutritionally vulnerable groups will complement an overall strategy for a safe, healthy, and nutritionally adequate diet. Snack foods, distributed through governmental or non-governmental organization projects or promoted through social marketing on the commercial marketplace, might play an interesting public health role in the future. – Noel W. Solomons, MD, Center for Studies of Sensory Impairment, Aging and Metabolism (CeSSIAM), Guatemala City, Guatemala. ■

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## ■ Conference report:

# Enhancing the micronutrient content of cereal grains and products

The Annual Meeting of the American Association of Cereal Chemists, which was held in Charlotte, North Carolina, USA, on October 14–18, 2001, featured a 2-part symposium dedicated to global and regional opportunities for enhancing the micronutrient content of cereals and cereal products. The symposium was co-chaired by V. Mannar (Micronutrient Initiative, Canada) and P. Ranum (SUS-TAIN, Washington, DC). A summary of the symposium follows.

## The global challenge

More than a third of the world's population has a reduced learning and working capacity, and suffers poor health because their diets do not contain adequate amounts of essential micronutrients. This could be avoided by providing small amounts of the micronutrients on an ongoing basis. One of the ways in which this could be done is through fortification of commonly eaten staple and processed foods.

In developed countries, food fortification has played a valuable role in nutrition over the last 40 years. In developing countries too, numerous opportunities exist for single and multiple

fortification of commonly eaten foods, including a range of cereals and cereal products. Food fortification offers a unique opportunity for the food-processing industry to simultaneously expand its markets and profitability while playing a key role in improving the physical, social and economic well-being of the people.

If the dynamics of market economies in developing countries responded perfectly to the needs of consumers, then private investment would have already capitalized on the overwhelming opportunity offered by food fortification.

However, most consumers are unaware of their 'hidden hunger'. This, according to G. Maberly (Rollins School of Public Health, Emory University, Atlanta), is why there is little demand for such a solution in developing countries.

To accelerate the implementation of food fortification in more countries, greater efforts are needed to encourage governments, industry and other sectors to collaborate. Of all these parties, those who produce and sell flour are the most important in the endeavor.

## Criteria for success

Fortification of staple foods is one of the most economical, sustainable, safe and effective tools available. South Africa and the Philippines have successfully implemented fortification of cereal flours with vitamin A, confirming that it can be done effectively with simple technology. The cost of fortification has little effect on the price of the food (0.2–2%). H. Cori (Roche Vitamins Ltd) calculated that it can cost less than 10 US cents a year to meet an individual's micronutrient requirements. It is, however, important to work closely with an experienced partner who can cope adequately with all technical issues.

In many African and Asian countries, consumers typically mill small batches of staple grains at local hammer mills to get their weekly supply of wheat flour or maize meal. To address the micronutrient needs of at-risk populations living in this situation small scale fortification (SSF) is being tested and advocated (L. Laleye and AS. Wesley, Micronutrient Initiative). Training on proper blending methods, quality control and community education are important during the implementation of

activities. Several organizations are working to improve the design and function of self-sustained mobile milling units capable of milling, fortifying and packaging cereal flours.

One of the most fundamental decisions associated with food fortification is the choice of food to be fortified. P. Dexter (University of Arkansas, Fayetteville) discussed the importance of rice as a staple food and vehicle for fortification, and presented an overview of the current technology and rice enrichment practices in commercial use, addressing concerns related to nutrient stability, bioavailability and sensory evaluation.

### Plant breeding aspects

As an alternative to food fortification, HE. Bouis (International Food Policy Research Institute) and RP. Glahn (USDA ARS, Ithaca NY) discussed the opportunities for improving micronutrient content of cereal grains through plant breeding or selection of appropriate plant strains.

Bouis described an interdisciplinary, international effort to breed varieties of rice, wheat, maize, beans and cassava with higher levels of available vitamins and minerals for release to farmers in developing countries. This promises to make a significant, low-cost, sustainable contribution to reducing micronutrient deficiencies in humans, and may well have important spin-off effects for increasing farm productivity in developing countries in an environmentally beneficial way.

Glahn compared iron bioavailability from various strains of rice and wheat using an in-vitro digestion/cell culture model. Although iron concentrations varied widely, there was no correlation between concentration and uptake. Nevertheless, the method shows promise as a rapid, cost-effective tool to predict human iron uptake and as a screening method to determine what cereal varieties, foods and fortificants can best combat iron deficiency anemia.

