

SCN News, Number 12

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UNITED NATIONS NATIONS UNIES

ADMINISTRATIVE COMMITTEE ON COORDINATION – SUBCOMMITTEE ON NUTRITION

A periodic review of development in international nutrition compiled from information available to the ACC/SCN



The important role of care in nutrition

(Source: UNICEF/5884/Roger Lemoyne)

RECENT ACC/SCN PUBLICATIONS

Update on the Nutrition Situation, 1994 (November 1994)

Refugee Nutrition Information System Reports of the Nutrition Situation of Refugee and Displaced Populations. Every 2 months. #9 February 1995, #10 April 1995.

Controlling Vitamin A Deficiency (SOA No. 14) (January 1994)
by Stuart Gillespie and John Mason. A report based on the ACC/SCN Consultative Group Meeting on Strategies for the Control of Vitamin A Deficiency, July 1993, Ottawa, Canada.

Effectiveness of Vitamin A Supplementation in the Control of Young Child Morbidity and Mortality in Developing Countries (SOA No. 13) (December 1993)
by G.H. Beaton, R. Martorell, K.J. Aronson, B. Edmonston, G. McCabe, A.C. Ross, and B. Harvey. Report of the findings of a review of the scientific evidence on the effectiveness of vitamin A supplementation on mortality and morbidity in children from developing countries.

Nutritional Issues in Food Aid (SOA No. 12) (August 1993)
Report of symposium on "Nutritional Issues in Food Aid" held at the 19th Session of the ACC/SCN in Rome, February 1992. Includes papers on the support of public works by food aid as a nutrition intervention, which age groups should be targeted for supplementary feeding, effects of supplementary feeding on the growth of children with infection, experiences of feeding programmes, and protecting refugees' nutrition with food aid.

Second Report on the World Nutrition Situation. Volume I: Global and Regional Results (October 1992)

Second Report on the World Nutrition Situation. Volume II: Country Data (March 1993)

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FEATURES

The Role of Care in Nutrition – A Neglected Essential Ingredient

The causes of poor child nutrition are undergoing a substantial reassessment with recent understanding of the importance of care. Richard Longhurst and Andrew Tomkins of the Institute of Child Health summarize current thinking.

by Richard Longhurst and Andrew Tomkins, Centre for International Child Health, Institute of Child Health, 30 Guilford St (University of London), London WC1N 1EH, UK

Introduction

The causes of poor child nutrition, all reflected in child survival, growth and development are undergoing a substantial re-assessment. For a long time nutrition outcomes have been equated primarily as being dependent on availability of food, in which the term household food security is used, and the presence of infection which influences the intake, absorption and utilisation of food. There has been some recognition that 'other factors', never properly defined, were important. People with knowledge of nutrition at all levels: family members, village workers, government officials, international civil servants and academics, have often recognised other determinants in the process, usually referring to issues such as 'social factors', 'ignorance' and, in some cases, 'love and support'.

A problem in identifying these other 'social' factors, was that they were often seen as too closely inter-twined with 'food' and 'health' as to be separated. Now these non-food, non-health factors are being brought together in a coherent and practical manner within an understanding of the role of care in nutrition outcomes. Care consists of the actions necessary to promote survival, growth and development, involving actions at the household level parallel with household food security and health promoting behaviour. Resources for improving care exist at the household level: income, food, time, attitudes, relationships and knowledge.

Care for children is recognised within the Declaration on the Rights of the Child as follows: "the child... needs special safeguards and care, including appropriate legal protection, before as well as after birth" and in the UN Convention on the Rights of the Child in Article 3: "to ensure the child such protection and care as is necessary for his or her well-being" and elsewhere in Article 6 and in Articles related to protection from abuse and in especially difficult circumstances such as war and when deprived of the family environment.

The principal drive for promoting and clarifying the concept of care in child nutrition outcomes, within the context of food and health has come from UNICEF. Within its nutrition strategy, adopted in 1990, and in work leading to it, especially in the Iringa Nutrition Programme in Tanzania, care of women and children was recognised, with household food security and the nature of the health environment and health services as one of three conditions, each necessary but not sufficient, for the fulfillment of child survival, growth and development. The actions of food, health and care were the foundation of the work of the ACC/SCN group meeting of November 1990 which reviewed actions that had been undertaken to address the major problems of underconsumption and malnutrition especially among the poorest, to point the way for renewed efforts in the 1990s.

At the International Conference on Nutrition, held in Rome in December 1992, food, health and care were recognised as the three fundamental components for nutritional well being. The theme paper on care for the ICN drew on empirical work world-wide and on consultative meetings with nutritionists, medical doctors and child psychologists. The role of NGOs and religious groups has been invaluable.

Care within maternal and child health has been strongly promoted within WHO and more recently, economists have begun to delve within households as the basic decision-making unit in their efforts to understanding the allocation of resources (or 'household economies'), work that had been carried out among others by the International Food Policy Research Institute (IFPRI). Most recently, papers on topics relating to care and nutrition of the very young child (from birth to 3 years of age) were presented at a UNICEF-funded meeting at Cornell University, New York, in October 1994. At the Institute of Child Health in London, work has been performed on methods for assessing and analysing care situations, developing guidelines and designing workable interventions, particularly for children in especially difficult circumstances.

Research from three areas – 'positive deviance', 'failure to thrive' and fieldwork on care in Central America – has confirmed what many field workers have understood: that care in terms of affection, emotional support, and effective allocation of resources with an atmosphere of stability and security has a direct influence on child nutrition as defined in terms of survival, growth and development. This research has shown that even in situations of poverty involving household food insecurity and an unhealthy environment, enhanced care giving can promote good nutrition outcomes in young children.

Care means different things to different professions and people. "Care" in general refers to the provision in the household and the community, of time, attention and support to meet the physical, emotional, intellectual and social needs of the growing child and other family members. It leads to the optimal use of human, economic and organisational resources. At an extreme, lack of "care" is neglect. Care in terms of child nutrition refers to facilitating the optimal use of household food resources for child feeding, and the optimal use of parental (or other) resources to protect from infection and care for the sick child, or other vulnerable members (e.g. the disabled, elderly). Care in the form of stimulation, affection and support can have a direct effect on growth in the young child, by affecting the timing of release of growth hormones and matching of nutrient intake with requirements.

Among groups of people regarded as nutritionally vulnerable, attention is often devoted to the very young child. However, there are other vulnerable groups for whom care is important such as mothers, refugees, the elderly, the disabled, the school age child and those suffering the shock of an emergency. Children in especially difficult circumstances who have dropped through the safety net of family and community support require special care interventions. Positive care behaviours allocate the household food supply to household members according to need (it should be recognised that this may conflict with cultures where males feed first) and promote the dietary intake of family members who are unwell. Loss of appetite from infection or emotional stress is thus not accepted as an obligatory event. Care involves encouragement, coaxing, keeping food safe and even provision of alternative more expensive, appetizing food sources. Care behaviours also encourage health promoting behaviour such as the use of latrines and appropriate water supplies and support health seeking behaviour through regular visits to preventive and curative medical services. All of these behaviours can be promoted and supported by government ministries of health, agriculture, education and community development, together with NGOs. Programme planners who find it difficult to understand why children are not fed when adequate food appears to be available in the household, nor wash their hands when water and soap are already used may look to care behaviours for some of the reasons.

Development programmes aiming to improve nutrition outcomes need to recognise Care as a crucial ingredient along with 'food' and 'health'. Programme managers should start with a situation-specific appraisal. This involves finding out who are the caregivers involved and how existing child care practices can be protected and supported. This appraisal also involves a dynamic understanding of trends and how the pressure on child care practices are changing. Through a process of assessment, analysis and action, then re-assessment, re-analysis and so on – a recurring Triple-A cycle – resources available at household and community level can be activated by different forms of communication to improve care, and hence nutrition.

Care, Nutrition and the Young Child

Care is vital in the nutrition of the young child. According to Professor Engle of CalPoly in California care giving behaviours include "breastfeeding, diagnosing illnesses, determining when a child is ready for supplementary feeding, stimulating language and other cognitive capacities, and providing emotional support". Thus, the use of bottle feeding breaks down the most effective way of caring for the very young child, which is via breast feeding. The role of the caregiver is obviously very important and although it is generally assumed that mothers are the primary caregivers, in many societies care is shared by older siblings, older relatives and possibly by other families in community-organised arrangements. The role of fathers is very important as they have specific care-giving behaviours to impart but often their care giving role is limited because of employment, personal leisure or attitudes.

Engle has also drawn attention to an important concept for analysing the need for, and impact of care, especially for the young child. This is the division of care behaviours into those which bring a child up to a minimally healthy level (compensatory behaviours) and those designed to increase the child's capabilities, growth or development (enhancement behaviours). She has pointed out that if parents do not value enhancement child care, extra time (an important resource) may be spent on other activities thought to be more important for the family such as income generation or leisure, rather than child care.

Research by psychologists has shown that the characteristics of a child strongly affect the nature of care that s/he receives. The two-way feedback between child and carer is very important: a non responsive child reduces the care s/he gets while a responsive and active child elicits more care from the care giver. Nutritionists have not given much attention to this, but it is acknowledged that characteristics such as appetite, temperament, responsiveness, health status and gender all influence caring behaviours. The need for care is often greatest with cases of severe protein-energy malnutrition. Inadequate levels of Care may well have been the reason for the cause of the nutrition problem in the first place. Therefore a re-inforcing cycle is set up.

Dr Urban Jonsson of UNICEF suggests that care behaviours for the young child can be grouped into four: i) feeding behaviours including breastfeeding, and complementary feeding especially those relating to frequency, amount and density; ii) hygiene behaviours related to food, personal and home, iii) psychosocial behaviours including responsiveness, warmth, involvement and opportunities for learning and iv) health behaviours such as service utilisation, oral rehydration therapy and home care. Feeding behaviours may be as important as food availability for child nutrition. Care factors provide specific lessons for supplementary feeding. The areas of appetite and complementary feeding are very important and only now are being properly understood.

Promoting care in the context of breast feeding involves several supporters. Employers need to provide adequate maternity support and facilitation of breast feeding in the workplace, governments must provide adequate control of the media and agreement by the food industry to ensure responsible activities regarding advertising of infant and child feeding commodities. Free or low cost supplies of breast-milk substitutes must not be provided to maternity services. Hospital personnel must be trained in the physical and psychological elements of breast feeding, with changes in hospital practices regarding births and stronger support for breast feeding. The lactating mother also needs support by other family members.

For severely malnourished children there is increasing consensus on the best regimes for treatment with regard to content of energy, protein, mineral, electrolytes and vitamins. There is also agreement, in general, on effective, affordable regimes of infection control. However, with few exceptions, there has been rather little attention to care issues that are necessary for the effective delivery of these interventions, including protecting and promoting traditional and effective child care practices. This obviously involves support for the carers; in some programmes this has been neglected such that the carers become demotivated, frustrated and ineffective. Such issues need attention within the family and organisations such as primary health care projects to prevent and manage organisational and personal stress.

A lot of the work on care has been directed at the child under three years of age and at pregnant and lactating women within the context of breast feeding. But care remains equally important for the nutrition of other groups and is equally neglected as a means of understanding how efforts to improve their welfare can be improved. Care has an important role in increasing nutrient intake and decreasing episodes of infection in high risk groups. Also, despite the considerable attention given to micronutrients over the last few years, for example, care as a factor in enabling their intake has been little examined.

Care, Nutrition and the School Age Child



The nutrition of the school age child has often been neglected, compared to the preschooler. But care and nutrition are vital for child development and health. Many school feeding programmes, for example, ignore care completely, their objective is often to make sure that a child consumes a specific amount of nutrients. The timing and nature of meals and the related social interaction are important opportunities to combine with knowledge of nutrition which might usefully be incorporated into the curriculum with practical experience of preparation and consumption of nutritious food prepared and eaten in hygienic environments. In such instances, care can be seen as the driving force which stimulates education ministries, schools and communities to ensure that resource provision accompanies theoretical learning. Care of individuals within schools who are 'not coping' because of malnutrition requires the incorporation of recognition and appropriate response within "teacher training". This is particularly important for children who do not receive breakfast or are micronutrient deficient. Similarly the special needs of children from particularly disadvantaged families require sensitive, informed and effective treatment.

In many countries the number of school age children attending school has remained constant; in some countries they are falling. The costs of primary school education, the need for the child as a worker in poor communities, decreasing opportunities for employment, civil disruption, and orphanhood from various causes including AIDs means that even in harmonious families and communities, school attendance may be limited. Add to this the burden of street children, those involved in exploited labour and the generally unattached, there is now increasing need to consider the care of school aged children who do not attend school. There is urgent need to promote appropriate interventions from the voluntary, religious and governmental sectors which involve unconditional care for individuals and the unattached. While these activities are normally considered the responsibility of social welfare services, the scale of the problem is so great that all avenues of response should be considered. Care may well involve avoidance of over-nutrition. With the one child policy in China for instance, there is likely to be increasing emphasis on essential micronutrient supplementation, by parents, in order to achieve scholastic and physical success. Similarly, foods that promote dental caries should be avoided.

Care, Nutrition and the Disabled Child

Many reports suggest that in both developed and developing countries about 7% of children have some form of disability. However, most studies show that, on average only 2–3% of children are considered disabled by the community and needy of special attention. Many causes of disability relate to poverty and care and nutrition can do much to prevent disabilities and ensure that the disabled child is not at a disadvantage.

