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Administrative Committee on Coordination SUB-COMMITTEE ON NUTRITION

SCN NEWS

a periodic review of developments in international nutrition compiled from information available to the ACC/SCN



Nutrition and the Environment

United Nations Administrative Committee on Coordination

SUB-COMMITTEE ON NUTRITION

—The UN System's Forum for Nutrition—

The Administrative Committee on Coordination (ACC), comprised of the heads of the UN Agencies, recommended the establishment of the Sub-Committee on Nutrition (SCN) in 1977, following the World Food Conference (with particular reference to Resolution V on food and nutrition). This was approved by the Economic and Social Council of the UN (ECOSOC). The UN members UNDP, UNEP, UNESCO, UNFPA, UNHCR, UNICEF, UNRISD, UNU, IFPRI and the ADB are also members. From the outset, representatives of bilateral donor agencies and nongovernmental organizations. The Secretariat is hosted by WHO in

The **mandate of the ACC/SCN** is to serve as the UN focal point for promoting harmonized nutrition policies and strategies, and to strengthen collaboration with other partners for accelerated and more effective action against malnutrition. The **aim of the SCN** is to raise awareness of and concern for nutrition problems at global, regional and national levels; to refine the direction, increase the scale and strengthen the coherence and impact of actions against malnutrition worldwide; to promote cooperation among UN agencies and partner organizations. The SCN's annual meetings have representation from UN Agencies, NGOs; these meetings begin with symposia on subjects of current importance for policy. The SCN brings such working groups on specialized areas of nutrition. Initiatives are taken to promote coordinated activities — interagency programmes, meetings, publications — aimed at reducing malnutrition, reflecting the views of the agencies concerned. Regular reports on the world nutrition situation are issued. *Nutrition Policy Papers* articulate current knowledge on selected topics. *Nutrition Policy Papers* are published twice a year, and the *World Nutrition Situation* is published quarterly. Decided by the Sub-Committee, initiatives are taken to promote coordinated activities -- interagency programmes, meetings, publications -- aimed at reducing malnutrition, primarily in developing countries.

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SCN NEWS is issued in July and December each year by the Secretariat of the UN ACC Sub-Committee on Nutrition. Your contributions to future issues are welcome. **SCN NEWS** aims to help the sharing of experience in nutrition. If you wish to receive **SCN NEWS**, or would like to suggest other names to be added to our distribution list, please contact the Secretariat at unsystem.org/scn/

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chairman's round-up



This issue of SCN News deals with nutrition and the environment. We trust you will find the information contained here both provocative and useful. The Secretariat chooses feature topics for suggestions sent to us by our readership. With two major global conferences held in the past two months on environmental concerns, as well as increased media attention to climate change and global warming, environmental pollution and safety of the food supply, we felt it appropriate to set out a series of linkages with nutrition. We are especially grateful to Rainer Gross and Noel Solomons for their spirited assistance during both the planning and preparation of

We also include a report of the main presentations of the annual session: keynote addresses by Kul Gautam, Eduardo Doryan and F.H. Abed. In addition, summaries of the recommendations for action arising from our Working Groups are provided. The Working Groups are at the heart of the SCN – its driving force. Through information sharing and networking, they identify critical issues for further attention by SCN participating bodies. This section of SCN News will appear regularly.

Recent months have seen a number of important appointments. Rita Bhatia, who served as senior nutritionist at UNHCR over the past nine years, has joined the World Food Programme in Rome. Rita's wealth of experience in food and nutrition in emergencies and humanitarian assistance operations. Rita represented UNHCR on the SCN since the early 90s. She played a leadership role in the Working Group on Nutrition and Emergencies, where she and Anne Callanan moved the agenda on nutrition in emergencies steadfastly forward. The SCN Secretariat

quarterly Refugee Nutrition Information bulletin. Rita is replaced at UNHCR in Geneva, by Zahra Mirghani. Before Geneva Zahra worked as the UNHCR nutritionist in Tanzania and will bring her considerable experience in food and nutrition. We welcome Zahra to the SCN

David Alnwick, a friend and strong supporter of SCN over the years, leaves UNICEF this month to join WHO where he will head the Roll-out Programme. David joined UNICEF in east Africa almost 20 years ago, and spent the past decade at UNICEF headquarters, where he served as senior micronutrient advisor, chief of the nutrition cluster, and subsequently chief of the health cluster. David has

been an outstanding and articulate advocate for nutrition throughout his professional career. WHO also recently announced the appointment of Professor Pekka Puska to the Noncommunicable Diseases cluster, where he will be Director of Health Promotion and NCDs Prevention. Professor Puska is from the National Public Health Institute in Helsinki, and over the past few years has been leading a major project. This renowned project gave major support to the notion that the prevalence of cardiovascular disease is substantially influenced by changes in the diet. Professor Puska will be a strong voice for nutrition in chronic disease prevention and health promotion.

There have been staff changes too in the SCN Secretariat. Dr Arabella Duffield, who has served as Coordinator of the Refugee Nutrition Information System over the past 18 months, left the Secretariat in August. Arabella joined CONCERN as a nutritionist and is currently working in Ethiopia. Arabella's energy, good humour and professionalism were very much appreciated. Brian Jones joined the Secretariat in December, carrying on this important work. Brian has an MSc in public health nutrition from the London School of Hygiene and Tropical Medicine, and has most recently been working as the nutrition and food security coordinator with Action Contre la Faim in Indonesia. Dr Judith Pojda, who worked as SCN News Editor since January 1999, left the Secretariat in October. In addition to editing the recently-issued SCN News on low birthweight, Judith brought to the Secretariat fresh new ideas on the content and style of nutrition messages.

As we go to press, I have just learned that my predecessor and past chair of the SCN, Sir Richard Jolly, has been awarded the Knight Commander of the Order of St. Michael and St. George. The award is in recognition of his outstanding service to international affairs. The announcement will appear in the New Year's honour list in the UK. We congratulate Sir Richard

As many of you already know, our 28th session will take place in Nairobi, April 2 to 6. The SCN symposium to be held on April 3 will focus on Nutrition and HIV/AIDS. It will be open to the public. The Working Groups, which meet April 4 and 5, are open to all those with professional involvement in nutrition. I look forward to seeing you then, if you have not done so before.

Namanga Ngongi



advocacy in practice

The SCN's Strategic Plan (April 2000) recognizes the increasing need for effective advocacy. The multiple sectors it plays a vital role, along with the broad implications of the benefits of sound nutrition, and of the adverse impacts of malnutrition in developing and industrialized countries underscore the need for communicating clearly to actors outside the nutrition community. The Plan reported on the decision to appoint up to four Nutrition Advocates, who would:

- ◇ Assist the SCN Chair in raising awareness of nutrition problems and mobilizing commitment to s
- ◇ Act as spokespersons for the SCN in support of the malnourished throughout the world and those at risk of
- ◇ Propose new ideas for the SCN to consider in order to strengthen its work in accelerating malnutrition at the international, regional and national levels.
- ◇ Act as SCN spokespersons for nutrition in natural and man-
- ◇ Extend the SCN's already large advocacy network of nutrition professionals to seek to influence key decision-makers and leaders at senior governmental and private sector levels.

We are delighted to announce that
Professor Monkombu Sambasivam Swaminathan has accepted to serve as a
Distinguished Nutrition



Professor MS Swaminathan, the architect of India's green revolution and the first World Food Prize Laureate in 1987, is based in Chennai (Madras) and Chairs the M.S. Swaminathan Research Foundation. The Foundation, truly a "foundation without walls", is committed to a mission of harnessing science and technology for sustainable and socially equitable development. Professor Swaminathan is also UNESCO Cousteau Chair in Ecotechnology and this year won the prestigious Indira Gandhi Peace Prize. His many other distinguished awards include the UNEP Sasakawa Award. He is a member of various academies including the Royal Society of London, the US National Academy of Sciences, Russian Academy, Italian and Chinese Academies.

Javier Perez de Cuellar described Professor Swaminathan (October 1987) as: "... a living legend. His contributions to agricultural science have made an indelible mark on food production in India and elsewhere in the developing world. By any standards, he will go into the annals of history as a world scientist of rare dis-

We look forward to working with Professor Swaminathan.



Nutrition and the environment

OVERVIEW

Rainer Gross and Noel Solomons

The nutritional status of populations depends to a great extent on environmental conditions. The relationship between nutrition and environment was taken into account in the conceptual framework introduced by UNICEF in the early 90s. In this framework environment was depicted as an important causal factor for disease, leading to malnutrition. This issue of *SCN News* explores linkages between nutrition and the environment in a much broader context, and raises emerging policy issues. Environment—encompassing soil degradation, global warming, waste disposal and other factors—has far more pervasive implications for the biosystem “nutrition” than perhaps was evident when the conceptual framework was first described.

Roetten and Krawinkel use the food-health-care scheme as a point of departure for their analysis of how food insecurity, especially in an age of nutrition transition and urbanization in developing countries, places new strains on food availability (production) and accessibility (pricing). These authors argue that any pre-existing degradation of arable and pasture lands, or any degradation caused by food production, will constrain the availability of nutrients, increase competition for food, and impact food security negatively.

This topic is picked up as well in the essay by Hazell using the contrast of food security challenges in the densely-populated and intensively farmed Asian region with those of the rurally entrenched and remote populations of Sub-Saharan Africa. Hazell provocatively argues that much of the degradation in Africa—soil erosion, loss of soil fertility and deforestation—is the consequence of traditional agricultural practices, and further that upgrading the infrastructure towards more intensive and modern farming will reverse the environmental degradation involved with producing human food in Africa. Given the

fragility of Sub-Saharan ecosystems, however, one wonders whether they bear extrapolation to the practices employed in Asia, and whether or not the slash-and-burn practices that have filled the air with smoke from Indonesia to Malaysia justify characterising Asian approaches to food production as necessarily modern and environmentally friendly. Here, conflicts between economic and environmental development goals become obvious.

Environment has a far more pervasive implication for nutrition than perhaps was evident in the early 90s

A paper by staff of the Worldwatch Institute, entitled *The Climate Wild Card*, probes some of the possible impacts of climate change on food production and food security. Issues raised here are all the more critical given the failure of recent efforts by 170 countries meeting in

the Hague in November to translate the 1997 Kyoto Accord into enforceable treaty to reduce greenhouse gases. Last year's report to the ACC/SCN by the *Commission on the Nutrition Challenges of the 21st Century* began to grapple with the implications of supplying food to the world's population in the context of the stresses on the physical and human environments, and an extract from that report illustrates some proposed practical steps.

Micronutrient malnutrition or “hidden hunger” became a major concern of public nutrition during preparations for the World Summit for Children in the late 80s. Solomons sets a framework for analysis of the interactions between micronutrient deficiencies and pollution beyond the classical example of lead toxicity and iron status. Solomons shows that a series of direct and indirect interactions from the dietary side toward the environmental, and vice versa, frame the global campaign to eliminate micronutrient deficiencies among vulnerable populations. A group of consultants engaged by the International Atomic Energy Agency met recently to discuss the relationship between environmental pollution and nutritional status (see p 64). Recommendations were made to IAEA for research in

which nuclear analytical and isotope techniques may play a prominent role.

In her article on environmental contaminants in breastmilk, Harriet Kuhnlein discusses the problems of toxic residues—both organic and inorganic—polluting the marine environment which is the habitat of fish and sea mammals in the Arctic region. The safety of maternal milk, and hence the wisdom of a policy to promote exclusive breastfeeding in the first semester of life, is challenged by the growing concentration of heavy metals and organochlorines in the waters of Hudson and Baffin Bays. Few detailed studies can be cited to guide any new policy directions, but this problem is of concern to advocates supporting breastfeeding. Penny Van Esterik takes the approach that breastfeeding advocates have a responsibility to critique the evidence, as well as the manner in which this information is communicated to policy makers and the general public. The author points out that breastmilk is not necessarily more contaminated than other tissues, such as blood or body fat, it is simply easier to collect and measure. As an adjunct to Van Esterik's paper a *Guideline Statement on Breastfeeding and Dioxins*, prepared by International Baby Food Action Network, provides an example of such clear communication. This *Statement* is especially relevant to the historical meeting this month in Johannesburg where some 122 countries agreed on the text of a legally-binding treaty that will require governments to minimize and eliminate use of persistent organic pollutants.

Johns and Eyzaguirre make an almost plaintive salute to the relationship of pre-aculturated people to nature. It is unlikely that contemporary society will willingly exchange the Whopper for sorghum porridge or give up Internet communication for smoke signals. A world of six billion has no real option to get its micronutrients from roadside weeds even if we suppressed herbicide use. The authors are absolutely correct when they comment that "a varied diet is the key" and equally insightful in observing that "modern agriculture and associated technological solutions to food and nutritional problems must be bal-

anced against environmental costs." Finding this balance on our way to ten billion inhabitants is a challenge this planet sadly might not achieve.

While there is a vast literature on intensive crop production, there is less on intensive *livestock* production. Jacky Turner describes some of the costs of high-input livestock production as well as the environmental impacts. Demand for animal source protein, already very high in some middle income countries, will continue to accelerate throughout the developing world as incomes rise. Diet choices have a strong impact on the environment. Consequently, food and nutrition policy is, at the same time, environmental policy.

Food and nutrition policy is, at the same time, environmental policy

Livestock blood is a major waste-product of meat production. Disposing of livestock blood safely is both difficult and costly. Mäurer and Schumann describe an interesting use for haem iron. This can be extracted from livestock blood, the authors propose, and used in fortification programmes to address iron deficiency anaemia. However, recent developments with regards to infectious zoonotic conditions, namely bovine spongiform encephalopathy (BSE) which leads to variant Creutzfeldt-Jacob (vCJD) disease in humans, highlights the limitations of recycling food products for human consumption within the food chain. It has to be recognized that not only the source of the nutrient fortificant and the food technology employed, but also how consumers' perceptions will be important in scaling up.

Is the nutrition community prepared to play its role in monitoring the impacts of industrial materials on the nutrition and health of populations? A set of recommendations made by a group of toxicologists drawn from eight laboratories in six European countries at a recent international conference on *Metals and the Brain*, illustrates just how complex this task may be—both in terms of the nutritional science, but also in terms of the way in which risk should be communicated to the public. These recommendations concern human exposure to aluminum and possible effects on neurological health.



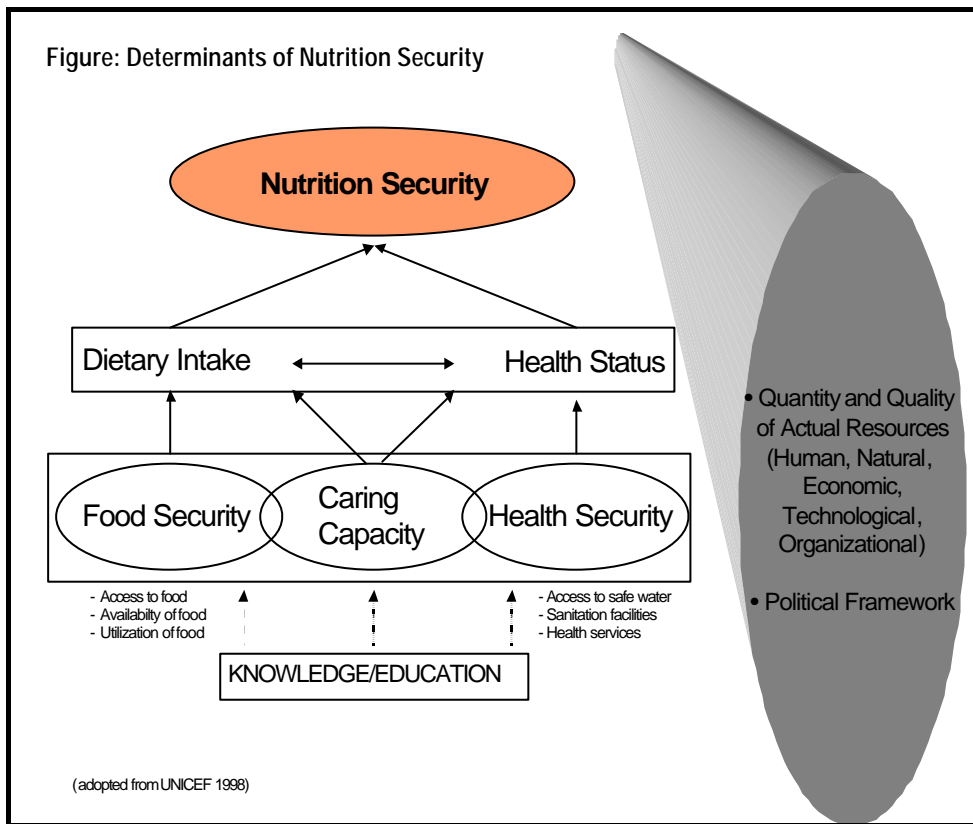


FOOD ACCESSIBILITY, NUTRITION AND ENVIRONMENT

Ulrike Roetten and Michael B. Krawinkel

Adequate *food* security requires the availability of physical supplies of food as well as household access to such supplies either through production, purchase in the market or other means. However, in order to guarantee *nutrition* security, food supplies need to meet the specific nutrient requirements of individuals.¹ The food-health-care causal framework for nutrition identifies a number of contributing factors to nutrition security (Figure).²

production, household income and food prices.¹ Income and prices are special concerns in urban areas where home food production for consumption is low. For example, in Accra more than 90% of the food consumed is purchased.⁴ Access to food for the growing population in urban areas in Asia, Africa and Latin America is an important matter of interest for national and international food security strategies.



Two factors that have an immediate impact on nutrition are dietary intake and health status. Increased food access will not necessarily improve food utilization when other factors, such as health or social environment, are not favourable.³ Appropriate care for mothers and children, access to health services, and a healthy environment (e.g. sanitation facilities; potable water, health care etc.) are often the missing links to adequate nutrition at the household and individual level.

Food accessibility is ensured when households and all individuals within those households have adequate resources to obtain appropriate foods for a nutritious diet. Household access to food primarily depends on home

About 73 million people will have been added to the world's population each year between 1995 and 2020, a total increase of 32%. An overwhelming 97.5% of the increase in population is expected to occur in the developing world, whose share will increase to 84% of the total population by 2020. About a third of the total population increase is anticipated to occur in just two countries—China and India. Population growth will occur mainly in the cities of the developing world. Whereas the rural population is expected to increase by less than 300 million in the developing world during this period, urban population will double to 3.4 billion in 2020.⁵ This enormous increase of the urban population demands strategies to secure access to food in cities.

Nutrition—as an outcome of food security—is vulnerable to environmental degradation because access to food is a function of the physical environment. Drought and soil erosion often accompanied by social conflict may seriously disrupt production and acquisition strategies and, therefore, threaten food availability and access. These shocks often lead to a loss of productive assets, e.g. livestock. They also have severe implications for the future productive potential of households and their long-term food security.¹



The world's growing population will continue to exert pressure on food supplies. Developing countries will account for about 85% of the 690 million ton increase in the global demand for cereals between 1995 and 2020.⁵ It is estimated that six to seven million hectares of agricultural land in developing countries become unproductive due to soil erosion alone each year. Waterlogging, salinization, and alkalinization from irrigation damage account for another 1.5 million hectares per year.⁶ In Central America, nearly one-third of all used land is seriously degraded, including 74% of the agricultural land. In comparison, 19% and 16% of all used land in Africa and Asia, respectively, i.e. 65% and 38% of the agricultural land is seriously degraded.⁷ When agricultural land becomes infertile, farmers either let the land lie fallow until it recovers or, if there are other land resources, they abandon unproductive lands and move on, often clearing new forest lands to cultivate. The newly cleared land is then farmed and the process is repeated.⁸

The aim of supporting poor farmers in food production, combined with concerns about excessive dependence on fertilizers, pesticides, and irrigation water, has stimulated interest in an "agroecological approach" to agricultural production. Ideally, the agroecological approach is aimed at reducing the amount of external inputs that farmers use, relying instead on available farm labour and organic material, as well as on improved knowledge and farm management. There is tremendous potential to promote increases in sustainable productivity in small-scale agriculture.⁵ This concept of sustainable agriculture has the potential to improve food safety and to reduce contamination of groundwater by reducing the use of pesticides and agricultural chemicals. However, in practice there are some constraints to the wide-scale application of sustainable ag-

riculture. Lack of productive soil due to erosion or desertification, problems with yield variability, high labour requirements, organisational constraints and overburden of women may contribute to low acceptance rates of the agroecological approach.

Adding an environmental dimension to food and nutrition security would help to draw attention to these aspects:

- ◇ soil health care, water harvesting and management, conservation of biodiversity and improved post-harvest technology
- ◇ environmental hygiene (e.g. sanitation, access to safe water), and access to qualified health service
- ◇ adequate care, especially for children and women,
- ◇ education.

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POLICIES FOR ACHIEVING FOOD SECURITY WITHOUT DEGRADING THE ENVIRONMENT

Peter Hazell

Modern agricultural technologies have transformed the global food situation from one of widespread shortages and famine in the 1960s to one in which there is more than enough food for everyone were it more equitably shared. These advances have been particularly dramatic in Asia and Latin America where cereal yield growth has outstripped population growth, leading to significant gains in the per capita availability of food and calories.

Yet despite these achievements, some 1.2 billion people remain in abject poverty (less than \$1/day) and do not get enough to eat. Many more live on nutritionally inadequate diets. About 160 million pre-school children are malnourished, with serious implications for their future mental and physical capacities. About 90% of the developing world's poor now live in Asia and Sub-Saharan Africa, and these countries will also need to feed over 1 billion more people by 2020.

This paper contrasts the food security challenges facing the Asian and Sub-Saharan African regions. It also discusses appropriate policies for reducing environmental problems while achieving greater food security.

FOOD SECURITY CHALLENGES IN ASIA

Asia's remarkable transition from widespread food deficits in the 60s to national food surpluses today has been accompanied by an equally dramatic reduction in poverty: from one in two Asians in 1970 to one in four today.¹ But there is a paradoxical food situation in Asia today.

On the one hand, there are huge numbers of increasingly affluent Asians (an emerging middle class) who are rapidly diversifying and enriching their diets. This has led to a veritable explosion in demand for livestock products, fruits, vegetables and vegetable oils. This in turn has led to rapid growth in livestock production and in demand for feedgrains. The International Food Policy Research Institute (IFPRI), amongst others, is projecting potentially large feed grain imports by Asia in the future. But these growing imports are not driven by basic food security needs. It is not a problem of filling bellies with essential foods, but

of meeting the dietary aspirations of the newly affluent. Lester Brown's projected foodgrain crisis in China is really a problem of emerging middle-class affluence, not a food insecurity problem.²

Despite this growing food affluence for many, about 800 million Asians live in poverty and have poor access to food; 120 million pre-school children are malnourished. Two thirds of Asia's poor live in South Asia. The poor are predominately rural people, and most live in rainfed agricultural areas. In India and China, about one third of the poor live in rainfed areas with limited agricultural potential. These people do not have the means to buy the food they need, despite its ready availability. They desperately need better livelihood opportunities.

There are very favorable opportunities for greater diversification of Asian agriculture to meet the changing food consumption patterns of the more affluent. Markets for livestock products and feedgrains are growing rapidly. Farmers will prosper most in those regions that can best compete in the market. Competitiveness requires investments in rural infrastructure (including roads, transport, electricity) and improvements in marketing and distribution systems for higher value, perishable foods (such as refrigeration, communications, food processing, storage and food safety regulations). Agricultural growth of this type can make important contributions to incomes and poverty reduction in rural Asia, but like the green revolution, it is likely to leave many poorer regions and poor people behind. Special attention is needed to help small-scale producers capture part of these growing markets, even within regions that have good infrastructure.

The food insecure in Asia will increasingly become more concentrated in urban ghettos and less-favored rural areas. These people will gain relatively little from the growth just described. To reach them, other, more targeted policies and investments will be required

There are very favorable opportunities for greater diversification of Asian agriculture to meet the changing food consumption patterns of the more affluent

These will need to include adequate safety net programs in rural and urban areas (food subsidies, employment programs and training schemes) and also greater investment in the development of less-favored areas. Policy makers have been reluctant to do this in the past, preferring to rely on the 'trickle down' benefits (increased employment and migration opportunities and cheaper food) from investments in high-potential areas. This has proved insufficient: the poor are multiplying faster than they are leaving in many less-favored areas and population densities are likely to increase for at least a few more decades. Without adequate investments in basic infrastructure and human development, less-favored areas will lose out even further as agricultural markets become more commercial and competitive. These people will become victims of market liberalization and globalization, not beneficiaries, with worsening poverty and environmental degradation.

However, with the right policies and investments, many less-favored areas could actually do quite well. For example, unlike crops, livestock and agroforestry can often prosper in zones with poor soils and climate: some less-favored areas can become important eco-tourist attractions in increasingly more affluent societies. Rapid economic growth in Asia is also creating new growth opportunities for non-farming activity in many less-favored areas.

Does investing in less-favored areas have to mean less growth per dollar of investment compared to investing that money in high-potential areas? Few would dispute the possibility of achieving bigger direct reductions in poverty by investing in less-favored areas, but are there significant tradeoffs against long-term growth and poverty reduction? Recent IFPRI research on India says no.³ In fact, many investments in less-favored areas now offer a "win-win" strategy for India, giving more growth and less poverty. This may also be true for other Asian countries that have already invested heavily in their high-potential areas (e.g. China). Undertaken in the right way, these investments can also contribute to a reduction in environmental degradation (see later).

FOOD SECURITY CHALLENGES IN SUB-SAHARAN AFRICA

Sub-Saharan Africa faces a very different situation than Asia today. In fact, it is similar to the Asian situation of the early 60s with widespread poverty and malnutrition, large national food deficits, and high and increasing dependence on food imports and other concessionary aid.

Also like pre-green revolution Asia, yields are very low and there is tremendous potential for increasing them with the right technologies.

But, there is also a big difference between Sub-Saharan Africa today and pre-green revolution Asia. Rural Africa has a much lower density of infrastructure and weaker institutions to serve agriculture. This means that market access and transport costs are daunting obstacles to development. Investments in sophisticated technologies are simply not economical when the market price of fertilizer is three to five times the world price, or when the extra production cannot be transported and sold, so that it returns low prices or actually perishes. Too many "green revolution" projects have failed in Africa because they were not profitable for farmers once the project's subsidies and transport support systems were withdrawn.

It will take massive investments to bring rural infrastructure and logistics up to the required levels in much of rural Africa. Work at IFPRI shows that it would take enormous amounts of investment in Africa's rural infrastructure just to bring it up to the standards that India enjoyed in the 50s.⁴ One reason it is so costly is that Africa itself is huge and its population density is only a fraction of Asia's. This great abundance of land is both a blessing and a curse. It is a blessing because it offers considerable potential for future growth. It is a curse because the per capita investment costs of establishing a good logistics support system are daunting—it would require an unbearable tax burden if rural Africans were expected to pay for this themselves. Frankly, it is hard to see how this problem can be solved any time soon. Relocating people within smaller areas has some economic appeal, but does not work in practice (e.g., Tanzania). New technologies in telecommunications and energy (e.g. internet, satellite phone systems, and solar/wind energy) may offer lower cost solutions to some types of infrastructure, but farmers still need roads, transport systems and markets to move and trade commodities.

There are some well-located irrigated and high-potential rainfed areas in Africa that have good access to markets and inputs, and where green revolution type technologies can be profitable and make an important contribution to national food security. However, much of rural Africa will need to look to lower-cost alternatives for meeting the food security needs of local people, at least for

unlike crops, livestock and agroforestry can often prosper in zones with poor soils and climate



brought up to required levels. They will need improved natural resource management practices and technologies to harvest and conserve more water, to generate and recycle soil organic matter and plant nutrients, and low-input technological breakthroughs like drought-resistant crop varieties. Biotechnology may offer special opportunities to solve some of these problems, but only if the public sector undertakes or promotes the right kinds of research.

MANAGING ENVIRONMENTAL PROBLEMS ASSOCIATED WITH AGRICULTURE

As argued above, agricultural growth has a continuing and crucial role to play in alleviating poverty and food insecurity in Africa and Asia. However, much more needs to be done than in the past to ensure that this growth is not environmentally destructive.

It is useful to distinguish between two types of environmental problems associated with agriculture. On the one hand are the intensively irrigated and high-potential rainfed areas (the green revolution areas) where modern varieties and high levels of fertilizers and agro-chemicals are used. They are the breadbasket areas that feed the developing world's burgeoning urban populations. The problems here largely relate to the excessive use and mis-management of fertilizers and pesticides that pollute waterways and upset ecosystems, irrigation practices that lead to salt build up and eventual abandonment of good farming lands, decline of groundwater levels, and loss of biodiversity. However, the high-yield gains achieved in these areas in recent decades have saved huge areas of forest and other environmentally valued or fragile lands that would otherwise have been converted to crop production.

On the other hand, an enormous amount of environmental degradation in rural areas has little to do with modern farming systems. A great deal of deforestation and land degradation (including soil erosion and soil fertility loss) has occurred in densely populated, less-favored areas that did not benefit from the modern farm-

ing revolution. This degradation is not driven by excessive intensification; quite the reverse, it is driven by insufficient agricultural intensification relative to population growth. As more and more people seek to eke out a living in these areas, they crop land in unsustainable and erosive ways, and fail to replenish the soil nutrients that they remove. The problem is aggravated by poor access to fertilizers that are key to maintaining yields and sustaining soil fertility. These two contrasting environments require very different solutions.

High-potential areas

The management of intensive farming systems in irrigated and high-potential rainfed areas requires better management of modern inputs. Their current misuse is hardly surprising as millions of largely illiterate farmers have only recently begun to use them for the first time. The problem has been exacerbated by inadequate education and training, an absence of effective regulation of

water quality, and input pricing and subsidy policies that made modern inputs too cheap and encouraged excessive use. Policy and institutional reforms that correct inappropriate incentives can and are making an important dif-

**market access and transport costs
are daunting obstacles to development...
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to move and trade commodities**

ference. Improved technologies, such as precision farming, ecological approaches to pest management, pest resistant varieties and improved water management practices can even increase yields while they reduce chemical use.¹

Can ecological (or low external input) farming substitute for modern agriculture in these breadbasket areas? There is some, mostly anecdotal evidence that competitive yields can sometimes be obtained at the plot level. But the approach requires more labor, mixed farming (including crop rotations and crop-livestock integration), and use of fallow and green manures to generate organic matter and nitrogen. These methods are expensive (wages are higher in better-developed regions), and mixed farming and fallows have high opportunity costs because part of the land is kept out of its most profitable uses. For countries with limited land for growing basic

ures also reduces national food supplies. Moreover, without use of some external inputs, especially phosphate, potassium and lime, yields cannot be sustained under these farming systems on most soils.

In rich countries with abundant food supplies, the option exists of labeling foods produced as "organic" or "ecologically friendly", and charging a price premium to offset their higher costs. The resulting price changes may not be unbearable for most people, and their governments could afford to subsidize food for the needy and farm incomes where needed. But taking this same approach in most African or Asian countries would be disastrous, aggravating poverty and malnutrition for hundreds of millions. These countries simply do not have the option of moving to farming systems that reduce total foodgrain output and raise food prices.

Less-favored areas

In many less-favored areas and a large part of Africa, the answer to much environmental degradation lies in the greater use of irrigation and modern inputs to achieve higher yields, matched with improved management of soil moisture and organic matter. Current input use is very low in these areas. For example, fertilizer use in Sub-Saharan Africa averages 11.6 kg of NPK nutrients per hectare of cropland compared to 158.4 kg in Europe and 265 kg in East Asia.⁵ Greater use could help restore soil fertility and increase yields without becoming an environmental threat. Unfortunately, because many less-favored areas have limited infrastructure and market access, greater use of modern inputs is difficult and often unprofitable, and farmers must find alternative ways to increase yields.

Ecological and low external-input farming approaches have important roles to play in these regions, at least until such time as infrastructure and markets are better developed. The greater labor intensity of these technologies is not necessarily a problem in many labor-abundant regions unless there is seasonal bunching of tasks. However, although desirable, allocating much land that would otherwise be in crop production to fallow, green manures, rotations and livestock may not be feasible for many small-scale farms, nor may the use of composts and manures for soil replenishment where these compete for more pressing household energy needs.

Although more skillful administration of traditional farming systems offers some promise for improved land management and for raising food production in many less-

grass roots development agencies for their low external-input approaches are not substantiated by any rigorous testing with experimental controls. Nor is it clear that these successes work in larger areas of farmland, particularly in areas where poor soils and limited rainfall constrain possibilities for generating much organic matter without some use of inorganic fertilizers.

CONCLUSIONS

Public investment in agricultural research, rural infrastructure and human development is still fundamental for achieving food security in developing countries. However, these investments need to be targeted in ways that are more beneficial to the poor than in the past, and supported by policy and institutional reforms that improve incentives for the sustainable management of natural resources. In this context, it is disheartening to see that public investment in agriculture and rural areas is falling in many developing countries, a decline that is not being compensated for on any meaningful scale by private sector investment. Tight government budgets and donor fatigue are mostly to blame. It will not be easy to reverse this decline, and much more attention will need to be focused on doing "more with less." This will need to involve better targeting of public investments and improved performance by the institutions that provide basic infrastructure services. These kinds of reforms could make a significant difference in compensating for reduced levels of public investment in Asia, but they will not be nearly enough to compensate for grossly inadequate levels of rural infrastructure in rural Africa.

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CLIMATE WILD CARD—WATER AND FOOD SECURITY

Worldwatch Institute

The buildup of carbon dioxide and other heat-trapping gases in the atmosphere confronts irrigated agriculture with the prospect of a changing climate. Like the joker in a game of cards, climate change has the potential to greatly alter the "game" of agriculture, but scientists do not know exactly how, when, or under what conditions this wild card will be played. They do know that Earth's temperature will rise, which in turn will intensify the global hydrological cycle. A warmer atmosphere will hold more moisture, increasing global rates of evaporation and precipitation by some 7-15%. Rainfall patterns will shift, with some areas getting more precipitation and some getting less. River flows will change. Hurricanes and monsoons are likely to intensify, and sea level will rise from thermal expansion of the oceans and the melting of mountain glaciers and polar ice caps. Although the major climate models agree fairly well on global-scale changes, they are not finely tuned enough to predict what will happen regionally and locally. This uncertainty makes it difficult to plan wisely for new dams, reservoirs, and irrigation systems that are supposed to last a half-century or more. Most disturbing, in cases where climate change results in less rainfall, areas already at or near water limits may move into a long period of shortages.



Many of the world's important irrigated areas depend on water from mountain snowmelt. These include much of the Indus and Ganges River basins in South Asia, the Aral Sea basin in Central Asia, the Colorado basin in the U.S. Southwest, and the Sacramento-San Joaquin valleys in California. Mountain snowpack acts like a reservoir, storing water in the winter and then releasing it during the spring and summer as the snows melt. The dams, reservoirs, and irrigation systems built in these regions are designed and operated with this pattern of river runoff in mind. These systems may be particularly at risk in a warmer world. With more precipitation falling as rain and less as snow, the volume of water stored naturally in mountain snowpacks will drop, and more winter precipitation will immediately become river flow. Moreover, the snowpack will melt earlier and faster, causing more risk of flooding in the spring and reducing the amount of wa-

ter available just when irrigated agriculture needs it most—during the hot, dry summer.