### Regional opportunities

In the second part of the symposium, speakers presented examples of cereal fortification interventions in various parts of the world.

In Brazil, the Ministry of Agriculture has identified the wheat and corn milling

industries as candidates for implementing a government-promoted voluntary large-scale iron fortification strategy. R. Germani (Embrapa Agroindustria de Alimentos, Rio de Janeiro) described the steps taken to elaborate quality assurance guidelines, and ensure support for the millers in implementing the program.

As part of the process to establish a national food fortification program in South Africa, a national food consumption survey, as well as stability tests and organoleptic evaluations of fortified maize meal and wheat flour were initiated. L. Kuyper (CSIR, Pretoria, South Africa) reported that fortification with 33% RDA of vitamin A, thiamine, riboflavin, niacin, B6, folic acid, iron and 20% RDA of zinc caused a color difference in brown bread flour as well as in brown and white bread, but no taste differences were noted. Fortification did not influence acceptance of bread flour, the color of raw maize meal or the flavor of cooked maize porridge.

L. Turner (SUSTAIN) described efforts in Mexico, Guatemala and Costa Rica to start a voluntary fortification program for commercially produced corn masa flour (used to make tortillas, the main food staple) with iron, zinc and B vitamins. Tortillas provide insufficient iron because of low natural iron levels and high phytic acid content. SUSTAIN provides technical support to the industry and government to help identify iron fortificants that can optimize bioavailability, cost-effectiveness, and consumer acceptance of the fortified product.

CK. Lutter (Pan American Health Organization, Washington, DC) addressed problems associated with the use of fortified complementary foods in Latin America. Foods introduced in the 1970s and 1980s contain more protein and less fat than those formulated in the 1990s. The content of micronutrients also varies considerably. For example, zinc, known to be limiting in the diets of young children, is not routinely added.

Recognizing the burden of long-term supplementation programs, the Government of the Philippines developed a comprehensive fortification strategy to allow for their progressive phase out. The goal was to fortify widely available foods with vitamin A, iron and iodine, and so increase the micronutrient intakes of the vulnerable groups

(preschool children and women of reproductive age) by at least 50% of the RDA by 2004. R. Miller (MOST Project, USAID) noted that the important feature of this program is its recognition that a multifaceted approach involving mandatory fortification of staples and voluntary fortification of luxury food items is the best way to improve the health of the target population.

EPLM. Schoffelen (UNICEF, Indonesia) presented evidence that double fortification of noodles with zinc and iron is feasible provided that elemental iron is used. The Government of Indonesia and the country's five flour mills examined the effect of fortification with two different premixes containing iron (ferrous sulfate or elemental iron), zinc, thiamin, riboflavin and folic acid on the quality of flour, bread and noodles. Premix was added at 3 concentrations and compared to unfortified flour. The results indicate that ferrous sulfate can be used in bread, but not in instant noodles because of changes in color and taste after cooking. The premix containing elemental iron had no adverse effects.

Q. Johnson (Micronutrient Initiative, Canada) described cereal fortification efforts in Africa, Asia and the Middle East, where commercial market trends are being accelerated by advocacy and technical assistance from international agencies working with governments. In the Philippines and Indonesia much of the flour supply is fortified. In India, some flours are commercially fortified, and expanded programs are under consideration. Fortification programs are being developed in Bangladesh, Pakistan and China. In Sub-Saharan Africa, some major brands of wheat flour and maize meal are fortified on a voluntary basis. Several nations are considering a mandatory approach. Guidelines for iron and folate fortification have been published in the North Africa and Eastern Mediterranean region based on consultations with WHO, MI and UNICEF. Saudi Arabia and Oman already began fortifying. ■

## ■ Conference report:

# Food fortification initiatives in West Africa

On November 6th, 2001, a group of stakeholders met in Accra, the capital city of Ghana, to discuss recent food fortification initiatives in West Africa, and to guide the Ghanaian government in its own efforts to eliminate micronutrient malnutrition among the population. The workshop provides an excellent example of collaboration between the public and private sectors, and between countries: the stakeholders included representatives of government, industry, the United Nations and other aid agencies.