The nutritional status of the disabled child is often poor; in many cases the disability has been caused by previous nutritional insults such as vitamin A deficiency leading to blindness, cerebral palsy as a result of premature birth or low birth weight caused by poor maternal nutrition or iodine deficiency causing varying degrees of mental retardation. Malnutrition among the physically or mentally handicapped child is a common

reason for marginalisation. In addition severe malnutrition due to insufficient energy intake is also a major disabling factor. Malnourished children get infections more seriously: diarrhoea for example can lead to serious dehydration, high fever and sometimes brain damage. Many disabilities can be prevented with improved care practices, protecting against infections and household and community accidents, making a strong case for care at community and national level to prevent energy and micronutrient deficiency induced disabilities. Communities need to have the resources to ensure iodised salt can be purchased and that, for example, vitamin A capsules can be distributed effectively and equitably.

As mentioned earlier, the obverse of care is neglect; many handicapped children may be neglected, but not because of any uncaring attitude on behalf of the family. In the scramble for scarce resources within a poor family there is a negative outcome for those who require more compensatory care, and may never even begin to receive the desperately needed enhancement care, especially in societies where the period of 'being cared for' is very short. For example, children who are disabled from birth with cerebral palsy may have feeding difficulties such that their families will continue to have to do everything for them long after other children have developed self-feeding skills. Extra attention paid at this stage will avoid future malnutrition and compounding of the disablement. Furthermore, the potential for improved function among disabled children and adults as a result of improved nutrition, is considerable. The problems of disabled children need more attention and advocacy with the introduction of programmes that recognise their special circumstances. They often 'fall between the cracks' of bureaucratically-defined programmes.

Care, Nutrition and the Urban Child

What are the principle differences between an 'urban' child compared to a 'rural' child and how does this affect care? There are increasing concentrations of people in urban areas depending on a higher level of economic diversification than an agriculturally based society. There is crowding, more of a cash economy, a lower level of physical activity in certain occupations, predominance of manufacturing, bureaucratic and service activities and some degree of organised public services. In addition it is believed that family ties may be weak especially for those who have entered an urban community recently. However, urban populations enjoy greater political clout. About twenty years ago the data showed that malnutrition was higher in rural areas but since then the differences have narrowed.

The urban economy and economic constraints resulting from recession and adjustment have caused an increase in the numbers of women working outside the home. The impact of women's work in terms of child nutrition appears to vary depending on the type of work undertaken, its intensity and location and level of income received. Women may not work longer than in rural areas but may have to travel further for that work. Employers may discourage accompanying children. Women may face confusion from health professionals and advertising with extra messages for child care and feeding. In many cases the time for child care is reduced. Fathers are often absent. Urban social systems are seen to differ from rural ones with important often destructive social consequences for child care. There is debate as to whether urbanisation results in a lack of community or different forms of community.

Social conditions are certainly different with additional stresses and dangers such as violence, drug addiction and prostitution. The urban environment is probably more unhealthy in terms of sanitary conditions: the disposal of both industrial and domestic waste are health hazards. Differing patterns of infection are seen both to cause and result from malnutrition. Breastfeeding is seen to have declined in many urban areas in terms of duration, if not of incidence, and thus emerges as a further cause of urban malnutrition.

It is in urban areas that especially disadvantaged children will exist. Children from the age of six upwards will be vulnerable to shocks from lack of supervision and discipline/nurture, prostitution, drugs and poisoning. Care programmes for urban children have to take account of the fact that they may not be located in a family, and that this care structure has to be provided in some form through other community institutions. Indigent children and orphans need to be considered as a special group for care and be included in nutrition programmes such as community kitchens.

Care, Nutrition and Refugees and People in Emergencies

The importance of care, within the context of food and health, is also leading to a different way in which we understand emergencies. Emergencies have grown in number and intensity over the last ten years, and many, especially in Africa, but also in the former Yugoslavia and Soviet Union, are also associated with conflict. As a result of these crises, the number of internally displaced people and refugees has grown; in Africa refugees and displaced now number 20 million, the size of a fair-sized nation. Many emergencies, including those of the sudden onset nature, have been seen as crises of food: people have nothing to eat and

this has to be provided for them from outside as rapidly as possible. Famine relief has become common especially in the Horn of Africa and food aid operations have taken a lot of the resources of multilateral and bilateral agencies.

However, over the last ten years, the notion that food alone meets the short term needs of populations in an emergency has been re-assessed. For children there is now a clear understanding that food and infection control alone are not enough. The major reason for this reformulation is that not enough attention has been devoted to understanding how those affected by an emergency behave. In most cases, they are not 'helpless victims' but cope and adapt to a crisis whether unexpected or not. These coping mechanisms are now beginning to be understood within the operational context of many agencies: strategies involve a number of insurance mechanisms, disposal of productive assets, income diversification, leading to distress activities such as splitting of families and communities and migrating to relief camps. Several of these will have important implications for children.

Families often decide to protect livelihoods rather than lives, which suggests that food intake is reduced early in the crisis (rather than later as is often assumed) and that the wage earners and their assets (e.g. livestock) are also protected. This will have negative implications for child care. With income diversification and longer searches for water, food and work, the amount of time devoted to children is also likely to decrease. Distress and destitution activities include migration by entire family units, prostitution and in extremes, selling off and abandonment of children.

When families migrate and join other destitute families in camps then a food crisis becomes compounded by a health crisis'. Congregations of large numbers of weak people with poor sanitation often cause outbreaks of infectious diseases such as cholera and measles. It is for this reason that health care, including widespread immunisations of children and provision of clean water, is now a component of relief aid. (Recent analysis of data from some famines in India in the nineteenth century has shown that malaria (in the irrigated areas) was the greatest cause of mortality, not lack of food by itself.) Refugees suffer from the same types of nutritional deficiencies as other groups, but often more so due to their increased destitution. Mental and emotional illnesses are also common among the displaced. Recently the importance of micronutrient deficiencies among refugees and the displaced has been extensively documented. Apart from vitamin A and iron deficiencies, scurvy and pellagra deficiencies have been seen in refugee populations.

However there had been little attention paid to components of care in relief interventions, until the effects of conflict on children became better understood. Care interventions involve maintaining intellectual and cognitive development, psycho-social care relating to the direct traumatic effects on child emotional development related to loss of personal security, and broader aspects relating to a child's wider social needs. In several emergencies involving conflict (popularly known as "complex" emergencies), children have suffered traumatic experiences including the sight of parents and others being killed. Therefore compensatory care related interventions have been needed for psychological rehabilitation. Emotional stress as a result of recent traumatic experiences may be very severe, affecting care of self and children. Withdrawal, depression, anxiety and despair have profound impact on appetite. Thus improved management of such problems should become an integral part of nutritional care. It is particularly important that teachers recognise that post traumatic disaster disorders may be an explanation for the "difficult" child, refusing to pay attention or eat.

More recently care has been broadened as an important emergency intervention to mitigate the disruption that occurs to a child's environment: loss of schooling, normal patterns of social life, separation from the family and protection during conflict from abduction, conscription, rape, imprisonment, abuse wounding and murder, all in contravention of the Geneva Convention. Care in the form of maintaining school education is increasingly being recognised as essential during a crisis, although it remains a low priority for donors after feeding and health care. A school binds a community together maintaining an air of normality, keeping children's minds off the shocks that the emergency may be causing.

In refugee camps, activities are designed to be very service delivery oriented to mechanically deliver food, immunisations and water. Care interventions are not usually included. Breast feeding is not encouraged and organising social activities for children happens only in rare cases. Child play is not usually encouraged. More can be done to ensure that family and social units stay together and maintain some cohesiveness so that young children do not become cut off from their families. Informal schooling could be organised in the camps. All of these have positive effects on nutrition and child development.

Conclusions

Care for improving nutrition, it has been emphasised, revolves around the allocation of resources and appropriate behaviours. Resources for the poor are always scarce; when resources are constrained, allocation always has negative implications for someone. So the whole issue of care has to revolve around the rights of children. Actions for improved child care has to be driven by an ethical position that the child has first call on resources. The fact that improving care also improves nutrition and function is therefore a helpful, but not necessary, imperative for improving nutrition.

Many interventions can have an impact on care, directly or indirectly. Actions taken by governments and other bodies at international and national or regional level can affect care at household level. It is not a closed family matter for the mother and child. At all levels care has to be recognised as an important factor in nutrition. Much is already known about food intake and health as inputs for nutrition; emphasis on care does not weaken their importance. In fact it does the opposite: understanding care issues will enable a more effective understanding of first, food as a commodity to be consumed and be used as a resource for improving livelihoods and family welfare and second, the health environment and health services in the context of available family practices and resources. Most importantly basing nutritional improvement on care, as well as food and health means that communities can take power into their own hands to improve the welfare of their children and not be solely directed by service delivery options from outside their community.

At national level many economic activities can have an impact on care in terms of improving the resources available at community level, including income generation and credit programmes that improve women's control over income, literacy and nutrition education that reflects resource scarcity at the household level, technology devices for workload reduction and legislation for rights for women and children. Whether these can be translated into improved care depends on whether care is seen as a responsibility for all, not just the primary care giver. Protection against harmful trends including necessary legislation and enforcement is another measure that can be taken nationally. Breast feeding should be protected and encouraged. In the community, care can be legitimised as an activity for the responsibility of all. Informal young child care networks can be strengthened with resources to expand beyond custodial services to provide enhancement care in terms of nutrition supplementation and cognitive and psycho-social stimulation. There are good models for this in several countries, notably Nepal. Within formal and informal employment relations, child care facilities could be instituted and strengthened. The importance of care in the promotion of nutrition is too important to be neglected any longer.

Bibliography

Engle, P. (1992) *Care and Child Nutrition* Paper for the International Conference on Nutrition. UNICEF, New York.

Gillespie, S. & Mason, J. (1991) *Nutrition Relevant Actions: Some Experiences from the Eighties and Lessons for the Nineties*. ACC/SCN State-of-the Art Series Nutrition Policy Discussion Paper No 10. ACC/SCN, Geneva.

Hanbury, C. (1992) *Child-to-Child and Children Living in Camps* Child-to-Child Trust, Institute of Education, University of London.

ICN (1992) *Caring for the Socio-Economically Deprived and Nutritionally Vulnerable*. Theme Paper No 3. FAO/WHO, Rome.

Myers, R. (1992) *The Twelve Who Survive: Strengthening Programmes of Early Childhood Development in the Third World*. Routledge/UNESCO, London. (See especially Chapter 9).

Ressler, E., Tortorici J., & Marcelino, A. (1993) *Children in War: A Guide to the Provision of Services*. UNICEF, New York.

Richman, N. (1993) Children in Situations of Political Violence. *J. Child Psychol. Psychiat.*, **34**(8), 1286–1302.

Werner, D. (1987) *Disabled Village Children: A Guide for Community Health Workers, Rehabilitation Workers, and Families*. Hesperian Foundation, Palo Alto

Zeitlin. M., Gassemi, H. & Mansour, M. (1990) *Positive Deviance in Child Nutrition*. UNU, Tokyo.

Update on the Nutrition Situation

Summary of findings from the recently published ACC/SCN "Update on the Nutrition Situation, 1994".

The ACC/SCN's "Update on the Nutrition Situation, 1994" was published recently. Here is a brief summary of its main findings.

How has nutrition done in the 1990s? New data available at country level¹ give recent trends in prevalences of underweight children, as the main nutritional indicator, in 18 countries. With earlier data, we now have estimates of trends in some 35 countries. These are shown in Figure 1, from the ACC/SCN's "Update on the Nutrition Situation, 1994", recently published (to order, see inside front cover).

¹ Many national surveys have been assisted by the Demographic and Health Surveys (DHS) project.

For Sub-Saharan Africa, seven of the eight trends show recent deterioration, the exception being Tanzania. This probably indicates general worsening of nutrition in Africa. Conversely, in the Near East and North Africa, and in South America, it seems likely that the generally improving trends of the 1980s are continuing, and both these regions are likely to reach prevalences now typical of developed countries by around the year 2000, at the present rate. The situation looks similar for many countries in Middle America and the Caribbean, however deterioration was noted in Nicaragua, and we are unsure of trends in Mexico and Cuba. In South East Asia the signs are that the rapid rates of improvement of the late 1980s probably continued. Newly available data from China indicate rapid improvement in underweight prevalences from 1987 to 1990.

Over half the underweight children in the World are in South Asia, thus estimates of trends in this region have enormous importance. New data are scarce. A surveillance system in Bangladesh indicates improvement from 1990 to 1993. Recent changes in the situation in India are harder to assess, as data gathered in 1991/92 are from a rather small sample – tentative results are that, of seven states assessed, three showed a deterioration, and four had no significant change. General improvement was previously estimated between 1975–79 and 1988–90. India suffered an economic slow-down in the early 1990s, and there is reason to hope that the reversal of the improving trend indicated may be temporary.

Rates of change in underweight prevalences can be compared with those necessary to reach the nutrition improvement goals – halving the prevalence from 1990 –2000 – endorsed by the World Summit for Children (UN, 1990) and the International Conference on Nutrition (FAO/WHO, 1992).

In South East Asia, China, Middle America/Caribbean, South America, and Near East/North Africa, the rates of improvement in many countries are good enough to reach the goal of halving the prevalence.

South Asia has the largest task, starting with both the highest prevalences and massive population. Thus although the rate of improvement here is estimated to be fairly similar to that in other improving regions – with the possible exception of India recently – these rates are not enough to meet the halving-the-prevalence goals. The rate required (because the starting prevalence is so much higher) is almost twice that of elsewhere, at nearly three percentage points per year, compared with one and a half for Sub-Saharan Africa or South East Asia. In contrast, in Sub-Saharan Africa a prevalence change of –1.5 percentage points per year would on average be required to meet the goal of halving the prevalence by the year 2000; but most of the observed trends in this region are actually positive, indicating deterioration in nutritional status.

An important determinant of nutrition trends is the economic growth rate. Comparing rates of change of GDP *per caput* with rates of change in prevalence shows an intriguingly close fit – see Figure 2. A first use of this relationship is to get some idea as to how generalizable prevalence data are, using the known GDP growth rates.