As mountain glaciers shrink, large regions that rely on glacial runoff for water supply could experience severe shortages. The Quelccaya Ice Cap, the traditional water source for Lima, Peru, is now retreating by some 30 meters a year, up from only three meters a year before 1990, posing a threat to the city's ten million residents. And in northern India, a region already facing severe water scarcity, an estimated 500 million people depend on the tributaries of the glacier-fed Indus and Ganges rivers for irrigation and drinking water. But as the Himalayas melt, these rivers are expected to initially swell and then fall to dangerously low levels, particularly in summer. In 1999, the Indus reached record high levels because of glacial melt.

These "reservoirs in the sky," where nature stores fresh water for use in the summer as the snow melts, are shrinking and some could disappear entirely. This will affect the water supply for cities and for irrigation in areas dependent on snowmelt to feed rivers. If the mass of snow and ice in the Himalayas—which is the third largest in the world, after the Greenlandic and Antarctic ice sheets—continues to melt, it will affect the water supply of much of Asia. All of the region's major rivers—the Indus, Ganges, Mekong, Yangtze, and Yellow—originate in the Himalayas. The melting in the Himalayas could alter the hydrology of several Asian countries, including Pakistan, India, Bangladesh, Thailand, Viet Nam, and China. Less snowmelt in the summer dry season to feed rivers could exacerbate the hydrological poverty already affecting so many in the region.

John Schaake, a hydrologist with the U.S. National Weather Service, analyzed potential changes in the pattern of flow of the Animas River where it runs through Durango, Colorado. He found that a temperature increase of two degrees Celsius, with no change in precipitation, would have little effect on the total volume of annual runoff. The seasonal pattern of that runoff, however, would change greatly because of the reduced winter snowpack

and its faster melting.

Schaake's model showed that, compared with current runoff patterns, average runoff in January through March would increase by 85%, while in the critical months of July through September it would fall by 40%. Without more reservoirs to store the increased winter/spring runoff, serious shortages would likely occur in summer—just the time when competition for water is keen for irrigation, for hydroelectricity, and to keep rivers flowing enough to sustain fisheries, dilute pollution, and support recreational activities. If, for the sake of illustration, similar kinds of altered river flows around the world necessitate a 20% increase in reservoir storage capacity, some \$200-400 billion in new investment could be required just to sustain the current irrigated areas. Additional investment would be needed to expand irrigation systems to farming regions where rainfall becomes insufficient or too unreliable. In a warmer climate, increased evaporation in the spring would dry out the soil in some areas, leaving less moisture for evaporation and local rainfall in the summer. If even two percent of existing rain-fed land worldwide requires irrigation to remain productive, the climate price tag could rise by another \$120 billion—assuming today's average cost of irrigation projects. Future costs would be considerably higher.

Even if governments, international donors, and private investors could come up with such large sums, food security will likely be at risk for decades as planners, engineers, and farmers try to discern if the rainfall and runoff shifts that are occurring are long-term or temporary, and thus whether such investments are justified. Peter Gleick, of the California-based Pacific Institute, notes that "one of the most difficult climatic changes for most regions to handle would be increased variability--and thus more frequent extremes: higher peak floods, more persistent and severe droughts, greater uncertainty about the timing of the rainy season. Few such changes would be beneficial."

There will, of course, be countervailing positive influences. Higher carbon dioxide levels in the air have a fertilizing effect on many crops, boosting rates of photosynthesis. They also cause plants to narrow the opening of their stomata, which reduces water consumption. Because these physiological changes can lead to higher crop yields and lower crop water use, they partly explain why some scientists find little cause for concern about climate change's impacts on agriculture. But for crops to benefit from the fertilizing effects of carbon dioxide, they must have sufficient soil moisture; otherwise, potential yield gains will quickly turn to losses. For example, a lack of soil moisture during the flowering, pollination, and

grain-filling stages of growth is especially damaging to maize, wheat, soybean, and sorghum. If soils dry out in late spring and summer, and irrigation water is not available or sufficient to make up the deficits in soil moisture, harvests will suffer.

Some models that paint a fairly rosy picture about climate change's impacts on world agriculture fail to take into account this critical issue of water availability. In one study reported in the science journal *Nature*, for example, models assumed that "water supply for irrigation would be fully available at all locations under climate change conditions". In effect, the researchers assumed away a potentially big part of the problem.

Although no one can say precisely how irrigated agriculture will be affected by global warming, a few things are fairly certain. First, the future will not be a simple extrapolation of the past. Most water planning for the future, however, is necessarily based on past trends. Engineers are designing dams for the 21st century based on 20th century hydrology data, even though river flows may change considerably as the climate warms. Second, for some period of time, reservoir and irrigation systems are likely to be poorly matched to altered rainfall and runoff patterns. This may leave farmers short of water during the dry summer months. And third, if and when the needed adjustments are made, they will be costly.

The ironic flipside is that large-scale ice melt would also raise sea levels and flood coastal areas, currently home to about half the world's people. Over the past century, melting in ice caps and mountain glaciers has contributed on average about one-fifth of the estimated 10-25 cm global sea level rise. The rest caused by thermal expansion of the ocean as the Earth warmed.

During this century, the existing climate models indicate the sea level could rise by as much as one meter. If the Greenland ice sheet, which is up to 3.2 km thick in places, were to melt entirely, sea level would rise by seven meters. Even a much more modest rise would affect the low-lying river floodplains of Asia, where much of the region's rice is produced. According to World Bank analysis, a one meter rise in sea level would cost low-lying and already food insecure Bangladesh half its rice land. Numerous low-lying island countries would have to be evacuated.

Excerpted from various Worldwatch Institute publications, including "Pillar of Sand: Can the Irrigation Miracle Last?" by Sandra Postel (VW Norton & Co., 1999)

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An ever-green revolution

The ACC/SCN-appointed Commission on the Nutrition Challenges of the 21st Century argued that a further revolution in agriculture will be required to adapt food production systems to growing needs and the changing environment.

Key aspects of the new approach to food production to improve food security include:

- ◇ Increased investment in agricultural and natural resource management. The strengthening of agricultural research and extension systems will be vital. This runs counter to the substantial reduction in funding of agricultural research in the developed world where a crude link has been made between investment in agricultural research and the economic costs of all the food surpluses and export subsidies. The acknowledgement that developed countries will benefit from investing in tropical and subtropical agricultural research needs to be established along with much closer links to the needs and experience of small, local farmers.
- ◇ Research and dissemination of new knowledge, appropriate technology and novel techniques to farmers. Strong national and international support for innovation is vital.
- ◇ Development of total resource management (as in some Chinese villages), integrated pest management and soil fertility programmes to ensure that progress in food production is sustainable over the longer term.
- ◇ Policies that ensure property rights to land, improved access to credit, effective and efficient markets and temporary fertilizer subsidies (where prices are high), to prevent further degradation of land.
- ◇ Reconsideration of less-favoured lands. These are the rain-fed rather than irrigated breadbasket regions. Studies suggest that the marginal returns on government investment are higher in these areas.
- ◇ Reform of water policies at the local, national and international levels to avoid conflict. Improved irrigation, integrated catchment management schemes and the development of ground water resources should yield substantial benefits in improving access to water for food production. The feasibility of water pricing should be considered by local government.
- ◇ Community involvement in agricultural development. If technology is to be transferred successfully to local food producers, it is essential that it meets their needs and is suitable for local conditions. In particular, the involvement of female food producers in agricultural development should be actively encouraged.
- ◇ The development of stronger property rights for land, water and other natural resources. People invest in resources that they own or can trade. This helps to prevent further degradation of the resources.
- ◇ An impetus from international agencies to push world food systems into preparing for the forthcoming changes in global climate. The impact of climate change will vary from location to location, but adaptive changes in agriculture can help minimise the negative effects.
- ◇ Improved climate information systems and dissemination of information to food producers, to help offset the predicted increase in the 'extreme' weather events which often constitute disaster for farmers.
- ◇ Exploration of public/private co-operation so as to involve private enterprise in tackling the problems of the world's poor.

Source: Commission on the Nutrition Challenges of the 21st Century (2000) *Ending Malnutrition by 2020: an Agenda for Change in the Millennium*. Final Report to the ACC/SCN. ACC/SCN, Geneva.

MICRONUTRIENT DEFICIENCIES AND CONTAMINATION

Noel W. Solomons

Since the decade of the 90s, the public health community has turned away what was termed from *protein-energy nutrition* toward the paradigm of "hidden hunger", and to an interest in vitamin A deficiency, iodine deficiency disorders, and iron deficiency and its associated anemia. The implications for mortality and morbidity of micronutrient malnutrition states have spearheaded this renaissance of interest. Severe vitamin A deficiency leads to childhood blindness which is a death sentence in most deprived settings, but marginal vitamin A deficiency is associated with over 20% excess mortality from childhood diseases. Severe iodine deficiency is well known to produce cretinism, but it also contributes to foetal loss. Iron deficiency and anemia are associated with increased susceptibility to certain infections, and to decreased physical and mental performance. Severe gestational anemia has been associated with impaired pregnancy outcome and maternal mortality. Over the last ten years, a by-product of this focus on micronutrient malnutrition has been the emergence of interest in other micronutrient deficiencies of public health importance such as zinc, vitamin B12, folate, selenium and riboflavin.

A comprehensive framework for understanding the genesis of nutrient deficiencies was produced by Victor Herbert¹ originally as five (but now as six) possible causal mechanisms. These are illustrated in Box 1. Although there is limited documented evidence relating environmental contamination to decreased absorption, utilization or destruction of nutrients, there is sufficient research to form a basis of inquiry

Box 1: The six possible causes of all nutrient deficiency states

- Decreased Intake*
- Decreased Absorption*
- Decreased Utilization*
- Increased Destruction*
- Increased Wastage*
- Increased Requirements*

Source: modified after Herbert¹

trients and environmental factors, however, we need a framework for what constitutes contamination. A reference outline is provided in Box 2.

Box 2: Types of contaminants

INORGANIC

- ◇ *Atmospheric*
global warming gases
air quality contaminants
- ◇ *Terrestrial*
heavy metals
radionuclides

ORGANIC

- ◇ *microbiological*
fungus toxins
- ◇ *pesticides/herbicides*
organophosphates
organochlorides

INDIRECT INTERACTIONS OF ENVIRONMENTAL CONTAMINATION AND HUMAN MICRONUTRIENT NUTRITION

Within the domain of direct biological interactions, it is prudent to begin with the effects of environmental contamination on non-human species, both plants and animals, that form part of the human food supply. This could have repercussions on the nutrition of the human population, especially that related to vitamins and minerals. Instances of pollution have differentially affected certain species. Petroleum spills have devastating consequences on marine mammals and birds. This has been recently demonstrated with the South African penguin. It has been estimated that the entire (endangered) population of the California sea otter would be extinguished by an oil spill over a particular range of the California coastline. The history of the thinning of egg shells of birds of prey due to the pesticide DDT which is concentrated in their food-chain is well documented. For those indigenous, hunter-gatherer groups that depend on wild fish and game for their diet, rich sources of micronutrients would be eliminated.

This interaction can reduce consumption of an important micronutrient source not only by killing off the species outright, but also by rendering it inedible. The detection of a high content of organic mercurial compounds in swordfish in the 70s is the classic example. An admoni-

The content of this issue of *SCN News* provides information on the gamut of environmental contamination. For the present discussion of interactions between micronu-



tion against consuming this marine fish went out three decades ago. Although it has been shown that certain mineral-mineral interactions, specifically a selenium-mercury antagonism², mitigates the toxic consequences for the human consumer, concerns about the safety of swordfish persist to this day. High levels of environmental cadmium in the coastal fishery waters of Japan and Korea and its role in *Itai-Itai* disease have similarly produced reticence to consume fish and shellfish.³ Shellfish are avoided when, as part of the "red tide" phenomenon, an algal toxin with often lethal respiratory paralysis effects is deposited in the plankton-feeding bivalves of coastal beds. Coastal crustacea are rich in zinc and other minerals, and avoiding them would reduce intakes in subgroups of the population.

The fear of environmental pollution can operate to adversely influence micronutrient status in one anecdotal, but plausible and unique situation. Inuit in the Hudson Bay and Baffin areas of northern Canada have become aware of the heavy metal and organic chemical pollution of their waters. Marine pollutants are concentrated up the food chain. The Inuit winter diet is based on large marine mammals (seals, narwhals) and fish which have high concentrations of these pollutants. There are instances where arctic mothers have refused to breastfeed because of fear of passing these contaminants from their milk to their infants (see p 18). Not being breastfed would have obvious impacts on the micronutrient status of infants and general health.

For plants, fungal contamination and fungal toxin formation, either with aflatoxin or fumonisins, represent an environmental hazard to human consumers. The toxin of the mold *Aspergillus flavum* has a special affinity for legumes and nuts. So strict are the tolerances of aflatoxin by the health authorities of the European Union, for instance, that ground nut importation is almost impossible. The fungus *Fusarium moniliforme* has a predilection for maize. The fumonisin toxins in corn in Africa is suspected to be part of the complex etiology of gastroesophageal cancers in the region.⁴

DIRECT INTERACTIONS OF ENVIRONMENTAL CONTAMINATION AND HUMAN MICRONUTRIENT NUTRITURE

Models of potential biological inter-relationships are outlined in Box 3. The first two examples of direct interactions between contamination and micronutrient status involve aggravant or synergistic relationships, in which one factor makes the other worse.

Box 3: Models of potential biological inter-relationships of micronutrient nutriture and environmental contamination

AGGRAVANT (SYNERGISTIC)

- ◇ Environmental contamination can produce or exacerbate a micronutrient deficiency
- ◇ Micronutrient deficiency can make one more susceptible to the effects of environmental contamination

ALLEVIATIVE (ANTAGONISTIC)

- ◇ Environmental contamination can prevent or alleviate a micronutrient deficiency
- ◇ Micronutrient deficiency can make one more resistant to the effects of environmental contamination

Synergistic relationships: In the domain of mutual aggravation, illness acts on micronutrient availability or reserves. The stress reaction of the human body produces catabolism of tissues and wastage of nitrogen (protein) and endogenous micronutrients.⁵ The rigors of the respiratory distress and infections produced by smog could initiate excessive wastage of micronutrients. Contamination of drinking water supplies and recreational bathing areas with fecal effluents is a worldwide problem. The quandary of ritual bathing in the Ganges River in India due to its contamination with fecal pathogens is now legendary. Fecal pathogens, ranging from *Vibrio cholera* to *Giardia lamblia*, produce diarrheal episodes. This is a situation in which food is withdrawn, nutrients are poorly absorbed⁶ and endogenous nutrients can be lost in excess both in the urine⁵ and from the intestinal secretions themselves.⁷

With respect to heavy metals, cadmium toxicity produces a nephropathy and the damaged kidneys become sieves for certain micronutrients. Zinc contamination from the environment into the food supply could produce a situation in which iron and copper nutrition would be affected in the exposed individuals, insofar as the absorption of high amounts of zinc produces an intestinal blockade to the passage of these trace metal nutrients. Both deficiency states lead to a microcytic anemia.

Conversely, that micronutrient deficiency can make one more susceptible to the effects of environmental contamination is illustrated by the classic case example of pollution-nutrition interaction, that of iron and lead.⁸ Plumbism, a severe syndrome of lead intoxication, was known in the early industrial age when this metal was used for common implements. Milder forms of lead intoxication

are known to cause cognitive impairment in children and has recently been implicated in hypertension in lead-exposed women.⁹ Iron absorption is regulated by the iron reserves of the host. When iron status is adequate or excessive, its absorption is down-regulated. The uptake of ingested lead, from lead-based paint, from fuel exhaust, or from pottery glaze, is similarly blocked by a common cellular mechanism of absorptive regulation. Good iron status protects against lead toxicity in a lead-ridden environment. Conversely, iron deficiency, which affects 40% of preschool children in developing countries produces an avid capture of dietary iron through up-regulation of its transport. The same co-adaptation mechanism works in these populations to enhance the uptake of environmental lead through the gut.

Antagonistic relationships: A third variant would be environmental contamination preventing or alleviating a micronutrient deficiency. One could imagine that metallurgical mining could be initiated in areas in which the human populations and fauna were deficient in one or another trace element. For instance, a *de novo* release into the soil or water of selenium or zinc from mining or manufacturing activities could have the transient effect of resolving low micronutrient status in the human, livestock and wildlife populations, while continued exposure would lead to toxicities.

For the fourth variant of the interaction, namely that of micronutrient deficiency making an individual more resistant to the effects of environmental contamination, there are no obvious or confirmed examples. A series of theoretical postulates, worthy of investigation can be advanced, however. Such a postulate would involve iron, iron deficiency, and contaminants that act as oxidants or promoters of *in vivo* free-radical generation. Ionizing radiation and several organic substances initiate cellular oxidation. In theory, the richer the intracellular pool of iron, the more sustained and vigorous might be the oxidation. Ironically, iron deficiency may be protective against the effects of oxidizing contaminants in the environment.

UNINTENDED CONTAMINATING CONSEQUENCES OF PUBLIC HEALTH MEASURES TO PREVENT OR CORRECT HUMAN MICRONUTRIENT MALNUTRITION

Public health authorities have the responsibility to alleviate endemic micronutrient deficiencies. Unfortunately, some of the same social and economic forces that promote micronutrient malnutrition also stand in the way of public and private actions against it. Nonetheless, an armamentarium of four modalities to combat endemic deficiencies, used alone or in combination, have been outlined.¹⁰ These include: 1) nutrient supplementation; 2) nutrient fortification; 3) food-

sity of diet toward increased consumption of micronutrient rich sources; and 4) general health measures to improve nutrient absorption or reduce loss. Hence, our final consideration is of direct or indirect measures to alleviate public health problems that could theoretically produce situations of environmental contamination. A micronutrient fortification or supplementation scheme might contaminate. Promotion of cultivation or livestock or fishery development to improve human micronutrient status could also lead to pollution of the environment. Some examples are illustrative:

Fluoridation of water supplies is implemented to combat dental caries. Fluorosis is a potential consequence of an intervention designed to protect micronutrient status. Transient iodine excess in the form of thyrotoxicosis, or the so-called *jodbasedow* phenomenon, is well documented in iodine-deficient areas when salt or bread fortification with iodine is supplemented rapidly in a population with long-standing IDD.¹¹ Experience from goitrous areas of China where iodine-containing fertilizers were used poses another example of micronutrient improvement combined with a risk of environmental over-shoot. The "seeding" of the hyposeleniferous Finnish soils with selenium fertilizer is, to date, a success story in improving the selenium status of plants, livestock and the human population,¹² but it was curtailed after a few years of application, because of rapid selenium renewal in the environment.

Modern agriculture is based on the use of a series of chemicals some of which are potentially-contaminating substances for the environment. Iodine antiseptic is applied to the udders of dairy cattle to prevent bovine mastitis. This is one example, there are many more. Ironically, the equally disquieting scenario of genetically-modified crops, responds in part to chemical contamination by reducing the need for herbicides and pesticides to maintain high crop yields. In some settings dietary diversification will include the promotion of micronutrient-rich foods of animal origin. Intensive livestock production, itself, is an environmental hazard, as shown by the methane-loaded and ammonium saturated low areas of the Netherlands (see p 29). There is an environmental cost to putting meat on the table. Having organ meats such as liver and kidney on the menu is even more interesting. These are the richest sources of vitamins and minerals, but they also contain concentrated environmental toxins.

POLICY AND PROGRAMMATIC CONSIDERATIONS

It may be considered suspiciously self-serving that a nutrition investigator would conclude that research—and a



standing of micronutrient malnutrition and the environment. Evidence outside the arch-classic examples is scant. One would have to move a research agenda forward in order that nutrition policies and programs could be influenced and guided by scientifically sound and biological principles. The same uncertainty as to the causality in relationships of the synergistic type, however, renders the use of micronutrient status monitoring, as an adjunct to surveillance of environmental contamination, premature at best.

The lasting impact of this issue of the *SCN News* perhaps will be to open some eyes -- and some channels -- regarding the links between and among the toxicological, nutritional and agricultural domains. Some of the evidence presented here could help forge multi-disciplinary perspectives to the, as yet, unasked and certainly unanswered queries about the interface of micronutrients and environmental contamination in this ever more crowded, public health-challenged global community.

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Women and the Domestic Environment

In many developing countries, women are responsible not only for cooking and performing most of the domestic work that sustains the family but they are also responsible for growing food crops, fetching water and gathering fuel. However, when food is inadequate women are often more affected than men due to their lower status in many societies and higher energy needs as a result of their physical work. As a consequence they often suffer more malnutrition resulting in lower immunity and greater susceptibility to infection. Food security at the household level could be improved through:

- ◇ Practising sustainable agriculture. This ensures enough food is produced without causing land degradation. It includes rotating crops, leaving land fallow, proper stocking density, reducing use of chemicals, reducing soil erosion.
- ◇ Encouraging storey farming. This is mainly in overcrowded areas where land is limited. It can be practised by growing vegetables like kale (*Brassica oleraceae* var. *acephala*) in sacks of soil to increase the yield per unit land.
- ◇ Practising agroforestry to ensure increased food production. This also ensures availability of fuel within the vicinity, hence reducing the energy used going to look for fuel at far places.
- ◇ Literacy training for women and increased education for girls which will improve productivity. Nutritional education is also very important; this sensitizes people on the value of food and good nutrition.
- ◇ Increasing women's physical and human capital without sacrificing their limited time, their children's welfare, or their own health and nutritional status.
- ◇ Provision of clean water and adequate sanitation to reduce trekking to fetch water.
- ◇ Launching gender-sensitization fora by governments and other organizations to highlight the status of women's nutrition.
- ◇ Providing more affordable agricultural inputs for women involved in agriculture.
- ◇ Improving wage policies especially where women work in industries and are exposed to high risks.

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PERSISTENT ENVIRONMENTAL CONTAMINANTS AND BREASTFEEDING

Harriet V. Kuhnlein

Concern for contaminants in breastmilk has to be one of the most pressing issues in environmental protection. It gives clarity and imperative to the need for interdisciplinary research, contaminant emission controls, and sound public health advice. In this issue of the SCN News, a perspective on organochlorine and heavy metal contaminants that affect populations focuses on the quality of breastmilk and the health of infants.

ORIGIN OF CONTAMINANTS

Persistent contaminants are those that do not easily biodegrade and disappear once they are released into the environment, and therefore they insidiously accumulate over time in the environment and in people. Persistent contaminants include organochlorines such as PCBs, dioxins, DDT, and HCH, as well as heavy metals such as mercury, lead and cadmium. All have been introduced into the environment by large industries beginning in the 40s and 50s. Heavy metals are naturally present in the earth's crust, but during this century their entry into biological species has been accelerated. When present in the natural environment, contaminants accumulate in food species and move up food chains, with organochlorines accumulating in fat tissues and heavy metals (particularly mercury) accumulating in muscle, organ and other meat or skin tissues. These contaminants are present worldwide as a result of long-range transport in air and ocean currents following release at industrial sites, or in the near environment of local industries, such as mining and pulp processing plants.¹ They accumulate in human tissues and are released in breastmilk. Recent concern for the use of mercury in dental amalgam has also prompted public health concern for breastmilk mercury levels.²

Dioxin is the organochlorine entity composed of several compounds that is identified as a likely cancer hazard, and it interferes with normal growth and development of many animal species. Evidence is building of its toxicity to humans. Dioxin occurs as a by-product of several industrial processes, with an estimated 3000 kg per year

released worldwide into the environment. Responding to a report by the North American Commission for Environmental Co-operation authored by Barry Commoner,³ the Inuit Circumpolar Conference of Canada called upon the Government of the United States to stop dioxin pollution, which accounts for 70-82% of the dioxin atmospherically deposited in Nunavut communities. This has raised public concern for the health of food species and quality of breastmilk.⁴ Persistent contaminants of several kinds are now known to be present in Inuit Arctic traditional food species, in areas very distant from industrial emissions, with dietary exposure of some contaminants exceeding federal tolerance levels.⁵

TOLERANCES FOR LEVELS OF CONTAMINANTS IN BREASTMILK

Estimates of exposure to contaminants through breastmilk must obviously take into account the *types and concentrations* of the residues in the milk as well as the amount of milk consumed. The concern for contaminants in breastmilk relates to the fact that there is little dietary diversity, if any at all, for most infants in the early months after birth. Further, tolerances are often set based on animal toxicology experiments that are then extrapolated to adult body weight. Additional extrapolation to infant body weight may disregard potential quantitative differences in sensitivity. In other words, with respect to potential contaminant toxicity and establishment of tolerance levels, "infants are not just small adults," but there is no consistent way to estimate the differences.⁶

Organochlorines are expressed as units based on fat content of the milk (μg or pg/g milk fat) or as whole milk, assuming a milk fat concentration of 3.5%. Mercury is the only heavy metal that has been recognized to accumulate in the food chain to the extent that potential risk from milk to the breastfed infant is considered. Mercury tolerances are based on ng/ml whole milk and may be expressed as total, organic or inorganic mercury^{7,2}. However, established guidelines for dietary intake ex-

Box 1: Chemical identities of five persistent organochlorines

<i>DDT</i>	<i>Dichlorodiphenyl-ethanes</i>
<i>PCB</i>	<i>Polychlorinated biphenyls</i>
<i>Dioxin</i>	<i>A mixture of polychlorinated dibenzo compounds</i>
<i>HCH</i>	<i>Hexachlorocyclohexane</i>
<i>Toxaphene</i>	<i>A mixture of chlorinated camphenes</i>

dietary diversity, if any at all, for most infants in the early months after birth. Further, tolerances are often set based on animal toxicology experiments that are then extrapolated to adult body



press contaminants in units per kg body weight per day ($\mu\text{g}/\text{kg bw}/\text{d}$), which for infants depends on the extent of breastmilk consumption and body weight, which are not often reported in population studies. Box 2 presents some of the established dietary guideline levels for contaminants in food, which are sometimes also applied to breastmilk. A caveat to these guidelines is that each is established through toxicological testing and consideration of one contaminant at a time, when natural food sources, such as breastmilk, of affected populations usually contain multiple contaminants. Unfortunately there has been little research on this real-life circumstance, and the effects of multiple simultaneous contaminants are mostly unknown.⁶ The US Agency for Toxic Substances and Disease Registry has recently reviewed pesticide exposure through breastmilk, and describes the establishment of minimum risk levels (MRLs) for each contaminant in breastmilk that can be used for screening purposes. It is emphasized that MRLs are deliberately conservative with several safety factors, and are not suitable for food regulatory purposes. For breastmilk, MRLs are based on an average daily intake of 700 ml of milk and 24 g of milk fat. For example, an MRL for DDT is 0.0025 mg, based on these calculations for a 5 kg infant.⁸ This is in stark contrast to the food regulation guideline for DDT found in Box 2.

Box 2: Canadian Food Guideline levels of six persistent contaminants – per 100g

Mercury	50 mg
Arsenic	300 mg
Lead	50 mg
DDT	500 mg
PCBs	200 mg
Dioxins	0.002 mg

RECENT FINDINGS OF BREASTMILK CONTAMINANT LEVELS

Concentrations of total DDT, PCBs, and dioxins in non-representative samples from various nations have been reviewed by UNICEF⁷ and Polh and Tylenda.⁸ It was noted that whole breastmilk from industrialized countries has higher concentrations of PCBs (15-40 $\mu\text{g}/\text{g}$) and dioxins (0.2-0.6 pg/g), whereas developing countries have higher concentrations of chlorinated pesticides, such as DDT and metabolites (0-300 $\mu\text{g}/\text{g}$) and HCH (up to 0.084 mg/l whole milk).

Breastmilk samples in Kazakhstan were found to have high levels of the dioxin congener TCDD (6.2-118.2 pg/g fat), HCH, and DDT, all thought to emanate from local-

ized sources.⁹ Total toxaphene was found to be significantly higher in recent samples of breastmilk from the Keewatin district of Nunavut, Canada (mean 67.7 ng/g fat) compared to Southern Canada in two time periods (6.03 and 12.1 ng/g fat). Dioxins in the Keewatin samples had the mean sum of toxic equivalents (TEQ) of 6.5, whereas the Eastern Arctic Inuit in Nunavik had 34.2, as assessed in 1990.¹⁰ In Brazil, total mercury in breastmilk of mothers in gold mining districts of the Amazon basin ranged from 0.0 to 24.8 ng/g whole milk (mean at 5.85 \pm 5.9 SD).¹¹ These breastmilk levels of dioxins, toxaphenes and total mercury are among the highest reported to date from natural food resources. In comparison, Iraqi women who consumed methylmercury-contaminated bread made from agriculturally treated seed in the early 70s had peak milk mercury levels of 200 ng/g .⁷

DIETARY EXPOSURE

While breastmilk may be considered the main or only exposure vehicle of infants who are breastfed, dietary exposure of women is more complex. To be considered are the multiple food sources of contaminants, the levels of contaminants in each, as well as the extent of consumption. Although fish is considered the main natural source of mercury for most populations at risk, several sea mammals also contribute high mercury levels to dietary mercury of some groups. Several species, particularly high food-chain mammals, can provide varying amounts of total dietary levels of a variety of organochlorines and heavy metals, depending on the extent of consumption.^{5,12}

Concern for dental amalgams that release inorganic mercury has been investigated in Sweden² and Germany.¹³ Maternal dental amalgam mercury was found in breastmilk, however dietary mercury particularly from fish was a confounding variable. In the German study, maternal dental amalgams were considered of minor importance in comparison to maternal dietary mercury exposure for breastfed infants.

Thus, persistent environmental contaminants are indeed found in breastmilk and maternal diets. In fact, multiple contaminants are present and are contributed from a variety of maternal food sources of natural origin as well as dental amalgam. However, considerable research has documented that it is fetal rather than lactational exposure that contributes the major sources of organochlorines and mercury to the infant.¹⁴ Dietary exposure of women through the childbearing years, perhaps the entire life term until parturition, seems to be the primary

Nevertheless, breastmilk worldwide remains as source of contaminants to infants.

INADEQUATE ASSESSMENT OF LONG-TERM EFFECTS

There is clearly a need for more research not only for continued monitoring of breastmilk levels, but for the effects of exposure of contaminants to the fetus and infant through breastmilk and other introduced food. Importantly, the possible toxicological interactions of multiple contaminants introduced through breastmilk, and the possible interaction of nutrients and contaminants in this important food need to be studied. The effects of lifetime accumulation and multigeneration studies need to be established, as do studies on variable effects from levels in primiparous births in contrast to those born later to the same woman.¹⁵

It is still recognized that the known benefits of breastfeeding outweigh the largely unknown risks of contaminants present in breastmilk

Maternal milk as a source of nutrients and immunity for the infant has been widely known for decades. In non-industrialized countries breastfeeding confers a greater likelihood of survival from diarrhea and respiratory infections, and in industrialized countries breastfeeding reduces the number of episodes from ear infection, diarrhea, and other chronic disease. Furthermore, breastfeeding confers a measure of protection for women from ovarian cancer or premenopausal breast cancer.⁷

As persistent contaminants continue to accumulate worldwide, there are pressing needs for policies and action to deal with this crisis. Most importantly, the body of evidence for fetal and infant exposure to organochlorines and heavy metals gives imperative for international actions to stop emissions globally such as those undertaken by the United Nations Environmental Program.¹⁶

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COMMUNICATING ABOUT RISKS AND INFANT FEEDING

Penny Van Esterik

Breastfeeding advocates have a responsibility to examine and critique the continuously accumulating evidence concerning breastfeeding and environmental toxins, and how this information is communicated to policy makers, advocacy groups, and the general public. Because of the widespread pollution of rural and urban environments, toxic substances such as PCBs, dioxins, phthalates, and heavy metals have been found in samples of breastmilk. We hear so much about toxins in breastmilk because breastmilk is a medium that is convenient and cheap to test and not because it is necessarily more toxic than blood or body fat.

In assessing the impact of breastfeeding on infant outcome, it is difficult to separate in utero effects from postnatal effects. Intrauterine contamination which occurs at critical earlier stages of fetal development, is unavoidable and probably represents the more serious health concern. Although more than 10% of the cumulative toxic equivalent intake (TEQ) from birth until 25 years of age is thought to be due to breastfeeding, what must be advocated is a reduction in mothers' exposure to pollutants, not a reduction in breastfeeding.

Bottle feeding also takes place in a polluted environment using an industrially produced product subject to contamination and accidents. Infant formula is usually reconstituted using tap or surface water, which may contain toxins and diarrhoea-causing pathogens. Hormone-disrupting chemicals such as phthalates, nonylphenols, and bisphenol-A have been found in plastic feeding bottles. Therefore, we should be aware that whatever needs to be examined about breastfeeding should be examined about alternatives to breastfeeding as well.

Breastfeeding as a media subject is both sexy and emotional. It is an irresistible topic because every story has the potential to be sensational and controversial. The emotional ambivalence about breastfeeding expressed by many individuals and groups heightens the drama of stories. In the case of environmental pollution and toxins in breastmilk, there are both contradictory messages from the experts as well as differences in interpretation

by the media. Breastfeeding advocates are vulnerable if they ignore potential risks associated with breastfeeding. They are also at times defensive, for they speak on behalf of a product—breastmilk—with no commercial endorsement, and on behalf of a life-sustaining process—breastfeeding. Advocates may react with appropriate (or in the case of emotional overreaction, perhaps inappropriate) responses that will make a media splash, creating an even more sensational story. Breastfeeding mothers may overreact to perceived threats to breastfeeding because they are so intimately bound up in the protection of their breastfed infants.

Advocacy groups supporting breastfeeding have worked to contain the damage done by reports on contaminated breastmilk by publicizing the contamination of water and other foods

Advocacy groups supporting breastfeeding have worked to contain the damage done by reports on contaminated breastmilk by publicizing the contamination of water and other foods. When the *New York Times* accused breast-

feeding advocates of suppressing "scientific evidence" about HIV/AIDS transmission through breastmilk, infant formula manufacturers offered to sell infant formula to agencies in affected countries. In this way, they "redeem" themselves in the public eye, for their aggressive promotion of their products in those same countries that now accept their offers of subsidized infant formula. Because of the political implications of all these messages, communicators must walk the fine line between "scare tactics" and "suppressing the evidence". Neither toxins in breastmilk nor HIV/AIDS and breastmilk are amenable to the 30 second sound bite required by many media sources.

Breastfeeding is one point of entry for talking about the much broader questions of contamination, pollution, and environmental health. But there are often serious discrepancies in the way environmental pollution and breastfeeding are thought and talked about by environmentalists and breastfeeding advocates. The environmental literature speaks of breastmilk as a warning system for environmental exposure. But breastfeeding advocates speak of breastmilk as total nutrition for an infant from birth to six months. Breastfeeding advocates stress that breastfeeding provides some protection from breast cancer while environmental groups point out the substances in breastmilk that are carcinogenic. Environmentalists accuse breastfeeding

cates of burying their head in the sand and suppressing information critical of breastfeeding. Headlines about polluted mother's milk signify ultimate sacrilege, but they seldom suggest solutions. Evidence of pollutants in breastmilk tells us about serious environmental problems for children. It does not, however, tell us about serious environmental problems caused by breastfeeding. For example, it is not known how exposure to toxins affects formula-fed infants, breastfed infants, and adults.¹ If breastfeeding in a contaminated world were all that dangerous, one would expect to see increased incidence of cancers among people who were breastfed. In fact, breastfeeding may even mitigate affects of prenatal toxic exposure.

Determining the risk associated with breastfeeding in relation to environmental pollutants is not always easy. Risk assessments are often presented as if they are objective and quantitative statistical constructs that are based on measurable characteristics, ignoring the subjective and political side to risk assessment. Generally, the media fails to place risks in a broad ecological context and time frame. Nowhere is that more obvious than with reporting on breastmilk and environmental toxins. The role of media in risk amplification also needs further study, particularly since measures taken to prevent hypothetical consequences to infants (such as recommendations to stop breastfeeding) may do more harm than good.