### Nutrition actions justified

Almost half of the 18.5 million population of Ghana is under fifteen years of age. Malnutrition is common. Rosanna Agble (Nutrition Unit, MOH, Ghana) reported that a quarter of the children under six years are stunted and/or underweight; at least 80% are anemic, and 85% are vitamin A deficient. Iodine deficiency is common in many parts of the country. About 11% of Ghanaian women are underweight. At the same time, more than a quarter are overweight, and there are growing concerns about the increasing risk of diet-related chronic disorders. The level of knowledge about nutrition, hygiene and disease prevention is low; caring practices for children and pregnant women suffer as a result of widespread taboos and misconceptions, and unequal distribution of labor and resources in families and communities in favor of men.

As part of its national malnutrition control program, the Ministry of Health distributes vitamin A capsules twice a year to children aged between six months and six years. Over the past two years, more than 90% coverage has been achieved, said National Program Coordinator Esi Amoafu. Nevertheless, availability and consumption of vitamin A rich foods are inadequate. So it is imperative to put in place an effective food-based strategy as well. Other activities include nutrition education and social marketing to promote breast feeding and increase consumption of micronutrient-rich foods.

Ghana started mandatory salt iodization in 1995. The National Salt Producers

Association of Ghana was highly receptive to it, but, as National Program Coordinator J. Armah pointed out, enforcing the law and ensuring good quality products has been difficult because of the large number of small-scale salt producers.

### Food fortification: the basics

Hector Cori (Roche Vitamins Ltd) presented a short overview of the history of food fortification, explained some of the technological processes involved, and showed that food fortification is worth the effort and financial investment. According to the World Bank, an effective nutrition program can increase a country's gross domestic product (GDP) by as much as 5% at a cost of only 0.3% of GDP.

Before starting a food fortification initiative, countries should carefully examine the issues involved, encouraged Roy Miller (Executive Director, USAID/MOST). It should be seen as part of a comprehensive program. It is also important to understand the pros and cons of mandatory/voluntary fortification, and of national/regional programs.



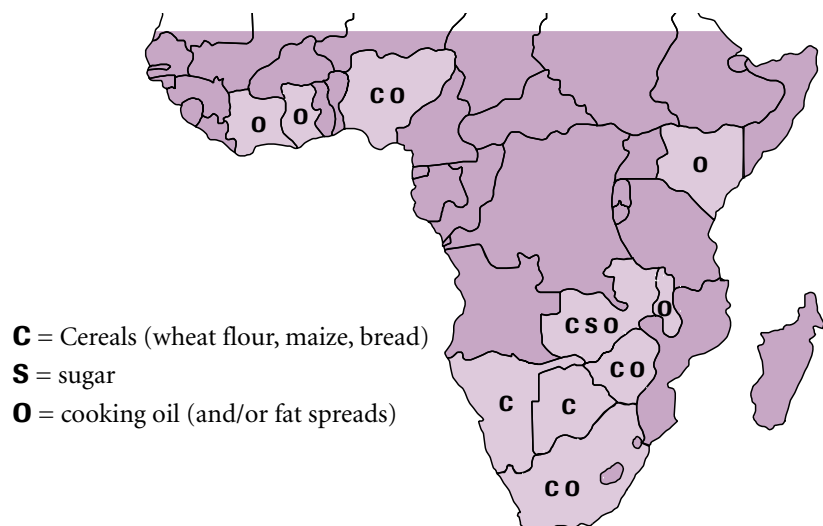
*Henriette Odoi-Agyarko, Deputy Director, Public Health, MOH, Ghana: "The current vitamin A supplementation program has reduced infant mortality by 25%. A similar impact could be achieved with food fortification. We must therefore implement this program as soon as possible".*

"Fortification is one of the most effective means to achieve success," he said, "and USAID is ready to assist the Ghanaian government in its endeavor."

### Setting a good example

Help is also at hand from other African countries with fortification experience (Figure 1). Heidi-Lee Robertson (Vitamin Information Centre, South Africa)

**Fig 1: Status of staple food fortification in subsaharan Africa.**





*Mandatory salt iodization and public-private initiatives for voluntary fortification of cooking oil and maize porridge in Ghana set the pace for other efforts to improve the health of the population through better nutrition.*



presented examples of currently marketed fortified foods, and described how each country organizes its nutrition activities.