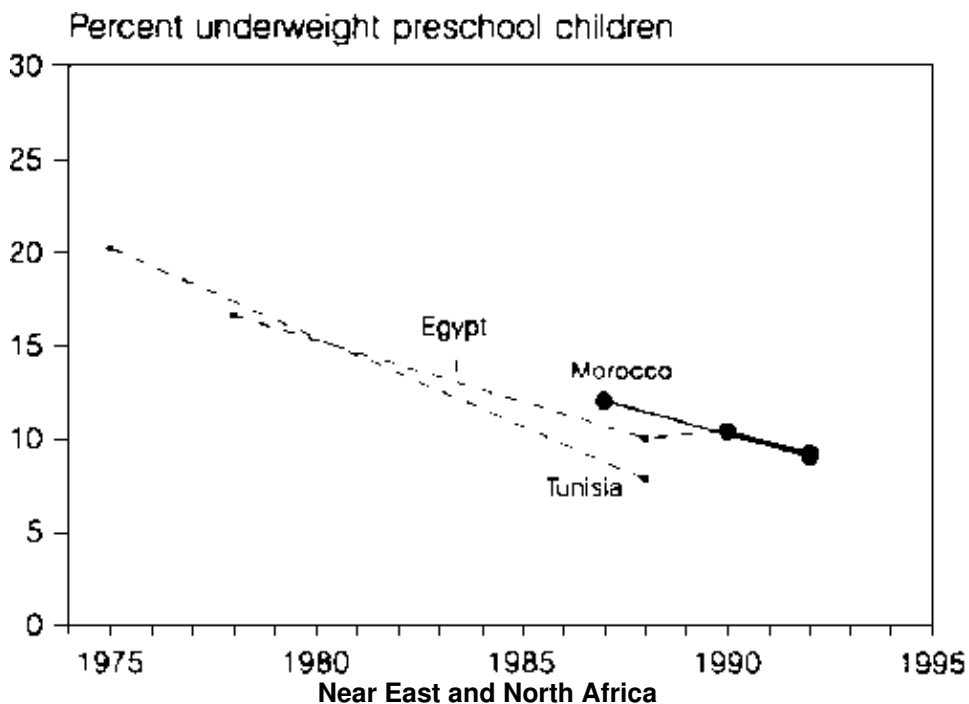
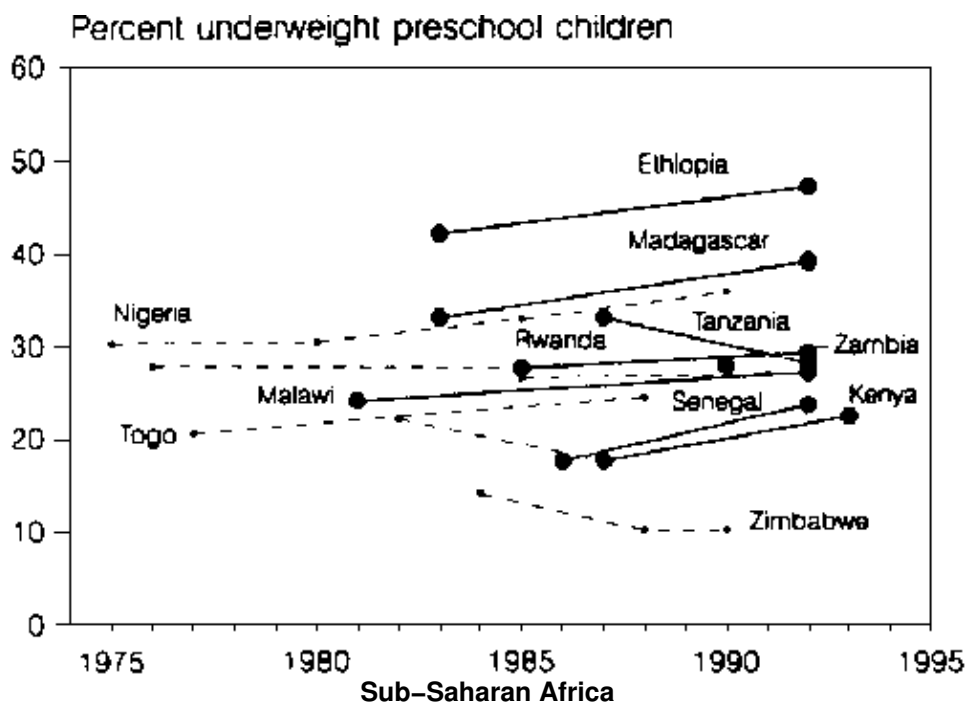
The question of how typical are the recent estimates is particularly important for Sub-Saharan Africa. Here there are eight recent national estimates available – most showing deterioration – but these only cover a minority of the population (in contrast, for example, to the data coverage in Asia). The average GDP change for the eight countries was recently slightly negative (–0.2% for 1985–92), compared with –0.8% for Sub-Saharan Africa overall. Thus these eight countries were slightly better off, if anything, than the average for Sub-Saharan Africa in 1985–92. The nutrition situation in Sub-Saharan Africa probably deteriorated somewhat more than indicated from the eight countries with available data.

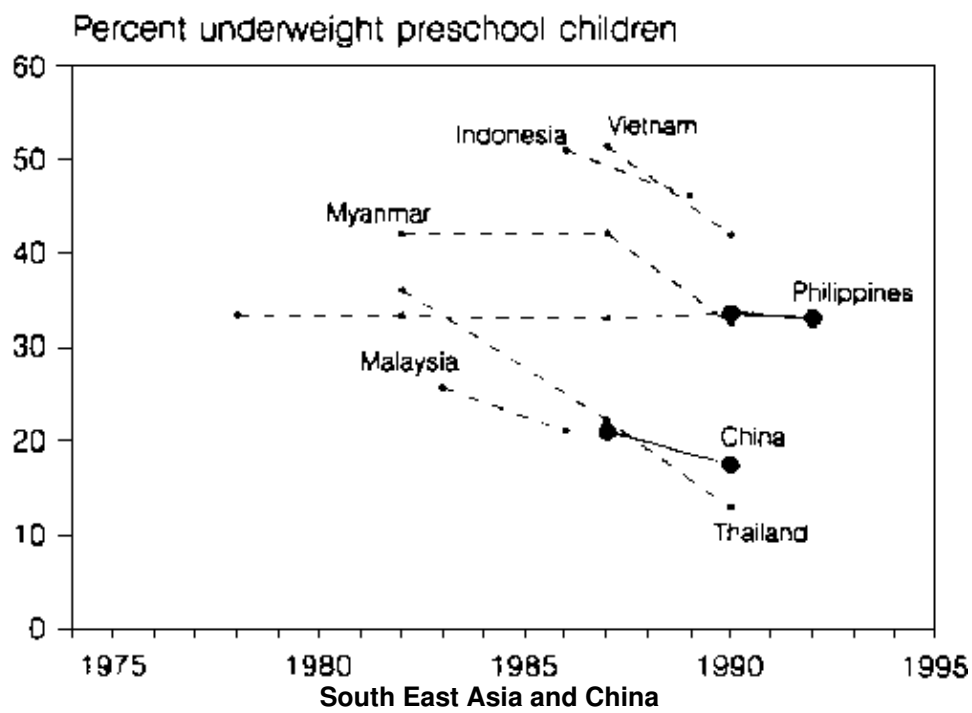
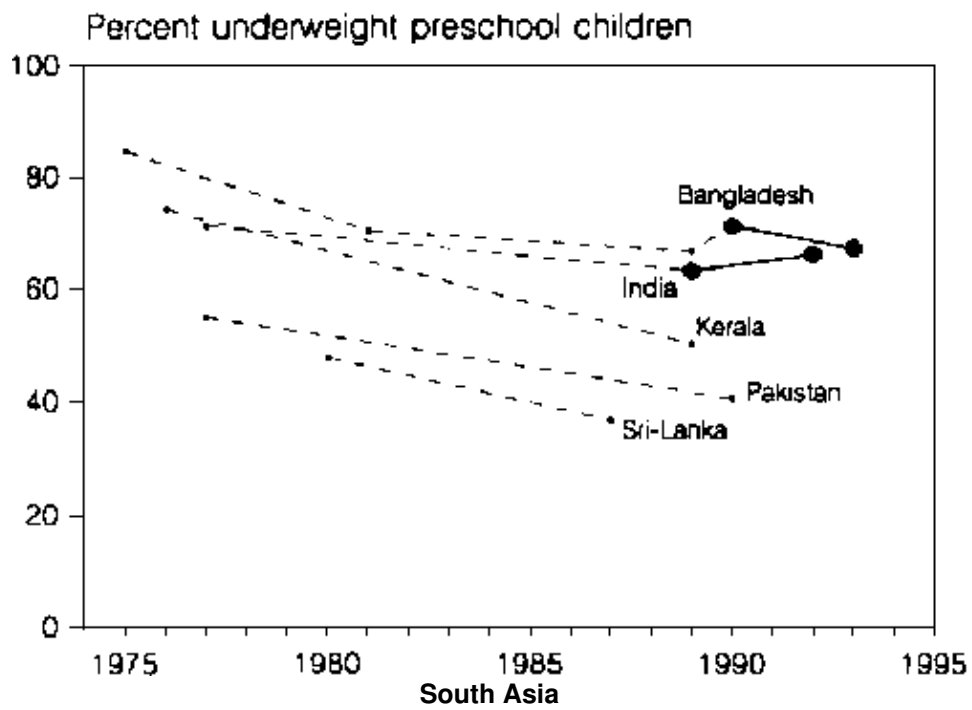
Was the trend in the early 1990s worse than that in the 1980s? Nutritional trends in Sub-Saharan Africa are estimated as static in 1985–90 and increased in 1990–92. The nutritional trend probably worsened in the early 1990s in Sub-Saharan Africa. The situation in South Asia depends on average largely on India, for which direct estimates indicate increasing prevalences in some states.

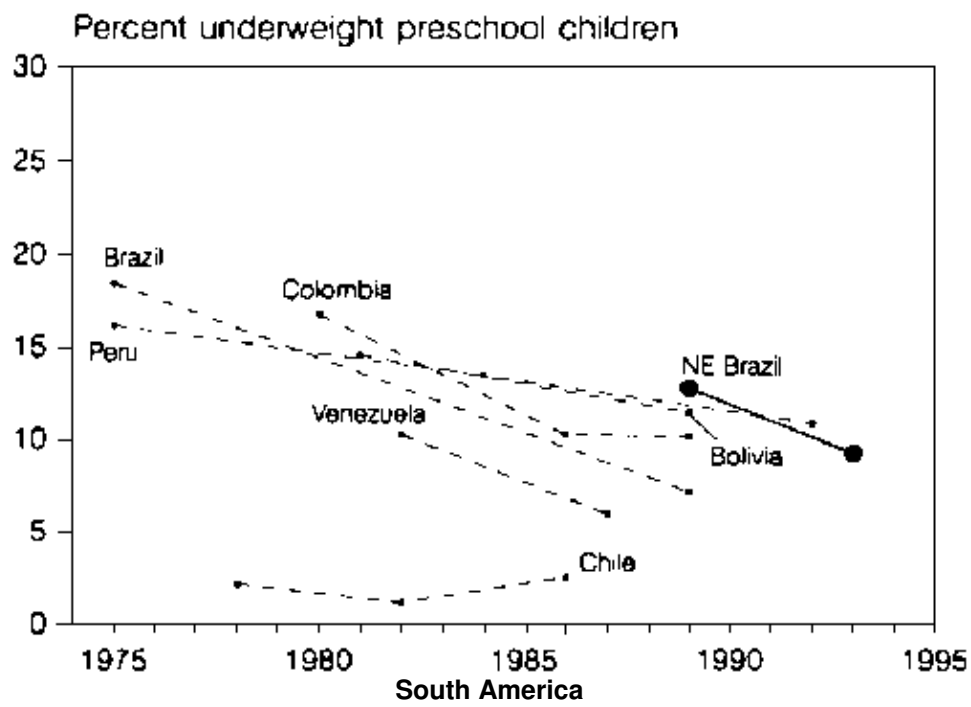
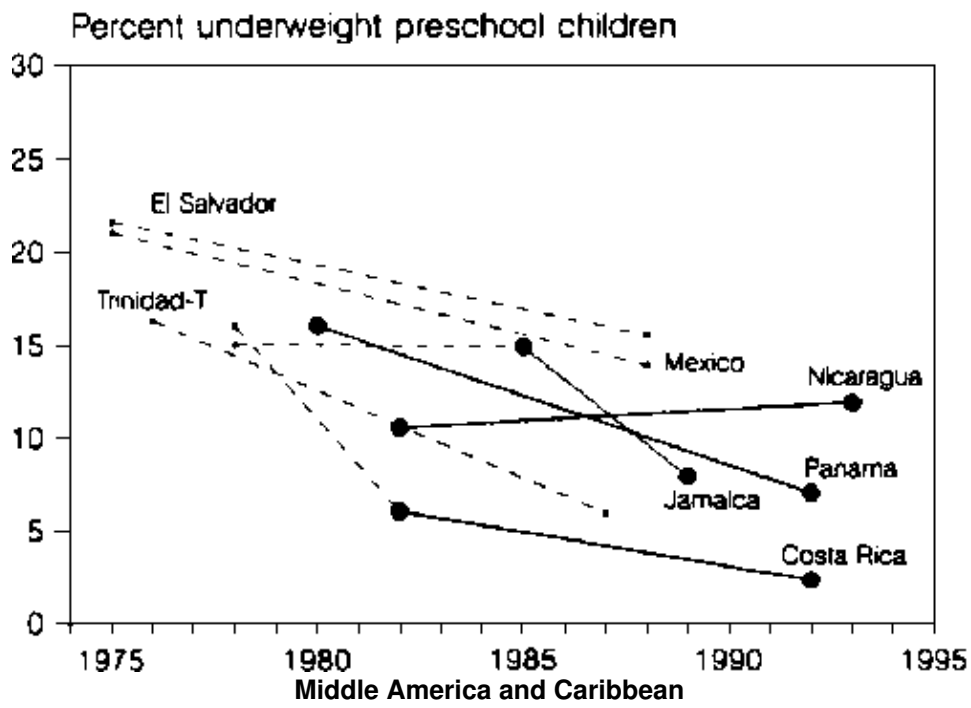
In other areas of the world the underweight trends in the early 1990s were generally similar to those in the late 1980s. In fact, in most regions the GDP growth rate improved after 1990, and nutritional improvement outside Sub-Saharan Africa and possibly India probably continued into the early 1990s.