Industries demand 'proof of harm' before agreeing to regulation, but often 'scientific' levels of proof are not available. Environmental groups should not have to prove that pollutants are hazardous before protective legislation can be put in place; mothers should not have to prove that their breastmilk is safe. How did the burden of proof shift from corporations and governments that allow contamination, to breastfeeding mothers who worry that they should have their breastmilk tested for contaminants?

A number of breastfeeding advocacy groups, including LaLeche League, IBFAN and WABA, have produced brochures for public education on this issue. The WABA folder, *Breastfeeding: Nature's Way*,² argued in general terms that breastfeeding is natural, sustainable, and non-polluting. It included examples of how the production of infant formula has proved vulnerable to contamination by bacteria, radioactivity, chemicals and foreign bodies, listing specific recalls and accidents. Referring to the fact that PCBs and other pollutants have been found in some samples of cow milk and breastmilk, it pointed out that WHO concluded

that the advantages of breastmilk far outweigh any possible risks. Finally, it reassures the reader by pointing out that levels of toxins found in breastmilk fell by around 35% in Europe between 1988 and 1994.

breastfeeding may even mitigate affects of prenatal toxic exposure

Coalition building among environmental groups, breastfeeding advocates and women's health activists is necessary.

These groups are co-travellers who must work together to advocate for social change. Cooperation amongst the groups might involve the following principles:

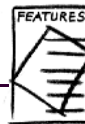
- ◇ acknowledge what is known about contaminants in breastmilk
- ◇ stress prenatal exposure as contributing to the body burden of all babies, not just breastfed babies
- ◇ identify the source of the pollution (chemical industries), not the source of evidence (breastmilk)
- ◇ stress the risks associated with artificial breastmilk substitutes and the risks of not breastfeeding when communicating about contaminants in breastmilk
- ◇ draw attention to alternatives to toxic products, not alternatives to breastmilk
- ◇ avoid metaphors of downloading toxins from one body to another
- ◇ avoid "pump and dump" as a solution to concern about breastmilk
- ◇ make clear in media reports that any testing of breastmilk is done for bio-monitoring programs, not for advising individual mothers on the condition of their breastmilk
- ◇ draw attention to contaminated milk, not contaminated mothers
- ◇ suggest practical actions to reduce contaminant loads, such as limiting consumption of fatty meats and dairy products

Reaching a consensus about contaminants and breastfeeding will not be easy. Acting and communicating in the face of scientific uncertainty and highly charged emotions is particularly challenging. But most would probably agree with the policy: "Health professionals advise that the known benefits of breastfeeding outweigh the potential risk of exposing infants to PCBs in human milk".³

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IBFAN GUIDELINE STATEMENT ON BREASTFEEDING AND DIOXINS

In recent weeks there have been an increasing number of reports in the press about the problems caused by dioxins. Dioxins are produced during various industrial processes, particularly during burning and incineration. They are environmental contaminants and are found mainly in the food chain where they are absorbed by humans. Dioxins are stored in body fat and are extremely persistent. Absorption takes place mainly through the food we eat (90-95%) but also through the air we breathe (5-10%). Breastmilk is often cited as a source of dioxins, but this is because fat soluble contaminants are relatively easily measured in breastmilk, not because breastmilk is any more contaminated than other body parts.

A recent review noted that studies have shown that the effects of dioxin contamination were associated with exposure via the placenta rather than via breastmilk. In areas of high contamination levels due to industrial processes or accidents, the available scientific literature indicates that a high level of dioxin contamination during pregnancy can lead to the impairment of child growth and development. Importantly however, it was concluded that breastfeeding, even in a contaminated environment, has a positive impact on the development of children as compared to those artificially fed.¹

As a result of these findings, a number of countries have advocated that breastfeeding should continue to be "encouraged and promoted on the basis of convincing evidence of its benefits to the overall health and development of the infant".²

The International Baby Food Action Network (IBFAN) agrees with this recommendation and further recommends that the debate about dioxin contamination should not unduly influence a mother's decision to breastfeed.

- ◇ breastmilk provides optimal, unique and perfectly balanced nutrition for a baby
- ◇ breastfeeding affords many irreplaceable health advantages for both mother and child
- ◇ pregnant women and breastfeeding mothers should be alert to the problems caused by chemical contaminants
- ◇ all citizens should work to raise awareness of the dangers of environmental pollution.

IBFAN urgently calls upon decision makers in industry and politics to adopt environmentally-friendly initiatives in production and waste-disposal, to promote political awareness of ecological dangers, and to create the appropriate legal framework to prevent the harmful contamination of our environment, and to protect the health of our children, both present and future generations.

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This statement was developed by the IBFAN working group on Contaminants in Baby Foods in response to media scares on this issue. It was reviewed by members of the IBFAN Co-ordinating Council in November 2000. This statement is intended as a guideline to assist IBFAN groups in preparing a response to press reports and will be shared with other concerned NGOs.

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Governments Finalize Persistent Organic Pollutants Treaty

Johannesburg, 10 December 2000

Diplomats from 122 countries have finalized the text of a legally binding treaty that will require governments to minimize and eliminate some of the most toxic chemicals ever created. "Persistent organic pollutants (POPs) threaten the health and well-being of humans and wildlife in every region of the world", said John Buccini, the Canadian government official who chaired the talks. "This new treaty will protect present and future generations from the cancers, birth defects, and other tragedies caused by POPs."

Executive Director Klaus Töpfer of the United Nations Environment Programme, which organized the negotiations, applauded the strong international regime that has been established for promoting global action on POPs. "This is a sound and effective treaty that can be updated and expanded over the coming decades to maintain the best possible protection against POPs", he said.

The treaty sets out control measures covering the production, import, export, disposal, and use of POPs. Governments are to promote the best available technologies and practices for replacing existing POPs while preventing the development of new POPs. They will draw up national legislation and develop action plans for carrying out their commitments.

The control measures will apply to an initial list of 12 chemicals which include eight pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, and toxaphene), two industrial chemicals (PCBs and hexachlorobenzene, which is also a pesticide), and two unwanted by-products of combustion and industrial processes (dioxins and furans). A POPs Review Committee will consider additional candidates for the POPs list on a regular basis. This will ensure that the treaty remains dynamic and responsive to new scientific findings.

A financial "mechanism" will help developing countries and countries with economies in transition meet their obligations to minimize and eliminate POPs. "New and additional" funding and technical assistance will be provided. Most of the 12 chemicals are subject to an immediate ban. However, a health-related exemption has been granted for DDT, which is still needed in many countries to control malarial mosquitoes. This will permit governments to protect their citizens from malaria - a major killer in many tropical regions - until they are able to replace DDT with chemical and non-chemical alternatives that are cost-effective and environmentally friendly.

Similarly, in the case of PCBs, which have been widely used in electrical transformers and other equipment, governments may maintain existing equipment in a way that prevents leaks until 2025 to give them time to arrange for PCB-free replacements. Although PCBs are no longer produced, hundreds of thousands of tons are still in use in such equipment. In addition, a number of country-specific and time-limited exemptions have been agreed for other chemicals.

Governments agree to reduce releases of furans and dioxins, which are accidental by-products and thus more difficult to control, "with the goal of their continuing minimization and, where feasible, ultimate elimination". Other national measures required under the treaty relate to reporting, research, development, monitoring, public information and education.

The meeting in Johannesburg was the fifth and final POPs negotiating session and was attended by some 600 participants. The treaty will be formally adopted and signed by ministers and other plenipotentiaries at a Diplomatic Conference in Stockholm on 22 - 23 May 2001. Governments must then ratify, and when 50 have done so the treaty will enter into force. This process normally takes several years.

Of all the pollutants released into the environment every year by human activity, POPs are among the most dangerous. They are highly toxic, causing an array of adverse effects, notably death, disease, and birth defects, among humans and animals. Specific effects can include cancer, allergies and hypersensitivity, damage to the central and peripheral nervous systems, reproductive disorders, and disruption of the immune system.

These highly stable compounds can last for years or decades before breaking down. They circulate globally through a process known as the "grasshopper effect". POPs released in one part of the world can, through a repeated (and often seasonal) process of evaporation - deposit, evaporation - deposit, be transported through the atmosphere to regions far away from the original source.

In addition, POPs concentrate in living organisms through another process called bio-accumulation. Though not soluble in water, POPs are readily absorbed in fatty tissue, where concentrations can become magnified by up to 70,000 times the background levels. Fish, predatory birds, mammals, and humans are high up the food chain and so absorb the greatest concentrations. When they travel, the POPs travel with them. As a result of these two processes, POPs can be found in people and animals living in regions such as the Arctic, thousands of kilometers from any major POPs source.

Fortunately, there are alternatives to most POPs. The problem is that high costs, a lack of public awareness, and the absence of appropriate infrastructure and technology often prevent their adoption. Solutions must be tailored to the specific properties and uses of each chemical, as well as to each country's climatic and socio-economic conditions.

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NUTRITION FOR SUSTAINABLE ENVIRONMENTS

Timothy Johns and Pablo B. Eyzaguirre

The merging of community development priorities with those of environmental conservation brings with it recognition that unless human populations meet their basic survival needs they cannot afford to conserve. At the same time, unless local communities protect the environments around them they have limited hope to thrive beyond the short term. As nutrition represents the most fundamental of human needs it provides a useful perspective from which to consider this paradox.

Global fora have acknowledged in broad terms that integrity of the environment and meeting basic human needs are interconnected (see: World Declaration on Nutrition¹, International Conference on Nutrition², Convention on Biodiversity³, Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture.⁴ Unless environments are used in sustainable ways, it will become progressively more difficult to feed the world's population.

Health of humans intrinsically connects with the health of the ecosystems in which they live. However, these ecosystems are affected by rapid processes of change in both industrialized and developing countries that profoundly alter relationships between components of that environment. Disruption in environmental integrity in turn affects patterns of human health, disease and nutritional status.

TRADITIONAL FOOD SYSTEMS

From an evolutionary perspective, organisms are adapted to a particular environment when they are able to meet their biological needs. Throughout their history as a species, humans developed specific modes of subsistence to diverse environments ranging from the equator to polar regions, from sea level to elevations exceeding 4000 meters, and from humid rainforests to hot deserts. The unique features of many of these environmental relationships as they involve satisfying nutritional needs have been documented among extant populations with traditional lifestyles,^{5,6} often populations identified as indigenous. The nutrient complementarity of Mesoamerican diets based on maize, beans and squash and

the associated niacin-releasing techniques of maize preparation forms a classic example. Similarly, rice, pulses and milk products provide a balance of amino acids for subsistence farmers in India. In situations where animal protein and fat provide the primary energy sources, such as among Arctic hunters and dryland pastoralists, adaptive practices including specialized preparation techniques and the use of wild plants ensure that essential vitamins and minerals are consumed.

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While nutritional sciences have provided a framework for interpreting the adaptive significance of traditional systems, elucidation of the nutritional basis for

health problems in contemporary contexts can guide the application of traditional knowledge and resources and efforts in environmental conservation necessary for the identification of sustainable solutions.

ISSUES IN HUMAN HEALTH

Malnutrition

Malnutrition is seldom seen in ecological terms, perhaps due to a lack of historical reference points (baseline data) or perspectives on antecedents associated with the development of nutritional problems. However, analysis of traditional systems often reveals underlying environmental factors. Overpopulation reflects a breakdown of traditional ecological balance; without opportunities to disperse geographically, expanding populations exceed the carrying capacity of their environment. Decreased mortality rates associated with modern health care contribute to this.

Overpopulation and factors that undermine the capacity to produce food lead to inadequate food intake and/or consumption of nutritionally poor foods. Famine may be associated with environmental extremes that in many cases have anthropogenic causes. Micronutrient malnutrition may reflect a disruption of traditional patterns of subsistence resulting in reduced access to and intake of crucial biological resources.

So-called diseases of affluence such as diabetes and coronary heart disease also represent disruptions of hu-

man-environmental relationships. Traditional subsistence patterns couple energy expenditure for food procurement and other activities with intake of foods with low energy density. In addition to energy over-consumption in diets of industrial societies, increased reliance on processed foods may affect health by reducing intake of nutrients and non-nutrients that protect health more subtly.⁷

Changes in disease factors

Nutritional status is compromised by disease factors of environmental origin and is a critical factor in the severity and prevalence of illnesses. Disruption of natural ecosystems can increase rates of infectious disease by increasing rates of exposure to vector-borne disease such as malaria, leishmaniasis, or dengue,⁸ or through impacts on density-related factors such as sanitation and direct person-to-person transmission.

Major public health problems of global importance such as tuberculosis, gastrointestinal diseases, measles and respiratory disease all reflect the interaction of nutritional and environmental factors.⁹ Malnutrition may result in micronutrient deficiencies such as vitamin A and iron that affect the immune system and compound these and other diseases.¹⁰

Environmental contamination from industrial and agricultural chemicals such as heavy metals, organochlorines and radionuclides can also compromise nutritional status and health.¹¹ Cancers can be attributed to contaminants, and fear of exposure can lead people to abandon components of their traditional food systems. Northern populations who rely on hunting and fish are particularly vulnerable to these disruptions, as discussed in other papers in this issue of *SCN News*. Unfortunately, dietary alternatives based on market foods in remote communities are expensive and usually of lower nutritional quality.

DYNAMICS OF LOSS OF ENVIRONMENTAL HEALTH

Ecosystem destruction and loss of biodiversity

In areas of traditional subsistence, large-scale economic enterprises such as forestry, mining and agriculture activities destroy—or make conditions unsuitable for—the plants and animals on which people meet their nutritional needs. Deforestation, destruction of watersheds and changes in land use can dramatically affect water relations and meteorological cycles; these in turn contribute to crop failures and drought. In addition to directly affecting nutrient intake, loss of bio-resources affects economic livelihood. Migration and colonization such as that occurring in areas of tropical forests,¹² while motivated by the

need to relieve problems of overpopulation in other areas, lead to profound environmental change and health problems of the type described above for both immigrants and indigenous populations.

Urbanization

Increasing population and urbanization intensify the challenge of obtaining adequate nutrition in a sustainable manner. Urban populations make increasing impacts on the environment through market demands, by settling in agricultural areas, and through pollution associated with industrial growth and urban waste. In this situation the urban poor are doubly affected by deficiencies in diet and by the negative consequences of living in unhealthful conditions.

Cancers can be attributed to contaminants, and fear of exposure can lead people to abandon components of their traditional food systems

Urban diets in developing countries—often characterized by energy excess, reliance on fat frying and asso-

ciated oxidizing conditions and low intake of fruits, vegetables and other components of traditional forms of ingestion⁷—are setting the stage for an emerging epidemic of diabetes, cardiovascular disease and cancer facing the next generation.

Globalization of agriculture

Urbanization and international trade in food and income-generating crops stimulate commercial agriculture. While modern technology-based farming is essential for producing food for the growing population in local cities and globally, methods that depend heavily on energy inputs are rarely benign in terms of environmental impacts. Consumption of fossil fuels and petrochemicals in the form of fertilizers or pesticides has global climatic consequences, while locally intensive mechanized cultivation can lead to erosion and destruction of the soil and eventual loss of productivity. Run-off leads to the contamination of water systems and destruction of the productive capacity of marine and lacustrine resources. In many cases economic pressures may lead to development of land that is not well-suited for agriculture.

Pesticides have both local and global impacts on diet and nutrition. Apart from the toxicological consequences of direct exposure, local contamination may reduce the dietary options of local populations. Herbaceous plants that grow as weeds in fields or along margins and consumed as pot herbs and relishes are traditionally important supplements and sources of micronutrients for many people.¹³ Herbicides, fungicides and insecticides may elimi-



nate these or make them unfit for consumption. The consequences of persistent organic pollutants (POPs) that are transported in the atmosphere are felt on traditional food systems far removed from major sites of pesticide use¹¹, (see box for information on the POPs treaty, p. 24).

Erosion of food crop diversity

In many regions of the world, multiple pressures are threatening plant diversity. Global modern agriculture typically focuses on yields of a few crops. Years of genetic engineering have brought about high yielding, pest- and drought-resistant varieties of a small number of distinct food crops. Whereas over seven thousand plant species have been traditionally used for food, three species – rice, wheat and maize – account for sixty percent of the total energy intake in the human diet.¹⁴ The sheer magnitude of agricultural effort applied to these three crops has led to a decline in the consumption of more diverse grains. There has been an accompanying decrease in the variety of vegetable and fruit species consumed. Influences compounding this trend include cultural change and urbanization.¹⁵ Additionally, many traditional foods are now associated with being poor or backward. This has led to changes in dietary patterns and the amount of dietary diversity. Little is known about the impact of these dietary changes on human nutrition.

The goal of alleviating malnutrition is not as simple as increasing protein and energy intake. Experience has shown that improvements in agricultural output are not always associated with positive changes in human nutrition. Consuming even large amounts of only one or two staple crops, such as rice or wheat does not provide the nutrients necessary for a healthy and productive life. In order to ensure an adequate supply of all nutrients essential to human growth and development, a varied diet is key.

Genetic modification holds considerable promise for selective improvement of plant nutrient composition. Although genetically modified organisms (GMOs) are currently subject to considerable scrutiny for their potential adverse affects on human health, the ecological impacts of this technology are probably greater and also require careful evaluation. One of the current trends in the use of GMOs in agriculture is their reliance on monoculture and the reduction of plant diversity within fields and field mar-

gins. The requirements of GMOs as they are currently being developed for agriculture do not allow for the diversity of weeds and other plants that are typically important nutrient sources from fields of staple crops.¹³

Although the precept that potential benefits derived from modern agriculture and associated technological solutions to food and nutritional problems must be balanced against environmental costs is recognized in principle, the necessity for sustainable forms of commercial agriculture in developing countries is, generally speaking, given less weight than in industrial countries. In both contexts research and development of alternative technologies that demand less inputs, and are usually on a small scale, have much to offer in nutritional, environmental and social terms.

The sheer magnitude of agricultural effort applied to rice, wheat and maize has led to a decline in the consumption of more diverse grains

Consequences for rural populations

Populations living a subsistence lifestyle in rural environments range from those utilizing local resources in a traditional manner to landless peasants and agricultural labourers. The former group are most directly affected by reductions in biodiversity of plants and animals used for subsistence and as components of the environments in which these organisms live. Here environmental disruption can be the trigger for impoverishment and social disintegration. Loss of a traditional subsistence base can bring about the conversion of indigenous communities to landless labourers. Reduced economic and subsistence options lead to malnutrition. Continued environmental deterioration further reduces the means people have of meeting their needs.

SOCIOCULTURAL CONSIDERATIONS

Knowledge of traditional resources and subsistence methods forms an important aspect of indigenous culture that is fundamental to identity of culturally defined groups. Continuance of cultural practices is important in contributing meaning and self-affirmation in the lives of individuals. Because resource exploitation is often a social activity, disruption of subsistence patterns weakens social bonds. Social disintegration leading to the loss of traditional means of subsistence can lead directly to malnutrition. Disturbance in social organization and lack of social cohesion can be synonymous with impoverishment that in turn affects nutritional status.

The issue of whether traditional systems are inherently more sustainable than modern alternatives can be ap-

proached in ecological and sociocultural terms. The dynamic interaction between the biological imperative of growth characteristic of human societies, biophysical constraints, and cultural controls appears to be more at equilibrium in traditional societies. Strong bonds with land and spiritual values associated with the natural world, characteristic of indigenous cultures, have been suggested as contributing to an inherent conservation ethic.

Whatever the case, such values are fragile and vulnerable to modern forces of change. Nonetheless, even in situations where relationships within the biological and social environment have been disturbed, such cultural values can form important components of programs of public health education and ecological recovery. In turn, integration of the biological, social and cultural dimensions of human environmental relations is as essential to present and future sustainability of human health as it has been throughout history.

NUTRITION FOR SUSTAINABLE ENVIRONMENTS

Nutrition research as it identifies fundamental human needs provides essential information on the consequences of environmental degradation and change on human well-being. In turn nutritional status of populations, as a recognisable outcome, should guide other scientific disciplines and programs of intervention in the identification of sustainable solutions to the environmental and economic problems facing global communities.

Concerns for quality in crop improvement efforts seldom include nutrition, or, if they do, tend to focus on protein. Some research and intervention programs have focussed on micronutrient priorities such as vitamin A or minerals through genetic improvement, crop diversification and considerations of soil properties. More attention needs to be applied to identification of crop varieties and minor crops with selective nutritional assets and to the nutrient and phytochemical analysis of indigenous crops and wild edible species. In particular greater importance should be given to the genetic diversity of plant species and the high micronutrient content present in a variety of different fruits and vegetables.

While such institutional approaches are essential to ad-

dress problems of a global magnitude, national efforts, most importantly of local communities, are also important. Locally-focussed multi-disciplinary activities that combine nutrition research, ethnobotany and ecosystem and resource management with health care initiatives, and which embrace participatory models of empowerment and initiative, offer real hope for addressing problems at the levels where people are directly affected.

Major health problems of the 21st century relate to nu-

tritional deficiency and to dietary change in both rural and urban settings. Combined with understanding of traditional systems and resources, nutritional analyses help to identify the biological and sociocultural components of solutions. Addressing nutritional needs offers a primary rationale for the preservation of traditional systems of knowledge and life-style, the conservation of wild and cultivated resources, and the sustainable use of the environments in which they are located.

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FACTORY FARMING AND THE ENVIRONMENT

Jacky Turner

INTENSIVE LIVESTOCK PRODUCTION

At the end of the 20th century, intensive farming of animals for food was increasingly promoted as the answer to the needs of the developing world for an abundant and varied diet. The scenario of rapidly increasing consumption of meat, milk and eggs and of the intensification of animal production systems has been presented as both inevitable and desirable. The US-based Council for Agricultural Science and Technology, an organisation of US farm and agricultural science associations, stated in 1999 that when compared to grassland or mixed farming, the "intensive (industrial) systems" of producing animal food "have contributed most to the relatively low-cost meat and milk enjoyed by consumers in developing countries".¹ Similarly, a paper from FAO research and policy experts published in 1998 reported that "The trend of further intensification and specialisation of demand-driven production is inescapable".²

Salespeople and investors from the major agricultural countries, development agencies and national governments are all taking a part in driving farm animal intensification—and it is happening fast, especially in pig and poultry farming. Fifteen years ago nearly all poultry rearing in Thailand was backyard production, whereas today less than a quarter of Thailand's poultry are supplied from villages³. An investigation of animal farming in Thailand, Brazil, India, China and South Africa⁴ conducted for Com-

passion in World Farming during 2000 has showed "an alarming picture of burgeoning intensive livestock production".³ Compassion in World Farming's report argues that animal intensification is a misguided policy in the quest for better diets and that history proves the cost of intensive farming to the environment, to the animals, and to consumers and small farmers to be unacceptably high.

THE HISTORY OF FACTORY FARMING

Fifty years ago in Europe, intensification of animal production was seen as the road to national food security and a better diet. The policy was supported by guaranteed prices, encouraging high inputs of feed, fertiliser, pesticides and veterinary medicines. The intensive systems—called 'factory farms'—were characterised by confinement of the animals at high stocking density, often in barren and unnatural conditions.



Battery cages for laying hens, here in use in Thailand, are being phased out in much of Europe

Productivity increased but the animals paid a high price in suffering. Caged in sow stalls or battery hen cages, farm animals are unable to exercise or to perform many natural behaviours. They suffer from diseases such as lameness, digestive problems and osteoporosis. Extreme selective breeding for high yield causes major health and welfare problems such as skeletal disease in fast-growing chickens and mastitis in dairy cows.

The environment has also paid a high price in terms of water, air and soil pollution, overuse of water and land

and loss of biodiversity and landscape. As the British Government Panel on Sustainable Development recognised in 1997, "Farming methods in the last half century have changed rapidly as a result of policies which have favoured food production at the expense of the conservation of biodiversity and the protection of the landscape".⁴

These policies also encouraged overproduction. By 2000, European policy makers were turning away from intensive farming, not least in the face of unsustainable production support costs. Meanwhile public opinion is also turning against intensive farming amid concerns about human health—BSE being a direct result of intensive animal farming—and about environmental degradation. The systems that were intended to produce cheap food are now increasingly seen as involving huge external costs, estimated to be £2.3 billion per year for the UK alone.⁵

THE COST OF HIGH INPUTS
Intensive farming of high-yielding animals requires large amounts of protein-rich and energy-rich feed. This is necessary because the animals are

confined and separated from natural sources of food and also because a forage diet is unable to satisfy the feed requirements of these highly selected animals. A high-yielding dairy cow may need 4700 kg of forage and 1600 kg of concentrate feed in a year.⁶ A feedlot beef animal needs 1400 kg of feed in the "finishing" period.⁷

Animal feed production consumes scarce resources of land, water and energy. Large amounts of the world's cropland are given over to producing food not for people but for confined animals. Over 90% of world soybean production is used for animal feed. Worldwide, about one third of the grain harvest is fed to farm animals. In spite of this, the European Union imports about 70% of its total protein requirement for animal feed and a European Parliament report commented in 1999, "Europe can feed its people but not its [farm] animals."⁸

animal intensification is a misguided policy in the quest for better diets

Large amounts of the world's cropland are given over to producing food not for people but for confined animals... Animal feed requirements put huge pressure on the world's water resources.

In turn, the need to grow animal feed helps drive the intensification of arable farming worldwide, leading to well-documented damage to water and soil resources and loss of biodiversity. Overuse of nitrate fertilizer reduces species diversity and damages soil fertility. A 10-year scientific study published in *Nature* has shown that long-term soil fertility is reduced and 60%

more nitrate leaching occurs when crops are intensively farmed compared to methods using no agrochemical inputs.⁹ Nitrate pollution of surface and ground water—damaging biodiversity and drinking water—comes mainly from agriculture. A major use of pesticides is for animal feed production. Worldwide, the two crops which account for the highest percentage of herbicide sales are the feedcrops soya and maize.

Intensive animal farming is highly water-intensive. Over a third of the world's cropland is now dependent on irrigation. Eighty seven percent of fresh water consumed is used for agriculture,¹⁰ while the UN predicts that 40 countries will suffer from extreme or absolute water shortages in the next 20 years.¹¹ Animal feed requirements put huge pressure

on the world's water resources. It has been estimated that it takes 100 times more water to produce one kg of beef than to produce one kg of wheat.¹⁰ Irrigation itself causes salinization, estimated to affect about half of all irrigation systems worldwide.¹² In addition, intensive agriculture is highly dependent on fossil fuel energy for pumping and for fertilizer production.

INADEQUATE POLLUTION CONTROL

By the end of the 20th century, it was generally accepted that intensive animal farming had caused environmental pollution wherever it had become established—and even in countries where regulatory frameworks are strongest.

Europe and the US have shown that pollution from ammonia, nitrate and phosphate arising from animal manure and slurry becomes a serious problem when animals are concentrated on unnaturally small areas of land in intensive farms. Slurry is a very polluting liquid mixture of

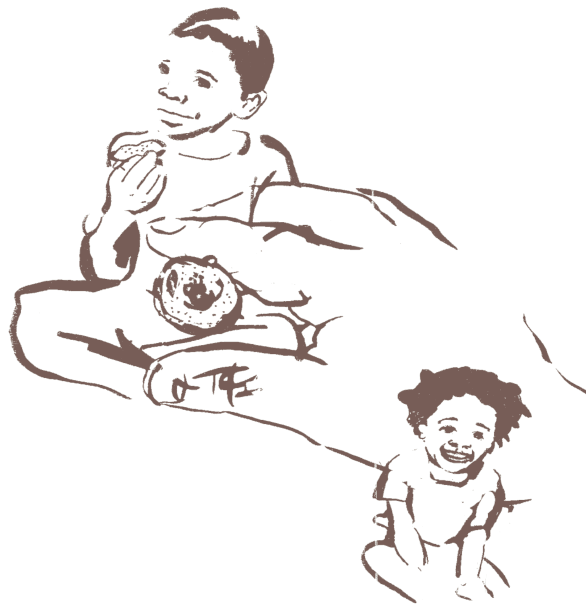


urine and faeces, collected in intensive animal units. The US Department of Agriculture has stated, "The continued intensification of animal production systems without regard for the adequacy of the available land base for recycling presents a serious policy problem".¹³ Large-scale air and water pollution incidents affect US factory farming areas, such as North Carolina (pigs) and Chesapeake bay (poultry). In the Netherlands, the problem of disposing of animal slurry has become so serious that pig production will have to be reduced by 25% to meet environmental standards. Agriculture contributes 80-90% of the ammonia pollution and 50-60% of the nitrate pollution in Europe.¹⁴ Intensive animal farming is an important source of emissions of carbon dioxide, methane, nitrous oxide and ammonia, variously associated with global warming, ozone depletion and acid deposition.

There is little or no pollution control currently in many developing countries. This means that, as in Europe and North America, liquid slurry from factory farms can pollute surrounding land and waterways, while peri-urban intensive units cause serious environmental nuisances.

ENVIRONMENTALLY-FRIENDLY ANIMAL FARMING

In the second half of the 20th century intensive animal farming in the industrial world, such as in Europe and North America, caused great suffering to animals and great cost to the environment. Many people would argue that a high global consumption of animal products will always be unsustainable – given the existing demands of feed production and waste disposal. Others argue that the solution is to take more of the "old medicine". They believe that the expansion of animal production in developing countries can be met by increasing the world's cereal output (arable intensification) and increasing the feed conversion of animals (intensification of animal husbandry).¹⁵ We are now in a situation where the consumption of animal food and intensive animal farming are escalating in the developing world. But it is not too late for policy-makers to change direction.



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ABBATOIR BLOOD USED IN FOODS: AN EXAMPLE OF NUTRITION-ENVIRONMENT INTERACTION

Andreas Mäurer and Klaus Schumann

From Biblical times, bovine, ovine, porcine and avian flesh has been prepared by bleeding through the carotid vessels. Blood conserved using hygienic, sterile procedures is a food source with a long-standing tradition in cuisines around the world, e.g. for the production of blood sausages. Due to increased meat consumption, however, exsanguination blood quantities far exceed the demand. A biodegradable waste-product, blood should not be released into general drainage sewage, but rather be disposed of in an appropriate manner which will not damage the environment. Blood collected and conserved in an unsanitary fashion can be used as feed for domestic carnivore pets. In the context of nutrition and environmental contamination, we focus here on a unique example of synergistic interaction. The maximal usage of slaughterhouse blood as a resource for human and domestic animal feeding could include channelling this by-product into the food fortification effort aimed at reducing iron deficiency and removing this waste product from the environment.

Prehistoric humans were hunters and thus, carnivorous, which may explain the development of specific mechanisms for intestinal heme-iron absorption. Enzymatic digestion of hemoglobin to heme and globin degradation products in the intestinal lumen seems to prevent the aggregation of heme molecules and increases absorption rates markedly over those found for highly purified heme products.¹

Heme iron is highly bioavailable with absorption rates in the range of 20-32%.^{2,3} Absorption rates of 20% were maintained when the heme iron concentration in a meal ranged between 0.28 and 4.48 mg,⁴ showing that the percentage of heme iron absorbed decreases very little with increasing quantities in the diet.⁵ This is in contrast to inorganic iron and contributes to the low incidence of iron deficiency in populations with high meat consumption. Also, iron-binding ligands have little effect on heme iron which is largely inaccessible in its porphyrin shell. Thus, simultaneous intake of ascorbic acid does not increase and the chelator desferrioxamine does not decrease the absorption of heme iron.^{6,7} Accordingly, inhibition of heme-iron absorption by food ligands such as phytate and tannin is low.⁸ This is in contrast to non-heme iron, the absorption of which is severely impaired by

food ligands⁹ which are common in black beans, corn, rice and other cereals.

The problem with the use of fresh blood products for food fortification is that they degrade rapidly, making transport and storage difficult. Processes to separate the heme from abattoir blood have been refined and applied since the 1980s. Examples from Chile,^{10,11,12,13} the United Kingdom¹⁴ and Spain¹⁵ document the potential of hemoglobin fortification. There are an estimated two billion iron-deficient individuals in the world, primarily in developing countries. This projection for the use of animal blood would, in effect, bring a highly bioavailable source of iron to bear on the problems of iron deficiency and iron deficiency anemia in vulnerable groups. Hemoglobin is a macromolecule with a weight of 65,458 Dalton, 94% of which is globin. This leaves only 6% for the iron containing heme moiety, making hemoglobin a very bulky iron carrier.

Therefore, a simple and cheap method to split heme from the globin moiety was developed that can be used for bovine, ovine, porcine and avian blood. Splitting heme from globin increases the shelf life of the product and decreases the quantity of fortificant needed to add a defined amount of iron to a given food matrix. The production process includes smooth acidic hydrolysis of the hemoglobin and separation of the iron-rich heme aggregates by centrifugation. The separation method was designed for low technology with limited investment in equipment required. The process can be performed in less industrialized countries and is comparably cheap. Assuming that blood as a waste product enters the calculation for free, the production cost is approximately \$1.50 kg heme-product. One kg of heme-product corresponds to approximately 500 aliquots of 30 mg Fe. This quantity should last for 500 weeks, if a supplementation dose of three RDAs/week is assumed, corresponding to approximately \$ 0.16 per capita/year. This figure is likely to decrease, if the production process were scaled up for high quantity output. However, it does not contain the cost for the food matrix, mixing, storage and distribution. The separated globin could be utilized as a technical protein to improve the economics of the process.



In Guatemalan children fed heme-fortified refried black beans, the ability of such a partly purified heme product to reverse anemia and to build iron stores was at least equivalent to that of ferrous sulfate, which is regarded as a "gold standard" for iron availability studies. Moreover, the heme product was far superior to FeSO₄ with regards to taste.¹⁶ The black color of heme limits its use to dark food matrices such as black beans or chocolate-flavored food products.

Taste and shelf-life of the fortified product is a key issue in iron fortification. In this context, an additional advantage of heme over inorganic iron is its low interaction with the food matrix. The formation of formylfurane, which gives a poor taste, was determined in potato-flips fortified with the new partly purified heme product. After 14 weeks of storage at 40 °C (2.7 mg Fe/100 g) the formylfurane content was ten times lower than in FeSO₄-fortified flips. Accordingly, hemoglobin fortification of biscuits increased the peroxide index by less than 20% and no differences in taste and appearance were found after storage at 40 °C for 60 days.¹⁰ Also, hemoglobin-fortified weaning food did not change organoleptic attributes after eight months storage at room temperature.¹⁵ Fortification of olive oil with partly purified heme (200 mg Fe/100 mL) showed limited lipid peroxidation. At the same concentration, FeCl₃ fortification produced significant amounts of hexanal under these conditions. Thus, the production of a β-carotene and heme iron-fortified, high-energy snack food based on palm oil seems possible to simultaneously fight iron and vitamin A deficiency. Until now iron has not been added to a fat-based matrix because of the risk of lipid peroxidation. This incompatibility has been an obstacle for a combined fortification-based intervention program against vitamin A and iron deficiencies, the most commonly observed micronutrient deficiencies worldwide.