The Economic Community of West African States (ECOWAS), comprising 15 countries including Ghana, strongly backs efforts to expand food fortification, according to Shawn Baker (Helen Keller International, Côte d'Ivoire). Experience with salt iodization in the region has been very encouraging. This has raised the confidence of the nutrition community, and created an unprecedented momentum for further micronutrient programming in general and for food fortification in particular. Preliminary studies have identified several promising vehicles (bouillon cubes, sugar, oil, flour). To reach all the target population, a mix of interventions will be needed. Appropriate ECOWAS standards and directives, as well as marketing guidance and monitoring resources will facilitate the process. Those countries with a well developed food industry should lead the way for the other member states.

The ECOWAS member country Nigeria formally launched food fortification in December 2000 as part of the strategy to control vitamin A deficiency. Frank Onyezile (UNICEF, Nigeria) described the process involved and the

lessons learned. He stressed the importance of establishing effective partnerships that address the concerns of all stakeholders. Capacity building (to ensure proper control and monitoring) and communication (to keep everybody fully informed) are essential. Among the critical issues, he noted the need to set and ensure high quality standards, to mobilize the food industry and consumers, and to control the market (to avoid imports of nonfortified products, and to reduce tariffs on imported micronutrients). Nigeria plans to fully implement fortification of oil, sugar and flour with vitamin A in 2002.

Both Ghana and its neighbor Côte d'Ivoire have launched public-private initiatives for the voluntary fortification of cooking oil with vitamin A. His company is committed to supporting the government in its efforts, said Kofi Essuman (Unilever Ghana Ltd). High standards for production and quality control will ensure that the fortified product contains enough vitamin A to have a significant impact on intake, but no serious risk of overdosage.

#### Global Alliance for Improved Nutrition

During the Ghana workshop, Monique Mosolf (USAID, Washington, DC) informed participants about a new initiative—the Global Alliance for Improved Nutrition (GAIN)—that expects to become operational later this year. GAIN is an alliance of public and private sector organizations seeking to save lives and improve health, productivity and cognitive function through elimination of vitamin and mineral deficiencies. GAIN will support developing countries in their efforts to implement locally developed food fortification and other supportive interventions. Organizations working in developing countries will receive grants in support of country-based initiatives for food fortification, based on comprehensive national nutrition strategies. GAIN partners and resources include bilateral donors, foundations, UN and other multilateral agencies, developing countries, private sector companies, non-governmental organizations and academic institutions. A Board of Directors, will set the alliance's policies and guide its activities. A small secretariat, headed by an executive director, will manage day-to-day operations.

#### The way forward

At the end of the meeting, delegates defined the following resolutions as offering the best way forward:

- Establish a multinational fortification alliance comprising the food industry, public health institutions, health and development partners, and regulatory bodies;
- Develop a national strategic plan for food fortification;
- Create a positive consensus within government and the food industry through appropriate advocacy;
- Develop consumer awareness;
- Conduct food consumption surveys and assess household practices;
- Catalogue the Ghanaian food industry and its fortification potential;
- Explore possible food vehicles and develop quality standards;
- Address legislative and enforcement issues.

Summing up the meeting, Paul Arthur (Director, Health Research Centre, Ghana) emphasized the importance of complementary interventions and other countries' experience: Advocacy, legislation, enforcement, and a constant reevaluation of what has already been done are all important for success.

## ■ News in brief:

### New and Noteworthy in Nutrition

After an 18-month break, the International Food Policy Research Institute has revived the newsletter "New and Noteworthy in Nutrition" (NNN) and will initially produce three issues a year in printed and electronic versions. The new editor is Stuart Gillespie, of the Consultative Group on International Agricultural Research (s.gillespie@cgiar.org).

Originally created as an internal memo at the World Bank, NNN seeks to inform and stimulate, rather than to educate. It provides "a dynamic interchange between research and development communities on nutrition-relevant issues". NNN has a much wider scope than Nutriview. Topics include nutrition policy, nutrition transition, nutrition and care, human rights, and HIV/AIDS. Just half a page of the first issue is devoted to micronutrients. The last page (Bulletin Board) shows links to new materials on the Internet.