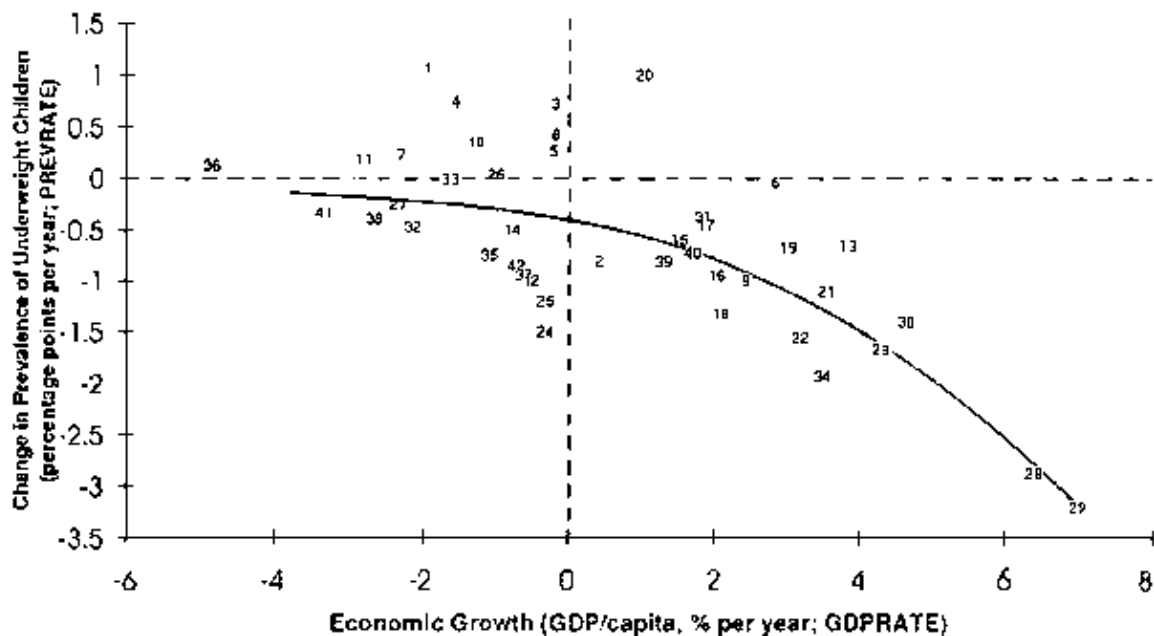
Figure 1. Recent Trends in Prevalence of Underweight Children

(New results are shown as solid lines and points; dotted lines are data previously given in Figure 1.3 of Second Report, Volume II, page 5)









Key

Country	From.	To
1. Ethiopia	1983,	1992
2. Kenya	1982,	1987
3. Kenya	1987,	1993
4. Madagascar	1984,	1992
5. Malawi	1981,	1992
6. Rwanda	1976,	1985
7. Rwanda	1985,	1992
8. Senegal	1986,	1992
9. Tanzania	1987,	1992
10. Togo	1977,	1988
11. Zambia	1984,	1992
12. Zimbabwe	1984,	1988
13. Egypt	1978,	1988
14. Egypt	1990,	1992
15. Morocco	1987,	1992
16. Tunisia	1975,	1988
17. Bangladesh	1981,	1989
18. Bangladesh	1990,	1993
19. India	1977,	1989
20. India	1989,	1992
21. Pakistan	1977,	1990

22. Srilanka	1980,	1987
23. Indonesia	1986,	1989
24. Malaysia	1983,	1986
25. Myanmar	1982,	1990
26. Philippines	1982,	1990
27. Philippines	1990,	1992
28. Thailand	1982,	1990
29. VietNam	1987,	1990
30. China	1987,	1990
31. CostaRica	1982,	1992
32. El Salvador	1975,	1988
33. Jamaica	1978,	1985
34. Jamaica	1985,	1989
35. Panama	1980,	1992
36. Nicaragua	1982,	1993
37. Trin/Tobago	1976,	1987
38. Bolivia	1981,	1989
39. Brazil	1975,	1989
40. Colombia	1980,	1989
41. Peru	1984,	1992
42. Venezuela	1982,	1987

For the first time, economic growth and nutritional change can be compared, as illustrated in figure 2. Rapid economic growth is associated with improving nutrition – certainly for such countries as Thailand and Vietnam in the 1980s (points 28 and 29 in Figure 2), and also for those growing well but less fast such as Indonesia (23) and China (30). Other countries with positive economic growth rates generally show nutritional improvement – with considerable variation – but the relationship becomes more diffuse around and below zero growth. Interestingly, prevalence probably still decreases somewhat (about -0.3 pp/year) at zero growth.

An underlying long-term tendency to improvement seems to be the good news – associated with such factors as increasing education and falling fertility – but this is often disturbed by shorter-term crises, which may be economic, political, environmental, or a combination of these. Worse, pessimism is reinforced concerning what the real long-term nutritional trend is in Sub-Saharan Africa.

The deviations from the average line in figure 2 are important. Many of the points seen in figure 2 to be improving faster than the average (for growth) seem plausible – e.g. Jamaica (34), Sri Lanka (22), Zimbabwe (12); similarly a number of notably deteriorating cases are well-recognized – e.g. Ethiopia (1), Madagascar (4), Rwanda (6). (Note that the data for India, 1989–92, point 20, are particularly tentative). Nonetheless, factors explaining the better-than-expected deviations should be examined systematically – for example are they related to social expenditures (health, education, etc.)? increased food security'? – and preliminary observations outside the scope of this overview, indicate that this may be so.

Interpretation is complicated by the fact that many countries with good economic performance are also able to support specific nutritional activities – Thailand and Indonesia are again examples of this. More detailed investigation is needed to disentangle the relative effects of such different nutrition-relevant actions. Economic growth (in part through increased food security), health and education, and community-based nutrition programmes all probably contribute to improving nutrition.

The availability of nutritional data has improved to such an extent that it is increasingly feasible to assess trends, and indeed in future it will be more possible to focus selectively on countries of special concern and interest. For this analysis in late 1994, 46 trend estimates (country–periods in 35 countries) were available in 1992, 29 national trends could be assessed and for the Update Report in 1989. In only around ten cases could trends be directly estimated. National data (observations at one point in time) are available now from over 100 surveys. The data, compiled by WHO, now usually include prevalences of stunting and wasting, as well as underweight and greater use of these indicators can be foreseen. A number of important publications now regularly include these indicators, such as UNICEF's State of the World's Children and Progress of Nations, UNDP's Human Development Reports, the World Bank's World Development Reports, and Bread for the World's annual Reports on the State of World Hunger. These estimates and publications all use the same basic data, and are generally consistent with each other.

So, in the places where nutrition problems are coming under control – such as Latin America – the '90s have seen continued improvement. But in the two worst affected regions, in numbers and prevalence, the picture is worrisome. Sub-Saharan Africa is deteriorating. South Asia is improving only slowly, if at all. The mid–90s will be crucial.

John Mason
Marito Garcia

Update on the Nutrition Situation, 1994

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Chapter 1. Overview (from which this article is taken)

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Chapter 3. The Nutrition Situation of Refugee and Displaced Populations. Sections on Asia (Afghanistan. Iraq, Butanese Refugees in Nepal, Myanmar (Rohingya) Refugees in Bangladesh) and Sub-Saharan Africa (Sudan, Rwanda/Burundi, Angola, Liberia Region, Mozambique Region. Somalia. Shaba Region in Zaire, Ethiopia, Refugees in Kenya.)

Specific Deficiencies Versus Growth Failure: Type I and Type II Nutrients

Two types of responses have been identified when a child's intake of an essential nutrient is insufficient – either there is continued growth whilst the body uses up the nutrient resulting in specific deficiency signs, or there is reduced growth while the tissue concentration of the nutrient is maintained. Michael Golden of the University of Aberdeen explains.

by Michael H.N. Golden, FRCP, Dept of Medicine and Therapeutics, University of Aberdeen, Scotland.

A child responds to a deficiency of an essential nutrient in one of two quite different ways. First, heⁱ can continue growing, consume the body stores and then have a reduction in the bodily functions that depend upon the deficient nutrient. Or, second, he can stop growing and avidly conserve the nutrient in the body to make it more internally available and maintain the concentration of the nutrient in the tissues. The difference between these two responses is fundamental and can be seen in experimental and farm animals, bacteria, and even in plants grown on soils that have the same nutrient deficiencies. The nutrients whose deficiencies give rise to the first response (growing, with specific deficiency signs) or the second (reduced growth, non-specific signs) are referred to as type I and type II nutrients.

ⁱ Unfortunately the English language has no pronoun for he/she hence he is used to refer to both males and females.

A list of the nutrients that fall into each category, and their response characteristics is given in table 1.

Why is it important to distinguish these two classes of nutrient? We usually think about specific nutrient deficiencies as if they give a type I response. Type II deficiency is usually ascribed to protein–energy

deficiency. Yet the possibility of this latter response – usually growth failure – resulting from other deficiencies has been generally ignored by nutritionists. The deficiencies may therefore remain largely unmeasured and uncorrected.

I have argued^{1,2} that type II nutrient deficiency is responsible for considerable amounts of the widespread stunting in height. If this is correct then up to half the children in the world may have unrecognized type II nutrient deficiency. Let us compare and contrast the type I and type II nutrients and explore the implications of the different ways in which we respond to a dietary lack of these nutrients.

Type I Nutrient Deficiency

These are the nutrients (see table 1) which are required principally for specific metabolic functions in the body, rather than for metabolism in general. During deficiency the person continues to grow normally, the body store is consumed and then the concentration of the nutrient in the tissues falls so that the specific metabolic function that depends upon the nutrient declines until the person becomes ill. The illness is recognized by particular and characteristic signs and symptoms; growth may be affected secondary to the illness. Well-known examples are anaemia (iron deficiency); beri-beri (thiamin deficiency); pellagra (niacin or nicotinic acid deficiency); scurvy (vitamin C or ascorbic acid deficiency); xerophthalmia (vitamin A or retinol deficiency); and iodine deficiency disorders (IDD).

The diagnosis of a deficiency of a type I nutrient is relatively straightforward – we can usually recognize the clinical picture; then we either measure the concentration of the nutrient itself or measure the protein or enzyme that depends upon the presence of the nutrient or test the relevant metabolic pathway or physiological function. For example, with iron deficiency we recognize anaemia, examine the red cells and then measure ferritin, iron, transferrin or protoporphyrin. Similarly, with iodine we recognize the goitre and the signs of hypothyroidism and then measure iodine, thyroxine or other thyroid related hormones. Doctors, nurses and nutritionists learn to recognize, diagnose and treat all the type I nutrient deficiencies listed in the table. Because these deficiencies are well recognized, we give priority to ensuring that there are adequate amounts in the diet, we try to supplement or fortify foods where deficiency is common, and we develop specific programmes to alleviate the problems.

Type II Nutrient Deficiency

In contrast, there are *no characteristic signs or symptoms* that differentiate which type II nutrient deficiency an individual has. They all give the same picture of poor growth, stunting and wasting. This is very important because it means that a person can easily have a specific deficiency that is unrecognized. Usually this is ascribed to overall food inadequacy, or protein–energy malnutrition – but we have generally not distinguished this from other possible causes such as deficiency of other type II nutrients. Most of what follows refers *not* to energy itself, as discussed in the last section.

When there is a deficiency of one of the type II or 'growth' nutrients the person stops growing, the body starts to conserve the nutrient so that its excretion falls to very low levels and there is minimum reduction in the tissue concentration. With continued or severe deficiency the body may start to break down its own tissues to release the nutrient for use by the rest of the body; this process is associated with a reduction of appetite. There are no body stores of these nutrients, other than normal tissue, that can be called upon in an emergency and into which excess nutrients can be deposited. Thus, as the tissue is broken down to release the deficient nutrient, the excess of all the others that are released during tissue breakdown is excreted from the body and lost. During reversal they will all have to be given to the person to make good these losses as well as replacing the deficient nutrient. These deficiencies do not affect any organ or tissue in particular, except perhaps in relation to those with very a high mitotic and synthetic rate such as the immune system and the intestinal mucosa; rather all tissues and organs are affected.

These have always been the 'problem' nutrients without clearly defined diagnostic tests or determination of human requirements. With animals the requirements have been assessed with "growth" assays. In other words the experimental animal has been given a diet with graded amounts of the nutrient and the point at which there is no increase in growth rate is taken as the requirement. As such experiments have not been performed in humans for ethical reasons, we are not clear about the precise requirements for man. Nevertheless, it is clear that the desired rate of growth is the major determinant of the dietary requirement for all the type II nutrients. They *all* need to be supplied in greatly increased amounts when rapid weight gain is required, for example during convalescence from illness, and when catch-up in height or weight is needed.