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ALUMINUM AND HEALTH

Recommendations arising from an interdisciplinary working group on Aluminum Neurotoxicology, sponsored by the European Union and presented at the recent First International Conference on Metals and the Brain Padova, Italy, September 20-23, 2000

All populations are exposed to aluminum, an environmentally abundant element. The neurotoxicity of this metal has been known for more than a century. More recently, it has been implicated as a causal factor in some pathologies related to dialysis treatment, including encephalopathy, bone disease and anemia. In addition, it has been suggested that aluminum exposure is a cofactor in the development of some neurodegenerative diseases, including Alzheimer's disease, although direct evidence for this is still controversial. Examples of aluminum neurotoxicity are well recognized in experimental animals and in individuals with renal failure (due to aging, intoxication or renal disease), and there are grounds to link neurodegenerative disorders to aluminum exposure. Furthermore, an increased concentration of aluminum in infant formulas and in solutions for home parenteral nutrition has been associated with neurological consequences and metabolic bone disease.

For all these reasons, the EU-sponsored Working Group on Aluminum Neurotoxicology proposes the following recommendations as guidelines to avoid risks due to aluminum accumulation and potential toxicity. These recommendations will be updated when relevant new scientific data become available.

RECOMMENDATIONS

GENERAL

1. It would be valuable to define as completely as possible which groups are at risk for iatrogenic aluminum loading, and under which conditions aluminum exposure represents a health hazard. The more complete our knowledge the better basis we will have to judge whether different types of aluminum exposure are hazardous to the general population or to susceptible subgroups.
2. A provisional list of groups at risk of iatrogenic aluminum loading should include, at a minimum, people with impaired renal function, infants, the elderly and patients on total home parenteral nutrition. Where such exposure occurs, serum aluminum concentrations should be less than 30 µg/L and possibly lower.
3. Urinary aluminum is an indicator of aluminum absorption: the ratio of excreted aluminum to retained aluminum depends on the integrity of renal function.
4. Aluminum may enter the human body by mouth, intravenous infusions and through the environment. Specific controls are needed to reduce *each* risk of exposure.

ORAL EXPOSURE

5. Aluminum in drinking water should be less than 50 µg/L. Silicon is relevant to aluminum toxicity and, therefore, water silicon concentrations should be monitored in parallel.
6. Aluminum content should be declared in all food preparations and pharmacological products.
7. Citrate-containing compounds appear to increase the bioavailability of ingested aluminum. Therefore, particular care should be taken to avoid these compounds in combination with aluminum-containing drugs. With citric acid, the enhanced gastrointestinal absorption may be compensated for by a parallel increase in urinary aluminum excretion, where there is good renal function. However, it is strongly suspected that other dietary acids (for example succinic and tartaric acids) also increase aluminum-bioavailability but do not cause any compensatory increase in urinary excretion. Ascorbate and lactate also significantly enhance gastrointestinal absorption of aluminum.
8. It is recommended that acidic food, for example acid cabbage and tomato, should not be cooked or stored in aluminum ware. It has been shown that the juice of acidic cabbage cooked in aluminum pots can contain aluminum levels of up to 20 mg/L.
9. Special efforts should be taken to prevent contamination of foods and beverages with aluminum either directly or during preparation, in particular with regard to infants, the elderly and individuals with suboptimal renal function.

10. Magnesium depletion increases the risk of aluminum accumulation especially during pregnancy and in the neonate with possible consequences for normal growth and development. Magnesium depletion is also common with aging.

11. Iron depletion also increases the risk of aluminum accumulation, because iron and aluminum share common carriers.

PARENTERAL EXPOSURE

12. Aluminum in all intravenous fluids should be controlled, monitored and labeled. There is a general consensus that the aluminum content of intravenous fluids used for children and adults with renal failure or undergoing dialysis, should be as low as possible and in any case no higher than 10 µg/L.
13. Parenteral nutrition fluids that are high in aluminum should not be used.

ENVIRONMENTAL EXPOSURE

14. There is a need for more research on the absorption, metabolism and neurotoxic effects of aluminum in occupational settings. It would be useful to monitor the total aluminum content in serum and urine of exposed workers. Furthermore, there should be detailed neuropathological studies at autopsy of workers highly exposed to aluminum, and comparison with similar studies in long-term dialysis patients in the general population.

INFANTS AND CHILDREN

15. Preterm infants are particularly vulnerable to aluminum because of their immature renal function. Particular attention should be directed to artificial milks, especially soy based infant formulas or feeds, which may contain high concentrations of aluminum.
16. Prospective studies on the possible effects (including cognitive, behavioral, motor, delayed calcification for example) of elevated aluminum exposure in healthy children as well as in children with different degrees of renal failure and other pediatric groups.

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27th Session

This section of **SCN News** provides information on our most recent annual session. The ACC/SCN 27th Session took place in Washington DC in April 2000. Two keynote addresses were given by senior officials of UNICEF and the World Bank. Both speakers provided inspiring messages for all of us working towards nutrition goals. They also reflected on some of the key findings of the SCN's **Fourth Report on the World Nutrition Situation**, launched the same day, and committed their agencies to new strategic alliances. The annual Dr Abraham Horwitz Lecture, given by Deepa Bhat, a student at Tufts University, provided new insights into the design of programmes to tackle foetal malnutrition and improve pregnancy outcomes. Seven of the SCN's Working Groups were convened, and their reports are summarized here. The Working Groups are the driving force of the SCN. It is through SCN Working Groups that participating agencies take an active role in the substantive areas of greatest importance.

Kul Gautam

Deputy Executive Director, UNICEF

Mr Chairman and distinguished participants at this meeting -- which has so many of the world's "who's who" of nutrition -- I am afraid that if I speak about nutrition, I will make a fool of myself and reveal my ignorance or superficial knowledge on nutrition. There is an expression in my language that says: "don't light a candle where there is bright sunshine". Guided by that advice, I won't speak on nutrition to this assembly of some of the world's best and brightest in the area. Instead, I will speak about a safer subject -- mobilization -- and will raise some questions for us all to ponder and act upon.

Let me assure you that I'm not trying to avoid UNICEF's responsibility as a member of the SCN to speak on nutrition. We have here a large delegation from UNICEF, and I do have a written statement prepared by my competent colleagues. I have read the SCN's *Fourth Report on the World Nutrition Situation*, the final *Report to the ACC/SCN of the Commission on the Nutrition Challenges of the 21st Century*, the draft Strategic Plan for the SCN, and the fascinating report of last year's SCN meeting.

What I gather from these reports -- and so many others on the subject of nutrition -- is the following: that nutrition -- and malnutrition in particular -- is a subject that has been over-studied and under-acted-upon; and that we now understand quite adequately the problem of malnutrition -- its grave and lasting consequences and, on the other hand, the virtuous impact of effective, positive nutrition interventions. Yet the world is not mobilizing enough to end malnutrition as a public health problem.

Instead, even as we speak, a famine of horrific proportions is unfolding in the Horn of Africa. Fifteen years ago, a similar famine aroused the world's conscience, and a massive response through Live-Aid, Band-Aid, and "We are the Children" campaigns. Today there seems to be

compassion fatigue. Although we know better than ever before what needs to be done, what approaches work, and the world's capacity to respond is so much better now than ever before, it is hard to arouse the world's compassion for what appear like chronic crises in the Third World. It is even harder to arouse genuine solidarity for long-term development.

We would probably get a lot more media coverage on famine and malnutrition if we could fly in Elian Gonzalez to Ethiopia, than all the excellent reports of the ACC/SCN.

What is to be done? And where have we failed? In 1990, the World Summit for Children endorsed eight nutrition goals. They were all ambitious, but *none were unattainable*. It is worth reflecting on why we have greater success in achieving some goals than others. Tremendous progress has been made on salt iodization and IDD elimination. Respectable progress has been made towards the reduction of vitamin A deficiency. Good progress has been made on breastfeeding promotion, especially through the Baby-Friendly Hospital Initiative.

Some would argue that, unlike underweight or stunting or basic education, these goals had easy technical fixes, silver bullets, and did not require significant behavioural change. I respectfully disagree.

In all the goals where we have had significant success, the key has been our ability to communicate and articulate the goals in simple, easily understandable ways to decision-makers and leaders; to demonstrate convincingly how the goals are achievable in their political or official lifetime; how the goals can be pursued without emptying the state coffers; what political, tactical, moral benefits it would bring to them, and what international support

and recognition can be brought to bear. In some cases, attracting the support of the private sector has been useful. In all cases, invoking publicity by the media has been vital.

In goals where we have faltered, we have failed to articulate them and position them in a convincing manner.

Many of us recall the inspiring manner in which the late Jim Grant of UNICEF used to convince leaders, great or small, to pursue goals that at first seemed impossible, but were made impossible *not* to pursue. Our incoming SCN chair, Mr. Ngongi, referred to such an example that occurred at a meeting some years ago of Central American presidents for universal salt iodization.

Sometimes, in nutrition, we are more concerned about being scientifically correct than programmatically effective. We wish to do the right thing, but don't do it right.

Now, ten years after the World Summit for Children, we at UNICEF are embarking on developing a new agenda for children in the next decade. In this new agenda, Early Childhood Care, Survival, Growth and Development, with nutrition as a vital element, will be a core component. I would like to invite the nutrition community to suggest – as you had done ten years ago and as the SCN has done over the past quarter century – a new set of goals, targets and strategies around which we could try to mobilize political leaders, corporate leaders, civil society organizations and the media.

Let me pose a couple of questions on whose feasibility we would appreciate your advice. Yesterday, at a meeting on early childhood care and development, World Bank Vice-President Eduardo Doryan spoke about how child growth might be made a proxy indicator for poverty reduction. For over two decades, we have known the value, the sensitivity of child growth as the best measure of child nutrition. Yet growth monitoring has not quite gone to scale except in a few countries.

Can we now take up this subject and try to nail child growth as the gold standard for measuring the success of development efforts? Both the *Fourth Report* and the *Commission Report* emphasize that where child growth has been monitored at community level in combination with guidance and support for parents, child malnutrition rates have declined more rapidly. Can we make child growth monitoring and promotion a new political imperative?

When the World Bank and IMF missions visit countries, they always ask questions about a variety of economic indicators – on GDP growth rates, inflation rates, balance of payments. What if the Bank missions were to make a practice of also asking about the status of GMP – growth monitoring and promotion, or child growth rates?

Richard Jolly has been the architect of the wonderful *Hu-*

man Development Report for some four to five years. But I am not sure that we have ever really made a case that child development is the foundation of human development, that the most important growth indicator is that of growth of the foetus in the womb and of the baby under two years of age. If development is about empowering people, then empowering mothers, families and communities to monitor the most important growth indicator would seem to merit high development priority.

As nothing succeeds like success, can we now envisage double fortification of salt – adding iron to combat anaemia? How wonderful it would be if we could transform our most spectacular failure of the past decade – not making a real dent in the world's most prevalent micronutrient malnutrition, anaemia – as the new decade's most spectacular success. Fortification might not be the only answer. Perhaps there are other approaches as well. But surely, this ought to be feasible if we put our minds to it.

I read somewhere an analysis that at current rates, it will take a century to reduce malnutrition to a level at which it would stop being a public health problem. Our challenge ought to be to eliminate malnutrition as a public health problem within a single generation, not in 100 years. My reading of these documents indicates to me that we now have the know-how to make this feasible. What is lacking is vision and bold leadership. We, here at the SCN, we are or can be those leaders. If not us, who? If not now, when?

May I suggest to the development agencies and donors present that we endeavour to double our investment and triple our impact over the next five years on nutrition programmes? That as a minimum, we identify 10 to 15 countries, mostly in South Asia and sub-Saharan Africa, with major problems of malnutrition, where the conditions are ripe for our joint action in new partnership. Let me say without stealing the thunder from Eduardo's presentation next, that the World Bank as the single largest funder of nutrition could certainly double or triple its investment in nutrition. Can we United Nations agencies and bilateral donors help with good project preparation work at the country level, and creation of demand from governments for nutrition loans so that the Bank can triple its investment?

We at UNICEF are committed to putting a sharp young-child focus on our nutrition efforts – in fact in all our development efforts – to emphasize the dynamic concept of growth and to redouble our outreach and partnership with you all. We believe that UNICEF, with our increasingly human rights and child rights-oriented approach to programming, can play an important advocacy role to position nutrition as a central development concern. If we can join hands to do that, we might have some hope of getting the protesters outside the barricades to join us inside for a common cause.

Thank you.



Eduardo Doryan Vice President & Head of Human Development Network The World Bank

It is a professional privilege and personal pleasure to welcome you to the World Bank, and to speak here today at this important meeting, which brings together a large contingent of the global leadership against malnutrition. Since I became Vice President for the Human Development Network here, eight months ago, I have gone through a crash course in 'What's What in Nutrition' and 'Who is Who in Malnutrition Reduction'. However, since my early youth I remember the work done in my own country to document nutrition issues in particular the well known case, at least at that time of the Puriscal county. Later on in public office both in the Science and Technology portfolio, and particularly in the Education one, nutrition issues were indeed a key element in policy making.

In the Bank, my very first field trip was to Bangladesh, a country where, as you know, as many as 50% of babies are born with low birthweight, and nine out of ten children are not growing adequately in the critical first two years of life. I don't have to explain to you what this stunting and wasting means in terms of:

- ◇ compromised human potential, including physical and mental impairment
- ◇ reduced learning capacity and educational achievement
- ◇ increased vulnerability to illness and premature death, both in early life, but also in later life (as the Barker studies are showing)
- ◇ lowered productivity, both economic, social and cultural
- ◇ even intergenerational effects
- ◇ not to speak of the sheer human suffering, something we can now also see vividly on our television screens that highlight the slow-onset famine in Ethiopia and the Horn of Africa.

Bangladesh is a silent emergency, Ethiopia a loud one, and all this is happening in many countries all over the developing world as we enter the 21st century. There is no doubt: this is a grotesque failure of humanity, a humanitarian disaster that need not happen, that should by now be entirely avoidable. Malnutrition and hunger are an outrage: a human rights violation but also bad politics, as Mr Gautam has said, and, I would add, bad economics as well. I will come back to this point in a minute.

The reports we have before us --- especially the *Fourth Report*, but also the *World Development Report 2000/1*, UNICEF's *State of the World's Children Report 1998*, the

Commission Report, and the World Bank study among 60,000 people called *Voices of the Poor* --- all these reports make clear how enormous the challenge of malnutrition is. Never before have we known so accurately how heavy is the 'global burden of malnutrition'.

Bad and good news

That is the bad news. But there is also some good news. Because we have now a solid understanding of how to tackle these problems, at the macroeconomic level, at the multi-sectoral level, and at the community level.

Just last week, the World Bank and the Government of Bangladesh successfully negotiated what I think will be one of the world's largest malnutrition reduction programmes, the National Nutrition Project, the first of a series of three projects over the coming 15 years, with a total price tag of over US\$1 billion.

Several of you here today have been involved in the design of this project or its precursor, the Bangladesh Integrated Nutrition Project. These are prime examples of a sharply targeted, highly focused set of interventions aimed at preventing or mitigating malnutrition by focusing on young-child growth monitoring and promotion, and by fostering behavioral change at the household level. Few projects have enjoyed such concentrated attention by so many experts, of different partnering agencies -- local, national and international -- that we at the World Bank are confident that it represents the first of a new generation of efforts to bring down malnutrition on a large scale, within a generation.

While there may not yet be a full technical consensus among nutritionists, we believe that a pragmatic agreement is emerging on what needs to be done --- thanks in no small measure to the work of the ACC/SCN. As you know, the World Bank is the single biggest provider of funds for nutrition, and we have been involved in this field for about 25 years. I think it is not incorrect to say that the World Bank helped put nutrition on the international development agenda.

During recent years there has been an important increase in the portfolio for Human Development (education, health, population, social protection and nutrition), however, there has not been an equal increase for nutrition. Still the Bank's nutrition portfolio averages around US\$120 million a year. In addition to the Bangladesh project, there are also a number of substantial new

projects in the pipeline, which would maintain commitments at this level. However, it is useful to rethink what the limitations are and what has to be done to move as fast as the overall Human Development portfolio.

Our constraints have been two fold: 1) we are overstretched in our technical capacity (staff and consultants) to go through the new wave of projects that include policy dialogue, sound sectoral studies, and the whole process of preparing more sound projects while maintaining high quality in the current portfolio, and 2) we deal with a diverse set of stakeholders. Many do not yet recognize the importance of nutrition, or have limited capacity to prepare and implement projects. I will be making some specific recommendations on how we plan to overcome these two limiting factors.

Friends, the world is easily capable of doing much, much more-- and so is the World Bank.

And I want to assure you that we are committed to significantly stepping up our efforts in this field, because we are now more than ever convinced that if you reduce malnutrition you will reduce poverty-- which is increasingly the focus of all World Bank operations. This is very much at the core of the Comprehensive Development Framework, which brings a more holistic view of development, more balance between macroeconomic, human development and institution building, more country ownership and a more strategic and long term view of development and its outcomes.

Why, what and where?

In the next minutes I would like to touch on three topics:

- ◇ why the World Bank considers it important to intensify efforts and increase impact
- ◇ what those efforts would entail, and
- ◇ where the resources should come from

The World Bank, with its specific mandate, also looks at nutrition through an economic lens. We conclude, from many economic studies, that investments in carefully designed malnutrition control projects give tremendous returns, particularly if they are supported by appropriate macroeconomic policies and multi-sectoral alignment.

This is especially important for low-income countries and societies, because, if we are willing to take a long-term perspective of, say, 20 or 30 years, we can see that malnutrition reduction has powerful and positive impacts on economic growth and human development.

Nutrition today is perhaps the *best development bargain available*. Some rough estimates show that whereas mal-

nutrition costs the world around US\$80 billion each year (due to lowered economic productivity, illness and the cost of treatments, poor performance of the educational system), addressing malnutrition cost-effectively would cost less than US\$5 billion per year, with costs borne jointly by governments, donors and consumers.

One of the most remarkable pieces of information I recently came across is that micronutrient malnutrition robs many countries of five percent of their gross domestic product through death and disability, yet countering this problem successfully could be done for as little as 0.3% of GDP. With such favorable benefit-cost ratios few countries can afford *not* to address micronutrient malnutrition.

Similarly favorable benefit-cost ratios are available for the promotion of breastfeeding and young child growth.

It is now increasingly apparent that adequate nutrition is as much a necessary condition for development as it is a desirable outcome of development.

So we at the World Bank are keen to increase our investments in malnutrition control, especially in countries that need it most. It is our intention to make nutrition an essential part of our dialogue with governments and other stakeholders and partners, particularly in the context of the new Poverty Reduction Strategy. As you are aware, President Wolfensohn has proposed an increased use of the Comprehensive Development Framework as a means to harmonize and synergize all development efforts at country level. I would welcome specific ideas from our partners on how we might collectively proceed against malnutrition, in selected countries, spelling out our respective contributions and accountabilities, in accordance with the comparative strengths that each of the partners bring to the table.

From our side I propose the following:

First, in as many countries as practicable, and as soon as possible, we work together to make child growth another key indicator of the overall development effort, along with the conventional economic growth. The Development Assistance Community (DAC) has already recommended that the world begin to use the anthropometric indicator weight-for-age to measure how we are doing in poverty reduction as we move forward toward the 2015 goal of halving extreme poverty. Young child growth, measured by monthly bodyweight changes, is one of the most sensitive of all outcome indicators, and can be used by parents, community and district leaders, state governors and prime ministers. Growth monitoring data on a nation's children can provide timely and telling feedback that planners, politicians and donors need, month to month, to see the results of their social and economic policies, and to measure the human development impact of poverty reduction strategies. Growth monitoring and promotion would facilitate sharper targeting, emphasize appropriate behavioral changes, and



introduce a preventive thrust in the programme. It could be designed as a routine monthly contact service with children under the age of two, or it can be done as a special statistical effort of nutritional surveillance.

Second, and this relates to what I learnt last week, I propose that we do the ground work to establish a consortium to meet the challenge of low birthweight head on. I am thinking of something like the partnership model we have for immunizations (called GAVI) or the Safe Motherhood Initiative. We must find ways to break the intergenerational transmission of malnutrition and poverty by putting a new focus on reducing the high prevalence of low birthweight—the 30 million babies who begin life with such a poor start. I see this as an important plank in countries' Poverty Reduction Strategy, for all the reasons you, the experts here, know so well. It also fits in well with several other Bank priorities, such as our work on Tobacco and Health, Prevention of Teenage Pregnancies, Safer Motherhood and Reproductive Health, and Girls Education. Globally, we haven't done well, or enough in reaching adolescent girls and improving their nutritional and overall status, but I believe that we can no longer ignore adolescent girls in our development discourse as we enter the 21st century.

Third, I propose renewed efforts to deal with micronutrient deficiencies, especially through mass fortification and supplementation action. Here the private and the peoples' sectors can play a far more important role than they have thus far, to complement the public sector. The success of the global salt iodation effort is encouraging, and we would be keen to learn whether the experts now believe the time is ripe to begin planning for double fortification of salt, adding iron.

This, I believe, is an essential minimum package which the World Bank would want to work on together with colleagues in this room. When it comes to poverty reduction, and malnutrition reduction, the World Bank should no longer be regarded as a lender of the last resort, but rather as a proactive partner prepared to promote malnutrition control as a priority investment during Country Assistance Strategy negotiations or in consortia meetings.

But, you may ask, where will the resources come from? Here I propose that we all double our nutrition investment, but also aim to treble our impact! All donors and development institutions should seriously consider doing that over the next three to five years. That would be a minimum, if we are serious about reducing absolute poverty by 2015 by 50%. Can we do it alone? No. Can each of you do it alone? No.

We need your help. You need ours. Preliminary estimates show that an additional US\$2-\$3 million per year over the next five years in grant funds could leverage some US\$500 million extra World Bank investments in malnutrition control in 15 to 20 countries in four regions, in addition to the al-

ready planned investments.

This amounts to US\$100 million extra per year—roughly doubling our investments in nutrition, ranging from project innovations to large scale investments (of US\$25 million and higher), after proper nutrition sector work (such as the example from India, entitled *Wasting Away*), country-specific analyses of the situation and opportunities, ensuring local capacity building and institutional strengthening, and a strong emphasis on monitoring and evaluation.

We should, as Dr Gautam has proposed, make a start during this week to identify countries with big malnutrition problems where the conditions are ripe for joint action in new partnership, perhaps 10 or 15 countries to begin with, mostly in Sub-Saharan Africa and South and South-East Asia.

We have recently completed this Nutrition Toolkit that summarizes the technical lessons we have learnt in the past two-and-a-half decades. It represents, I am told, state-of-the-art approaches and insights that can now be widely applied, and we are in the process of planning a series of team training courses with clients, partners and staff around this new Toolkit.

Clearly, to achieve these new beginnings, partnerships are not an option, but an imperative. I envisage strategic alliances with different partners, globally and at country level, each bringing their best comparative advantages to the joint endeavor. We have been building a stronger alliance with our friends in UNICEF in this direction.

Ladies and Gentlemen, it should not be too difficult to capture the attention and imagination of the world for such a renewed initiative. Before new images of emaciated and dying children begin to haunt us again, subtly undermining our convictions and resolve, let us come together and agree on the centrality of malnutrition and poverty reduction to the future of many, many countries.

This ACC/SCN 27th Session could well become a turning point in our battle with this age-old problem, provided that the global nutrition leadership here assembled so decides. Although I am new to this field, I believe that the urgency and importance of the task compels us all to find new ways forward, to leapfrog over old obstacles and past resistances. I do not find the problems themselves as frightening as the questions they raise about our capacity to gather our forces and act. That is where we all, individually and organizationally, need to reach deep inside ourselves, and begin to end malnutrition. This is an idea whose time has come — as, surely, apartheid was in the past decade, and colonialism before that.

Thank you.

Fourth Dr Abraham Horwitz Lecture

What makes the difference? Applying the positive deviance approach to improve pregnancy outcomes

Deepa Bhat

I am honored to have been selected to deliver the *Fourth Dr Abraham Horwitz Lecture*. Dr Horwitz is a legend in the field of nutrition and a role model for many of us in the younger generation. I had the privilege of meeting Dr Horwitz two weeks ago in his home here in Washington. With the kind efforts of Alan Berg, we were able to see the cherry blossoms together. In India, we use the term *darshan* to describe a meeting with an inspirational person. Meeting Dr Horwitz was for me an experience of *darshan*.

During this Lecture I would like to show how use of the positive deviance concept and methodology can improve pregnancy outcomes. It could be said that wherever this method has been tried, there have been promising and successful results.

First, the concept of positive deviance and its use in developing countries to improve child growth will be introduced. Then the critical importance of the pregnancy period in the nutritional life cycle will be discussed briefly. Finally, the outline of a proposal to utilize positive deviance to reduce intrauterine growth retardation and low birthweight will be presented.

Positive Deviance Based Nutrition Activity to Date

The pioneering work on the application of the positive deviance concept to nutrition was carried out by Professor Marian Zeitlin at Tufts University in the late 80s. The concept of positive deviance draws upon both the importance of behavioral change in nutrition as well as the importance of accentuating the positive. The role of behavioral change was well articulated by Alan Berg, former senior nutrition advisor to the World Bank who wrote in his book, *The Nutrition Factor*¹, "An important part of the nutrition gap is the information gap. Although lack of purchasing power is a major constraint, many nutritional deficiencies would be moderated if people knew how better to use the resources already at hand." Positive deviance shows people how to accomplish this. Poverty is not necessarily an over-riding constraint when using the positive deviance approach. The positive deviance approach points out that people can succeed nutritionally in low-income communities. The positive deviance approach attempts to show that the resources needed to succeed nutritionally are often available in the community. The "positive deviants" are utilizing these resources effectively.

The importance of stressing the positive was underlined by former Harvard Professor Mark Hegsted in 1967 who advised that "we should pay a great deal more attention to the

reasons for nutritional successes rather than nutritional failure."

Application of the positive deviance approach to nutrition evolved out of the observation that most poor communities include impoverished families with well-nourished children.² This observation, in turn, raised the question of how do some poor families have well-nourished children when their neighbors do not? That is, what is their "deviant" behavior? Zeitlin suggests that these deviant characteristics may be behavioral, social, psychological or physiological. Most prior research focused on problems. Positive-deviant research centers on solutions. The positive deviance approach works with the surroundings of the citizens and deals with their limitations and also their potential.

Utilization of this concept focusing on child growth at the community level has been undertaken with considerable success by the US-based nongovernmental organization Save the Children, with support from various donors including USAID, UNICEF and several corporations and universities. In Save the Children's own words, "Positive deviance is a developmental approach that is based on the premise that solutions to community problems already exist within the community".³

The basic positive deviance model adapted by Save the Children involves growth monitoring promotion (GMP) every two months for every young child. Specific age coverage varies slightly from country to country. Children falling below $-2SD$ in weight-for-age enter a two-week Nutrition Education and Rehabilitation Program, or NERP session, with their mothers. The NERP session itself is modeled on the "Hearth" model developed by Drs Warren and Gretchen Berggren in which, ideally, positive deviance mothers themselves participate in the counseling of mothers of malnourished (low weight for age) children, and in which mothers bring a portion of the raw food which will be prepared into nutritious meals.

Children who remain moderately or severely malnourished at the conclusion of the NERP session are automatically enrolled in the next session. An average positive deviance project employed by Save the Children might have four GMP sessions and four NERP sessions and continue for a period of one year.⁴

It is worth noting that this model differs conceptually from those followed in large scale, multi-year nutrition projects in Bangladesh, India, Indonesia, and Tanzania. It differs not only in the use of the positive deviance concept but also in



the premise that intensive daily meal-based sessions (usually a complete meal plus counseling lasting two hours) will produce dramatic improvements in a short period of time.

The basic model of GMP and NERP sessions is complemented by additional activities in particular countries. In Vietnam a Nutritional Revolving Loan Program provides credit for poultry activity to the households of children failing to graduate after two NERP cycles. Vietnam is also initiating a project that addresses healthy pregnancies for new mothers similar to that being proposed in this *Lecture*. In most countries, these efforts are integrated with complementary immunization, disease control, micronutrient, deworming and family planning activities provided by Save the Children and other organizations.

Finally, positive deviance programs in several countries are experimenting with what is called a "Living University" in which staff and volunteers from project areas train counterparts in new areas to facilitate project expansion. The positive deviance approach is employed currently in 15 countries. Vietnam and Egypt will be used as examples.

The results of these positive deviance-based nutrition projects have been dramatic. The Poverty Alleviation and Nutrition Program (PANP), the project in Vietnam, resulted in a 40% reduction in malnutrition of children under the age of three, and a 68% reduction in the prevalence of severe malnutrition. The pilot program moved 3092 children out of moderate or severe malnutrition to mild malnutrition.⁴ Now the program has expanded to about 108,000 children.

In Egypt projects of 12 months duration reduced the prevalence of moderate and severe malnutrition from 47% to 13% in one area and to an astonishingly low 1.4% in another.⁵ Of children "who graduated" from NERP sessions in Egypt, none relapsed during the year of project operations. The pilot program covers about 1000 children. Although data on behavioral change has been limited to date, studies indicate that messages have been disseminated effectively.

In such short duration projects, sustainability is of critical importance. Sustainability here means that once the NERP sessions have ended and the organization leaves the project area, the messages taught are still applied and improved nutritional status is maintained. The results to date have been noteworthy. In Vietnam, an assessment of sustainability found that three years after the termination of project services, the nutritional status of project participants remained higher than that of matched controls. Even more impressive was the finding that siblings of these children, who had never been exposed to the program were also much better nourished than age-and gender-matched controls. The caretakers also fed their children, the younger siblings more meals per day on average than their comparison counterparts. In Egypt, recent data suggests that sus-

tainability may require some minimal follow-up for message reinforcement. Where such follow-up was in place, malnutrition prevalence increased by only 1.6 percentage points in 14 months. Where follow-up was absent, prevalence increased by ten percentage points in less than one year.⁵

While the annual cost per child, using direct cost data from the Egypt project, is roughly three times higher than World Bank-assisted projects in South India and Bangladesh, the short duration and high impact of positive-deviance projects makes them comparable in terms of overall cost-effectiveness. Comparable projects assisted by World Bank provide supplements only. Positive-deviance projects on the other hand provide full meals and counselling to all enrolled children who are moderately and severely malnourished. The positive-deviance program is considered permanent rehabilitation. This means that because mothers are being educated and behaviors are targeted, improved nutritional status will be maintained and relapse will be infrequent. There are two additional outcomes of this program. In Vietnam, at least one more family member of each child is included as an indirect beneficiary. Also, there is anecdotal evidence that a significant number of deaths are avoided due to the program.⁶

In Vietnam, PANP provides education through role modeling and hands on experience, enabling women to learn from each other in the community. It reinforces good habits already in existence. PANP is based on the belief that in order for development gains to be sustainable, strategies and solutions to community problems need to be identified *by community members themselves*.³ The positive deviance model respects the culture, thus making the program more easily accepted in the community. These programs involve the community heavily from the outset. They use existing infrastructure and community health workers, and organize women in focus groups for their mutual support.

In the positive-deviance model, society is paying attention to positive role models and using them to assist others in their own community to reach the next level.

The positive-deviance method has been utilized to rehabilitate malnourished children. It is proposed now to improve pregnancy outcomes; specifically to prevent intrauterine growth retardation and to reduce the number of low birth-weight babies.

The Case for a Positive Deviance Based Pregnancy Intervention

The importance of reducing intrauterine growth retardation (IUGR) and improving pregnancy outcomes hardly needs recounting for those in the international public health arena. Suffice it to say, that low birth weight, a prime result of IUGR, has been closely associated with growth retardation, poor mental performance, morbidity and mortality during childhood⁷ it may also increase susceptibility to chronic dis-

eases including cardiovascular disease, diabetes mellitus and hypertension, which in turn affects adult productivity and mortality.⁸

Some 30 million infants born each year in developing countries have experienced intrauterine growth retardation.⁹ In the developing world as a whole, one in five newborns will be low birthweight. In Sub-Saharan Africa, the figure is one in six. For South Asia, the area of the world contributing the largest number of low birthweight infants, the figure is as high as one in two – in Bangladesh for example.

It is also clear that maternal malnutrition is in large part responsible for IUGR and low birth weight, and poses an enormous risk for reproductive age women themselves in developing countries. Indeed the health-related indicator with the greatest differential between developing and industrialized countries is maternal mortality with rates often 100 times higher in poorer countries. Effective project activity addressing malnutrition before and during pregnancy not only would reduce rates of maternal mortality but would also reduce nutritional depletion that often occurs over the course of successive pregnancies. Dr Roger Shrimpton¹⁰ (formerly of UNICEF), in a review of global low birthweight prevention, concludes by saying, "I now see low birthweight prevention as the critical missing link of programs designed to improve both maternal and child survival and development. In many developing countries, there seems to be an obvious relationship between rates of low birthweight and rates of both child malnutrition and maternal mortality."

It is important to note that affecting birthweights through pregnancy interventions is more complex than we once believed and certainly far less linear than the relationship between child nutrition interventions and child growth. Nonetheless there is broad acknowledgement that addressing maternal malnutrition during pregnancy will have positive effects whether they manifest themselves in pregnancy weight gain, birthweight, survival of offspring or growth of offspring.

Because so many of the determinants of IUGR and low birthweight are behavioral, activities oriented towards behavior change, such as the positive deviance-based program of Save the Children, would appear to have a comparative advantage in addressing the problem, at least in countries where maternal malnutrition is not strongly income determined. Among the behavioral factors associated with IUGR are age of first pregnancy, inadequate birth spacing, absence of prenatal care, inadequate energy micronutrient intake prior to and during pregnancy, inadequate daytime rest during pregnancy and smoking or alcohol consumption during this period. These behaviors can all be targeted during the prenatal period.

Data collected in March 2000 in Egypt in communities which have participated in Save the Children's positive deviance-based projects geared to children, indicate clearly

the opportunities that exist to influence some of the behavioral determinants of low birthweight. While only two to six percent of women reported consuming more food than usual during their last pregnancy, 25-40% reported intentionally consuming less than usual.⁵ Only one third of these mothers had regular day time rest during their pregnancies, a finding associated with the fact that almost none received assistance from their husbands in relieving their work load. Finally only 46% received any prenatal care and only 39% received any micronutrient supplements.⁵ Neither, to date, is routinely provided in that part of Egypt and both are usually procured from private practitioners rather than government clinics.

A Positive Deviance Based Pregnancy Education Program

In Vietnam, the Healthy Pregnancy and New Mother Program (HPNMP), implemented by Save the Children, has been able to reach 88% of pregnant women in the villages covered. The program met its objective of bringing about adequate pregnancy weight gain in over 60% of the women reached.

The adaptation of the positive-deviance program to pregnancy proposed in this *Lecture* would build on this work with pregnant women in Vietnam.

Rather than focussing on specific "positive-deviance food" as is often the case in Save the Children's child-based projects, this proposal would focus primarily on behaviors. The study question here would be: How do some mothers give birth to healthy babies when other mothers do not? What are they doing in the prenatal stage that makes the difference? Additionally, rather than focussing exclusively on pregnant women themselves as agents of change, my proposal would target mothers-in-law and husbands. The positive deviance program is envisioned to operate in this way. The aim of this study is to determine which behaviors and practices result in a healthy newborn. The objective would be to promote healthy pregnancies and safe deliveries in order to decrease the incidence of low birthweight babies.

Following appropriate village level discussions and volunteer training, the first step would be the positive deviance inquiry. This inquiry would be conducted by a team of interviewers. This would be accomplished by carrying out baseline surveys, in project and control areas, to collect data on body mass index (BMI) of women early in pregnancy, pregnancy weight gain and birthweights and/or the weights of infants under one month of age. Data would also be collected on each of the behaviors discussed earlier, plus information on age, educational level, parity, and socio-economic status of the women. All pregnant women in the community would be weighed and women with low body mass index would be enrolled in the program. Questions on feeding and caring practices, health



care seeking behaviors and knowledge of safer motherhood practices would also be asked. Analysis of this data would permit a determination of those positive deviant behaviors associated with adequate pregnancy weight gain and adequate birthweight among low-income women but practiced less often among lower income pregnant women as a whole. This quantitative data collection would be coupled with focus group discussion and key informant interviews and direct observation in homes in an effort to identify inappropriate practices which are unlikely to emerge from the baseline survey itself.

and pregnancy weight gain are the outcomes of interest in this positive-deviance based intervention program.