A PDF file of the first issue (#36) can be downloaded from the IFPRI website (www.ifpri.org). ■

### Eliminating VAD in Africa

The special issue of the Food and Nutrition Bulletin published in December 2001 is based on a workshop held in Cape Town, South Africa, in November 2000<sup>1</sup>. It seeks to capture some of the extensive experience with food-based approaches to avoid vitamin A deficiency on the continent.

At the end of the meeting three working groups discussed the three major approaches supplementation, dietary improvement and food fortification, and came to the conclusion that all strategies should be combined and weighted depending on the specific situation. Supplementation is important where clinical deficiencies are serious; Food fortification can reach major sectors of the population; the promotion of foods rich in vitamin A can be sustained by the beneficiaries themselves, and is an important entry point into broader food-security strategies for Africa. ■

1. Long-term food-based approaches toward eliminating vitamin A deficiency in Africa. Food and Nutrition Bulletin, Special Issue. 2001; 22: 351-470.

### Society of public nutrition formed

On August 28, 2001, thirty-eight participants at the ICN in Vienna met to create the International Society of Public Nutrition. The aims of this new society are to deal with issues of policy making and program development in all the ways that these influence human nutrition conditions. Its main fields of activity include nutrition and human rights, implications of biotechnology for public nutrition, human resource development, design, implementation and evaluation of nutrition programs, and research to identify feasible options for policy and program implementation.

Membership is open to professionals in the fields of nutrition, human rights, agriculture, economics, law, education and labor relations, as well as all others interested in providing an effective contribution to the improvement of public nutrition. Focal points have been identified in various countries with a view to creating local groups or even national societies of public nutrition. For further information, please contact Aaron Lechtig (alechtig@terra.com.pe) ■

## ■ Events:

### 9th Asian Congress of Nutrition, New Delhi, India, February 23-27, 2003.

Theme: Nutrition goals for Asia-Vision 2020. Objectives: Promote awareness of latest advances in nutrition science; compare country experiences with programs for improving nutritional status of populations; identify procedures for encouraging community participation; promote optimal utilization of locally available foods; promote practice of scientific dietetics in hospitals.

Information: Dr C. Gopalan, Nutrition Foundation of India, C-13 Qutab Institutional Area, New Delhi-110016, India. Tel/fax: 91-11-6857814/6560106. E-mail: acn2003@yahoo.com Website: www.acn2003india.net ■

## ■ Letter to the editor:

Dear Sir.

In your article "Food fortification gains support in Africa" (Nutriview 2001/1) the food fortification status of Nigeria as indicated was out of date.

It was Professor Nnanyelugo (Dept of Food Science and Nutrition, University of Nigeria, Nsukka)<sup>1</sup> who reported that a consultative group on food fortification was set up by UNICEF (Nigeria) in 1995 to explore the possibility of enriching foods with priority nutrients.

The consultative group identified bouillon cubes, MSG, salt, sugar and wheat flour as potential vehicles for fortification. Since then, considerable progress has been made by relevant industries to fortify these and other food items. The food fortification status as of January 2001 is shown in Table 1. – Dr EO Akpanyung, Dept of Biochemistry, University of Uyo, Nigeria. ■

**Table 1: Food fortification status in Nigeria, January 2001.**

Status	Legislation
'Enriched' wheat flour (B <sub>1</sub> , B <sub>2</sub> , niacin, iron)	Mandatory
Iodized salt	Mandatory
Margarine fortified with A, D, B <sub>1</sub> , B <sub>2</sub>	Voluntary
Malt drinks fortified with C, B <sub>1</sub> , B <sub>2</sub> , B <sub>6</sub>	Voluntary
Cocoa-based beverages enriched with vitamins and minerals	Voluntary
Custard powder (corn starch) fortified with vitamins and minerals <sup>2</sup>	Voluntary
Bouillon cubes fortified with vitamins and minerals	Voluntary
Milk enriched with vitamins and minerals	Voluntary

## References

1. Nnanyelugo DO. Opportunities for food fortification in Nigeria. A review article sponsored by the Vitamin Information Centre. South Africa. 1999.
2. Akpanyung EO et al. Antinutrient profile and chemical composition of custard powder produced in Nigeria. J Food Sci Technol 2001; 38: 120-123.