There are major conceptual and practical difficulties when we try to understand these deficiencies. Thus, for example, it is difficult to comprehend how an animal can die from zinc deficiency when it has a *normal* concentration of zinc in its tissues³; yet such an animal will die without zinc and it will respond rapidly and dramatically to small amounts of dietary zinc. The same applies to the other type II nutrients. To appreciate how this comes about is to understand these nutrients. They form part of the structure and fundamental metabolic machinery of each and every cell; they form the structure of the body and are concerned in practically every metabolic pathway and all the fundamental process such as protein and nucleic acid synthesis, metabolite transport and ionic gradients. During deficiency there is a reduction in all these processes so that the person is less able to withstand environmental stress or infection and maintain his "milieu interieur" and homeostatic control; this is how those with a type II deficiency die.

Responses

The strategy that the body uses for dealing with day to day fluctuations in intake is different for the two classes of nutrient. With the type I nutrients the body maintains a store that is added to and drawn upon to buffer changes in supply. In contrast, with the type II nutrients, some of the dietary intake is incorporated into functional tissue during its "turnover" and the rest, which is in excess, is excreted. In the face of a low intake the body homeostatically reduces the excretion to minute amounts and recycles the nutrient, within the body. However, this conservation and re-use strategy means that growth (which increases the required total pool of the nutrient if the concentration is to be maintained) cannot occur during a period of limited intake; the body maintains the concentration of the nutrient in the tissues mainly by stopping growth as soon as there is a dietary limitation of any one of these nutrients. The child's body goes into a 'maintenance mode', with all the functions, apart from growth, continuing normally. If the low dietary intake continues for a sufficient time then, as the individual 'maintains' himself, he falls further and further behind his peers to eventually present as growth failure.

As the response to a deficiency – growth failure – is the same for each of the nutrients, when we observe growth failure it could be caused by a lack of any one of the type II nutrients and we cannot be sure which is responsible. This is not a major problem in practice because we should treat type II deficiency by giving a diet which contains sufficient amounts of *all* of these nutrients in a balanced way.

The mechanisms by which the body ceases growth in response to nutritional lack (by reducing the production of the hormonal mediators of growth, down-regulation of receptors, reducing protein synthesis, etc.) give a similar hormonal picture to that seen in endocrine disease. Apart from poor growth, no feature reproducibly corresponds with deficiency, indeed there does not need to be any 'defect' in the animal's metabolic pathways that can be related to the diet and held responsible for the growth delay; only the adaptive hormonal changes mediating the slow growth need be present. Growth failure, and growth failure alone, is the clinical sign characteristic of a diet deficient in protein, zinc, magnesium, phosphorus, potassium, etc. The reduced cellular turnover will also affect the immune system, and these deficiencies may present with an increased prevalence of infectious disease. This is in line with the observation that growth failure is correlated with lowered immune response.

The response to a long standing mild deficiency is a diminutive person, with the body in proportion. The extent of the stunting will be in relation to the integral of the degree of shortfall of the nutrient and time. With a mild deficiency there will be no clinical signs whatsoever, until growth failure becomes apparent: if the diet is restored before growth failure is diagnosed the deficiency will go completely undetected. With a severe deficiency, or pathological loss of the nutrient, there may be loss of tissue leading to wasting, without necessarily time for stunting to become apparent; again the nutritional nature of the wasting may remain undiagnosed and be ascribed to toxins, infection, worms, persistent diarrhoea or another pathological agent. The balance between the severity of the deficiency and its duration will also determine the relative amounts of stunting and wasting that are produced. Mild, chronic deficiencies are expected to be more common than severe, acute deficiencies so that stunting would be predicted to be more common than wasting: this is what is observed.

As a consequence of not having a store for type II nutrients, when there is a negative balance for one of these nutrients, implying tissue catabolism, there is a negative balance for *all* the components of lean tissue. Thus protein, zinc or potassium deficiency, for example, will each lead to a negative balance of the other type II nutrients, *in proportion* to their relative concentrations in the tissues that are being broken down. This was shown elegantly by Rudman *et al* in parenterally fed adults⁴. Nutrient balance studies are thus unreliable in predicting which nutrient is deficient in the diet. When we observe a negative balance for any one nutrient such as nitrogen, we should consider a type II nutrient deficiency as a possible cause. During treatment, as whole tissue has been lost, all the components for that tissue to be resynthesized need to be given

irrespective of the cause of the negative balance and weight loss.

Table 1

A. Classification of nutrients according to whether the response to a deficiency is a reduced concentration in the tissues and specific clinical signs (type I), or a reduced growth rate with non-specific signs (type II).

TYPE I nutrients	TYPE II nutrients
iron	potassium
copper	sodium
manganese	magnesium
iodine	zinc
selenium	phosphorus
calcium	protein
fluorine	nitrogen
thiamine	carbon skeletons of essential amino acids
riboflavine	threonine
pyridoxine	lysine
nicotinic acid	sulphur
cobalamin	[oxygen]
folate	[water]
ascorbic acid	[energy]
vitamin A (retinol)	
vitamin E (tocopherol)	
vitamin D	
vitamin K	

B. The differences between typical type I and type II deficiency responses

TYPE I	TYPE II
<i>growth continues in early stages</i>	<i>growth failure first response</i>
<i>specific clinical signs develop</i>	<i>no specific clinical signs</i>
<i>tissue concentration drops with deficiency</i>	<i>tissue concentration maintained with deficiency</i>
<i>body stores exist</i>	<i>no body store of these nutrients</i>
<i>concentrated in particular tissues</i>	<i>not in any particular tissue</i>
<i>specific enzymes affected</i>	<i>general effect on metabolism</i>
<i>not usually anorexic</i>	<i>anorexia common response</i>

<i>tissue concentration independent of the other type I nutrients</i>	<i>tissue concentration dependent upon all the other type II nutrients</i>
<i>tissue concentration maintained in different metabolic states</i>	<i>tissue concentration may change (drop) with metabolic state</i>
<i>food sources very variable</i>	<i>ratio in foods not very variable</i>
<i>diagnosed by biochemical tests</i>	<i>do not give biochemical abnormalities</i>
<i>anthropometric abnormality only appears late in the deficiency</i>	<i>diagnosed by anthropometric abnormality</i>

Because of the avid metabolic conservation possible, it is extremely difficult to produce a deficiency of one of these nutrients *in the non-growing child or adult* by dietary means alone; there usually has to be a pathological loss of the nutrient from the body. Thus, it is almost impossible to produce sodium deficiency in the normal adult⁵ unless there is excess sodium loss in sweat or diarrhoea. Depletion of the type II nutrients sufficiently severe to cause loss of function are thus usually found in association with disease such as persistent diarrhoea and are probably the reason that persistent diarrhoea is associated with anorexia and weight loss (instead of an increased appetite as one would expect with energy deficiency).

Dietary Fellow Travellers

Because the type II nutrients are fundamental to basic biological processes throughout the plant as well as the animal kingdom, they tend to have similar concentration ratios in many foods. It is not, therefore, unusual for diets to be deficient in several of these nutrients. These nutrients are dietary 'fellow travellers'. It is very difficult or impossible to determine if a particular type II nutrient is causing growth failure in the individual², however, it is relatively simple to find out if a child with low weight-for-height or short stature has a deficiency of one of these nutrients. The growth response to a trial of a *complete and balanced* diet should form part of the assessment of such children, in a setting where such assessments can reasonably be undertaken.

Effect on Appetite

Apart from growth failure, the other response which is common with a deficiency of each of these nutrients is anorexia; this is corrected if the nutrient is supplied. Thus, if a child with zinc deficiency is supplemented with zinc, he will regain his appetite and have an increased intake of protein, energy, potassium, and even non-supplemental zinc, in response to the specific supplement⁶. Clearly with these nutrients it is impossible to interpret dietary intake data for single nutrients or energy as the increase, or decrease, in the intake and utilization of the nutrient under consideration may be caused by a dietary variation of a different nutrient altogether. In the study by Krebs *et al*⁶, protein intake was low; if supplemental protein (without zinc) had been given there would have been no response and the conclusion possibly drawn that the short stature was not nutritionally based at all. As growth will be limited by the most deficient nutrient, it is only possible to have a 'deficiency', in the classical sense, with one type II nutrient at a time – the limiting one. Thus, even if a diet contains very reduced quantities of a particular nutrient, protein for example, no response to supplementation and no specific consequences are to be expected, if another type II nutrient is even more limiting. When a poor appetite is seen in a patient it is a signal that there may be a type II nutrient deficiency.

The concepts of a type II nutrient have been accepted with respect to the essential amino acids being properly balanced each in its appropriate amount to make a protein with a high 'score' – it might be easiest to understand if this concept is expanded to include all the other type II nutrients as if they were essential amino acids in dietetic terms although, of course, they are nothing like amino acids in metabolic terms.

Strategies for Supplementation

When a dietary supplement is given, which does not contain *all* the nutrients required for new tissue synthesis, the rate of growth and the efficiency of growth will be determined by the most limiting nutrient in the new diet (basic diet plus supplement), not in the original diet or in the supplement alone, indeed by diluting the original diet an incomplete supplement can make a deficiency worse. Clearly, if an unbalanced supplement is given the other nutrients in the supplement will be used inefficiently; just as a diet with protein which has an

amino acid score of zero, because it lacks an essential amino acid, is totally useless and is wasted. The degree of inefficiency is related to the magnitude of the imbalance between the actual limiting nutrient in the diet as a whole and the nutrient under consideration. When we observe an inefficient use of nutrients or energy we can infer that the diet may be unbalanced with respect to one of the type II ingredients that is limiting growth and efficiency. This may be one useful measure of the adequacy of a diet as a whole – the efficiency of use of its energy for growth. Gross inefficiency is almost universal in reported supplementation trials⁷. This is not surprising as all these supplementation trials concentrated on supplying extra protein and energy whilst ignoring the other type II nutrients, particularly potassium, magnesium, zinc and available phosphorus.

As a further complication, the response to the supplement, and the required balance of nutrients in the supplement, will depend upon the precise mix of tissues that the person is trying to lay down. This will depend, in turn, upon the age of the subject, the degree of wasting and stunting that has to be made good, and the composition of the required new tissues. Clearly, the dietary requirements for skeletal growth, for muscle synthesis, for adipose tissue and for skin synthesis are likely to differ – but, by how much, in what way and whether this is ever a major factor has not been explored. It is likely that giving a diet with the same balance of nutrients as that which constitute the tissues themselves, with adjustments made for intestinal absorption, is likely to be the best starting point in prescribing an appropriate intake to prevent undernutrition, promote rapid recovery from illness and shorten convalescence.

Supplementation studies have shown that substantial numbers of children may have a type II deficiency in affluent as well as developing countries. Early investigations in Scotland⁸ and Alabama⁹ showed a growth response to adding milk to poor children's diets, the same response was shown by Malcolm in New Guinea¹⁰. In Africa there are consistent height differences between population groups that have different staple foods¹¹. And there are differences between the growth of western infants with different formulae¹²⁻¹⁴. In a series of studies in Colorado, Hambidge has shown a rapid increase in height with zinc supplementation of short children¹⁵. Similarly, in Ontario, 25% of short children responded to zinc supplementation with a height spurt¹⁶. Perhaps the children that did not respond to zinc had their height limited by one of the other type II nutrients. It would seem that the human response to a deficiency is the same as in experimental animals and that unsuspected nutritional limitation is a common cause of short stature.

I would emphasize that the examples chosen to illustrate the nature of deficiency of these nutrients have been largely drawn from work with zinc. This is because there has been a lot of interest and data published on the effect of zinc whereas magnesium, potassium and phosphorus, for example, have been ignored by nutritionists. However, the same principles apply to *all* of them and not just to the nutrients studied in the experiments reported. The crucial thing is to have the right *balance* of type II nutrients in the diet: this rarely happens and most of the supplemental diets we currently give to malnourished children or adults are limiting in one or other of the type II nutrients.

Deficiency of the type I nutrients give rise to biochemical abnormalities without any necessary anthropometric changes whereas the type II nutrients give rise to anthropometric abnormalities without biochemical changes. Clearly both are needed to assess the nutritional status of an individual patient. Nevertheless, it is ironic that anthropometric criteria are used to diagnose undernourished and malnourished individuals, who are then all too often treated with a diet that has energy and all the type I nutrients (whose deficiencies are prevalent) whilst the deficiencies (type II nutrients) that gave the wasting and stunting in the first place remain uncorrected. There is a pressing need for a new way of addressing the nutritional problems of the malnourished in a balanced and rational way.

Energy Deficiency

Although ENERGY could be regarded as similar to a type II nutrient in some respects, it really falls into a separate nutritional category. If type I nutrients are used for specific pathways and type II as building blocks of tissue, energy is the fuel that is burnt to power the process; "energy" is not a nutrient, per se; it is a measure of total food intake. Pure energy deficiency rises when there is insufficient food available (famine). However, a low energy (food) intake is frequently a result of loss of appetite rather than lack of available food of some sort; low energy intake is then not a primary Cause of malnutrition but secondary to the anorexia of type II nutrient deficiency, infections or other illnesses that similarly affect metabolism such as liver disease. Provision of more of the type of food that is already available within the household will not correct a low energy intake and weight loss due to anorexia, rather the underlying cause should be identified and corrected – unrecognised type II nutrient deficiency may be a common cause of this anorexia, and should be addressed by changing the quality of the food available rather than simply its quantity.