Given the vital importance of prenatal care and micronutrient provision, steps would also be taken in advance to assure that local health care facilities are capable of providing good care and are fully stocked with micronutrient supplies.

Primiparous or first time mothers are an ideal focus of such activity because first time mothers are new to child rearing and are likely to be open towards new information. It is an

DYNAMIC MODEL OF THE PROGRAM

INPUTS	ASSUMPTIONS OF THE INPUTS	OUTPUTS	ASSUMPTIONS OF THE OUTPUTS	OUTCOMES (BEHAVIORIAL)	IMPACTS	BENEFITS
<ul style="list-style-type: none"> □ PD mothers □ Training of Staff and volunteers □ PD foods □ PD behaviors □ assistance of local health clinics to assure capacity for ante-natal care and supply of micronutrients □ Physical center for activities □ project monitoring system 	<ul style="list-style-type: none"> □ There are PD mothers and children □ Staff and volunteers understand concepts and are motivated to apply them □ Local departments of health and clinic staff are receptive to the approach and cooperative □ Pregnant mothers will complete the PEP 	<ul style="list-style-type: none"> □ Monthly BMI screening for pregnant and newly married women □ Monthly recording of pregnancy weight gain for women already registered with counseling □ Utilization of ante-natal care and complementary services; supply of micronutrients 	<ul style="list-style-type: none"> □ Periodic attendance of mothers-in-laws and fathers at project sessions □ Mothers, mothers-in-law and husbands understand messages and are motivated to change behavior □ Women do not substitute the project meal for food normally consumed at home 	<ul style="list-style-type: none"> □ Changes in practices relating to positive deviant behaviors □ Increase in total daily intake of calories and micronutrients □ Women form continuing mutual support network 	<ul style="list-style-type: none"> □ Improved birth weights □ Improved pregnancy weight gain □ Improved growth of offspring 	<ul style="list-style-type: none"> □ Decreased maternal and child morbidity □ Decreased maternal and child mortality □ Sustainability of behaviors-mothers will apply to their second pregnancy □ Increased productivity in next generation

The next step would be organizing daily counseling and food provision sessions for women with low BMI plus women who fail to gain 1 kg of weight from one monthly weighing to the next. The name IMPRESS is given to these daily sessions which stands for Improving Pregnancy through Education and Supplementation. These sessions will be lead by a Community Health Facilitator/Volunteer (CHF/V) selected from the local village and trained by the organization. The CHF/V would be a woman from the community -- a good role model. The meal itself made in part from ingredients contributed by participants and always in a form easily prepared in the home, would provide an incentive for mothers to attend the sessions and provide needed energy and micronutrients, hopefully increasing daily intakes. Mothers-in-law and husbands would be invited to a specified number of these sessions. Counseling focussing on positive-deviant behaviors, other key nutrition and health information and messages dealing with child care (including the importance of exclusive breastfeeding and the timely introduction of complementary foods) would be done both by local trained volunteers and by positive deviant mothers themselves. Incentives would be provided for the latter. Enrolled women would continue to attend these sessions until delivery. Also, follow up and monitoring of these women would continue after delivery. Birthweight

anticipated that they will be more likely to apply what they have learned during their first pregnancy in their subsequent pregnancies. In fact, given the importance of first pregnancies and pre-pregnancy nutritional status, the daily food provision and counseling sessions would be targeted to any newly married women with low BMI.

Finally this program would try to instill a strong sense of community among reproductive age women in the project area, and an ongoing sense of responsibility on the part of experienced and successful mothers to share their wisdom with younger mothers and those less successful. Even after conclusion of the project *per se*, a support network of reproductive age women might continue to share wisdom and offer encouragement thereby sustaining gains achieved in the project.

Monitoring and evaluation of the project can be carried out with reference to the project conceptual framework. The monitoring system would focus primarily on inputs and on outputs or service delivery. Project evaluation would compare the pre-post changes in behavior between the project and control areas, and ultimately the changes in impact indicators, specifically in pregnancy weight gain and birthweights between project and control areas. What would be

gained? There would be improvements in birthweight and growth in the offspring. There would also be a higher intake of food energy and increased weight gain during pregnancy. Mothers would be educated about healthy pregnancy behaviors and knowledge of safer motherhood practices would be enhanced. It is not just one baby that would be affected. Succeeding babies would also benefit. An entire generation could be affected. Because of this impact, benefits such as a decrease in maternal and child morbidity and mortality would result. In terms of impact, the analysis would be extended to examine the child growth during their first year of life. Here the positive deviance approach would be used as a preventive measure to prevent unfavorable developmental outcomes which so often accompany fetal malnutrition.

Conclusion

The nutrition strategy first articulated by UNICEF in 1990 states that "the shortcoming of most nutrition-oriented programs to date is not the lack of well-documented interventions... It is rather the failure of most programs to explore fully how existing local skills and resources should be mobilized and supported in concert with technical interventions, in order to create an environment and a support structure that is more conducive to improved nutrition."

The positive-deviance concept as it has been applied to children and as it hopefully will now be applied on a larger scale to pregnancy outcomes, represents a prime means of doing just that- of utilizing skills, wisdom and life management techniques and approaches which have proven successful in a local context.

There is reason to believe that, as with the interventions geared to children, a positive deviance-based pregnancy intervention would be effective and if effective and sustainable with low levels of follow-up message reinforcement. The results could provide major benefit both to these mothers and to their offspring, improving their health and, in some instances protecting their lives. The next step for us is to encourage programs that focus on women, especially females of reproductive age.

In closing, the main message is, "positive deviance is an approach that would be able to improve pregnancy outcomes and thus reduce low birthweight babies." It is an activity worthy of Dr Horwitz and one worthy of this institution. It is our turn to make the difference.

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Lucy Thairu, Graduate Student in International Nutrition, Cornell University, will present the Dr Abraham Horwitz Memorial Lecture during the SCN 28th Session in Nairobi, Kenya, on

Infant Feeding Options for Mothers with HIV: Using Women's Insights to Guide Policies



ACC/SCN Working Groups

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Prevention of Foetal and Infant Malnutrition

(Formerly: Life Cycle Consequences of Foetal and Infant Malnutrition)

The Working Group Chair summarized the growing evidence that from conception onwards nutritional factors affect future health. Folate and iodine deficiencies in early pregnancy and iron deficiency in infancy are well documented examples. Several important events over the past year have helped to clarify how to go about designing large-scale programmes. A meeting on the prevention of low birthweight held in Bangladesh in June 1999 concluded that prevention of low birthweight requires a package of interventions, including better nutrition, control of infectious disease, and a reduced physical workload for pregnant women. Further, the UNICEF Care Initiative can serve as a basis for developing an integrated programme. A technical consultation on low birthweight held in the USA in March 2000 was organized to develop a broad coalition of researchers, organizations and donors working together to move the low birthweight agenda forward. This consultation recognized that low birthweight needs to be addressed through interventions focusing on female adolescents and prepregnant women. A series of studies showing strong associations between low birthweight and stunting at one year of age and chronic disease in adult life (the Barker studies or foetal origins of disease hypothesis) are now being replicated and expanded in the US. The Working Group noted that there are contradictions in the interpretation of the Barker findings and possible mechanisms are poorly understood. Finally UNICEF presented their 11-country low birthweight pilot programme.

The Working Group will report on the following issues in 2001:

- ◇ Achievements of a secretariat to be established at the Institute for Child Health in London. The secretariat will collect, summarize and disseminate new knowledge concerning low birthweight prevention.
- ◇ Achievements of an IDECG Task Force to critically review the Barker hypothesis and make recommendations for replication studies.
- ◇ Guidelines to assist in the monitoring and evaluation of low birthweight prevention programmes.
- ◇ Guidelines for programmes to evaluate the efficacy and effectiveness of a multiple micronutrient supplement for use during pregnancy.
- ◇ Programmatic experience and communication strategies for promoting nutritional improvement and weight gain during pregnancy.

Micronutrients

This Working Group brought together a large body of work in three main areas: vitamin A and iodine deficiencies and iron deficiency anaemia. A consolidated report of activities in the vitamin A area covered current status of programming, coverage, the work of partners, and future actions and perspectives. The difficulty in arriving at a reliable estimate of vitamin A deficiency was discussed. Estimates ranging from 125 million (MI/UNICEF/Tulane) to 250 million (WHO) preschool children affected are currently published. A report on iron deficiency touched upon research and programming activities including evidence on the permanent cognitive impairment of young children who suffer from anaemia, new micronutrient supplements for young children and increased international support for wheat flour fortification with iron. Some constraints noted included the need for better data on iron status, assessment methods and research on the causal relationship between iron deficiency and health outcomes; and the importance of integrating interventions such as iron supplementation, food fortification and education for dietary change; and of linking these interventions to other public health and nutrition activities, i.e., reproductive health and nutrition, malaria control and integrated management of childhood illness. A consolidated report of the agencies' work in the area of IDD elimination through salt iodization including the Salt 2000 Conference was presented. Remaining challenges to IDD elimination include low coverage rates in parts of Eastern Europe and Sub-Saharan Africa and the process of sustaining universal salt iodization while phasing out external assistance to salt producers.

The Working Group agreed to report on the following five issues in 2001:

- ◇ Progress in advocating for new and expanded programmes to prevent and control iron deficiency anaemia; as well as progress in gathering evidence for the effectiveness of large scale programmes. On vitamin A, the Group will report back on efforts to produce reliable prevalence estimates. UNU offered to act as the secretariat for iron.
- ◇ Recommendations on improving public health approaches to iron deficiency, including dosage, supplement and enrichment mix formulation, and methods for preventing iron deficiency in children less than two years of age.
- ◇ Stronger consensus on methods to establish the efficacy, effectiveness and impact of food-based approaches, especially for prevention of vitamin A deficiency.

- ◇ Situation analysis and possible recommendations on HIV/AIDS in relation to micronutrient deficiency.
- ◇ The setting of micronutrient goals for the coming decade and the success of incorporating these goals into those being developed for the 2001 Special UN General Assembly on a Global Agenda for Children.

Breastfeeding and Complementary Feeding

With regards to a Technical Consultation on Infant and Young Child Feeding convened in March 2000 in Geneva, WHO summarized the objectives of the Consultation, presented the rationale for the development of a new strategy and explained the general organization of the Consultation. Nine programmatic themes were discussed in depth at the Consultation, including the impact of globalization on infant feeding and increasing rates of exclusive breastfeeding. Discussion focused on the need to ensure that the new strategy is *rights based*, and the need for WHO to further review evidence concerning the optimal duration of exclusive breastfeeding. WHO reported that it is currently undertaking a systematic review of all published scientific literature on this issue including infant growth patterns worldwide, nutritional adequacy of breastmilk, health, morbidity and mortality patterns. The results will be available in early 2001. IBFAN reported on the background and development of a training module on infant feeding for humanitarian aid workers. This is a collaborative project of WHO, UNICEF, LINKAGES and IBFAN. IBFAN noted that there are many inconsistencies and gaps in the knowledge of humanitarian aid workers on infant feeding, and consequent inappropriate practices, resulting in poor health outcomes among the most vulnerable age group. Concerning mother-to-child transmission of HIV/AIDS, participants noted that breastfeeding protection, promotion and support, has weakened as a result of concern over the transmission of HIV through breastfeeding. Current messages on infant feeding are perceived as conflicting. UNICEF stressed that there is difficulty in monitoring the growth and health of non-breastfed children in HIV prevalent countries.

The Working Group agreed to report on the following issues in 2001:

- ◇ The resolution of technical questions regarding the recommended duration of exclusive breastfeeding.
- ◇ In conjunction with the Working Group on Nutrition and Emergencies, the dissemination of pre-service and in-service training on infant feeding issues to all humanitarian aid workers using two modules, one on Key Issues and Recommendations, and another on Basic Technical Knowledge.
- ◇ The consistency of messages delivered through national programmes regarding the prevention of mother-to-child transmission of HIV.
- ◇ The effectiveness of programmes to support good

breastfeeding techniques and exclusive breastfeeding (to prevent mastitis and subclinical mastitis) to reduce mother-to-child transmission of HIV.

- ◇ The re-launch and promotion of the three WHO/UNICEF/UNAIDS documents on HIV and infant feeding, given the widespread misunderstanding of their recommendations.
- ◇ For those agencies and NGOs involved in the reporting process to the *Convention on the Rights of the Child* committee, ensuring that country reports address progress on the state of Code implementation and related activities.
- ◇ The strengthening of Code implementation, especially in countries with high HIV prevalence.
- ◇ The incorporation of infant feeding issues into the discussions of other SCN Working Groups.
- ◇ Progress on development of the global strategy on infant and young child feeding.

Nutrition in Emergencies

This Working Group considered three main topics: problems associated with identifying and treating malnourished adults in Burundi and Congo-Brazzaville, recent research on infant feeding in emergencies, and issues associated with infant malnutrition. A presentation on adult malnutrition demonstrated the difficulty of determining the admission criteria for entry into feeding programmes for adults, the problems of dealing with chronic diseases in feeding centers, and some of the behavioural and social differences which need to be taken into account in the design of programmes for severe adult malnutrition. A discussion of research on infant feeding in emergencies highlighted the lack of coordination, quality and monitoring of infant feeding interventions in the Republic of Macedonia during the Kosovo crisis. There is a need for harmonization and clarification of the responsibilities of UN agencies and others in this area. This would involve a review and clarification of the MOUs between UN agencies. A presentation on infant malnutrition included a discussion of the problems of assessment of infant malnutrition for population surveys as well as for clinical care. Breastfeeding in the context HIV/AIDS and emergencies was also reviewed.

The Working Group agreed to report on the following issues in 2001:

- ◇ Achievements in the support of, and advocacy for, interventions addressing adult malnutrition. This will include an update on recent research findings presented at the inter-agency meeting which needs wide dissemination.
- ◇ In concert with the Working Group on Breastfeeding and Complementary Feeding, develop guidelines for the training of humanitarian staff on infant feeding issues in emergencies.



- ◇ WHO should make their nutrition manuals available on their website for global, low cost dissemination.
- ◇ RNIS's expanded coverage for one year should include the nutritional situation of selected population groups of more than 100,000 people displaced by natural emergencies.
- ◇ Achievements of a secretariat for this Working Group, to be located at the Emergency Nutrition Network .

Nutrition, Ethics and Human Rights

Mainstreaming human rights in nutrition must be the aim of the SCN and this should eventually be reflected in the work of all its working groups. NGOs working with a rights-based approach need the SCN Working Group as a UN focal point that can support and assist them in giving visibility and legitimacy to their rights-based work with food and nutrition issues at country level. It was decided that the Working Group would continue for at least two more years to ensure that human rights principles will be interpreted and operationalized. The potential for this is high given the growing UN and civil society commitment to human rights in general, and with the interest expressed by the UN High Commissioner for Human Rights in pursuing collaboration with the SCN that started with last year's symposium. Various MOUs developed by UNHCHR and single agencies provide scope for direct collaboration on food and nutrition rights.

The past year has provided a set of new working tools with which such collaboration can now more effectively be put into place, including the *General Comment No. 12 on The Right to Adequate Food* by the UN Committee on Economic, Social and Cultural Rights. The coming two year period will be a period of particular challenges in consolidating the response by the High Commissioner for Human Rights to the mandate given to her by the World Food Summit: to clarify the content of the right to food and steps needed to implement it. The process ought to come to a close with the marking of WFS + 5 in November 2001. The SCN community must take advantage of that process and be an active partner in it by contributing with its professional expertise and commitment to ending hunger and malnutrition.

The Working Group agreed to report on the following issues in 2001:

- ◇ Preparation of a manual on the interpretation and use of *General Comment No. 12*.
- ◇ Development of benchmarks and indicators for food and nutrition rights programming and monitoring.
- ◇ Recommendations made at the 26th session, several of which have been partially or fully completed.

Household Food Security

Dr Namanga Ngongi presented reactions to the consolidated agency report. He noted that: (a) an enormous amount of work is currently ongoing in the household food security area; (b) research reports are becoming more operational in nature, for example work on women's status and its effect on child nutrition status; (c) the steady shift of poverty and malnutrition to urban areas is a growing concern; (d) there is a profusion of databases on food and nutrition security and a need to harmonize indicators across databases; (e) there is a large number of publications available and downloadable from various websites; and (f) partnerships are growing and playing an important role in the household food security area. FAO presented information on the state of food insecurity in the world showing progress in some areas and declines in others, mostly in Sub-Saharan Africa. A presentation by the World Bank showed that even unprecedented income growth would only get us half way towards the target of halving undernutrition rates by 2020. The critical role of direct nutrition programmes was highlighted. Implications for targeted poverty programmes, the impacts of redistribution of income, and the extent to which findings can be generalized, particularly in the household and community levels, were discussed.

The FIVIMS project was presented and three proposals were put to the Group: (1) that the FIVIMS inter-agency working group play a major role in supporting the SCN's efforts in disseminating information on food insecurity; (2) that FIVIMS works closely through UN reform processes such as UNDAF and CCA; (3) that FIVIMS forms the basis of a new SCN working group on information systems. A discussion followed on how FIVIMS could help countries to strengthen their information systems. A question was also posed as to the feasibility of improving FAO's method for estimating the numbers of food insecure people. Several examples provided from the floor of new programming initiatives in urban areas, included those from CARE, FAO, GTZ, and ADB. WHO presented its multicountry study, currently underway in six countries, aimed at examining factors that relate to household food and nutrition security in vulnerable population groups. The next segment focused on ways in which agriculture and other food-based approaches could enhance their impact on malnutrition. Plant breeding approaches to increasing the micronutrient density of staple grains were discussed.

The Working Group will select one or several of the following suggested topics for their report in 2001:

- ◇ A review of programme activity in food-based approaches to improving nutrition (including food aid supported interventions) and an assessment of their effectiveness.
- ◇ A review of the impact of HIV/AIDS on household food security.

- ◇ A review of the role of the public sector in generating biotechnology for low income consumers and producers.

Nutrition of School-Aged Children

This Working Group heard three presentations on: the latest research on nutritional status of the school-aged child and programme impacts, results of a survey of partners and donors in school-based nutrition interventions, and efforts at the Bank to harmonize policies on school health and nutrition. A number of documents had been distributed which included recent results relevant specifically to school feeding programmes. This indicated that targetting school feeding to all grades may be inefficient from a student retention point of view. Another article on the cost-benefit of school feeding vs improved learning materials showed that school feeding had no effect on dropouts, had little impact on test scores, and was expensive. Participants were divided in their support for "universal" school feeding programmes. Some argued that cash incentives to increase school attendance could be more cost effective and need rigorous evaluation. The International Center for Research on Women presented some of the results of multiple programmes they have implemented for adolescents, including nutrition, HIV/AIDS, reproductive health and adolescent livelihoods.

The Working Group agreed to report back at the 29th Session (2002) on one task. The World Bank, WFP and FAO will work together on this task:

An inventory of school feeding programmes will be made, with a special effort to collect impact evaluations and with explicit attention to community-based school feeding programmes. This will assist in *harmonizing* school feeding policies among agencies.



James Allen Olson, Distinguished Professor, Iowa State University, died unexpectedly on September 22, 2000, just eighteen days before his 76th birthday. He will be remembered worldwide as a respected biochemist whose work contributed immensely to knowledge of retinoid and carotenoid biochemistry and metabolism, which is documented in over 400 publications. Jim also will be remembered for his public health pursuits toward development of methods to identify deficient populations and control the preventable health consequences of vitamin A deficiency. He was a teacher who guided over 90 graduate students, a gracious mentor to many international colleagues, and a sought-after speaker for his lucid, insightful and balanced presentations. His critical evaluations, expressed with respect for those with differing views, provided balance on controversial issues based on good science. An international symposium, "Functions and Actions of Retinoids and Carotenoids: Building on the Visions of James Allen Olson" will be held 21-24 June 2001 in Ames, Iowa, USA. More information is available by contacting the Symposium Committee, Department of Biochemistry, Biophysics and Molecular Biology, Iowa State University, Ames, Iowa, or on their website: <http://molebio.iastate.edu/~gfst/oslonsymp.html>

Barbara A Underwood, Scholar-in-Residence, Food and Nutrition Board, President, International Union of Nutritional Sciences (IUNS), Institute of Medicine, NAS, USA

The next issue of *SCN News* (#22) will provide a summary of the ACC/SCN 28th Session which will take place in Nairobi, Kenya 2-6 April 2001

—an outline of the programme can be found on page 49
—registration details are available from the SCN Secretariat by Email: accscn@who.int or on our website: <http://acc.unsystem.org/scn/>



The ACC/SCN 28th Session

will take place in Nairobi, Kenya

Monday 2 through Friday 6 April 2001

hosted by the World Food Programme

Registration details and agendas are available on the SCN website: <http://acc.unsystem.org/scn/>

Joint working sessions of UN Agencies, Bilaterals and NGOs will take place on Monday 2 and Friday 6 April — ideas for the Fifth Report on the World Nutrition Situation, amongst other items, will be discussed. A public Symposium on Nutrition and HIV/AIDS* will take place on Tuesday 3 April. Meetings of the ACC/SCN Working Groups on Capacity Strengthening for Food and Nutrition; Micronutrients; Nutrition, Ethics and Human Rights; Breastfeeding and Complementary Feeding; Nutrition in Emergencies; the Prevention of Foetal and Infant Malnutrition; and Household Food Security, will be held on Wednesday 4 and Thursday 5 April. Working Group meetings are open to all interested persons.

*Symposium participants will be welcomed by Dr Sam Ogeri, Minister for Public Health, Kenya. Dr Peter Piot, Executive Director UNAIDS, will provide a keynote address on The magnitude of the HIV/AIDS epidemic in Africa and current challenges. Dr Oliver Saasa, Head Institute of Economic and Social Research, Zambia will discuss Nutrition, HIV/AIDS and development; Dr Stuart Gillespie, IFPRI, Washington DC, will discuss Weathering the storm — the impact of HIV/AIDS on livelihoods, food security and Nutrition and Dr P K Dlamini, Minister for Health and Social Welfare, Swaziland, will discuss Nutrition and the Care Package . A panel discussion on implications for programmes will follow — and should promote lively discussion. The panel will comprise: Mrs Sofia Mukasa Monico, Director of The AIDS Support Organization (TASO), Uganda; Dr Ruth Nduati, Department of Paediatrics, Kenyatta National Hospital, Kenya and Dr Margaret Gachara, Kenya National AIDS Control Council. Ms Lucy Thairu, Graduate Student in International Nutrition, Cornell University, will present the Dr Abraham Horwitz Memorial Lecture: Infant Feeding Options for Mothers with HIV: Using women's insights to guide policies. A two-hour concluding session of the Symposium will be held on Wednesday 4 April, during which Dr Badara Samb, Chair of the ACC/SCN Working Group on Nutrition and HIV/AIDS will provide a synthesis of conclusions and next steps.

Programme news

Agencies report on their activities in Nutrition

Interagency

WHO, UNESCO, UNICEF, the World Bank and Education International: Partners in Taking a *FRESH* Start to School Health

For health to be put high on the agenda of education reform and given the priority attention it deserves, policy-makers, community leaders, teachers, parents and students will need to be convinced that health contributes to the overall goals and purposes of *the education sector*.

In April, 2000, Education International, WHO, UNESCO, UNICEF, and the World Bank jointly organized a strategy session at the World Education Forum in Dakar, Senegal. The strategy session was aimed at raising the education sector's awareness of the value of implementing an effective school health, hygiene and nutrition programme as one of its major strategies to achieve education for all.

This interagency initiative has identified a core group of activities, each already recommended by the participating agencies, that captures the best practices from programme experiences. Focusing initially on these activities will allow concerted action by the participating agencies, and will ensure consistent advice to country programmes and projects. Because of the focused and collaborative nature of this approach, it will increase the number of countries able to implement school health components of child-friendly school reforms, and help ensure that these programmes go to scale. The focused actions are seen as a starting point to which other interventions may be added as appropriate.

An effective school health, hygiene and nutrition programme offers many benefits:

- ◇ responds to a new need
- ◇ increases the efficacy of other investments in child development
- ◇ ensures better educational outcomes
- ◇ achieves greater social equity
- ◇ is highly cost effective.

Basic components of a school health programme should be made available *together*, in all schools. These would include:

- ◇ health related school policies
- ◇ provision of safe water and sanitation — the essential first steps towards a healthy physical, learning environment
- ◇ skills based health education
- ◇ school-based health and nutrition services.

Finally, the programme provides concise and sound reasons to foster effective partnerships between:

- ◇ education and health sectors
- ◇ teachers and health workers
- ◇ schools and community groups
- ◇ pupils and persons responsible for school health programmes.

Contact: Don Bundy, Principal Specialist in School Health, Human Development Network, The World Bank, 1818 H Street NW, Washington DC 20433, USA Fax:202-522-3233 EMail: dbundy@worldbank.org Web: <http://www.worldbank.org/> or Anna Maria Hoffman, Programme Specialist, UNESCO, place de Fontenoy, F 75352 Paris 07 SP, France. EMail: am.barthes@unesco.org Web: <http://www.unesco.org/>

Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS)

FIVIMS is an inter-agency effort — by UN agencies, bilateral donors, selected NGOs and research organizations — to promote better information systems on food insecurity and poverty at country level. Formed in 1997 in response to a commitment in the World Food Summit Plan of Action, the technical secretariat for FIVIMS is at FAO.

FIVIMS objectives are highly compatible with the SCN's three areas of strategic action, as described in the SCN Strategic Plan:

- ◇ **Harmonised policies and programmes:** In September, FIVIMS agreed with the UN Development Group Programme Network to begin integrating country-level FIVIMS work into the UN's Development Assistance Framework/Common Country Assessment (CCA) process on a pilot basis. National FIVIMS would contribute to the monitoring and evaluation databases that are needed to m-

prove the CCA activity over time. In addition, FIVIMS has committed to providing guidance on information systems best practices.

- ◇ **Review of UN system response to malnutrition:** FIVIMS country-level work will illustrate how sub-national data can be used in improved targeting of resources (food aid, nutritional interventions, other safety net programmes, poverty reduction programmes) to achieve the objectives in reduction of food insecurity and poverty to which all agencies are committed.
- ◇ **Advocacy and mobilization:** FIVIMS work, at country and global levels, helps maintain public attention focused on the progress made in meeting summit targets such as reducing the number of undernourished persons. As an example, FAO, as a contribution to FIVIMS, recently released the second issue of the *State of Food Insecurity in the World, 2000* (see p 70).

The operational capabilities of the FIVIMS Secretariat have recently been strengthened through the start-up of two new trust fund projects. One is financed by the European Commission and will do initial FIVIMS work in eight countries in the Caribbean, Africa, and Pacific regions. The second project, funded by Norway, is focused on doing poverty mapping in a FIVIMS context and involves collaboration among FAO, United Nations Environmental Program — Global Resource International Database, and the Geographic Information Systems consortium of the CGIAR (Consultative Group on International Agricultural Research). Work on FIVIMS is also being undertaken in approximately ten technical divisions of FAO.

Contact: David Wilcock, Director, IAWG, FIVIMS Secretariat. For more information on FIVIMS, consult the IAWG FIVIMS website: www.fivims.net ; or send an EMail to the IAWG FIVIMS Secretariat at: FIVIMS-Secretariat@fao.org. If you would like to be on the EMail list to receive the FIVIMS quarterly Newsletter, send an EMail to FAO's Mail server (mailserv@mailserv.fao.org). Leave the subject line blank and put in the first line of the message the following: SUBSCRIBE FIVIMS-L You will then receive a confirming welcome message in reply.

FAO

Improvement of School and Family Nutrition Through Integrated Agro-forestry Systems

In Panama, a two-year project aimed at improving school and family nutrition through an integrated agro-forestry system was recently completed. The project demonstrated how involving students, teachers, parents and field workers can significantly improve food availability and nutrition at the community level on a sustainable basis. The project was implemented in collaboration with the Government of Panama, with the participation of regional and local staff from five ministries and the First Lady's Office. The project had the technical support of many FAO divisions and services and was coordinated by the Food and Nutrition Division.

As a first step in implementing the project, a participatory rural appraisal (PRA) was carried out, involving the community and technical staff to assess the food and nutrition situation and needs of the 13 Integrated Demonstrative Units (IDU) located in the selected communities. The PRA was followed by participatory planning exercises.

A key element in the success of the project was the training of government field workers, teachers, parents and students themselves. To ensure the application of

appropriate technology and improved utilization of the local resources, an extensive training programme was carried out for government field workers at the national level. The training activities were replicated with students, teachers and parents who received training through a series of workshops, illustrated talks, field days and demonstrations in the pilot villages.

Over 300 families participated in the educational and production activities. The project contributed significantly to strengthening the organization and integration of some of the participating communities. The IDUs in the 13 pilot communities carried out a variety of very successful production activities. A wide selection of fruits and vegetables were grown on the school grounds or in nearby plots. There were activities to promote small animal production, agro-forestry and worm raising as well. Environmentally friendly and sustainable techniques were also promoted by the project. Overall, the project helped to improve the food security situation in the 13 pilot villages and expansion of the approach to other low income communities throughout rural Panama is expected.

Latin American and African Versions of FAO's Home Gardening Training Package

Food security has been defined by FAO and WHO as "access by all people at all times to the food needed for

a healthy life". Access to a nutritionally adequate and safe diet at all times is one of the most basic rights of every individual, yet for a significant number of households, it remains difficult to achieve. If, however, households have some land and labour, and are able to complement these with seeds, improved tools and the appropriate information, they can further develop their land and obtain more nutritious foods. In many humid and sub-humid areas of Asia, Africa, and Latin America people often cultivate compound farms or home gardens, sometimes referred to as backyard or kitchen gardens. Home gardens have an established tradition and are an important source of household food supplies. They can supplement food needs during the lean seasons and generate income. When a home garden is well-managed, even a small plot of land (e.g. 30 to 40 m²) can make a substantial contribution to household food needs and nutritional wellbeing.

In 1995, FAO published a training package for preparing field workers in Southeast Asia. This training package was designed for agricultural extension agents as well as other field workers who are involved with nutrition, home economics, health and community development. It aimed to strengthen their ability to promote home gardening as a step toward enhanced food security and better community and household nutrition.

At the request of nutritionists and agriculture professionals in Africa and Latin America, the Food and Nutrition Division has created three new versions of this successful training manual. The Latin American version of the material "*Mejorando la nutrición a través de huertos y granjas familiares. Manual de capacitación para trabajadores de campo en América Latina y el Caribe*" is completed and under distribution. It includes animal and vegetable production. FAO is supporting the implementation of national and regional training workshops utilising this manual in Central American countries (El Salvador, Honduras and Nicaragua) addressing professionals and field workers from different fields and public and private sectors. Versions for Africa will be published in English shortly and French next year. While these versions retain the general outline and the easy-to-follow training approach of the Southeast Asia version, they have been fully revised to include the eating patterns and agro-ecological, climatic and sociocultural conditions found in rural and periurban Africa and in Latin America.

FAO, 2000. Mejorando la nutrición a través de huertos y granjas familiares. Manual de capacitación para trabajadores de campo en América Latina y el Caribe. FAO (forthcoming in English and French). Improving nutrition through home gardening: a training package for preparing field workers in Africa. Contact: Luciana Ciaffi, Office of Director, Food and Nutrition Division, FAO. Web: [http://www.fao.org/es/](http://www.fao.org/es/esn/)

HKI

Helen Keller International

The fifth meeting of Nutrition Focal Points of the Economic Community of West African States (ECOWAS) was held in Bamako September 25-29, 2000. The meeting included over 100 participants and was opened by the Minister of Health from Mali. A delegation from the conference held an audience with the Prime Minister of Mali to discuss the importance of nutrition in the development of the region, and the future of the focal points network. The *Organisation de Coordination et de Coopération pour la Lutte Contre les Grandes Endémies* (the regional health organization for francophone West Africa) which has organized the meetings to date, was dissolved in December, 2000 to make way for the new West African Health Organization, under the auspices of ECOWAS. As Mali currently holds the position of president of the OCCGE and president of the ECOWAS, the meeting was very timely and the Prime Minister ensured the delegation of Mali's commitment to improving nutrition in Mali and the region. The meeting included a one-day technical update on breastfeeding, a review of country programs, stands set up by countries and partners, identification of technical themes for the next meeting, recommendations for strengthening the network regionally and in-country, and development of recommendations to be implemented in the coming year. The evaluation showed a strong level of satisfaction among the participants. This effort is supported by a number of partners including several USAID-funded projects (MOST, BASICS II, SARA, SANA and LINKAGES), UNICEF, WHO, and Helen Keller International. The next meeting will be held in Ghana in September 2001.

In preparation for the Nutrition Focal Points meeting, the LINKAGES project collaborated with MOST and Helen Keller International to produce an issue of their "Facts for Feeding" series entitled *Breastmilk: A Critical Source of Vitamin A for Infants and Young Children*. The document is available in French and English, and copies have been sent to all field offices.

In Niger, a survey to evaluate health workers' training needs in nutrition was carried out in the three districts of Diffa. As well, at the horticultural and nutritional site of Gabougoura, 15 varieties of vitamin A rich sweet potatoes are being evaluated for palatability. Both of these projects are funded by the Danish Cooperation.

In Mali, The Ministry of Health and the Regional Directorate supported a suggestion to organize Regional Micronutrient Days in the four circles of the Koulikoro Region not covered last June. This took place in November in conjunction with the second round of the National Immunization Days (NIDs). As a door-to-door strategy was used, Helen Keller expects a better coverage for iron/

folate than the 56% obtained during the first days in June, where the distribution was done from fixed posts. Better compliance is also expected than the 69% achieved the first time. Iron tablets have been supplied, and the costs will be supported by the Micronutrient Initiative (MI).

In Burkina Faso, HKI participated again this year as a member of the National Organizing Committee in the preparations for the year 2000 NIDs. Vitamin A capsule distribution was included in the first round of NIDs that took place in October with a door-to-door strategy. This activity is funded by the MI.

In Mozambique, Mr. Jose Caetano joined HKI as the Provincial Coordinator to oversee the MI-funded activities in Manica Province. Mr. Caetano has just returned to Mozambique after having lived in Europe and the United States for the past 25 years.

Preliminary data from the July distribution of vitamin A in Mozambique has been released by the Ministry of Health indicating a coverage rate of 78%. This distribution was done through a fixed-post campaign that lasted for four weeks.

The Mozambique office will receive an additional \$200,000 for the Life Cycle cooperative agreement from the global bureau of USAID. These funds will allow HKI/Mozambique to provide technical nutrition support to the new bilateral child survival/maternal health project managed by John Snow, Incorporated.

In Cameroon, during September 2000, the National Survey on Vitamin A Deficiency and Anemia continued training of data collectors and sensitization of selected communities. Funding for this survey comes primarily from UNICEF, Task Force SIGHT and LIFE and the WHO. Technical assistance is being provided by HKI and *Centre Pasteur*, Cameroon.

In Morocco, activities of the USAID MOST Project continued. Two local consultants are looking at issues concerning fortification of wheat flour with iron and folate. The report on the qualitative survey on micronutrients carried out in Agdz has been finalized.

In Guinea, field work for the National Iron Deficiency Anemia Survey (*Enquête Nationale sur l'Anémie Ferriprive en Guinée*) began in September. Six teams left for 40 days of field work to conduct the survey. Unfortunately, problems occurred in the areas bordering Liberia and Sierra Leone. The team covering the Forest Region is having serious problems in conducting the survey. Other teams have been obliged to replace certain clusters too close to the border for security reasons. A supervisory mission from the central level took place, and five

out of six teams have been visited. They are all progressing according to schedule. Radio announcements in French and local languages were aired for three weeks on national and rural radio. The survey is funded by USAID with additional support from the WHO, UNICEF and the World Bank.

During the first round of NIDs in Guinea, vitamin A capsules (provided by UNICEF) were distributed to children 6-59 months of age. HKI has produced 1,500 T-shirts carrying the NIDs logo and a vitamin A message on the back. A vitamin A radio programme was prepared to be aired on national radio. Support for NIDs is funded by USAID.

Eight abstracts were submitted by HKI with partners based on HKI work in Africa for the meeting of the International Nutritional Anemia Consultative Group which will be held in Vietnam in February 2001. The titles of abstracts with the name and EMail of the contact person are:

- ◇ National baseline survey on iron deficiency anemia in Guinea: A comprehensive study of children, adolescents and adults. Lina Mahy. hkigui@eti.net.gn
- ◇ Distributing iron through a campaign approach: The experience in Mali. Mohamed Ag Bendeck. mab.hki@spider.toolnet.org
- ◇ Increasing demand for iron/folate in peri-urban Mali. Mohamed Ag Bendeck. mab.hki@spider.toolnet.org
- ◇ Community-based distribution of iron/folate in Niger. Hamani Harouna. hkiniger@intnet.ne
- ◇ Improving iron supplementation in a child survival program in Niger. Ferdows Brah. hkiniger@intnet.ne
- ◇ Assessing quality of iron/folate services provided by health workers in Niger. Hamani Harouna. hkiniger@intnet.ne
- ◇ Cameroon national survey on anemia. Nancy J. Haselow. hki-cam@camnet.cm
- ◇ Flour fortification with iron in Morocco: A preventive strategy toward iron deficiency control. Houda Bel Hadj. Hdelhadj@cms.org.ma

*A copy of the workshop report can be obtained from Mohamed Ag Bendeck, Regional Nutrition Advisor, Email: mab.hki@spider.toolnet.org HKI's support for this effort is provided by USAID and the Micronutrient Initiative. Additional copies of *Breastmilk: A Critical Source of Vitamin A for Infants and Young Children* are available from the Niamey office by contacting Harouna Koché, Information Manager Email: hkiniger@intnet.ne The Mozambique office is currently preparing the Portuguese version.*

IFPRI

International Food Policy Research Institute

IFPRI Evaluates Mexico's Largest Rural Poverty, Health and Nutrition Intervention

In early 1998, IFPRI was asked to assist the Government of Mexico in the evaluation of its largest rural anti-poverty program. In 2000, The National Program of Education, Health and Nutrition (PROGRESA) was directing support to 2.6 million families in extreme poverty, or almost 40% of all rural families in Mexico. IFPRI's task was to assist the government of Mexico in determining whether PROGRESA had an impact on the rural poor.

After 18 months of fieldwork and analysis, the findings of IFPRI's evaluation are now emerging. After just three years, the poor children of Mexico in the rural areas where PROGRESA is currently operating are more likely to enroll in school, are eating more diversified diets and getting more frequent health care. The evaluation findings suggest that PROGRESA's combination of education, health, and nutrition interventions into one integrated package can be an effective means of breaking the intergenerational transmission of poverty.

In the area of health and nutrition, PROGRESA brings basic attention to health issues and promotes health care through free preventative interventions, such as education on hygiene and health, immunizations, and growth monitoring. Nutrition promotion includes the distribution of nutritional supplements, education in breastfeeding and complementary feeding and cash transfers for the purchase of food. Receipt of monetary transfers and nutritional supplements are tied to mandatory health care visits to public clinics. The program targets its benefits to children under five, and pregnant and lactating women.

What is perhaps most innovative about PROGRESA — a feature that has captured the attention of development practitioners throughout the world — is the critical mechanism PROGRESA has used to deliver its resources. PROGRESA gives money exclusively to mothers. Mexico has taken the lead in implementing an anti-poverty intervention that recognizes that mothers effectively and efficiently use resources in a manner that reflects the immediate needs of the family.

Some of the findings:

- ◇ Improved livelihood security for the poor depends on improving early childhood health care. Frequency and duration of illness have

profound effects on the development and productivity of populations. The IFPRI analysis indicates that improved nutrition and preventative health care in PROGRESA areas have made younger children more robust against illness.

- ◇ PROGRESA increased the number of first visits to the health clinics in the first trimester of pregnancy by about 8%. This shift to early pre-natal care significantly reduced the number of first visits in the second and third trimester of pregnancy. This positive change in behavior could lead to a significant improvement in the health of babies and pregnant mothers.
- ◇ The results of the evaluation show that median food expenditures were 13% higher in PROGRESA households when compared with control households. This increase was driven largely by higher expenditures on fruit, vegetables, meats and animal products — foods particularly dense in essential micronutrients. Median energy intake had also risen by 10.6%.
- ◇ The nutrition of preschool children is of considerable importance not only because of concern over their immediate welfare, but also because their nutrition in the formative stages of life is widely perceived to have a substantial and persistent impact on their physical and mental development and on their health status and productivity as adults. In 1998, survey results indicated that 44% of 12-36 month old children in PROGRESA regions were stunted. Data suggest that PROGRESA has had a significant impact on increasing child growth and has reduced child stunting; increasing by 16% the mean growth rate per year (corresponding to 1 cm) for children who received treatment in the critical 12-36 month age range.

PROGRESA is still in its early stages. Many of the impacts of the program are likely to manifest themselves in the future. Clearly, the simultaneous intervention in the health and nutrition of underfives from poor households today will positively reinforce school attendance, performance and attainment of children tomorrow. Thus, in addition to the benefits measured after three

years of operation, it is likely that PROGRESA will have additional benefits in future years.

Contact Emmanuel Skoufias EMail: e.skoufias@cgjar.org

An Operational Evaluation of the Government-sponsored Community Day Care Program in Guatemala

IFPRI has been collaborating with the government sponsored community day care program *Programa de Hogares Comunitarios* (HCP) in Guatemala since 1998. The program, which is under the Ministry of Social Works of the First Lady, provides care, food and early child stimulation to almost 10,000 preschoolers throughout the country.

IFPRI carried out an operations and impact evaluation of the program, and established a partnership with IN-CAP (Instituto de Nutrición de Centro-América y Panamá) to provide training and technical assistance in the areas of child feeding and nutrition. Key findings from the operations evaluation are presented here.

The evaluation focused on the urban slums of Guatemala City, which host approximately 25% of all the *hogares* in the country. The main reason for the urban focus is that women who live in marginalized urban areas are under increased pressure to work outside their homes in income-generating activities, and thus the scarcity of childcare alternatives can be a severe constraint to the household's livelihood, food and nutrition security. The HCP has great potential to alleviate some of these constraints and the evaluation sought to explore this potential.

Program background

The HCP was created in 1991 as a non-traditional child care alternative whereby a group of parents select a woman from the neighborhood and designate her as the *madre cuidadora* (care provider). Her task is to receive and care for up to ten children in her home, from Monday to Friday, from 6am to 6pm. During their stay in the *hogar*, the children receive care and affection, hygiene, early child stimulation, and food (two meals and two snacks).

In addition to providing initial training for the *madres cuidadoras*, the program provides furniture and supplies for ten children, and cooking equipment. On a monthly basis the program gives approximately \$1 per child per day to the *madre cuidadora* for purchasing food, gas and educational material. The program also gives her an incentive of \$3 per child per month, which

is complemented by a \$5 per child contribution from the parents.

Key findings of Operations Evaluation

Design and Operations

- ◇ The program is generally well designed, and responds to a great need for alternative child-care in the urban slums of Guatemala City. Overall the program is operating quite effectively, although delays in payments occur at times.
- ◇ The main constraint to operations is the lack of co-operation from parents, not only in helping out in the *hogares*, but also in complying with their required payments and monthly contributions to the *hogar*.
- ◇ Management of the *hogar* is usually a family enterprise. Various family members are actively involved in helping with domestic chores and with playing and taking care of the children, without remuneration. Clearly, *madres cuidadoras* would not be able to run their *hogar* without help from family members.
- ◇ *Madres cuidadoras* and their helpers are generally affectionate, caring and attentive to children's needs. Quality of care varies, however. Thirty-three percent of *madres* were observed yelling at children and 13% were observed hitting children. These unacceptable behaviors occurred in the presence of field workers, and are likely to be worse in the absence of visitors.
- ◇ *Madres cuidadoras* have extremely busy days, spending a large proportion of their time in food preparation, child feeding and child care, with very little time left for educational activities.

Attitudes and perceptions of the main implementers and users of the program:

- ◇ *Madres cuidadoras* are generally very positive about the program, they enjoy their work and perceive a great benefit from being able to work while taking care of their own children. They deplore the low level of participation of beneficiary parents. Their other concern is the high expectations from the program that they carry out psycho-pedagogical activities for which they do not feel adequately trained, motivated or remunerated.
- ◇ Beneficiary parents are extremely positive about the program, they are very appreciative of the *madres cuidadoras's* excellent work,

and are grateful to the program for its assistance. They suggest that the program should operate on Saturdays (when most of them work), and they also recommend a change in the program norms which restricts the number of young infants to one per *hogar* (because of the high children/caregiver ratio).

Conclusions

Our evaluation found that the HCP is a carefully designed and well implemented program that is much appreciated by both its users and its implementers. Our main recommendations to strengthen the program are: 1) to develop specific activities to promote greater participation of parents and communities; 2) to consider hiring specially trained staff to carry out the psychopedagogical activities instead of over-burdening the *madres cuidadoras*; 3) to include a health component in the package of interventions; and 4) to strengthen the training and re-training of *madres cuidadoras* to ensure high quality services. These areas should be prioritized in order to maximize the program's effectiveness, impact and long-term sustainability.

Contact: Marie Ruel at IFPRI EMail: m.ruel@cgjar.org

INACG

International Nutritional Anemia Consultative Group

The International Nutritional Anemia Consultative Group (INACG) is being guided by a newly appointed Steering Committee. The members are: Lena Davidson, Swiss Federal Institute of Technology Zurich, who is the chair; Suniti Acharya, WHO South East Asian Regional Office; John Beard, The Pennsylvania State University; Eva Hertrampf, Universidad de Chile; Marion Jacobs, University of Cape Town; Sean Lynch, Eastern Virginia Medical School; and Rebecca Stoltzfus, Johns Hopkins School of Public Health. Frances Davidson, Office of Health and Nutrition, U.S. Agency for International Development, serves as the Secretary of INACG.

The Belmont Conference on "Iron Deficiency Anemia: Reexamining the Nature and Magnitude of the Public Health Problem" was cosponsored by INACG in May 2000 with the World Health Organization and the Edna McConnell Clark Foundation. The proceedings of the conference held in Belmont, Maryland have been submitted to the *Journal of Nutrition* for publication.

A Study of Factors Influencing Operational Issues for Iron Supplements for Infants and Young Children, ed-

ited by Dr Alizon Draper and Dr Penelope Nestel, was recently published by ILSI Press for the Micronutrient Global Leadership project. The publication describes the results of studies carried out in four countries: Ghana, Nepal, Peru, and Sri Lanka, designed to explore behavioral and sociocultural factors that may influence the acceptability and use of iron-containing supplements for infants and young children aged below five years.

The publication is available free to developing countries and for US \$3.50 to industrialized countries. Orders may be placed by sending an EMail to hni@ilsil.org or by sending a facsimile to 202-659-3617

IVACG

IVACG to Celebrate Silver Anniversary in Hanoi

The International Vitamin A Consultative Group (IVACG) will celebrate its 25th Anniversary in Hanoi, Vietnam on 12-15 February 2001. The meeting theme is "25 Years of Progress in Controlling Vitamin A Deficiency: Looking to the Future". The meeting sessions will focus on the current state of knowledge surrounding vitamin A deficiency and successful strategies for controlling this public health problem.

The meeting is being organized jointly by the IVACG Secretariat, based at the ILSI Research Foundation, and the Local Organizing Committee of the Vietnamese Ministry of Health, chaired by Dr Tran Chi Liem. Primary support for the meeting is coming from the Micronutrient Global Leadership project of the Office of Health and Nutrition, Bureau for Global Programs, Field Support and Research, U.S. Agency for International Development. Assistance is also coming from the Task Force SIGHT and LIFE of F. Hoffmann-La Roche Ltd. and numerous other organizations.

A series of recommendations, generated by a meeting of experts held in Annecy, France in late October 2000, will be offered for discussion. These will form the basis of future action steps aimed at meeting the goals of the World Summit for Children. In addition, 140 poster presentations on a variety of vitamin A related issues will be available for viewing.

New IVACG Publications

Three new publications are available from the IVACG Secretariat. These are:

- ◇ IVACG Task Force report on Combining Vitamin A Distribution with EPI Contacts
- ◇ IVACG Statement on the Status of the Studies on

Vitamin A and Human Immunodeficiency Virus Infection

- ◇ IVACG Statement on Delivery of Vitamin A Supplements with DPT/Polio and Measles Immunization

For additional information about the XX IVACG Meeting, please visit the IVACG website at: www.ilsa.org/ivacginv.pdf. Copies are available free to developing countries and for US\$3.50 to developed countries. Copies can be requested by EMail at hni@ilsa.org or by facsimile at +202 659 3617.

IZiNCG

The International Zinc Nutrition Consultative Group

The International Zinc Nutrition Consultative Group (IZiNCG) was officially launched at the first Steering Committee meeting held in Stockholm, Sweden, coinciding with the international conference on *Zinc and Human Health* (June 12-14, 2000). IZiNCG has been established to promote improved zinc nutrition in vulnerable populations, primarily in low-income countries, and to provide related technical assistance to governments and international agencies. The group is under the administrative support of the UNU Food and Nutrition Program, IUNS, and the International Nutrition Foundation (INF). The IZiNCG steering committee is comprised of eight members with expertise in human zinc nutrition and metabolism, nutritional epidemiology, and public health nutrition programs. The committee is chaired by Ken Brown, Director of the Program in International Nutrition at the University of California, Davis and is co-chaired by Juan Rivera, of the National Institute of Public Health, Mexico.

Convening this international group to lead efforts in reducing zinc deficiency globally is timely. This was highlighted during the closing session of the Stockholm conference. The conference, sponsored by the International Zinc Association, was attended by 135 participants from 37 countries including nutrition researchers, public health policymakers, and industry representatives. Papers given at the conference collectively illustrated the far-reaching effects of zinc deficiency on human health, with infants, young children, and pregnant and lactating women being among the most vulnerable. The adverse health consequences of zinc deficiency include childhood growth retardation, impaired immune function, increased rates of infections such as diarrhoea and pneumonia and subsequent increases in mortality rates, and adverse outcomes of pregnancy. New information on zinc in the global food supply compiled from FAO national food balance data was also presented, suggesting that 48% of the world's popula-

tion may be at risk of inadequate zinc intakes. Strategies to alleviate zinc deficiency were also discussed, including dietary diversification, food fortification, and supplementation.

The closing session of the Stockholm conference heard several agency representatives acknowledge zinc deficiency as a major public health concern and give support for the development of programs to address the problem. The need to integrate zinc into existing micronutrient and other public health programmes was stressed in order to address problems of nutrient deficiencies more efficiently.

At the first meeting of the IZiNCG Steering Committee, three major categories of activities for the first year of operation were identified that would serve the group's goals:

- ◇ *Advocacy:* An important first step is to raise awareness among public health programmers and policy makers of the problems and magnitude of zinc deficiency. Thus, first year efforts will include communications with international agencies, governments, and other institutions with interests in public health and nutrition programs. Advocacy efforts will also be directed towards the collection and compilation of national level data on dietary zinc intakes, zinc and phytate content of local foods, and data on biochemical indicators of zinc status.
- ◇ *Education:* Educational materials including up-to-date information on zinc in human health and nutrition will be compiled and disseminated. Production of a technical document is currently underway that will include information on methods of assessing zinc status in individuals and populations and options and considerations for zinc nutrition interventions. The document is expected to serve both as an important advocacy tool and educational resource.
- ◇ *Coordination with other micronutrient programs:* The second IZiNCG steering committee meeting is scheduled in conjunction with the IVACG conference and INACG symposium in Hanoi, Vietnam, February 12-15, 2001. This will mark the beginning of formal discussions with other micronutrient consultative groups and others with interests in coordinated micronutrient programs.

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LINKAGES

The USAID-funded LINKAGES Project organized a one-day technical update on "Breastfeeding: Issues and Challenges in the New Millennium" for the Fifth Meeting of West Africa Nutrition Focal Points. More than 100 nutrition policy makers and programmers from 16 West African countries attended the meeting, held in Bamako from September 25-29, 2000. Presentations were made on optimal breastfeeding practices, HIV and infant feeding, breastfeeding and vitamin A, the economic value of breastmilk, and the *Code of Marketing of Breastmilk Substitutes* in West Africa. LINKAGES funded the rapid assessment by CRAN (Regional Center for Food and Nutrition) and IBFAN (International Baby Feeding Action Network) of nine West African countries' experiences with policy, legislation, and enforcement of the *Code*.

Each participant at the Bamako meeting received a packet with 15 recommended readings. Included in the packet were LINKAGES' most recent publications: *FAQ on Breastfeeding and Maternal Nutrition*; *FAQ on The Lactational Amenorrhea Method*; *Facts for Feeding on Breastmilk and Vitamin A*; and a computer-based slide presentation on *Maternal Nutrition: Issues and Interventions*.

LINKAGES supports other program activities in West Africa. In Ghana, LINKAGES works with the Ministry of Health, UNICEF, Catholic Relief Services, and the Ghana Red Cross to strengthen their capacity to promote exclusive breastfeeding and appropriate complementary feeding practices through a community-based, results-oriented behavior change approach. Nutrition policy analysis and advocacy at the national and regional levels is a key component of the Ghana program. In Togo and Burkina Faso, LINKAGES conducted two-week nutrition policy analysis and advocacy workshops for nutrition and health professionals from various ministries, universities, and NGOs. LINKAGES also works with two NGOs in Togo and the Ministry of Health in Burkina Faso to incorporate the promotion of exclusive breastfeeding into a community-based distribution system.

Copies of the presentations are available from LINKAGES. The publications, available in English, French, and Spanish, can be viewed on the website www.linkagesproject.org and ordered at linkages@aed.org. Also available is a new training module for health and family planning service providers on LAM: A Postpartum Temporary Contraceptive Option for Women Who Breastfeed.

March of Dimes

Task Force on Nutrition and Optimal Human Development

The March of Dimes has established a task force to develop food-based dietary recommendations and implementation strategies for women of childbearing age, pregnant and lactating women and children to two years of age. The issue will also be considered from the perspectives of the minorities in the industrialized societies and the populations of the developing countries. The report will be aimed at health care providers and policy makers.

The Task Force intends to put the recommended nutrient intakes established by other organizations (as RDAs or other guidelines) into food-based approaches appropriate to each of the groups identified above. If food alone is judged insufficient, the Task Force will propose recommendations for nutrient supplements or fortification as well.

The five major public health priorities for the Task Force have been defined as:

- ◇ achieving optimal weight for women during childbearing years and during pregnancy and lactation
- ◇ decreasing the prevalence of low birth-weight infants and optimizing outcomes of all children during the first two years
- ◇ enhancing strategies to decrease sub-optimal breastfeeding practices and improve complementary feeding
- ◇ ensuring adequate micronutrient reserves in women before and during pregnancy and lactation and in children in the first two years of life
- ◇ ensuring practices geared toward food safety for both women and children

The Task Force process will include review of the report by partner organizations. The report is expected to be distributed to health care providers and policy makers in the US and abroad in late 2001. The March of Dimes plans to work with partners with global and/or regional interests on implementation.

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UNHCHR

The New Special Rapporteur on The Right to Food

By its resolution 2000/10, adopted on 17 April 2000, the United Nations High Commission on Human Rights (UNHCHR) decided to raise the profile and potential implementation of the right to food by appointing, for a period of three years, a new Special Rapporteur whose mandate will focus on the right to food. In September 2000 the Chairperson of the Commission on Human Rights appointed Jean Ziegler as Special Rapporteur. Mr Ziegler has a Doctorate in Law, Political Science and Sociology. He has worked for the United Nations peace-keeping operation in Congo (1961-1962) and was also elected as a member of the Socialist Party to the Swiss National Council (1971-1995). Professor Ziegler currently holds academic appointments at the Faculty of Economic and Social Sciences and the Institute for Development Studies at the University of Geneva, and at the University of Paris - Sorbonne.

The Special Rapporteur shall report annually to the Commission on the accomplishment of the following main activities:

- ◇ to seek, receive and respond to information on all aspects of the realization of the right to food, including the urgent necessity of eliminating hunger
- ◇ to establish cooperation with Governments, inter-governmental organizations (in particular, FAO) and non-governmental organizations, on the promotion and effective implementation of the right to food, and to make appropriate recommendations on taking into consideration the work already done in this field throughout the United Nations system
- ◇ to identify emerging issues related to the right to food worldwide.

Professor Ziegler has been invited to visit Germany, Venezuela, Canada, France, Switzerland, Algeria and Italy (Rome food-based UN Agencies). In addition, he is working in close cooperation with FIAN International (Heidelberg), the Oslo-based University programme on food and development, the International Institute Jacques Maritain, Action contre la Faim and other NGOs interested in this field.

The Office of the High Commissioner on Human Rights will also organize, in 2001, a third expert consultation on the right to food, following those held in 1997 and 1998. This focus will be on implementation mechanisms

at the country level and experts will be invited from all regions to share their experiences.

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UNHCR

What does UNHCR currently do in the area of Nutrition?

The United Nations High Commission for Refugees (UNHCR), in assuming its protection mandate, works closely with the World Food Programme (WFP) and other partners to ensure that refugees are restored their dignity and right to food and nutrition. Refugees in exile often face serious problems in meeting their food and nutritional needs as a result of losing their traditional source of food and income. Hence, they become fully or partially dependent on external aid.

WFP shares with UNHCR the responsibility of meeting the food and nutritional needs of refugees. The aim is to ensure the restoration and maintenance of a sound nutritional status through the provision of food rations that meet the assessed requirements. The two UN organisations in 1994 established a Memorandum of Understanding (MOU) which was revised in 1997. This MOU clarifies the roles and responsibilities of each party and specifies working arrangements to ensure that both institutions operate as efficiently as possible.

At present WFP and UNHCR are in the process of revising the MOU for a third time to accommodate new developments and priorities in both organisations. Staff at all levels are involved in the process. This exercise will provide a good opportunity to evaluate the effectiveness and use of this important instrument.

As part of the ongoing restructuring process in UNHCR, the nutrition unit is part of the section concerned with Health and Community Development, which falls under the Division of Operational Support.

A new team of two nutritionists and one food aid officer runs the nutrition unit. The unit deals with food and nutrition related issues, and collaborates externally with WFP, WHO and other partners involved in delivering assistance to refugees and internally displaced persons worldwide, as well as relevant internal sectors at UNHCR headquarters. The unit plays an important role in the development of policies and guidelines in the field of nutrition – in particular needs assessments and monitoring.

Furthermore, UNHCR is aiming to improve its nutrition monitoring to include the assessment of micronutrient status. For instance in Tanzania, due to a high rate of anaemia, haemoglobin tests are included in the routine nutritional survey. The last one undertaken was in July 2000 for which a set of *Haemocues* and disposal accessories were made available to measure the haemoglobin of under fives and some mothers. In addition, UNHCR and CDC are conducting studies on the nutritional status of adolescents in Kenya and Nepal. UNHCR will continue to promote the monitoring of other additional indicators of micronutrient status – particularly among children and women.

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WHO

Latest News from NHD's Micronutrients Team

During 2000, Nutrition for Health and Development (NHD) overhauled its three micronutrient databanks which together cover iodine deficiency disorders (IDD), vitamin A deficiency (VAD) and anaemia. Originally established in 1991, these databanks were launched to generate estimates on the magnitude and distribution of micronutrient malnutrition and to track each country's progress towards their elimination. What makes these databanks unique? They are the only ones in the world to systematically collect clinical and sub-clinical data on IDD, VAD and anaemia. However, just as with any initiative with a long life span, it becomes necessary to take stock at certain times and rethink one's approach. Catalysed by the massive spread and outreach of the worldwide web allowing more people than ever before to access information and data, NHD will be releasing its databanks on its website in the coming year. The ground work to allow this has involved: designing and moving the whole system into a new software program; paring down the indicators to those which are realistically possible to use in large-scale public health surveys; checking every piece of information with its hard copy (for the IDD databank that means over 60,000 fields of data have been re-checked and over 1,400 added); re-categorising less reliable data and carrying out comprehensive reference searches for any surveys not currently available and contacting countries for those remaining.

The IDD databank will be online in early 2001. The databank for vitamin A deficiency and anaemia will follow suit later in the year. Ultimately, by making the data easy to access, it will not only create the momentum for more accurate reporting and provide fuel for more powerful ad-

vocacy and understanding, it will also help to keep the world's attention on these deficiencies which cause such massive loss of individual potential.

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WORLD BANK

The Iran Health and Nutrition project

The Iran Health and Nutrition project was approved in May, 2000 (US\$ 21.5 million). The project, which is the Bank's first nutrition project in Iran, is a follow-up of an earlier health project. The nutrition component is targeted at children under the age of two, and pregnant and lactating women. The nutrition activities include monitoring compliance with iron tablet consumption, and increasing functional nutritional literacy at the household level. A number of operational studies are also planned.

Bank's Investment in IDD

An analysis of three major IDD projects in China, Madagascar, and Indonesia, was recently done. In all three countries, collaboration between the private sector for salt iodization, and the public sector for monitoring and evaluation, was proving to be effective. The paper *An Analysis of Combating Iodine Deficiency: Case Studies of China, Indonesia and Madagascar*, by Chorching Goh, will soon be published as a Bank Working Paper.

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Many thanks to all who contributed to this section

— we are always happy to receive material for inclusion — with the aim of promoting cooperation amongst UN agencies and partner organizations

WORLD HEALTH POLICY FORUM

New body faces global health crisis, and demands 'revolution in world food policy'

Obesity, diabetes, cancer, as well as heart disease are now disabling and killing populations prematurely all over the world. These diseases are preventable. The World Health Policy Forum was launched at a recent meeting in Camogli, Italy, to address such urgent and important public health issues.

On behalf of the initial Forum members, Professor Paolo Toniolo of New York University said: '...health is a global issue. Human health is shaped by global forces'. He added: '...effective action needs governments, industry, universities, non-government organisations, and the media, working in partnership'.

In its first years the Forum will focus on food and public health policy. 'As one example, we now know that plant-based diets protect against cancer and heart disease' said Dr Toniolo. 'So we must encourage production, and therefore consumption, of vegetables and fruits. This means a revolution in world food policy'.

He added: 'Our discussions in Camogli show that decisions that may be crucial to global human health, for example concerning transgenic crops, are increasingly being made without democratic process. We need thriving private industry to serve the public interest. This is what the Forum is all about. The achievements of UN and other international organizations and of national governments in improvement of public health are well known. The Forum, new and highly flexible, will complement and magnify their work'.

Forum members came from all over the world to Camogli, and set out the **Camogli Declaration** on the vital importance of rational and progressive food policies to prevent disease and protect good health. Its text is printed on the next page.

Why the Forum?

Human health in much of the world continues to improve. But we face formidable new challenges. Real and perceived threats to human health now include explosive growth of populations and of cities; mass migrations; accelerating depletion of natural resources and damage to the environment; emergence of infectious epidemics, notably AIDS, and rapid rises of chronic diseases, including cancer; and irretrievable loss of valuable traditional culture and knowledge.

The major emerging public health issues at the beginning of the new century are not local or national. Human health is now largely determined by global forces, whose nature is not well understood. Current public policies tend to be fragmentary and focused on the individual. Coherent global strategies are needed, to ensure that political and economic policies are reconciled with the fundamental human right to good health and well-being, and other imperatives, including the sustenance, maintenance and development of the living and physical world, and of sustained employment, trade, tradition, culture, equity and wealth.

Currently, accelerated global economic competition tends to create vast inequitable accumulation of wealth, without consideration of human health and other public interests. In rich countries, material well-being induced by booming economies, creates a false sense of security in the face of global health problems that know no borders. Economically less-developed countries do not have the resources to address such problems coherently.

Policies are now increasingly often agreed, funded and enacted by corporate interests. The shift from public to private influence and control in the fields of food, nutrition, agriculture, trade and development policy, is unlikely to improve human health or protect the environment. The current public systems designed to set policy agenda, to advise governments and to guide industry, are not adapting rapidly enough to deal with the accelerated pace of change in all areas of human activity. Old policies are being applied to new problems.

The new World Health Policy Forum, initially an individual membership organization, is independent of governments, international agencies, public or private corporations, and of sectional or special interests.

The founding members of the Forum intend to create, maintain and develop worldwide networks of leaders in public health. These networks will then work in partnership with key players in associated fields, and in the public and private sectors, in order to develop and agree on policy action plans that address urgent and important international public health issues. The purpose of the Forum is to guide governments and industry towards rational, progressive and sustainable policies that reconcile public and private interests.

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The Camogli Declaration

We convened from around the globe in Camogli, Italy, September 24–27, 2000. We declare that, throughout history, the quality and nature of food supplies has influenced not just the health, but the fate of nations.

We further declare that sustainable food policies designed to improve human health are a prime responsibility of public policy makers.

Although nutrition science is still developing, enough is known to improve policy. Yet public health is often too low a priority on political agendas. New nutrition and food policies are urgently required to improve human health, which also recognize the social, economic and ecological context of health. In particular we emphasize that:

- ◇ food and nutrition play a central role in promoting health and preventing disease
- ◇ social and economic inequalities produce adverse effects on health
- ◇ inadequacy, lack of variety and poor quality of food affect health at all stages of economic development
- ◇ nutrition is rarely integrated with food and other relevant policies
- ◇ a concerted approach to food, nutrition, ecological sustainability and health is necessary.

We support the WHO Declaration of Alma Ata and the UN Covenant on Economic, Social and Cultural Rights. Adequate food, nutrition and health are human rights. Since the inception of these statements, the global food supply has experienced dramatic changes. These changes have had complex effects on people and the environment, including problems of nutritional excesses and deficiencies in both poor and rich nations.

The major causes of food insecurity and of nutritional deficiencies and imbalances are political and economic. On this basis, the role of the Forum is to engage with international and bilateral agencies, governments and non-governmental organizations and private industry. Together, we seek the enactment of policies that:

- ◇ Integrate health as a high priority
- ◇ Are ecologically sustainable
- ◇ Ensure the safety of producers and consumers
- ◇ Consider the effect of methods of food production on the livelihoods, and therefore the health, of those engaged in agriculture and related industries
- ◇ Use health promotion and the prevention of disease as fundamental strategies
- ◇ Use innovations in biotechnology in food production and processing only when compatible with the integrity of the environment and improvement of the nutrition, health and welfare of communities
- ◇ Build institutional competencies, professional education and leadership in food and nutrition sciences.

In pursuance of this Declaration of the World Health Policy Forum we, with the involvement of all relevant partners, commit ourselves to a fresh, creative, and innovative analysis of policy issues so as to devise and promote the most effective ways to protect and improve human health.

BRAC

Bangladesh Rural Advancement Committee

Nutrition Interventions: Challenges and Opportunities in the 21st Century

The Symposium on "Nutrition Stocktaking and the Challenges for the 21st Century" took place on 11 April 2000 during the SCN's 27th Session in Washington, DC.

The following is a summary of the address by Mr F H Abed, Executive Director of BRAC, Bangladesh

BRAC originally began in 1972 as a committee to aid thousands of Bangladeshi refugees. It has now evolved into the largest development organization in the world. BRAC's strengths lie in its pioneering leadership, entrepreneurial spirit, high calibre management, significant role in national development, and in the respect it has gained from the government, international donors and other NGOs. The organization's objectives are now defined as alleviation of poverty and empowerment of the poor. To attain these objectives, BRAC runs a Rural Development Programme, an Education Programme, a Health and Population Programme and an Urban Programme. BRAC's development interventions are carried out through a holistic approach where nutrition is a cross-cutting issue. BRAC's programmes promote household food security, crop diversification, income-generation and employment, so that families have the funds, knowledge and opportunities to meet their nutritional needs. BRAC's development interventions are provided through 90,250 Village Organizations with 3.5 million members.

Many of BRAC's income-generation programmes increase the yield and diversity of food produced in rural areas. The Agriculture Programme provides training, technical assistance, and credit to promote the cultivation of vegetables, rice, wheat, and maize. The Poultry and Livestock Programme aims to improve the household food security of its 1.3 million female participants. These women are trained in modern animal husbandry methods which increase production and consumption of eggs and meat to improve the population's protein intake. BRAC's Fisheries Programme, in collaboration with the Bangladesh Fisheries Research Institute, promotes pond aquaculture and culture-based fisheries in semi-closed large water bodies which contributes to the availability of fish in local markets. In an effort to help rural milk producers market their produce at a fair price and meet the high demand for milk and milk products, BRAC has established a dairy plant with an extensive nation-wide distribution network.

In Bangladesh, the poorest 15% of the rural population consume less than 1600 kcals per day. This severely food-insecure population, comprised of roughly 20 million people, is unable to access market-based opportunities. Some form of real income transfer, coupled with income generation assistance where possible, is necessary. The Vulner-

able Group Development (VGD) Programme is an example of one such targeted transfer programme. This programme provides short-term food assistance in the form of 30 kg of wheat per month for 18 months, to female headed, low-income households. BRAC collaborates with the World Food Programme by providing training, technical assistance and credit support to VGD programme participants. Since 1990, 800,000 women from the VGD have been mainstreamed into BRAC regular development programmes.

In 1993, with support from UNICEF, BRAC launched a community-based nutrition pilot initiative in Muktagacha sub-district to address the challenges of existing food shortages. It promoted long-term behaviour change through communication and education on intra-familial food preparation and distribution, and included food supplement demonstrations. The initiative was specifically targeted towards adolescent girls, pregnant or lactating women, and children under two years of age. Services were provided by community nutrition workers. BRAC's micro-credit, employment and income-generation programmes were linked to these interventions. The initial data showed that after a food supplementation period of two years, adolescent girls had increased their body weights. Women had increased their pregnancy weight gains, and their infants had greater birth-weights. A follow-up study of adolescent girls, three years after graduation, revealed that nutrition education had a positive impact on their nutritional perception, knowledge and practice.

In 1993-94, the Government of Bangladesh and other agencies, including UNICEF and the World Bank, sought to intensify the focus on nutrition with community-based, comprehensive services. BRAC served as a member of the core team which conceptualized and designed the Bangladesh Integrated Nutrition Project (BINP). This model was successful in creating effective public-private partnerships and inter-sectoral coordination for nutrition. BINP has been implemented in 40 sub-districts, and NGOs play a major role in its implementation. The programme has now been expanded into a national nutrition programme.