References

1. Golden, M.H. (1988) The Role of Individual Nutrient Deficiencies in Growth Retardation of Children as Exemplified by Zinc and Protein. In: *Linear Growth Retardation in Less Developed Countries*, pp. 143–163. Ed. Waterlow, J.C. Raven Press, New York.
2. Golden, M.H. (1991) The Nature of Nutritional Deficiency in Relation to Growth Failure and Poverty. *Acta Paediatrica Scandinavica*, **374**, 95–110.
3. Williams, R.B. & Mills, C.F. (1970) The Experimental Production of Zinc Deficiency in the Rat. *British Journal of Nutrition*, **24**, 989–1003.
4. Rudman, D., Millikan, W.J., Richardson, T.J., Bixler II, T.J., Stackhouse, W.J. & McGarrity, W.C. (1975) Elemental Balances During Intravenous Hyperalimentation of Underweight Adult Subjects. *Journal of Clinical Investigation*, **55**, 94–104.
5. McCance, R.A. (1936) Experimental Human Salt Deficiency. *Lancet*, **1**, 823–830.
6. Krebs, N.F., Hambidge, K.M. & Walravens, P.A. (1984) Increased Food Intake of Young Children Receiving a Zinc Supplement. *American Journal of Diseases of Childhood*, **138**, 270–273.
7. Beaton, G.H. & Ghassemi, H. (1982) Supplementary Feeding Programs for Young Children in Developing Countries. *American Journal of Clinical Nutrition*, **35**, 864–916.
8. Orr, J.B. (1928) Milk Consumption and the Growth of School Children. *Lancet*, **1**, 202–203.
9. Spies, H., Dreizen, S., Snodgrass, R.M., Arnett, C.M. & Webb–Peploe, H. (1959) Effect of Dietary Supplement of Non Fat Milk on Human Growth Failure. *American Journal of Diseases of Childhood*, **98**, 187–197.
10. Lampl, M., Johnston, F.E. & Malcolm, L.A. (1978) The Effects of Protein Supplementation on the Growth and Skeletal Maturation of New Guinean School Children. *Annals of Human Biology*, **5**, 219–227.
11. Nicol, B.M. (1959) The Protein Requirements of Nigerian Peasant Farmers. *British Journal of Nutrition*, **13**, 307–320.
12. Fomon, S.J., Filer, L.J., Thomas, L.N., Anderson, T.A. & Nelson, S.E. (1975) Influence of Formula Concentration on Caloric Intake and Growth of Normal Infants. *Acta Paediatrica Scandinavica*, **64**, 172–181.
13. Fomon, S.J., Filer, L.J., Ziegler, E.E., Bergmann, K.E. & Bergmann, R.L. (1977) Skim Milk in Infant Feeding. *Acta Paediatrica Scandinavica*, **66**, 17–30.
14. Salmenpera, L., Perheentupa, J. & Siimes, M.A. (1985) Exclusively Breast Fed Healthy Infants Grow Slower than Reference Infants. *Pediatric Research*, **19**, 307–312.
15. Walravens, P.A. & Hambidge, K.M. (1976) Growth of Infants Fed a Zinc Supplemented Formula. *American Journal of Clinical Nutrition*, **29**, 1114–1121.
16. Gibson, R.S., Vanderkooy, P.D.S., MacDonald, A.C., Goldman, A., Ryan, B.A. & Berry, M. (1989) A Growth–Limiting, Mild Zinc–Deficiency Syndrome in Some Southern Ontario boys with Low Height Percentiles. *American Journal of Clinical Nutrition*, **49**, 1266–1273.

Enrichment of Food Staples Through Plant Breeding. A New Strategy for Fighting Micronutrient Malnutrition

Howarth Bouis of the International Food Policy Research Institute (IFPRI) presents arguments for investing in a new strategy for reducing micronutrient malnutrition, through plant breeding.

Introduction

The four, broad, widely-recognized strategies for reducing micronutrient malnutrition are supplementation, fortification, dietary diversification, and disease reduction. This note introduces arguments for investing in a fifth, broad, concurrent strategy – plant breeding. Plant breeding not only holds great promise for making a significant, low-cost, and sustainable contribution to reducing micronutrient, particularly mineral, deficiencies in humans, it also may well have important spinoff effects for increasing farm productivity in developing countries in an environmentally-beneficial way. Trace minerals are important not only for human nutrition, but for plant nutrition as well.

An underlying cause and fundamental constraint to solution of the micronutrient problem is that non-staple foods, particularly animal products, tend to be the foods richest in bioavailable micronutrients, which the poor in many developing countries desire to eat, but cannot afford. Their diets consist mostly of staple foods, primarily cereals – in fact, per capita direct consumption of staple foods overall varies little according to income level. For the poor, these staple foods are primary sources of what micronutrients they are able to consume, particularly minerals. This also means that micronutrient deficiencies are likely to be more common than energy deficiency.

The plant breeding strategy seeks to take advantage of this existing human consumption behavior by developing staple food crops that, in some sense, fortify themselves – breeding staple crop genotypes that load high amounts of minerals and vitamins into their seeds.

The initial steps in the long-term effort to bring this strategy to a successful conclusion have already been taken by the Consultative Group on International Agricultural Research (CGIAR), a group of seventeen internationally-funded agricultural research centers seeking to raise farm productivity and food consumption in developing countries. Over the past two years, a coordinated plan has been developed involving collaborative research on five major staple food crops (rice, wheat, maize, beans, and cassava) between five core research institutes: three CGIAR Centers – (The International Center for Tropical Agriculture [CIAT], The International Center for Maize and Wheat Improvement [CIMMYT], and The International Rice Research Institute [IRRI]); the Waite Agricultural Research Institute of the University of Adelaide in Australia; and the Plant, Soil, and Nutrition Laboratory (PSNL) run by the USDA-ARS and located on the Cornell University campus – and a number of other collaborating institutes and scientists in developing and developed countries. The project was initiated and is being coordinated by a fourth CGIAR Center, the International Food Policy Research Institute (IFPRI). Initial screening for promising germplasm has already commenced, drawing on extensive germplasm banks located at CIAT, CIMMYT, and IRRI, and seeds provided by collaborating agricultural research organizations in developing countries.

Five Core Questions

A strategy of breeding plants that enrich themselves, that load high amounts of minerals and vitamins into their edible parts, has the potential for substantially reducing recurrent costs that are associated with other strategies, such as fortification and supplementation. However, this approach will work only if farmers are willing to adopt such varieties, if the edible parts of these varieties are palatable and acceptable to consumers, and if the extra micronutrients can be absorbed by the human body. In examining the feasibility of a plant breeding strategy, it is imperative to address five core questions, which are discussed below. Readers are referred to various references for more detailed justifications of the abbreviated answers provided.

Is it scientifically feasible to breed for staple food varieties whose seeds are micronutrient-dense? If so, how long will it take to develop such varieties?

There are at least three cases of agricultural research projects in developed countries which have successfully manipulated the efficiency of mineral uptake of plants and the mineral content of plant seeds, all of which have been commercially successful: zinc-dense wheat varieties, developed at the Waite Agricultural Research Institute of the University of Adelaide to improve plant nutrition in zinc "deficient" soils, are already being grown on a commercial basis in Australia; in the United States, an iron-efficient soybean has been developed to overcome problems of iron "deficient" soils; and also in the United States, cadmium levels in durum wheats have been reduced through plant breeding so as to meet quality standards in countries importing U.S. wheat.

In the Australian case, this breeding strategy was motivated by previous, more basic scientific research at Waite involving the trace minerals manganese and copper, which suggested that genetic variation between plant varieties was affecting the levels of uptake and grain content of these and other microelements and was associated with tolerance to low plant availability of the element in the soil.

Plant breeders associated with the CGIAR project estimate that, if the genetic inheritance is relatively simple as argued by Graham and Welch (1994), improved varieties could be developed within four years of having the essential facts and tools necessary for genetic improvement, but this time could double if genetic inheritance turns out to be unexpectedly complex and linked to undesirable traits. In either case, two to three years need to be added to this for national government agricultural research programs to test the new varieties before their release. Thus, ten years may be required before nutritionally-improved varieties could be available for commercial production by farmers in developing countries. A more optimistic estimate is six years, if exploratory work with promising genetic material identified at the beginning of the project proves successful.

What effect will breeding for micronutrient-dense seeds have on plant yields? Will farmers adopt such varieties?

Results from research at Waite and elsewhere show that where the soil is deficient in a particular micronutrient, seeds containing more of that nutrient have better germination, better seedling vigor, and/or more resistance to infection during the vulnerable seedling stage. These benefits to crop establishment can result in higher crop yield. Thus, the specific breeding goals for human and plant nutrition largely coincide. There is the expectation, therefore, that the new cultivars with higher contents of micronutrients will have an agronomic advantage to ensure they are competitive in the market place. In box 1 a summary of the main points made in a keynote paper presented by Drs. Robin Graham of Waite and Ross Welch of PSNL (1994) at an organizational workshop held in January 1994 is given, outlining the reasons to expect positive impacts on plant yields of crop varieties that are efficient in the uptake of mineral micronutrients from soils and that load high amounts of these minerals into seeds. Readers are referred to that paper for descriptions of studies and experiments undertaken to support the conclusions cited.

Will breeding for micronutrient-dense seeds change processing or consumer characteristics of staple foods?

Mineral micronutrients comprise a tiny fraction of the physical mass of a seed, perhaps ten parts per million. Dense seeds may contain perhaps as many as fifty parts per million. It is not expected that such small amounts will alter the appearance, taste, texture, or cooking quality of foods.

Betacarotene is associated with an orange or yellow color. Increasing the content of betacarotene in the seed will alter its color, which initially might well reduce consumer preference. However, through nutrition education, the potential drawback of a deep orange or yellow color clearly marking a nutrient-dense product, possibly could be turned to an advantage.

Will micronutrient intakes be increased to a significant degree? To what extent will the extra micronutrients in staple foods consumed be bioavailable?

An underlying cause and fundamental constraint to solution of the micronutrient problem is that non-staple foods, particularly animal products, tend to be the foods richest in bioavailable micronutrients, which the poor in developing countries cannot afford. Their diets consist mostly of staple foods, primarily cereals; in fact, per capita direct consumption of staple foods in the aggregate varies little by income level. For the poor, these staple foods already are primary sources of what micronutrients they are able to consume, particularly minerals.

Evidence on food staple consumption behavior suggests that, if the presently low iron content of food staples could be increased by a factor of 3.5 (say from 12 to 42 parts per million), this would double iron intakes, as suggested by data from the Philippines shown in table 1 (Bouis 1991). However, would this double the amount of bioavailable iron?

FAO/WHO recommends that people who obtain less than 10 percent of their calories from animal foods (this applies to the surveyed Philippine population as shown in table 1) need more iron because perhaps only 5 percent of total intake is absorbed. While doubling iron intakes would not allow the surveyed Philippine females to attain this RDA, particularly at very low income levels, there is no reason to think that the degree of absorption of additional iron would be lower than the present rate of absorption. Thus, bioavailable iron would also double, which should be of substantial benefit.

A breeding strategy of lowering the level of inhibiting substances (e.g. phytin) in the grain has often been suggested to increase the bioavailability of minerals already consumed. Phytin, being the primary storage form of phosphorus in most mature seeds and grains, is an important compound required for early seed germination and seedling growth (Welch 1986). Phytin plays an important role in determining mineral reserves of seeds and, thus, contributes to the viability and vigor of the seedling produced (Welch 1986, 1993). Selecting for seed and grain crops with substantially lower phytin content could have an unacceptable effect on production, especially in regions of the world having soils of low phosphorus status and/or poor micronutrient fertility (Graham and Welch 1994).

Such attempts to significantly lower the antinutrient content of seeds and grains requires a major shift in seed or grain composition. Because most of the antinutrients known to occur in seeds and grains are major organic constituents of these organs, they may play additional, but yet unrecognized, beneficial roles in plant growth and human health. Therefore, a breeding strategy of attempting to increase iron bioavailability by reducing antinutrient content is not recommended (Graham and Welch 1994).

Certain amino acids (such as cysteine and lysine, but particularly methionine) enhance iron and/or zinc bioavailability. These amino acids occur in many staple foods, but their concentrations are lower than those found in meat products. A modest increase in the concentrations of these amino acids in plant foods may have a positive effect on iron and zinc bioavailability in humans. Iron and zinc occur only in micromolar amounts in plant foods, so only micromolar increases in the amounts of these amino acids may be required to compensate the negative effects of antinutrients on iron and zinc bioavailability. These amino acids are essential nutrients for plants as well as for humans, so relatively small increases of their concentrations in plant tissues should not have adverse consequences on plant growth. The optimal breeding strategy from the point of view of bioavailability may be to increase levels of promotor compounds (Graham and Welch 1994).

Expenditure Quintile	1	2	3	4	5	All
Milligrams of iron per adult equivalent per day						
Food Staples	3.5	3.8	4.0	4.0	4.4	3.9
Meat, fish	1.2	1.5	1.7	2.3	3.7	2.0
Other Foods	1.9	2.2	2.4	2.4	2.2	2.3
All	6.6	7.5	8.1	8.7	10.3	8.2
Percent of RDA						
Preschoolers	65	78	77	86	107	81
Boys (6–12)	75	84	86	88	124	91
Boys (13–19)	68	69	80	80	89	77
Fathers	110	124	134	147	167	137
Girls (6–12)	70	65	80	84	103	78
Girls (13–19)	43	49	56	54	60	53
Mothers	53	57	62	66	76	63
All Family Members	66	75	81	87	103	82

Are there other lower-cost, more easily sustainable strategies for reducing micronutrient malnutrition?

A plant breeding strategy, if successful, will not eliminate the need for supplementation, fortification, dietary diversification, and disease reduction programs in the future. Nevertheless, this strategy does hold promise for significantly reducing recurrent expenditures required for these higher-cost, short-run programs by significantly reducing the numbers of people requiring treatment.

For example, in treating iron-deficiency in developing countries, Yip (1994) argues that if prevalence rates are

above 25%, the best approach is to develop programs to improve the iron nutrition for the entire population. In such situations, which for preschoolers and women in developing countries are the rule rather than the exception, this is cheaper than screening for iron-deficient individuals (in any event, the capacity does not exist to screen such large numbers of people). By increasing the iron content of food staples through plant breeding, the entire distribution curve for iron status (e.g. see figures 1, 3, and 4 in Yip) would be shifted to the right, so that targeting a subsequently smaller group of iron-deficient persons may become feasible. The iron intakes of those who still remain iron-deficient would be increased, and so would be of some benefit.