The United Nations has recognized adequate nutrition and health care for all as basic human rights. Now the major challenge is to shift the focus of nutritional activities from a welfare approach to a rights-based approach. Significant progress on this issue has been made since the 1999 ACC/SCN Symposium. While nutritional interventions, such as supplementation, fortification, and education may accelerate progress, they will have only a limited impact if the other burdens of the world's poor are not addressed. The focus must be placed on an integrated approach to food, health, agriculture, education, and water and sanitation, combined with sound social and economic policies.

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IAEA

International Atomic Energy Agency

Consultant Meeting on Nuclear Analytical and Isotope Techniques for Assessing Nutrition-Pollution Interactions

The IAEA convened a meeting of consultants December 11-15, 2000 in Vienna to advise the Agency on technical and programmatic issues related to nuclear analytical and isotope techniques (NA&IT) for assessing nutrition-pollution interactions. The consultants were Rainer Gross (chairperson), Jan Kucera, Peter Stegnar, and Chai Zhi-fang. IAEA staff were Venkatesh Iyengar and Borut Smodis.

The group acknowledged the acute problems of environmental pollution and malnutrition, lack of international interest in pollution-nutrition interactions, and the role of NA&IT which is relevant to monitoring both environmental pollution and nutritional status.

Successful applications of nuclear and nuclear-related techniques in monitoring pollutants and their biological impact and in nutritional research have been demonstrated in several coordinated research programs organized by IAEA. Together with other appropriate analysis, NA&IT can help to define indicators of pollution-nutrition interactions.

The consultants recommended that IAEA should:

- ◇ review national and international guidelines for the assessment of environmental pollution
- ◇ seek to harmonize with other UN agencies methods for the assessment of environmental pollution, in particular methods of data collection and approaches to data interpretation and risk assessment
- ◇ develop a research protocol for a multi-center study of pollution-nutrition interactions which explains impacts on human development; IAEA should support the planning and implementation of this research
- ◇ raise awareness of the importance of the interaction between environmental pollution and nutritional status for the economic and human development amongst the scientific community, political decision makers and the public
- ◇ organize related technical cooperation projects, training courses and other activities on assessment of pollution-nutrition interactions
- ◇ provide access to the literature pertaining to pollution-nutrition interactions for research centers, in particular in developing countries.

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Iom

Institute of Medicine

Dietary Reference Intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium and zinc

The Food and Nutrition Board in the USA has just released findings and recommendations on micronutrients that will guide policy makers, nutrition and health professionals and others for many years to come. The nutritional science of boron, molybdenum and vanadium (to name three) may seem far removed from the widespread micronutrient deficiencies that developing countries are tackling now with proven strategies. Also, setting dietary reference intakes for these nutrients is a costly proposition that few countries can undertake. Nevertheless, this release, and the full report that will follow, provides a wealth of information for all nutrition professionals, in all countries.

How much of these nutrients does one need on a daily basis to ensure good health? To answer that question the Board offers several categories of numbers that constitute the DRIs. The Recommended Dietary Allowance, or RDA, represents a daily nutrient intake goal for healthy individuals. There is no proven benefit of consuming levels greater than the RAD. The Adequate Intake, or AI, is also a goal for nutrient intake for healthy individuals, which is set when the scientific evidence is insufficient to determine an RDA. The AI is usually the amount found in a nutritionally adequate diet and individuals should use it as a goal for intake when no RDA exists. The Board also offers "tolerable upper intake levels", known as ULs. These represent a ceiling—the largest amount of a nutrient that healthy individuals can take each day without being placed at increased risk of adverse health effects. This is the first time the Food and Nutrition Board as set upper levels for some of the nutrients included in this review.

Copies of the full report *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc* will be available later this year from the National Academy Press. In the meantime a substantive press release is available at www.nap.edu (search Vitamin A in the title field).



Speaker's Corner

Dear *SCN News* Editor,

Nestlé and the Code

The marketing of breastmilk substitutes came under the scrutiny of Members of the European Parliament (MEPs) at a Public Hearing on 22nd November 2000 as they began to examine the effectiveness of international standards and codes of conduct. According to UNICEF, reversing the decline in breastfeeding could save the lives of 1.5 million infants around the world every year.

The *International Code of Marketing of Breastmilk Substitutes* was adopted by the World Health Assembly in 1981 under Resolution 34.22 as a "minimum" requirement to be implemented in its "entirety". Calls for the introduction of such a *Code* were given a boost by a hearing at the United States Senate in 1978. The European Parliament Public Hearing was called to examine why, nearly 20 years after the *Code* was introduced, baby food companies continue to be accused of marketing practices which put infant health at risk.

The Hearing, which was held before the Development and Cooperation Committee, focused on marketing in Pakistan. The non-governmental organisation *The Network for Consumer Protection in Pakistan*, was invited to present evidence, in part because it had registered complaints with the European Commission using export regulations which implement the *Code*. The Network, which is a member of IBFAN (the International Baby Food Action Network), has also conducted extensive monitoring in Pakistan. Its report, *Feeding Fiasco*, published in 1998, resulted from monitoring conducted in 33 cities, involving over 2,500 interviews with health professionals and mothers, examination of over 400 specimens of promotional and informational materials and analysis of product packaging. The Network also published the report *Milking Profits* last year presenting documentary evidence of company marketing methods provided by Syed Amar Raza, a former Nestlé employee. This substantiated the evidence found in the *Feeding Fiasco* report, including bribing of doctors with gifts and money, setting of sales targets and performance bonuses for marketing staff and direct marketing to mothers through baby shows and other activities.

Nestlé was invited to make a presentation to the Hearing. This was relevant because Nestlé figures prominently in the complaints of marketing malpractice from around the world. Nestlé's Swiss head office has taken action recently to counter the criticism, including launching a website and distributing occasional "Code Action" newsletters. At the Nestlé shareholder annual general meeting in 1999, Chairman Helmut Maucher, welcomed the opportunity for the company to present its case at the Hearing. It came as a surprise to the Parliamentarians, therefore, when Nestlé failed to send a representative to the Hearing, especially when different excuses were relayed by Members of the European Parliament. John Corrie MEP said he understood Nestlé was not coming because the event had been put on the agenda as a Special Meeting, a designation which did not seem sufficiently important. (Ironically Nestlé sent its Chief Executive to address students at the London Business School the following day.)

Richard Howitt MEP, who arranged the Hearing, said Nestlé had objected to the presence of IBFAN and UNICEF at the Hearing. Mr. Howitt told *The Independent* newspaper (23rd November) that Nestlé had demonstrated: "...utter contempt for a properly constituted public hearing. Not to attend reveals a combination of arrogance and distance which has set their cause back". UNICEF's Legal Officer, David Clark, made a presentation on the *International Code* and the subsequent Resolutions which clarify it and attempt to close loopholes in the original text. He commented: "...two principles, universality and the scope including all breastmilk substitutes, cannot be overemphasised given the tendency of the infant feeding industry to attempt to limit the application of the *Code*".

During questions, it was noted that Nestlé's "Charter" setting out its policy was limited to developing countries and to infant formula. Nestlé's incorrect interpretation of the Code and Resolutions was one of the criticisms of the third presentation by Sunil Sinha of Emerging Market Economics (EME) who had worked as a consultant for Nestlé, examining its activities in Pakistan. The audit involved interviewing Nestlé staff and doctors from a list provided by Nestlé. EME was told not to contact independent experts and an offer to provide information (made by Baby Milk Action, the UK IBFAN group) was not passed on to EME. All the same, the audit found violations, although these were either ignored because of the terms of reference or their seriousness minimised. A representative of the European Commission commented on its failure to act on the labelling violations reported to it by The Network. This highlighted the confusion over which or-

ganisations are the "competent authorities" to register complaints. Richard Howitt MEP called for the procedures to be reviewed as NGOs from several countries had registered complaints, but none had been acted upon.

The Hearings were called under a paper adopted by the European Parliament on 15th January 1999: EU standards for European Enterprises operating in developing countries. Amongst its provisions the paper calls on the Commission to implement international standards in a legally binding framework which is independently monitored so that trans-nationals can be called to account for their actions wherever they operate. This will require the support of the parliaments of the Member States of the European Union. The Commission is called on to work for trans-national accountability in other international fora, such as the World Trade Organisation (WTO). The Hearing is the first of what is to be an annual event. Its value in naming and shaming has already been demonstrated. In an interview on the BBC World Service a week afterwards, Nestlé Vice-President, Niels Christiansen, announced that Nestlé Swiss headquarters had instructed its Pakistan management to stop distributing gifts to doctors. However, it is business as usual in the rest of the world.

Mike Brady
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Baby Milk Action
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Dear **SCN News** Editor,

Fortified Infant Foods

During a consultancy in Indonesia in February/March 2000 I was very disturbed about the direction of a project with UN involvement. There is a high prevalence of underweight in infant and children under five years of age and particularly under two years of age (less than -2SD weight-for-age using the WHO reference). This has been increasing over the period 1991 to 1998, according to surveys carried out by Bappanas. Yet much of the donor nutrition budget during my consultancy was being directed to supporting the UNICEF Complementary Feeding Initiative which involves the distribution of a highly fortified manufactured infant food at a cost of 500 Rp per packet through the *posyandus* (the local village health post) with minimal if any nutrition education, or home reach.

I understand that the composition of this infant food is based on the recent WHO publication *Complementary Feeding of Young Children in Developing Countries*. My reading of this document is that its recommendations are based on theoretical calculations from Recommended Dietary Intakes and an analysis of complementary foods from Mexico and one other developing country, without reference to hard data such as the results of well-controlled feeding trials.

My summary of the nutrition situation in Indonesia was that international agencies with expatriate nutritionists were dismissing the ability of local foods to meet nutrient needs of all infants and small children in favour of the distribution of these highly fortified foods to mothers attending the *posyandus*. Of course the real situation is that those infants and small children who were most malnourished were from poor, disadvantaged families and are not reached through the *posyandus*. Even if their mothers attended the health post they did not have the money to buy the packaged food for their infants. Unfortunately much needed resources for nutrition programmes were being directed to subsidising the sale of the commercial packaged food, which is not reaching those most at risk.

My concern is that industry with its highly fortified foods now seems to have penetrated nutrition activities with questionable results in a very poor country with high rates of underweight and malnutrition in young children in needy and disadvantaged communities. Has there been any discussion in the ACC/SCN about this situation? Or am I out of step with the new thinking on nutrition improvement programs? It was heartening that my views were supported by the national nutritionists in Indonesia, but not by the expatriate specialists.

Ruth English
Nutrition Consultant
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Dear **SCN News** Editor,

Growth Monitoring to be buried or resurrected?

The charting of weights of children, which became known as growth monitoring, was introduced in the 60s and spread worldwide in the 70s. In the 80s, when cost benefit analysis was made, growth monitoring was found not to reduce mortality or affect levels of nutrition when studied nationally. However, in some communities particularly where NGOs are effective in health, it is still widely and successfully used. The reason for the failure was recognised in the 90s when discussion with those concerned with primary education brought to our notice the complexity of a line graph. Piaget, the Guru of education, considered line graphs one of the most difficult subjects to teach. In most developing countries the use of line graphs is not taught in primary schools. Fortunately a method of overcoming this problem has now been developed through the use of the Direct Recording Scale. With this scale the mother, when she places her child in the trousers below the scale, sees a large spring stretching up as she releases the child's weight. She then herself makes the next entry on the growth curve on the chart which is located behind the spring and at its top has a pointer with a hole in it. She can then compare this entry with the previous months. Unschooling mothers from the Masai in East Africa come to understand the significance of the growth curve as do grandmothers and daughters. Weighing takes place in or very close to the home and relatives are involved. There is also evidence that when faltering occurs the mother and family take action in giving the child additional goat or cow milk.

A number of trials of the scale are underway. In one location in the Philippines it became demand led. That is the people themselves were demanding to have the scales. The scale is very robust and to date of many thousands sent out, none are known to have broken. There are of course many problems still to be solved but weighing in the community empowers the mother and perhaps can be a step towards greater understanding of numeracy in a community.

Kul Gautam and Eduardo Doryan (see p 35 and 37) both emphasize the importance of early child growth and the need for growth monitoring. If, as I hope, there is to be a renewed emphasis on growth monitoring, its success will depend on working with those involved in primary education. Community health workers and mothers need to understand the value of growth monitoring to take action.

David Morley CBE MD FRCP
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Dear **SCN News** Editor,

I really want to thank ACC/SCN for publishing its papers on the web. I think that this is the best way to quickly disseminate information, news, and findings in our field. I wish other organizations would follow your lead!

Scott Poe
Centers for Disease Control and Prevention
EMail: snp5@cdc.gov



Dear **SCN News** Editor,

Thank you for a copy of the RNIS supplement on *Assessment of Nutritional Status in Emergency-Affected Populations*, July, 2000.

I was pleased with the final product and think that it makes a useful contribution to practice guidelines for famine relief. I was also very pleased when I came across a copy being used by nuns to assess starving adults at a mission right in the middle of the Ethiopia bush! It's great to see that it is in use where it's needed.

Steve Collins
Independent Consultant (co-author of RNIS supplement on *Assessment of Nutritional Status in Emergency-Affected Populations*)
EMail: steve@validinternational.org



Nutrition in emergencies



UNHCR Initiative to Combat Micronutrient Deficiencies in Refugee Populations

UNHCR recently received funds from the United Nations Foundation for a project to combat micronutrient deficiencies among refugees. The project aims to enhance the nutritional status of refugee children, women and adolescents in four countries: Tanzania, Kenya, Uganda and Ethiopia. The project, to be completed in two years, is expected to do the following:

- ◇ explore the use of iron cooking pots as a vehicle to address iron deficiency anaemia which is an endemic problem among refugee populations (jointly with WFP);
- ◇ develop field-friendly techniques to facilitate the assessment of micronutrient deficiencies among refugee groups;
- ◇ alleviate anaemia and improve pregnancy outcomes through the use of multiple micronutrient supplements.

During the second half of the year 2000, UNHCR launched, in collaboration with WFP, a pilot project to investigate the use of iron cooking pots in refugee settings as a vehicle to address iron deficiency among high risk groups. This part of the project is implemented through the Centers for Disease Control and Prevention (CDC) in Atlanta and the Institute of Child Health (ICH) in London. It was launched in Tanzania by means of a pilot test in a small camp. Distribution of the pots in a larger camp is expected to take place early in 2001 pending positive results from the initial pilot test.

In the other three countries (Uganda, Kenya and Ethiopia) micronutrient supplementation for pregnant women will be investigated. The development of field-friendly techniques is an ongoing process and agencies in the field have expressed great interest and willingness to collaborate.

The ultimate goal of the project is to improve the nutritional status of refugee women, adolescents and children by way of:

- ◇ Investigating the possible provision and use of iron pots over the standard aluminium pots (see p 33) used to improve the iron content in the refugees' diet, which may eventually lead to a change in policy.
- ◇ Drafting operational guidelines on the provision of micronutrient supplements to targeted groups.
- ◇ Introducing field-friendly techniques to assess micronutrient deficiencies in refugee camps, which will facilitate timely and accurate assessment and appropriate interventions to reduce excess morbidity and mortality among refugee women, children and adolescents.

The final results of the project are expected in 2002.

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Nutrition And The Environment: The Importance Of Wood And Water *World Food Programme*

People suffer from malnutrition due to a combination of factors that are directly related to environmental conditions. The links between nutrition and the environment may appear obvious, but they often go unnoticed when planning assistance programmes. This is especially true during the frantic early days of responding to a crisis. For example, food variety, food preparation practices and sanitary conditions are often assessed separately from food needs.

- ◇ For many of the world's poorest people, natural resources are the basis for their livelihood strategies in normal times and ensure their very survival in times of crisis. In Southern Sudan, the reliance on wild foods can be a coping mechanism necessary for survival. However, negative coping mechanisms can endanger life, health or longer-term food security. In Somalia, people resorted to eating seeds that had been coated with pesticides. In Tanzania, instead of eating the maize food pro-



vided by the international community, people planted the seeds, even though it was a hybrid variety and could not produce a future crop.

The Availability of Fuel-wood

The availability of fuel-wood is a crucial link between environment and nutrition. In times of fuel-wood shortage, households may be forced to change their cooking habits — reducing the number of meals, the quantity of food consumed and the types of food cooked. Fuel-wood shortages may also affect the quality and nutritional value of food consumed.

- ◇ Refugees in Bangladesh were prohibited from collecting standing wood and were given no fuel; they burned corncoobs to prepare their meals. They resorted to selling part of their food aid and risked imprisonment for collecting fuel-wood illegally.

Insufficient boiling of water due to fuel shortages may increase the incidence of illness from consuming contaminated water or poorly prepared food. Children are particularly affected by diarrhea caused by poor hygiene or improperly cooked foods.

- ◇ In Angola, newly displaced women were forced to use leaves and twigs for cooking. Water did not boil due to an inadequate fire, contributing to water-borne diseases and difficulties in cooking beans. It took up to ten hours of cooking for the beans to reach an edible state.

In times of fuel-wood scarcity women spend extra time searching for wood. This is time they could spend producing and preparing food, caring for children and earning income. Women's security also becomes an issue as they seek fuel-wood further from home.

- ◇ Refugees living in camps in Tanzania spend, on average, two entire days each week and travel great distances to obtain sufficient fuel-wood. Violence against women is also a problem: as many as one in four female refugees has been assaulted in search of fuel-wood.

WFP's Response

WFP addresses nutrition-environment linkages by providing food to be consumed immediately—with specific activities designed to prevent malnutrition—and by meeting longer-term food needs. WFP considers a number of strategies to reduce demand and prevent deforestation

and adverse nutritional impacts when fuel-wood is scarce. These include: providing pre-cooked blended foods in place of beans, supplying finer-milled grains or furnishing local milling facilities, and using energy-saving approaches, such as partial pre-cooking of cereals and pulses. However, WFP is often limited to commodities received from donors, leaving little flexibility in the foods provided. WFP encourages donors to provide food commodities that reduce cooking time, such as pre-cooked yellow split peas. WFP also works with its partners to assure the supply of cooking fuel and the inputs for wood production.

WFP times its assistance to coincide with the lean or hungry season, the critical time when people depend on forest plants and other natural resources for food and income. In India WFP assisted forest-dependent villagers to increase production of traditional forest commodities and conserve indigenous species.

WFP is committed to ensuring that women have adequate food and their nutrition is not put at risk. In many cultures, women and girls eat last and suffer most when there is insufficient food in the household. This is why WFP has established targets to put 80% of WFP's relief food directly in the hands of women, and between 50-60% of its resources under the control of women in other situations. Also, WFP asks women about their need for food as well as the availability of clean water, sanitary facilities and complementary inputs such as fuel.

WFP is working with its partners to generate awareness about the causes of malnutrition. We know it is as much a health and environmental issue as a food problem. We are working to ensure that all of our programmes reflect these important linkages.

Contact: Anne Callanan, Technical Support Unit ODT, Operations Department, WFP, Via Cesare Giulio Viola 68, Parco dei Medici, 00148 Roma, Italy; EMail: anne.callanan@wfp.org Web: www.wfp.org

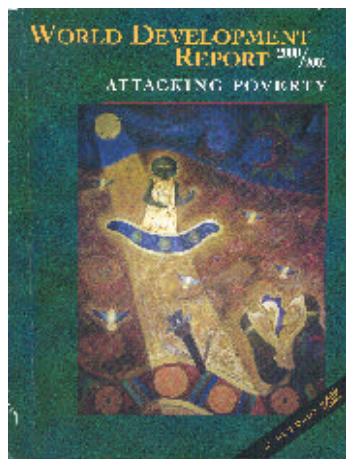


ACC/SCN Refugee Nutrition Information System

The SCN Secretariat is very pleased to announce that Brian Jones began working as RNIS Coordinator in December 2000 — the next RNIS Report (# 32) should be produced within the next few weeks

PUBLICATIONS

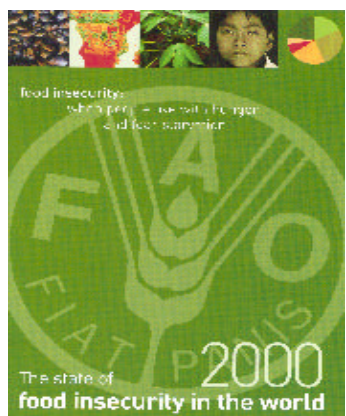
Editor's Note – these pages provide information on eight major publications released this past year. These reports are excellent sources of information for writers, lecturers, advocates and others involved professionally in *speaking up* for nutrition. The FAO report is especially noteworthy in that it provides data on levels of food insecurity, by region and by country. The others provide comprehensive information on key underlying and basic causes of poor nutrition outcomes. Two other important reports not available to us as we go to press with this issue of SCN News — The WHO/UNICEF/World Water Council Global Report on Water and Sanitation, and IFAD's Report on Rural Poverty — will be covered in our next issue.



World Development Report 2000/2001 Attacking Poverty

The world has deep poverty amid plenty. Of the world's 6 billion people, 2.8 billion – almost half – live on less than \$2 a day. This report, following on others in this series issued in 1980 and 1990, tries to expand the understanding of poverty and its causes and sets out actions to create a world free of poverty. It argues that major reductions in human deprivation *are possible*, and that the forces of global integration and technological advance can and must be harnessed to serve the interests of poor people. This report accepts the now established view of poverty as encompassing not only low income and consumption but also low achievement in education, health, *nutrition*, and other areas of human development. A companion publication "Voices of the Poor" presents what people say poverty means to them – powerlessness, voicelessness, vulnerability and fear. This background study was conducted in 60 countries and sought the view of 60,000 women and men living in poverty.

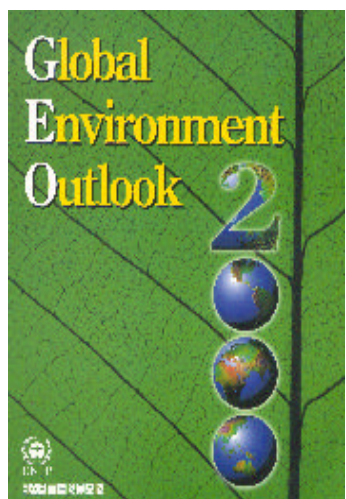
ISBN 0-19-521129-4 Oxford University Press or The World Bank, 1818 H Street NW, Washington DC 20433, USA. EMail: books@worldbank.org Web: www.worldbank.org



The State of Food Insecurity in the World 2000

The estimates provided in this report are disturbing: 792 million people in 98 developing countries are not getting enough food to lead normal, healthy and active lives. Even in industrialized countries and countries in transition the number remains the same as one year ago, when this report was in its first edition: 34 million. This slim report (only 31 pages) provides information on global and national efforts to reach the goal set by the 1996 World Food Summit: to reduce by half the number of food insecure people in the world by the year 2015. It introduces a new tool for measuring the severity of want: the depth of hunger. This is a measure of the per person food deficit of the food insecure within each country. Measured in kcals, it aims to assess just how empty the plate is each day. In industrialized countries, hungry people lack 130 kcals per day on average, while in five of the poorest countries, the daily food deficit is more than three times that, 450 kcals.

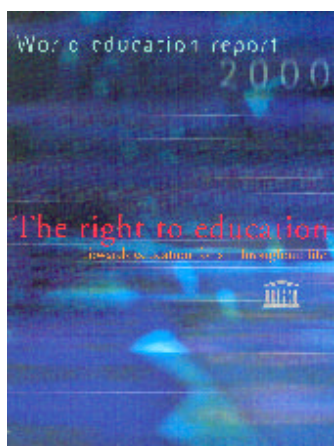
ISBN 92-5-104479-1 FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy. Web: <http://www.fao.org>



Global Environment Outlook, 2000 or "GEO-2000"

This is UNEP's millennium report on the environment, prepared in collaboration with no less than 30 environmental institutes as well as other UN agencies. It presents a summing up of what we have attained to date as custodians of the environmental goods and services provided by our planet. The facts are bleak, the challenges daunting. The report starts by setting out two over-riding trends. First, the global human ecosystem is threatened by grave imbalances in productivity and in the distribution of goods and services. Unsustainable progression of extremes of wealth and poverty threatens the stability of the whole human system, and with it the global environment. Secondly, the world is undergoing accelerating change, with internationally-coordinated environmental stewardship *lagging behind* economic and social development. Environmental gains from new technology and policies are being overtaken by the pace and scale of population growth and economic development. The report argues that the processes of globalization that so strongly influence social evolution need to be directed towards resolving the serious imbalances that divide the world today.

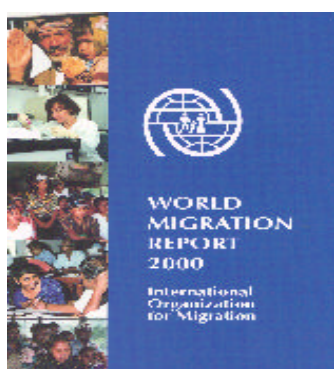
ISBN 185383-588-9 UNEP, PO Box 30522, Nairobi, Kenya. EMail: geo@unep.org Web: www.unep.org or Earthscan Publications Ltd, 120 Pentonville Road, London N1 9JN, UK. EMail: earthinfo@earthscan.co.uk Web: www.earthscan.co.uk



World Education Report 2000

Published by UNESCO, this report focuses on education as a basic human right, and was prepared to mark the International Year for the Culture of Peace. Despite the progress made in the decades that have passed since the Universal Declaration of Human Rights was proclaimed, there are more than 800 million illiterate adults in the world today, and nearly 100 million primary-school age children (and even more secondary school children) are not in school. Quality is also an issue. Millions of those who attend school regularly do not benefit from an education of sufficient quality to meet their basic learning needs. These needs become ever more pressing as the vast changes brought by the information technology threaten to marginalize entire populations living in poverty. Past trends as well as projections are presented, region by region. Projections foresee little change in the large number of out-of-school primary age children in Sub-Saharan Africa by the year 2010, while the number is predicted to decline in south Asia. This report is the fifth in UNESCO's biennial series of World Education Reports.

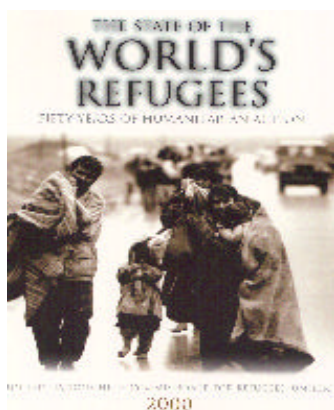
ISBN 92-3-103729-3 UNESCO, 7 Place de Fontenoy, 75352 Paris 07 SP, France. Web: <http://www.unesco.org/>



World Migration Report 2000

The purpose of this report, put out by the International Organization for Migration, is to provide an authoritative account of contemporary trends, issues, and problems in the field of international migration. The book is divided into two parts. The first examines the scale of migration and characteristics of international migrants, the types of movements now underway, the factors that contribute to migration, the global contexts in which these movements occur, and the policy issues associated with these trends. The second part reviews migration trends and recent policy development in major migration regions of the world. In nine separate regional chapters, trends in immigration and emigration are examined. More than half of international migrants live in developing countries. The most rapid growth in the number of international migrants tends to occur as a result of refugee crises.

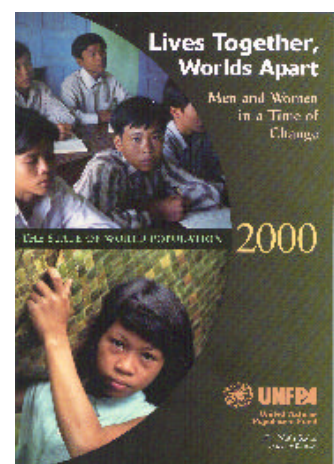
ISBN 92-9068-089-X IOM, case postale 71, CH 1211 Geneva 19, Switzerland. Web: <http://www.iom.int/>



The State of the World's Refugees: 50 years of humanitarian action

This large volume focuses on the history of *forced displacement* in the second half of the 20th century and the development of approaches to this problem. Published by the UNHCR, the UN agency with a mandate to provide both international protection and solutions for refugees, this is as much a history of the UNHCR's work as it is an analysis of population movements. The report points out that there has always been a tension between different actors involved in responding to the problem of forced displacement. That tension is especially evident in UNHCR's relationship with states. States are UNHCR's partners. However, UNHCR's role is often to challenge states either for causing refugee movements or for failing to provide adequate protection and assistance to refugees and asylum seekers. The report contains a large number of very useful maps and case descriptions of displacement events.

ISBN 0-19-924106-6 Oxford University Press. Web: www.oup.com or UNHCR, Centre for Documentation and Research, CP 2500, CH-1211 Geneva 2, Switzerland. EMail: cdr@unhcr.ch Web: <http://www.unhcr.ch>

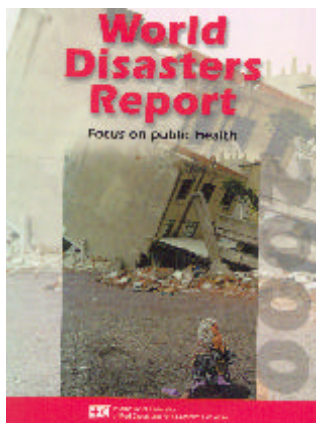


The State of World Population 2000

Lives Together, World Apart – Men and Women in a Time of Change

Published yearly by UNFPA, this report once again gives special attention to indicators that can help track progress in meeting the quantitative and qualitative goals of the International Conference on Population and Development (ICPD) in the areas of mortality reduction, access to education, and access to reproductive health services, including family planning. It makes the case for bringing gender inequality fully into the light and treating it as a matter of urgency affecting both human rights and development priorities. The report states that as much as 30% of economic growth may be attributed to *better health and nutrition*. Cuts in health services affect the poor most acutely, and poor women in particular. The report contains chapters on violence against women, the impacts of inequality on development as well as human rights. It also provides sobering information on the response of the donor community. The ICPD agreed that \$5.7 billion in international assistance would be needed for reproductive health and population programmes in the year 2000, rising to \$7.2 billion a year in 2015. Only about \$2.1 billion a year is currently being made available.

ISBN 0-89714-582-8 UNFPA, 220 East 42nd Street, New York, N.Y. 10017, USA. Web: www.unfpa.org



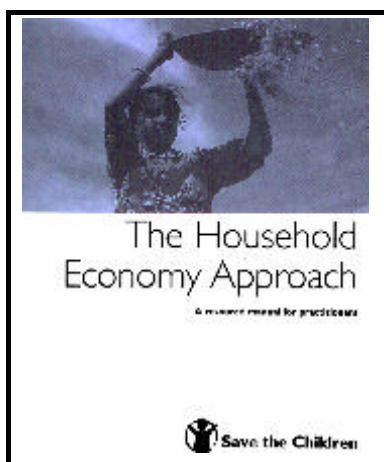
World Disasters Report: Focus on public health

This provocative report tries to get at the underlying causes of public health crises. As the Secretary General points out in his introduction, the Federation is best known for its disaster response, whether in local communities or the international arena, whereas the day-to-day work has more to do with providing basic health care and welfare. This report argues that advocacy at the international level must address some of the systematic threats to public health, such as lack of investment in solutions to developing world diseases and shifts from aid towards capital flows which may not serve the needs of the most vulnerable. The report is divided into two parts. The first documents a series of crises and impacts on affected populations: AIDS in Africa, North Korea's food shortage and malnutrition, the Chernobyl disaster, and Kosovo. The second part, "Tracking the system", reviews the International Federation operations over the years, and looks at two initiatives to improve its responses. The report also provides a very useful list of relevant websites at the end of each chapter.

ISBN 92-9139-066-6 International Federation of Red Cross and Red Crescent Societies, 17 chemin des Crêts, PO Box 372, CH-1211 Geneva 19, Switzerland. EMail: secretariat@ifrc.org Web: <http://www.ifrc.org>

**The Household Economy Approach – A Resource Manual for Practitioners
Save the Children**

Review by Anna Shotton, Programme Officer, Sudan Country Programme, World Food Programme



This resource manual is a step-by-step guide to the Household Economy Approach (HEA) and its application in relief and development situations. Using the HEA you can understand the economy of a chosen population and then analyse the impact of a shock such as a crop failure on household income and access to food and essential non-food items. The HEA has been used extensively in rural Africa to assess the impact of droughts on the food security situation and as part of early warning systems – though the manual points to many other possible uses. The book serves both as a reference guide to food security experts as well as an introduction to non-specialists.

The manual is divided into nine, short chapters. Chapter one introduces the basic concepts behind the HEA. The second chapter examines the concept of household vulnerability, outlining the elements that determine the severity of a shock. The manual goes on to give an overview of the HEA and the information needed to conduct an HEA analysis. It describes the aim of the HEA understanding "how families are making ends meet under both normal and abnormal conditions." Chapter four outlines the framework and definitions used in the HEA. All categories used are explained, though it is emphasised that the local communities being interviewed should play a key role in defining such classifications. The book then provides an overview of where and how to find the information needed for an HEA analysis. The pros and cons of many of the data sources are discussed, and the limitations of the data used in HEA examined. Chapter six describes some rapid rural appraisal (RRA) and participatory rural appraisal (PRA) methods that can be used to collect data for an HEA analysis. Each RRA/PRA tool is explained in turn, as well as how to use it. Again the pros and cons of some of these data collection methods are touched on. In the following chapter, different ways of cross-checking for data accuracy are described. Chapter eight takes you through the entire process of converting data collected into a description of the household economy of an area, then defining a problem and analysing the likely impact of this event on the household economy, and finally linking this to possible intervention strategies. This section includes many clear examples of calculating deficits in food and cash income across different wealth groups in an economy. The final chapter looks at how to present the information obtained through an HEA analysis and explains what to put under each section of a report. Lastly, there are annexes providing information on computer software used in the HEA and examples of data collection forms.

view of where and how to find the information needed for an HEA analysis. The pros and cons of many of the data sources are discussed, and the limitations of the data used in HEA examined. Chapter six describes some rapid rural appraisal (RRA) and participatory rural appraisal (PRA) methods that can be used to collect data for an HEA analysis. Each RRA/PRA tool is explained in turn, as well as how to use it. Again the pros and cons of some of these data collection methods are touched on. In the following chapter, different ways of cross-checking for data accuracy are described. Chapter eight takes you through the entire process of converting data collected into a description of the household economy of an area, then defining a problem and analysing the likely impact of this event on the household economy, and finally linking this to possible intervention strategies. This section includes many clear examples of calculating deficits in food and cash income across different wealth groups in an economy. The final chapter looks at how to present the information obtained through an HEA analysis and explains what to put under each section of a report. Lastly, there are annexes providing information on computer software used in the HEA and examples of data collection forms.

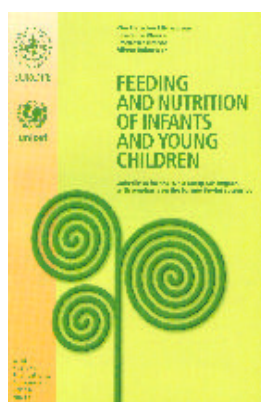
A refreshing feature of the book is that it is easy to read. The chapters are interspersed with illustrative graphics and end with boxes summarising the key points of each section. Based on personal experience, the authors highlight the practical difficulties of carrying out an HEA analysis, and provide tips on how to overcome them. The book even gives friendly warnings of some of the traps the users are bound to fall into when using the method for the first time. However, a word of caution for those interested in a gender analysis of the impact of shocks on economies and how households cope in such situations, since the manual does not touch on this area.

As the book suggests, the resource manual is best coupled with formal training in the approach. Arguably the beauty of this manual is that it presents, in an approachable manner, a comprehensive overview of a method that is gaining widespread recognition for improving understanding and responses to food insecurity.

ISBN 1-84187-029-3 Save the Children, Publications Sales, 17 Grove Lane, London SE5 8RD, UK. Web: www.savethechildren.org.uk

Feeding and Nutrition of Infants and Young Children

Kim Michaelsen, Lawrence Weaver, Francesco Branca and Aileen Robertson



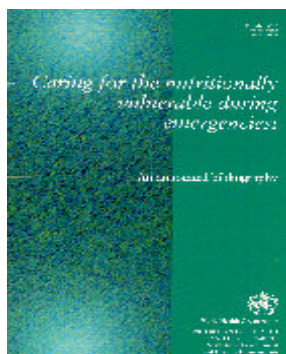
Optimum nutrition and appropriate feeding of infants and young children determine their health, growth and development. The transition from an exclusively milk diet to one that includes an increasing variety of foods occurs at a particularly vulnerable time. Poor nutrition and feeding practices during this critical period may increase the risk of interrupted growth and nutritional deficiencies. This publication contains the scientific rationale for the development of national nutrition and feeding recommendations from birth to the age of three years.

The guidelines are designed for the WHO European Region, with emphasis on the countries of the former Soviet Union, but they can be applied universally. They are especially applicable to the most vulnerable groups of infants and young children living in deprived conditions, mainly in the eastern part of the region, but also in ethnic minorities and in low-income families in western Europe.

This publication will allow policy-makers and national experts to develop or update their current national nutrition and feeding recommendations. It can also be used as a text for postgraduate education in child health.

ISBN 92 890 1354 0 WHO Regional Publications, European Series, No. 87. WHO Regional Office for Europe, Scherfigsvej 8, DK-2100 Copenhagen 0, Denmark.

Caring for the Nutritionally Vulnerable During Emergencies: An annotated bibliography

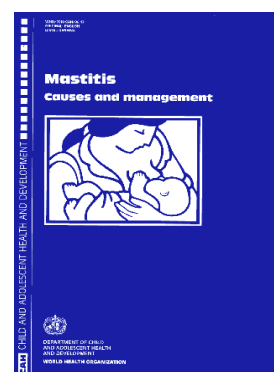


The primary focus of this bibliography is on the provision of support for the nutritionally vulnerable in emergencies, generally through food interventions. It contains both published 'white' literature and unpublished 'grey' literature that is not widely available in the public domain. Most of the 'white' literature consists of publications by United Nations organizations, non governmental organizations, peer-reviewed papers published in journals, and academic books. The 'grey' literature includes internal reports and papers from a number of international agencies, mainly based in Europe. Literature is also included on aspects of non-food-related care provision where this has important implications for nutrition outcomes. In addition, documents that describe methodologies which emphasize care as an important part of process have been included.

The bibliography does not represent a comprehensive review of all literature on care but contains examples of different approaches. Priority has been given to material relating to groups in emergency situations, although references are included that refer to post-emergency rehabilitation, or to conditions of extreme poverty where the approach is considered to be relevant to the application of care in emergencies. A significant proportion of this material relates to participatory approaches to needs assessment.

WHO/NHD/99.5. Nutrition for Health and Development, World Health Organization, 20 Avenue Appia, CH-1211 Geneva 27, Switzerland. Web: <http://www.who.int>

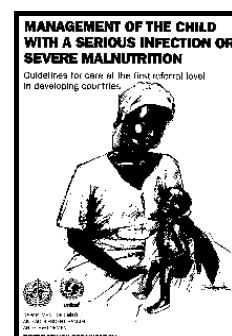
Mastitis: Causes and Management



This excellent document discusses all aspects of mastitis including its epidemiology, etiology, milk stasis, infection, pathology and clinical features, prevention and treatment. The authors stress the value of continuing breastfeeding throughout the treatment of mastitis. Effective management of breast fullness and engorgement and prompt attention to any signs of milk stasis and other breastfeeding difficulties are emphasized. Supportive counselling is an essential part of treatment along with effective milk removal, antibiotic therapy and symptomatic treatment for the relief of pain.

WHO/FCH/CAH/00.13 Department of Child and Adolescent Health, WHO, 20 Avenue Appia, CH-1211 Geneva 27, Switzerland. EMail: chd@who.int Web: <http://www.who.int/chd>

Management of the Child with a Serious Infection or Severe Malnutrition: Guidelines for Care at the First-Referral Level in Developing Countries



This manual is for use by doctors, nurses and other senior health workers who are responsible for the care of young children at the first referral level in developing countries.

It presents up-to-date clinical guidelines for both inpatient and outpatient care in small hospitals where basic laboratory facilities, essential drugs and inexpensive medicines are available.

The focus of these guidelines is on the inpatient management of the major causes of childhood mortality such as pneumonia, diarrhoea, severe malnutrition, malaria, meningitis, measles and related conditions. The manual complements standard, more comprehensive paediatric textbooks, which should be consulted on the management of rarer conditions or complications.

This manual is part of a series of documents and tools that support the Integrated Management of Childhood Illness (IMCI). It is consistent with the IMCI guidelines for outpatient management of sick children. These guidelines are applicable in most areas of the world and may be adapted by countries to suit their specific circumstances.

WHO/FCH/CAH/00.1 Department of Child & Adolescent Health & Development (CAH), WHO, 20 Avenue Appia, CH-1211 Geneva 27, Switzerland. EMail: cah@who.int
Web: <http://www.who.int/child-adolescent-health>

Complementary feeding of young children in Africa and the Middle East



The inter-country workshops on complementary feeding organized by the World Health Organization's Programme on Nutrition brought together nutritionists and food scientists from many African and Middle Eastern countries. This document captures the information presented at these workshops as well as giving background information on the scientific basis for complementary feeding. Additional chapters include an overview of current practices in Africa and the Middle East; the safety, quality and energy-density of

complementary foods; the framework for the small-scale production of complementary foods; methods and experience of preparing these foods in the home; communication tools and strategies for the promotion of appropriate feeding; a model for evaluating the nutritional impact of programmes to improve complementary feeding; a detailed description of the situation relating to the feeding of infants and young children in 33 countries in Africa and the Middle East, and experiences with small-scale production of complementary foods in 11 countries.

WHO/NHD/99.3 WHO/AFRO/NUT/99.4
Nutrition for Health and Development (NHD), World Health Organization 20, Avenue Appia, CH-1211 Geneva, Switzerland.
Web: www.who.int/nut

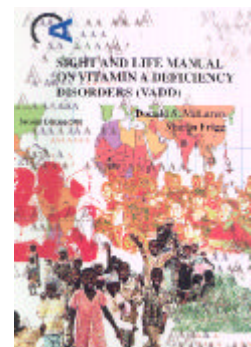
Zinc and Human Health Edited by: Kenneth Brown and Sara Wuehler



This document is based on a conference on zinc and human health: results of recent intervention trials and implications for programmatic interventions and program-linked research which was held at the University of California, Davis, October 1999. The report includes a summary of current knowledge on zinc metabolism, assessment of zinc status, estimate of the global prevalence of zinc deficiency, complications of zinc deficiency and the range of program approaches available to enhance zinc status. The second half of the report gives the results of small discussion groups, the ultimate objective of which was to prepare guidelines for the development of zinc intervention programs and to identify particular issues that require further research to facilitate program implementation. The report concludes with the research needs for this important area of nutrition.

ISBN 1-894217-13-6 The Micronutrient Initiative, P O Box 8500, Ottawa, ON, Canada K1G 3H9.
Web: <http://www.micronutrient.org/>

Sight and Life Manual on Vitamin A Deficiency Disorders 2nd edition Donald S McLaren and Martin Frigg



This handbook is the latest in the diverse range of information tools produced over the last few years by SIGHT and LIFE. The Manual takes a very practical approach to combating vitamin A deficiency. It deals with problems that are of concern to health and nutrition workers, especially those in the fields of child survival and protection of vision. If read through chapter by chapter it will provide a comprehensive and up-to-date account of the subject. The manual may also be used as a reference text. The first part deals with the physical and chemical nature of vitamin A, its sources in food and detailed information on the bioavailability of carotenoids. Subsequent chapters discuss vitamin A's role in health; methods of assessing vitamin A status; and its effects on morbidity and mortality. The epidemiology of vitamin A deficiency as well as progress made in its control are discussed. Finally, a chapter on the role of retinoids in general medicine is included. The result is an excellent handbook for those working in the "vitamin A front line" in developing countries who need an information tool that presents the complexities of this topic in a clear and understandable fashion without oversimplifying the issues.

SIGHT and LIFE, P O Box 2116, 4002 Basel, Switzerland.
EMail: sight.life@roche.com
Web: www.sightandlife.org

IFAD and NGOs : Dynamic Partnerships to Fight Rural Poverty



This publication describes the origin of the International Fund for Agricultural Development (IFAD) and explains its strategy and approach to fulfilling its mandate of promoting the economic advancement of the rural poor mainly by improving their productivity both on and off the farm. IFAD's partnerships with NGOs contribute to its objectives by securing maximum beneficiary participation and involvement of grass-roots organizations in projects. The booklet describes how IFAD works with NGOs to build capacity at the local level. Guidelines are given on how NGOs can initiate partnerships with IFAD and apply for grants.

IFAD, Via del Serafico 107, 00142 Rome, Italy. EMail: ifad@ifad.org
Web: www.ifad.org

LanguaL 2000 – Introduction to the LanguaL Thesaurus COST Action 99



LanguaL stands for "Langua aLimentaria" or "language of food". It is an automated method for describing, capturing and retrieving data about food. The work on LanguaL was started in

the late 70s by the Center for Food Safety and Applied Nutrition of the United States Food and Drug Administration as an ongoing co-operative effort of specialists in food technology, information science and nutrition. Since then LanguaL has been developed in collaboration with the US National Cancer Institute and, more recently its European partners, notably in France, Denmark, Switzerland and Hungary. Since 1996, the European LanguaL Technical Committee has administered the thesaurus.

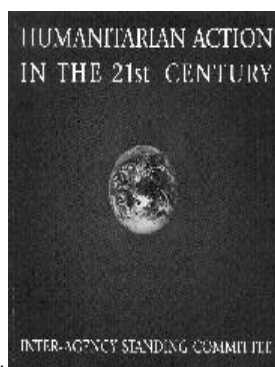
As constructed, LanguaL is a multilingual thesaural system using a standardised language for describing foods, specifically for classifying food products for information retrieval. LanguaL is based on the concept that:

- ◇ Any food (or food product) can be systematically described by a combination of characteristics
- ◇ These characteristics can be categorised into viewpoints and coded for computer processing
- ◇ The resulting viewpoint/characteristic codes can be used to retrieve data about the food from external databases

This manual describes the LanguaL thesaurus in some detail. It presents an in-depth example of how LanguaL can be applied and give general rules for indexing.

ISBN 92-828-9163-1 Office for Official Publications of the European Communities, European Commission, rue de la Loi/Weistraat 200, B-1049 Brussels, Belgium. Web: <http://europa.eu.int>

Humanitarian Action in the 21st Century (2000) Inter-Agency Standing Committee

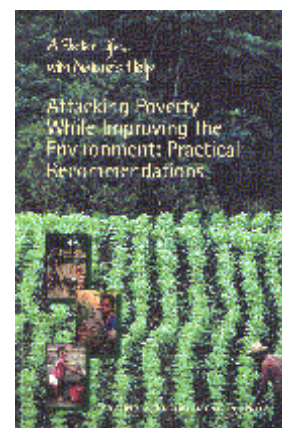


The Inter-Agency Standing Committee (IASC), chaired by the Emergency Relief Co-ordinator (ERC), ensures inter-agency decision-making in response to

complex emergencies. The IASC is formed by the executive heads of sixteen leading agencies and NGO consortia, providing a good representation of today's composite humanitarian world. This book gives the mission statement of each of the agencies along with each director's vision for the future – where they are going, what are the challenges, what is needed to get there. The need to build the capacity of governments and civil society organizations to meet their own responsibilities is a recurring theme throughout the book. Human rights must be strengthened, for without them sustainable human development is impossible.

ISBN: 0-9701247-4-0 Published by OCHA, on behalf of IASC, United Nations S.3600, New York, NY 10017.

Attacking Poverty While Improving the Environment: Practical Recommendations

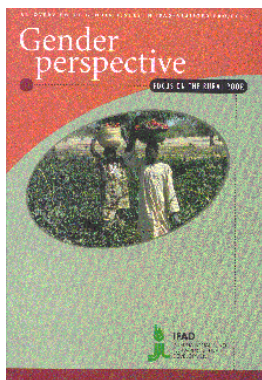


There is a recognized need to arrest the increase in poverty while at the same time reversing the current trends of environmental degradation. As part of the effort to meet the challenges, the United Nations Development Programme and the European Commission have embarked upon the Poverty and Environment Initiative. The goal of the initiative is to provide a forum for experienced practitioners, policy-makers, researchers and politicians to share their knowledge and identify solutions. This book outlines practical recommendations for attacking poverty while improving the environment. It emphasizes the need for conceptual shifts in our thinking which include engaging the poor as partners and creating incentives for them to mobilize resources for poverty eradication. Operational shifts such as moving to decentralized planning and

improved revenue-sharing mechanisms are also required for success. The booklet concludes with specific policy recommendations on infrastructure and technology development, and employment and compensation for the poor.

UNDP, Sustainable Energy and Environment Division, 304 East 45th Street, 10th Floor, New York, NY 10017, USA. Web: <http://www.undp.org/seed.pei>
 European Commission, Division for Environment and Natural Resources, Directorate-General for Development, European Commission, 200 rue de la Loi, B1049, Brussels, Belgium

**Gender Perspective
 – Focus on the Rural Poor**



During the last twenty years, IFAD has learned a great deal about the prevalence and causes of poverty and malnutrition and has increasingly recognized that taking a gender perspective helps to illuminate the nature of rural poverty. A gender perspective looks at how and why men and women experience poverty differently and become poor through different processes and in turn how rural development presents different opportunities and challenges for men and women.

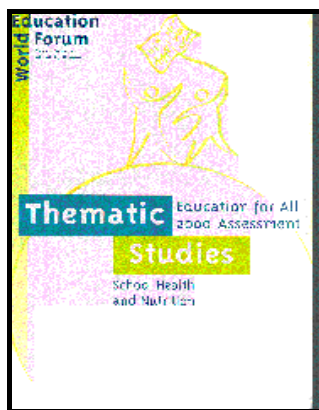
This booklet reviews gender issues in IFAD's ongoing projects and illustrates some of the opportunities regarding gender that IFAD has explored in the course of its initiatives. Areas touched on include training and literacy; rural finance; agricultural and livestock production; rural enterprise and marketing support; water, health and nutrition; and strengthening women's organizations and participation. The document indicates that there are still many challenges to overcome. IFAD recognizes the need to ensure increased and more equitable participation of women and men in project planning. It remains committed to enhancing the responsive-

ness of its projects to gender differences.

IFAD (International Fund for Agricultural Development) Via del Serafico 107, 00142 Rome, Italy. EMail: ifad@ifad.org
 Web: www.ifad.org

**Thematic Study on School
 Health and Nutrition**

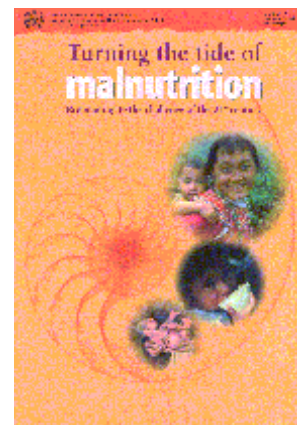
By Cheryl Vince Whitman, Carmen Aldinger, Beryl Levinger and Isolde Birdthistle



This report was commissioned by the World Health Organization's Department of Health Promotion, on behalf of Education for All (EFA) 2000. It was prepared for presentation and discussion at the World Education Forum in Dakar, April 2000. It reviews the major activities that have taken place in the school health and nutrition field around the world during the last 10 years. The link between learning and health clearly shows that EFA is unlikely to be achieved without significant improvements in the health and nutrition of students and teachers. Of the many effective research-supported strategies, two that are nutrition-related stand out: 1) school-based nutrition interventions can improve academic performance and 2) health and nutrition status affect enrolment, retention and absenteeism. Major suggestions are offered for the future including: the development of a shared vision; a commitment to act; a pledge to work collaboratively; and the importance of a global effort to share and acquire information.

EFA Forum Secretariat, UNESCO, 7 Place de Fontenoy, 75352 Paris 07 SP, France. EMail: efa@unesco.org
 Web: www.education.unesco.org/efa

**Turning the Tide of Malnutrition:
 Responding to the challenge of the
 21st century (2000)**



Malnutrition results from a complex interaction of the food we eat, our state of health and the environment in which we live. It affects at least one in three people worldwide afflicting all age groups and populations and is rooted in poverty and discrimination. This 20-page booklet highlights the determinants of malnutrition. Alleviating malnutrition, combating micronutrient deficiencies, controlling the global obesity epidemic are challenges that are being addressed by WHO in practically every corner of the world. Promoting proper feeding for infants and young children, and developing effective food and nutrition policies and programmes are all part of WHO's focus on nutrition. Global databases on child growth and malnutrition; micronutrient deficiency; iodine deficiency disorders; vitamin A deficiency; breastfeeding; obesity and adult body mass index; and national nutrition policies and programmes provide essential information on the current magnitude of the challenges.

WHO/NHD/00.7 Nutrition for Health and Development (NHD), World Health Organization 20, Avenue Appia, CH-1211 Geneva, Switzerland. Web: www.who.int/nut

**Food Safety for Nutritionists and
 Other Health Professionals**

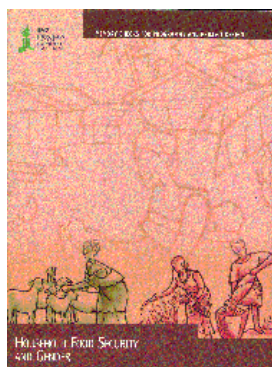
This training manual has been produced for use in courses aimed at helping nutritionists and other health professionals understand the basic principles of food safety, the causes of foodborne disease, and opportunities for prevention, whether in food service establishments or homes. Intended to support an eight-day course, the manual also can be used to train food and public health workers, nurses, home econo-

mists, and other health professionals who can contribute to improved safety.

Prepared jointly by WHO and the Industry Council for Development, the manual adopts a practical approach, emphasizing knowledge and skills needed to recognize unsafe food and food-handling practices, understand the implications for health, and develop appropriate intervention strategies. The manual features 27 lectures presented in eleven modules. While the document is primarily aimed at students having a limited knowledge of microbiology, students with more advanced knowledge can benefit from the sections on Hazard Analysis and Critical Control Point System and related training exercises.

WHO/SDE/PHE/FOS/00.1 WHO, 20, Avenue Appia, CH-1211 Geneva, Switzerland.
E-Mail: publications@who.int
Web: www.who.int

Household Food Security And Gender



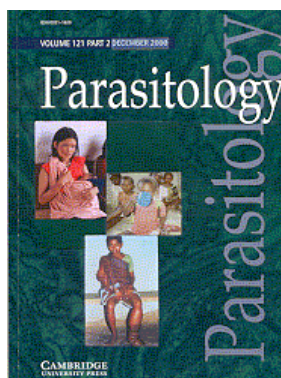
This 20-page booklet is intended to be used by team members and project staff in the design of projects, programmes or activities to be supported by the International Fund for Agricultural Development (IFAD). It contains a summary of issues to be addressed in designing projects on household food security and gender. The summary is followed by two support tools: a checklist to guide collection of socio-economic data at field level; and a household food security matrix that analyzes – using an IFAD project as an example – implications and risks for household food security of specific project activities and components. The second part of the booklet contains six thematic reminders on savings and credit; rural enterprises; livestock; environmental and natural resources; social and infrastructure constraints; and agriculture which can be used as reference

material by different team members according to their areas of specialization.

IFAD, Via del Serafico 107, 00142 Rome, Italy. E-Mail: ifad@ifad.org
Web: www.ifad.org

Controlling Intestinal Helminths While Eliminating Lymphatic Filariasis

Edited by LS Stephenson, CV Holland
and EA Ottesen, Supplement to
Parasitology vol 121, 2000



The Programme to Eliminate Lymphatic Filariasis (LF), launched in 1997, is a public-sector/private-sector partnership organized as a Global Alliance, with the World Health Organization serving as secretariat. Its principal purpose is to carry out the mandate of the 50th World Health Assembly (1997) to eliminate lymphatic filariasis as a public health problem worldwide, but its tools and strategies for achieving this goal also have important additional public health benefits. Foremost among these are the effects the Programme can have on the control of intestinal helminth infections in treated populations, largely because of certain similarities, or overlap, of the drugs and strategies used in the public health approaches to these parasitic infections.

This supplement, consisting of ten up-to-date review articles, provides important data for both recognizing and gauging the magnitude of the ancillary public health benefit LF elimination programmes can have on the control of intestinal helminths. The first six contributions focus on global malnutrition and on the public health importance and benefits of treating and controlling the three major intestinal nematodes (hookworm, *Ascaris lumbricoides*, and *Trichuris trichiura*) that are widely prevalent in the 73 countries where

lymphatic filariasis is endemic (and in hundreds of millions of people elsewhere as well). The first review describes the current state of global malnutrition particularly in relation to underweight, iron deficiency and anaemias, vitamin A deficiency, iodine deficiency disorders, and zinc deficiency. The second review explores the links between malnutrition and parasitic helminth infections, emphasizing in particular mechanisms through which parasites may cause or aggravate malnutrition. Three reviews on the public health importance of hookworm, *Ascaris*, and *Trichuris* describe the epidemiology, pathophysiology, and public health benefits of treating and controlling these infections, emphasizing their impact on maternal and infant morbidity and mortality, child growth and appetite, physical fitness and activity, and cognition and educational outcomes. The use of animal models to study human intestinal nematode infections is also reviewed in detail. The final four articles extensively review the principal chemotherapeutic tools that will be used in the programmes to eliminate LF and that will confer additional public health benefits from treating and controlling intestinal helminth infections; namely, albendazole, ivermectin, diethylcarbamazine, and the safe use of these drugs in 2 drug co-administration regimens. The supplement is designed to provide extensive background information and offer guidance for decision makers, researchers, and others with an interest in helminth control and its implications for public nutrition and development.

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ISBN 0-521-00506-X, 24.95/\$39.95. In UK,
send payment with order to Cambridge University Press,
The Edinburgh Building,
Shaftesbury Road, Cambridge CB2 2RU,
UK; in USA, Canada and Mexico, Cambridge University Press,
Journals Fulfillment Department, 110 Midland Avenue, Port
Chester, NY 10573-4930 USA.
Web: <http://www.cup.org/>

PLEASE KEEP
SENDING IN YOUR
REPORTS AND
PUBLICATIONS
— We will do our
best to include them
in the next issue

Bulletin Board

Courses, Meetings, Announcements

**FORGING EFFECTIVE STRATEGIES TO COMBAT IRON DEFICIENCY
6TH INTERNATIONAL CONFERENCE SERIES ON HEALTH PROMOTION
MAY 7TH – 9TH 2001, ATLANTA, GEORGIA**

Project IDEA of the ILSI Center for Health Promotion, the Centers for Disease Control and Prevention (CDC), Emory University and the Micronutrient Initiative are organising the 6th International Conference Series on Health Promotion. The meeting will examine technical, operational and policy issues relating to intervention strategies for iron deficiency and will seek to define practical steps that countries can use to implement and monitor effective prevention and control programs. Country-level experiences will be presented in the areas of iron fortification, supplementation, and other strategies. While emphasis will be placed on the role and practical implementation of iron fortification, a key theme throughout the conference will be the value of integrating multiple strategies to combat iron deficiency for all population groups. Conference objectives include the assessment of current prevention and control strategies for iron deficiency, and an examination of key country level experiences in industrialised and less developed countries.

Contact: Ms. Mai-Anh Hoang (Program Manager), Project IDEA at the ILSI Center for Health Promotion, USA. Tel: 770-934-1010, Fax: 770-934-7126, EMail: Mhoang@ilsi.org

**SUSTAINABLE FOOD SECURITY FOR ALL BY 2020
FROM DIALOGUE TO ACTION
2020 VISION CONFERENCE ANNOUNCEMENT
SEPTEMBER 4TH – 6TH 2001, BONN, GERMANY**

The conference is organised by the International Food Policy Research Institute in close collaboration with the German Federal Ministry for Economic Cooperation and Development. The conference takes stock of the current situation, reviews progress in achieving sustainable food security since the first 2020 Vision conference in 1995, and offers state-of-the-art projections from the international Food Policy Research Institute to show how many will go hungry in 2020 if appropriate action is not taken. The conference will also focus on emerging issues that are most likely to affect the global goal of achieving sustainable food security for all by the year 2020, including: pressing health and nutrition concerns such as AIDS, tuberculosis, rapid urbanisation and accelerating globalisation and trade liberalisation. The conference also hopes to prioritise actions that can have the greatest impact on improving food security, that can multiply local successes and innovative approaches and partnerships, and that can empower disenfranchised people, especially women.

Contact: Ms. Simone Hill-Lee, IFPRI 2033 K Street, NW, Washington, DC 20006 – 1002 USA. Fax: +1-202-467-4439, EMail: s.hill-lee@cglar.org

**BIOAVAILABILITY 2001
BIOAVAILABILITY CONFERENCE
MAY 30TH – JUNE 1ST 2001, INTERLAKEN, SWITZERLAND**

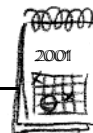
The conference will bring together experts from around the world to address issues of bioavailability of micronutrients in relation to public health. The conference will be conducted through oral and poster presentations and a series of workshops on topics such as calcium bioavailability in relation to bone health, phytoestrogen absorption and metabolic action, vitamin D, sunshine and cancer, and genetic engineering to improve micronutrient content and bioavailability. There will be three sessions; the first on minerals and trace elements, the second on minor plant components and the third on vitamins.

Contact: Laboratory for Human Nutrition, Institute of Food Science, Swiss Federal Institute of Technology, PO Box 474, CH-8803 Rueschlikon, Switzerland. Tel: +41-1-704-5700, Fax: +41-1-704-5710, E-mail: bioavailability.2001@ilw.agrl.ethz.ch
Web: www.ilw.agrl.ethz.ch/hu/bio2001/main.html

**ADVANCED TRAINING PROGRAM IN FOOD AND NUTRITION SECURITY
UNIVERSIDAD NACIONAL AGRARIA LA MOLINA IN LIMA, PERU
AUGUST 2001**

The *Universidad Nacional Agraria La Molina* in Lima, Peru will open a new Regional Postgraduate Program in Public Nutrition with emphasis in Food and Nutrition Security (FNS). Several international donors and agencies, such as the German Federal Ministry of Economic Cooperation and Development through the German Agency of Technical Cooperation (GTZ), FAO, PAHO and WFP support the program. The objective of the program is to contribute to the improvement of the FNS situation within the Andean countries through the development of human resources, strategies and instruments; create and disseminate new knowledge in the area FNS, and facilitate processes of change of attitudes and behaviors related to FNS. In August 2001, the Postgraduate Program will start a one-year Professional Master Program and a two-year Master of Science Program. At the end of both Master Programs the participants should be able to identify and analyze the nutritional situation of different population groups, recommend proper processes and methods of interventions and evaluations, and communicate and coach effectively with professionals from different sectors, representatives of the target groups and the general public. In addition, participants in the Master of Science Program should be able to formulate appropriate scientific questions regarding to FNS, design a data information system to analyze the collected data, and report and disseminate study results to the international community of sciences. The Postgraduate Program will give emphasis to teamwork, scientific critical thinking, skills of communication and management – all useful skills for life.

Contact: Email: pnp@lamolina.edu.pe or Web: www.lamolonia.edu.pe/pnp



**MASTER OF PUBLIC HEALTH (COMMUNITY NUTRITION)
SCHOOL OF POPULATION HEALTH, UNIVERSITY OF QUEENSLAND
ONE YEAR COMMENCING IN FEBRUARY 2001**

The Master of Public Health (Community Nutrition) is an update of the previous Master of Community Nutrition. It is run from the school of Population Health at the University of Queensland where it takes place over three semesters beginning in February. Two coursework-based semesters are held in the Brisbane campus and the third semester offers the unique opportunity for international fieldwork experience in Southeast Asia and the Pacific. The aims of the programme are to understand the biochemical and physiological bases of nutrition; to critically evaluate and apply expertise in an area such as nutrition policies, programs and planning and/or nutritional assessment in the community. There is also a strong focus on the investigation and critical analysis of particular nutrition problems in a fieldwork setting in rural or urban areas of southeast Asia and the Pacific. Graduate certificate and Diploma programs are also available.

Contact: The Director, Nutrition Program, The University of Queensland, Edith Cavell Building, Royal Brisbane Hospital, Herston, Qld 4029, Australia. Tel: +61 (7) 3365 5393, Fax: +61 (7) 3365 5599, EMail nutrition@nutrition.uq.edu.au Web: <http://www.acithn.uq.edu.au/nutrition>

**PRODUCTION AND USE OF FOOD COMPOSITION DATA IN NUTRITION
INTERNATIONAL GRADUATE COURSE
APRIL 17TH – MAY 5TH 2001**

The Caribbean Food and Nutrition Institute (CFNI) PAHO/WHO in co-operation with FAO (Food Policy and Nutrition Division) is running a graduate course on food composition information. The course is designed for analysts, teachers of nutrition and nutritional aspects of food chemistry, nutritionists, food scientists/ technologists and persons involved in food labelling and legislation. The course will comprise of lectures, seminars and group work and will cover topics such as the use of databases at different levels (international, household and individual) and the selection of foods and nutrients. The course will also review existing data and examine issues such as the design of sampling protocols, methods of analysis and critical evaluation, format and modes of expression, compilation of data, quality control, food nomenclature, computer software, data dissemination and guidelines for use of tables.

Contact: Caribbean food and Nutrition Institute, Mona Campus – University of the West Indies, P.O Box 140, Kingston 7, Jamaica.
Tel: (876) 927-1540-1 Fax: (876) 927-2657 E-mail: EMail@cfni.paho.org

**THE HUMAN RIGHT TO FOOD AND NUTRITION: PRINCIPLES AND POLICIES.
SUMMER GRADUATE COURSE OF THE CENTRAL EUROPEAN UNIVERSITY
JULY 30TH – AUGUST 10TH 2001, BUDAPEST, HUNGARY**

The course proposes to study the working of human rights systems through close examination of the human right to food and nutrition. Participants should gain an understanding of recent developments in nutrition rights and also develop skill in applying the nutrition rights approach in specific contexts. The course will examine the application of the nutrition rights approach in various contexts, e.g., in specific countries, and in relation to refugees, infants, drinking water, prisons etc. The course also seeks to build skills in the analysis of concrete situations to identify violations of the human right to food and nutrition and to formulate proposals for policy and legislation. There will also be an online course on nutrition rights run by George Kent from the university of Hawai'i.

Contact: Central European University, Summer University Office, 1051 Budapest, Nador utca 9, Hungary. Tel: (361) 327-3069, Fax: (361) 327-3124
EMail: summeru@ceu.hu Information for both courses can be obtained from the internet: <http://www2.hawaii.edu/~kent/COURSES.html>

**NUTRITION PROJECT MONITORING AND EVALUATION
TUFTS UNIVERSITY SUMMER COURSE
JUNE 4TH – 15TH 2001**

A practical and highly applied course designed to train participants in the specific skills needed to design and implement monitoring and evaluation systems for nutrition related projects. Participants will learn fundamental Monitoring and Evaluation principles plus practical techniques such as monitoring ratios, trigger points and cost effectiveness ratios. Examples and illustrations are taken from developing countries in Asia, Africa and Latin America but the course is also relevant for industrialised countries and those working in related fields (e.g. primary health care, or food security). The course will also present both computer and non-computer based strategies for collection, analysis and utilisation of data. The course is designed for middle-level program managers, Government monitoring and evaluation staff, international and bilateral assistance agencies and NGOs. Demand from previous years has been high, so early applications are advisable. Application deadline is April 15, 2001.

Contact: Sucheta Mehra, Tufts University School of Nutrition Science and Policy, 126 Curtis Street, Medford MA 02155, USA. Tel. 617-627-3223, Fax: 617-627-3887, EMail: sucheta.mehra@tufts.edu

**THE GRADUATE SCHOOL VLAG (ADVANCED STUDIES IN NUTRITION, FOOD TECHNOLOGY, AGROBIOTECHNOLOGY AND HEALTH SCIENCES) IN WAGENINGEN, THE NETHERLANDS, IN COOPERATION WITH THE UNU, FAO AND THE INTERNATIONAL UNION OF NUTRITIONAL SCIENCES, ANNOUNCE THE FIFTH INTERNATIONAL GRADUATE COURSE ON PRODUCTION AND USE OF FOOD COMPOSITION DATA IN NUTRITION
1-19 OCTOBER 2001**

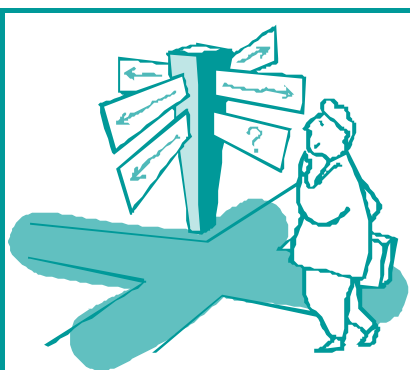
The course is intended for those involved in nutritional database programmes as analysts, compilers or users and will be of value to those teaching nutrition and nutritional aspects of food chemistry. The course will comprise lectures, seminars and group work. The course fee, including a Euro 330 non-refundable deposit, is Euro 3300. The fee covers accommodation and meals at the Wageningen International Congress Centre, course materials, tuition fees and excursions. The closing date for applications is 1 July 2001.

Contact: Secretariat FoodComp 2001, Wageningen University, Division of Human Nutrition and Epidemiology, P O Box 8129, 6700 EV Wageningen, the Netherlands. Tel: 31 317 485108, Fax: 31 317 483342, Email: foodcomp@info.nutepi.wau.nl. Web: www.wau.nl/vlag

**WORLD FOOD PRIZE 15H ANNIVERSARY
18-20 OCTOBER 2001, DES MOINES, IOWA, USA
LAUREATE NOMINATIONS DUE 28 FEBRUARY 2001**

Nominations for the 2001 World Food Prize are welcome through February 28. The Prize is awarded to an individual for achievement in any field involved in enhancing food production and distribution and increasing food availability and accessibility to those most in need, thereby reducing hunger, poverty, and human suffering and improving health, nutrition, and well being.

Contact: Judith Pim, Tel: 1 515 245 3796, Email: jpim@worldfoodprize.org Web: www.worldfoodprize.org



SCN News #22

The proposed theme for SCN News # 22 is nutrition goals and targets. The year 2000 marked the tenth anniversary of the World Summit for Children. A special session of the United Nations General Assembly is planned for September 2001. This event will bring together heads of state and governments, leaders of civil society, the private sector and young people themselves to review progress achieved. Year 2001 is also the 25th anniversary of IVACG, and the World Food Summit Plus 5 Event. Progress against nutrition goals and food security is mixed. Have the nutrition goals helped or hindered? Have they galvanised accelerated actions, forged new partnerships, advanced the frontiers of innovation? Or, have they created a culture of vertical thinking, isolating nutrition from the mainstream of development? We plan to publish a set of interviews and invited articles from managers and advocates working in developing countries.

- ◇ Have goals been an inspiration or a distraction?
- ◇ Have they helped to set priorities or to dilute them?
- ◇ What would new targets help to achieve that old ones did not?
- ◇ Over the 90s were resources for nutrition re-aligned or lost?

Let us know what you think!