What is the cost of plant breeding as compared with fortification and supplementation programs? The plant breeding effort can be thought of as a two-stage process. The first five-year phase will involve research primarily (but not exclusively) at the five core agricultural research centers mentioned above. The cost has been estimated at about \$2 million per year for research on all five crops. During this initial phase, promising germplasm will be identified and the general breeding techniques will be developed for adapting nutrient-rich, high-yielding varieties produced at these international agricultural research centers to specific growing environments in developing countries during phase two.

During phase two, the research sites will shift towards national agricultural research centers and the focus of the research will shift to adaptive breeding. Total costs for phase 2 are difficult to estimate, but will depend on the number of countries involved and the number of crops worked on in each country. Certainly, the annual costs for a individual country should not be more than the annual costs incurred by the five core agricultural research centers during phase one. After release of the successfully adapted, nutrient-rich varieties for commercial production, some maintenance breeding will be necessary.

To provide some sense of the magnitude of the recurrent annual costs involved in fortification and supplementation, a lower-bound estimate of the cost of iron supplementation is \$2.65 per person per year when all administrative costs are taken into account (Levin et. al. 1993). A lower-bound estimate for iron fortification is 10 cents per person per year. Consider a populous country such as India where as many as 28 million pregnant women may be anemic in any given year out of a total population of 880 million.

Box 1. Why Mineral Micronutrient-Efficient Crop Varieties Would Lead to Improved Crop Yields.

Summary of the main points made in a keynote paper presented at an organizational workshop on Food Policy and Agricultural Technology to Improve Diet Quality and Nutrition, January 1994, Annapolis, MD.

A low amount of a trace mineral in a "deficient" soil is not the problem, but rather the key to better plant growth is making more of the trace mineral that is already in the soil "available" to the plant.

A soil is said to be "deficient" in a nutrient when addition of fertilizer containing that nutrient produces better growth. However, the amount of a soil. This is because the major part of the trace mineral in the soil is "unavailable" to plants. The trace mineral is chemically bound to other elements in the soil. An alternative view, therefore, is that there is a genetic deficiency in the plant, rather than a deficiency in the soil.

Tolerance to micronutrient-deficient soils, termed micronutrient efficiency, is a genetic trait of a genotype or phenotype that causes it to be better adapted to, or yields more in, a micronutrient deficient soil than can an average cultivar of the species (Graham 1984). Growing zinc-efficient plants on zinc-deficient soils, for example, represents a strategy of "tailoring the plant to fit the soil" in contrast with the alternative strategy of "tailoring the soil to fit the plant" (terminology according to Foy [1983]). These efficient genotypes exude substances from their roots which chemically unbind trace minerals from other binding elements and so make the trace minerals available to the plant.

It is well understood that depletion of soil nitrogen takes only a few years if there is no replacement. Thus it is pointless to breed for greater tolerance to nitrogen-deficient soils. Phosphorus efficiency results in overall improvements in cost-efficiency, but depletion of soil phosphorus will eventually occur without replenishment. By contrast for mineral micronutrients, depletion may take hundreds or thousands of years, or may likely never occur at all, owing to various inadvertent additions and other processes (for example, minerals carried in windblown dust [Graham 1991]). It for which soil availability is low, but for which there are large reserves in the soil.

Micronutrient-deficient soils are widespread throughout developing countries.

As a guide, based on a number of soil surveys, particularly in China where the most extensive soil surveys have been done, it can be estimated that

Iron is the fifth most abundant element in the earth's crust, but the fraction of soil iron that may be in soluble form suitable for absorption by plants may be only 10–13% of total soil iron. Thus, depletion of soil iron is never an issue; rather, the issue is the ability of the plant to mobilise sufficient iron to satisfy its needs.

Zinc deficiency is probably the most widespread micronutrient deficiency in cereals. Sillanpaa (1990) found that 49 percent of a global sample of 190 soils in 25 countries were low in zinc. Unlike other micronutrients, it is a common feature of both cold and warm climates, drained and flooded soils, acid and alkaline soils, and both heavy and light soils.

Efficiency in the uptake of mineral micronutrients from the soil is associated with disease resistance in plants and so decreased use of fungicides.

Good nutritional balance is as important to disease resistance in plants as it is in humans. Micronutrient deficiency in plants greatly increases their susceptibility to diseases, especially fungal root diseases of the major food crops. The picture emerging from physiological studies of roots spanning four decades is that the elements phosphorus, zinc, boron, calcium, and manganese are all required in the external environment of the root for membrane function and cell integrity. In particular, phosphorus and zinc deficiencies in the external environment promote leaking of cell contents such as sugars, amides, and amino acids, which are chemotoxic stimuli to pathogenic organisms. In the case of zinc, a high internal zinc content did not prevent leakiness due to a deficiency of zinc external to the membrane.

It appears that micronutrient deficiency predisposes the plant to infection, rather than the infection causing the deficiency through its effect on root pruning (Graham and Rovira 1984; Sparrow and Graham 1988; Thongbai et al. 1993). Breeding for micronutrient efficiency can confer resistance to root diseases that had previously been unattainable. This means a lower dependence on fungicides, where they are already being used.

Micronutrient-efficient varieties grow deeper roots in mineral deficient soils and so are better able to tap subsoil water and minerals.

When topsoil dries, roots in the dry soil zone (which are the easiest to fertilize) are largely deactivated and the plant must rely on deeper roots for further nutrition. Roots of plant genotypes that are efficient in mobilizing surrounding, external minerals, not only are more disease resistant, but are better able to penetrate deficient subsoils and so make use of the moisture and minerals contained in subsoils. This reduces the need for fertilizers and irrigation. Plants with deeper root systems are more drought resistant.

Micronutrient-dense seeds are associated with greater seedling vigor that, in turn, is associated with higher plant yield.

An important function of the seed is to supply the young seedling with minerals until it has developed a root system large enough to take over this

The result is a transient and critical period of deficiency when the seedling is particularly vulnerable. Pathogens and weeds may gain an advantage not otherwise given, so that the plants never regain lost potential.

There is substantial genetic variability in the efficiency of uptake of mineral micronutrients from deficient soils and in nutrient loading into seeds; micronutrient efficiency is controlled by major, single gene inheritance.

The concentration and content of mineral micronutrients in seeds are the result of transport via living tissues (the phloem) from vegetative parts of the plant. Thus, seed density depends on both the micronutrient density of vegetative tissues and on the efficiency of the transport process itself. plant are high in micronutrients, the levels in the seed are always relatively low. An average view of genetic variation in micronutrient density is probably of the order of a factor of three, while their vegetative parts may vary perhaps 100 times more than that.

By far the most extensive survey of efficiency factors was carried out at the International Rice Research Institute by Ponnampereuma (1982). Over a period of 10 years, some 80,000 lines from the world collection were screened for types tolerant of a number of soil stresses, including micronutrient deficiencies. Tolerant types gave a yield advantage of about two tons per hectare under any of seven different soil limitations.

Ponnamperuma noted that zinc deficiency was widespread in wet rice and iron deficiency in dryland rice.

Linkage of zinc efficiency to other efficiency traits (for example, manganese) is poor, suggesting independent mechanisms and genetic control not linked to gross root system geometry. Zinc-efficient genotypes absorb more zinc from deficient soils, produce more dry matter and more grain yield, but do not necessarily have the highest zinc concentrations in tissue or grain. Although high grain zinc concentration also appears to be under genetic control, it is not tightly linked to agronomic zinc efficiency traits and may have to be selected for independently.

These figures imply that treating one-half of the anemic pregnant women in any one year through a well-targeted supplementation program would cost \$37 million per year. A fortification program reaching half of the population would cost \$44 million per year. Thus, the projected costs of a plant breeding strategy are relatively low. The major part of the cost is the initial one-time cost of development.

One can imagine that there will be unforeseen problems and costs associated with plant breeding not mentioned here. Daily doses of iron from supplementation and fortification programs may be higher than the additional iron likely to be added to the daily intake of food staples through plant breeding. Nevertheless, whatever refinements are necessary to these comparative cost estimates, there is no arguing the fact that the base, fixed costs of plant breeding are sufficiently low, that cost considerations are overwhelmingly on the side of a plant breeding strategy as compared with supplementation and fortification.

Moreover, these comparative costs do not take into account the potential benefits to improved agricultural productivity. For example, a CIMMYT wheat breeder based in Turkey, where soils are particularly zinc-deficient, went to Australia in 1993 to learn about ongoing plant research there, where growing conditions and soil constraints to improved productivity are similar to those in Turkey. He gave a presentation at the organizational workshop in which he estimated that, if the Australian zinc-dense seed varieties were adapted to growing conditions in Turkey, Turkish wheat tanners would save \$100 million annually in reduced seeding rates alone (seeding rates could be reduced from an average of 250 to 150 kilograms per hectare on 5 million hectares; a ton of wheat sells for about US\$200 on the world market). This does not count the benefit to yield, or the potential benefit of improved zinc status in humans.

Conclusion

Because of the comparatively long lead times involved in bringing the results of plant breeding research to bear on the mineral deficiency problem in humans, these efforts will not contribute to meeting the end-of-decade goals for reducing micronutrient malnutrition set out in the World Declaration on Nutrition and endorsed by 158 countries at the International Conference on Nutrition. However, the timing of the CGIAR project is such that the mineral-dense seed technologies could come "on-line" just after the major push to meet the end-of-decade goals through higher-cost strategies has run its course.

It would seem prudent to invest now in a plant breeding strategy to sustain the gains made by the end of the decade and to maintain momentum for further reductions in iron and other mineral deficiencies.

Very significant progress has been made in terms of (i) putting much of the requisite network of people and institutions in touch with one another, (ii) obtaining consensus among an interdisciplinary group of scientists that this research strategy looks promising in terms of its scientific feasibility and potential for improving human nutrition in developing countries, (iii) obtaining agreement on specific activities that scientists and institutions must undertake in coordination to make this happen, and (iv) initiating the research activities.

The key issues are not those of cost, or whether plant breeders eventually will be successful in developing micronutrient dense seeds if the relatively modest resources required are found to develop them. Rather the two key issues are:

- (1) Will the agronomic advantages of the mineral-dense seeds be sufficiently strong that they will be widely adopted by farmers in developing countries?
- (2) Will the additional nutrients contained in the seeds be of a sufficient magnitude and sufficiently bioavailable so as to have an appreciable impact on micronutrient status?

As outlined in this note, there is much scientific evidence to be optimistic, even excited, on the first count. There are good reasons to be optimistic on the second count as well.

References

- Bouis, H. E. (1991). *Household-level Demand for Micronutrients: An Analysis for Philippine Farm Households*. International Food Policy Research Institute, Washington, D.C.
- Foy, C. D. (1983). Plant Adaptation to Mineral Stress in Problem Soils. *Iowa State Journal of Research*, **57**, 355–391.
- Graham, R. D. (1984). Breeding for Nutritional Characteristics in Cereals. *Advances in Plant Nutrition*, **1**, 57–102.
- Graham, R. D. (1991). *Breeding Wheats for Tolerance to Micronutrient Deficient Soil: Present Status and Priorities*. In: *Wheat for the Nontraditional Warm Areas*, ed. D. A. Saunders, 315–332. Mexico City, Mexico: Centro Internacional de Mejoramiento de Maiz y Trigo.
- Graham, R. D., & Rovira, A.D. (1984). A Role for Manganese in the Resistance of Wheat to Take-all. *Plant Soil*, **78**, 441–444.
- Graham, R. D., & Welch, R.M. (1994). *Breeding for Staple-Food Crops with High Micronutrient Density: Long-term Sustainable Agricultural Solutions to Hidden Hunger in Developing Countries*. Paper Prepared for Presentation at an Organizational Workshop on Food Policy and Agricultural Technology to Improve Diet Quality and Nutrition, Annapolis, Md., U.S.A., January 10–12.
- Levin, H. M., Pollitt, E., Galloway, R. & McGuire, J. (1993). *Micronutrient Deficiency Disorders*. In: *Disease Control Priorities in Developing Countries*, ed. D. Jamison, W. Mosley, A. Measham, and J. Bobadilla. Oxford University Press. New York.
- Ponnamperuma, F. N. (1982). *Genotypic Adaptability as a Substitute for Amendments on Toxic and Nutrient-Deficient Soils*. In: *Plant Nutrition 1982. Proceedings of the Ninth International Plant Nutrition Colloquium*, ed. A. Scaife, 467–473. Slough: Commonwealth Agricultural Bureaux.
- Sillanpaa, M. (1990). Micronutrient Assessment at the Country Level: An International Study. *FAO Soils Bulletin*, **63**. Rome: Food and Agriculture Organization of the United Nations.
- Sparrow, D. H., & Graham, R.D. (1988). Susceptibility of Zinc-Deficient Wheat Plants to Colonization by *Fusarium graminearum* Schw. Group 1. *Plant Soil*, **112**, 261–266.
- Thongbai, P., Hannam, R.J., Graham, R.D. & Webb, M.J. (1993). Zn Nutrition and Rhizoctonia Root Rot of Cereals. *Plant Soil* (in press).
- Welch, R. M. (1986). Effects of Nutrient Deficiencies on Seed Production and Quality. *Advances in Plant Nutrition*, **2**, 205–247.
- Welch, R. M. (1993). *Zinc Concentrations and Forms in Plants for Humans and Animals*. In: AD Robson, ed, *Zinc in soils and plants*, ed. A. D. Robson, 183–195. Dordrecht, Netherlands; Boston, Mass., U.S.A.: and London: Kluwer Academic Publishers.
- Yip, R. (1994). Iron Deficiency: International Programmatic Approaches. *Journal of Nutrition*.

NEWS AND VIEWS

Including:

Can Half of All Hunger be Eliminated by 2000?/Greater Horn Information Exchange/Vitamin A: WHO/UNICEF Statement, IVACG; Mother-to-Child Transmission of HIV-1/New Initiative in Research and Training in Nutrition/Malaria Vaccine Tested in Tanzania/Meetings and Conferences.

Can Half of All Hunger be Eliminated by 2000? Meeting Assesses Progress Towards Bellagio Goals

In 1989, an international group of governmental planners, world hunger scholars, opinion leaders, and scientists met in Bellagio, Italy to discuss the problem of world hunger. Their discussions culminated in the production of a declaration –the Bellagio Declaration – which concluded that by concentrating on the achievement of four goals, it would be possible to halve world hunger by the year 2000 – the four goals being the elimination of famine deaths; the ending of hunger in half of the poorest households; the reduction of malnutrition among women and children; and the elimination of vitamin A and iodine deficiencies as public health problems.

At the mid–way stage of a decade of work towards achieving these goals, representatives from 18 countries and six international organizations, including many of those who were present in Bellagio in 1989, met at Mahidol University in Thailand last November to assess progress so far and to determine what else might be done in the next five years and beyond to fight hunger.

Amongst the participants at the meeting were Ellen Messer and Robert W. Kates, director and director emeritus respectively of the World Hunger Program at Brown University, Rhode Island – the institution responsible for carrying out the groundwork leading to the Bellagio meeting in 1989. The following data on world hunger presented and discussed by Ellen Messer in Mahidol is taken from a press release issued by Brown University shortly after the meeting.

Hunger numbers overall are declining. Although more than three–quarters of a billion people continue to suffer insufficient access to food based on their economic conditions, the trend is downward. And nations such as China, Indonesia and Thailand present evidence that malnutrition due to poverty can be sharply reduced by careful surveillance of consumption and nutrition data and annual budget allocations targeted at those too poor to afford food.

Famine is on the decline except in zones of armed conflict. Early warning systems and interventions that identify areas of food shortfall are preventing famines in formerly endemic areas. In a little–known but important success story, southern Africa suffered the deepest drought of the century in 1992, but good national planning and international assistance helped prevent death from famine. In contrast, political problems in such areas as the former Yugoslavia, Iraq and the Sudan, remain recalcitrant.

Forty nations have improved child and maternal nutritional health; 19 have reduced malnutrition prevalence to less than 10 percent, and 10 nations have plans that should help them reduce the prevalence of malnutrition to under 10 percent by mid–decade.

Efforts to improve micronutrient nutrition, especially to eliminate iodine deficiency disease and vitamin A deficiencies, are advancing through combinations of scientific and technical progress. Progress also is being made in national policy: At last count, some 82 out of 118 countries where iodine disorders are known to be prevalent have instituted universal salt iodization programs.

Economic growth, combined with social welfare programs, are being developed in many nations, and are being recognized by major donors, such as the World Bank, as joint keys to development. Non–government organizations, working with governments, have successfully engaged in a diverse and expanding number of public service enterprises that enable individuals in households and communities all over the developing world to gain food security, improve health and nutrition, and better the options for the next generation.

Increasingly, links are being made between the burgeoning number and scale of grassroots organizations and larger provincial, national and international programs. Experiences in overcoming hunger show that national plans of action are no longer limited to the realm of government, but also involve community and non–governmental organizations. Grassroots groups in South Asia, Africa and Brazil have been especially successful.

Finally, the media are increasingly vigilant in reporting situations of hunger, such that nations can no longer hide their policy inadequacies in addressing hunger disasters or their use of hunger as a weapon.

However, despite progress in the right direction, the feeling amongst participants was that it had been slower than anticipated. As Ellen Messer pointed out "five years is a very short time to assess progress and anticipate improvements" but suggested that "action could be taken now to examine countries where hunger and malnutrition are not on the decline to consider where some enlightened mix of economic and social programs might produce benefits over the remainder of the decade". Above all, she urged that "individuals all over the globe need to maintain their awareness of the problems and possible solutions so that they can create legitimate expectations for accomplishments. Hunger will only be halved, and later prevented, by

coalitions of concerned individuals and groups making peace, security, and the human right to food their priorities. These priorities need to begin now, to produce measurable accomplishments, by the end of the century."

(Source: Brown University Press Release, January 1995)

Greater Horn Information Exchange

The Greater Horn Information Exchange (GHIE) has been established to serve as a focal point for information sharing between and among the disaster response and national and international development communities active in the Greater Horn of Africa. This Internet resource, managed by William Bender and Daniel Zalik, is an outgrowth of the Rwanda Crisis Web, a World Wide Web (WWW) site established this summer by Zalik.

The GHIE, a no-fee resource accessible via email, telnet, gopher, and the WWW, is catalyzing the sharing of site reports, fact sheets, activity summaries, data sets, scientific papers and analyses. The utility of the GHIE is primarily a function of the active participation of users. In order to keep the GHIE up-to-date, relevant and sustainable, all organizations and agencies active in the Horn are encouraged to post materials.

To date the Rwanda Crisis Web (RCW) has enjoyed thousands of users from 45 countries requesting tens of thousands of documents. Over 60 megabytes on the RCW include materials from InterAction members, European NGOs, DHA, USAID and OFDA, UNHCR, UNICEF, WHO, ICRC, Amnesty International, CBC, USDoD, Human Rights Watch/Africa, the Secretary General and Security Council, and the European Union. Also accessible are an assortment of detailed geographic and situation maps.

Please select a country by clicking on this map:



The GHIE began in late February with funding from USAID's Bureau for Humanitarian Response's Office of Foreign Disaster Assistance. The resource is growing very quickly and already includes many geographic and thematic maps, sitreps, and datasets derived from FAO, WFP and UNICEF. Field operations guides, disaster histories, and activity summaries are being added. An exciting tool called Interactive Data Rendering allows users to graph data via the WWW.

Establishment of the GHIE is part of a larger USAID supported Greater Horn of Africa initiative which is designed to promote sustainable development and crisis prevention in the 10 countries comprising the Greater Horn.

The Greater Horn Information Exchange and the Rwanda Crisis Web are accessible via the WWW at

<http://www.intac.com/PubService/rwanda/HORN/>
<http://www.intac.com/PubService/rwanda/>

respectively. For information about other ways to access these resources, including via email, or how to post information, please contact Daniel Zalik (401 272 7802: zalik@intac.com) or William Bender (508.448.9472: bender@tiac.net).

(Source: Electronic Communication from William Bender. 14 March 1995)

XVI IVACG Meeting Focusses on Successful Strategies for Eliminating Vitamin A Deficiency

408 participants representing 56 countries – including policy makers, implementors, and scientists in health, nutrition, agriculture, and development – attended the XVI International Vitamin A Consultative Group (IVACG) Meeting, held from 24–28 October 1994, in Chiang Rai, Thailand.

The focus of the meeting was successful strategies for eliminating vitamin A deficiency as a public health problem, and their contributions to national development. Specific topics discussed include: linking vitamin A to development: food-based interventions, information, education, and communication; home gardening; assessment of vitamin A status; health implications of vitamin A deficiency; and recent advances in vitamin A-related biochemistry and molecular biology.

Progress towards the micronutrient goals of the World Summit for Children, and the International Conference on Nutrition were highlighted during the meeting. The World Health Organization (WHO) reported that in more than 90 countries vitamin A deficiency is still a public health problem, putting at risk the health and survival of an estimated 230.6 million children: 3.1 million preschool-age children annually are estimated to be clinically affected, and another 227.5 million are subclinically affected at a severe or moderate level. UNICEF and WHO have established policies for the achievement of the mid-decade goal of ensuring that at least 80% of all children under 24 months of age living in areas with inadequate vitamin A intake receive adequate vitamin A through a combination of breastfeeding, dietary improvement, fortification, and supplementation. The two organizations considered carefully the research presented at the meeting, and made a joint statement to meeting participants, reproduced in the box on page 22.

**WHO/UNICEF Joint Statement to XVI IVACG Meeting Participants
Chiang Rai, Thailand, October 26, 1994.**

WHO and UNICEF have an agreed policy document, approved by the Joint WHO/UNICEF Committee on Health Policy which provides guidance to WHO and UNICEF offices on action that the two organizations should support to assist countries to reach the Mid Decade Goal of increasing intake of vitamin A in young children.

This document states that a mixture of approaches should be supported, including supplementation, dietary diversification, and fortification. Where vitamin A deficiency is a clinical problem, supplementation programmes are warranted.

The document describes different ways in which vitamin A supplements can be delivered, and suggests that providing supplements of 100,000 IU with measles vaccine around 9 months is one important way of delivering supplements.

Increased consumption of dietary sources of vitamin A is also suggested as being an activity which should be promoted to help reach the goal.

The two agencies have carefully noted the scientific presentations given at this conference, and much of the scientific work does have important implications for policy development.

At the present time however we do not consider that any of the findings presented call for an immediate change in policy, and that the policy established above to achieve the mid-decade goal should be pursued.

With particular reference to the linking of vitamin A with measles immunization at nine months, we note that the study presented looked at the effect on measles immunization given at six months of age on antibody response, and that a small reduction was found. The reduction would be expected to be considerably less at nine months.

With respect to the work on the effect of dark green leafy vegetables on vitamin A status, both organizations have already noted that the choice of vegetables, and the way in which they are prepared and fed are important determinants of the bio-availability of pro-vitamin A. The presentations confirm this. The conclusions of the data presented should not, in the view of the two agencies, be taken as a reason to change existing programmes which are currently under implementation. In the design of new programmes, ways of maximizing the bio-availability of carotene should be sought, and steps are already underway to promote operational research in this area.

Both organizations reaffirm that in areas of vitamin A deficiency, supplementation of mothers within a month of delivery with 200,000 IU vitamin A is recommended to improve the vitamin A status of the mother, the level of vitamin A in her milk and the intake of an adequate amount of vitamin A by her nursing infant.

During pregnancy, emphasis should be placed on the mother receiving an adequate intake of vitamin A through her diet. Where circumstances do not permit this, supplements not to exceed 10,000 IU daily can

be given safely at any time during pregnancy.

Prophylactic supplementation to children is reaffirmed at levels of 200,000 IU for children 1 year of age and older and 100,000 IU for infants 6–12 months at intervals of 4–6 months. Where necessary and appropriate (particularly for non-breastfed infants in areas of vitamin A deficiency), 50,000 IU for infants less than six months of age.

WHO and UNICEF have agreed that the indicators appropriate for use in monitoring decade goals are serum vitamin A distribution curves or breastmilk retinol levels and prevalence of night blindness where this can be appropriately applied.

Periodic high-dose supplementation remains an important cornerstone of most national programmes. The Disability-Adjusted Life Years (DALYs) analysis of the World Bank and WHO confirmed that vitamin A supplementation is one of the most cost-effective public health interventions in developing countries. A study in Indonesia showed that low-cost, low-dose supplements improved the vitamin A status of lactating and pregnant women, and providing a supplement to the child at birth dramatically reduced subsequent mortality. It was recommended that supplementation programmes be targeted at both mothers and infants. Speakers stressed that innovative delivery methods of vitamin A were needed to cover more children, and in particular those in hard to reach areas.

The potentially important role of vitamin A in HIV and AIDS related morbidity and mortality was discussed. A study in Malawi linking maternal vitamin A status with mother-to-child transmission of HIV infection was discussed (see also page 27) and South African researchers reported that oral administration of moderate to high doses of vitamin A to HIV-1 infected infants resulted in a substantial reduction in morbidity.

Fortification, a dietary-based intervention, is another important intervention tool for combatting vitamin A deficiency. Successful fortification programmes in Guatemala – where sugar was used to provide a source of vitamin A to children – and in the Philippines – where margarine was used as the carrier for added vitamin A in a trial targeted at preschool children – were highlighted.

Evidence showing an increase in consumption of vegetables through home gardening projects in Bangladesh, Vietnam, India, and Niger was presented. In Bangladesh and Vietnam there was a concomitant decline in night blindness.

Meeting participants also emphasized the crucial role of information, education, and communications activities for all interventions and the need to complement educational activities with support in other areas, such as food production or storage, that strengthen desired behaviours.

In his concluding remarks, Dr Abraham Horwitz, IVACG Chairperson said "we should put to rest the apparent controversy between a medical model and a food model. There is only a human model with an overall objective, the virtual elimination of vitamin A deficiency".

Opportunities for Micronutrient Interventions (OMNI), a project of the Office of Health and Nutrition, Global Bureau for Programs, Field Support, and Research, U.S. Agency for International Development, provided significant support for this meeting. The IVACG Steering Committee and Secretariat organized the meeting collaboratively with a local organizing committee based at the Institute of Nutrition, Mahidol University. Other organizations, including bilateral agencies, United Nations agencies, and the food industry, provided additional support.

IVACG was established in 1975 to guide international activities aimed at reducing vitamin A deficiency globally.

IVACG strongly supports the goal of virtually eliminating vitamin A deficiency as a public health problem by the turn of the century. The XVI IVACG Meeting provided a forum for exchanging new ideas and important research findings, encouraging innovation, and promoting action programs to help reach the goal.

A complete report of the meeting will be available in May from the IVACG Secretariat, ILSI Research Foundation, 1126 Sixteenth Street, N.W., Washington, D.C. 20036, USA. Phone (202) 659 9024; Fax (202) 659 3617; and Email OMNI@DC.ILSI.ORG.

(Source: IVACG Press Release, January 1995; OMNI "Update", February 1995)

Conference on Unmet Research and Training Needs in Nutrition

Scientific understanding of the causes of malnutrition has advanced in recent years, as has experience of nutrition programmes that have significantly reduced malnutrition. Applying this knowledge to running more effective programmes may be lagging. More programme-oriented training and operational research in nutrition might greatly improve the situation. These ideas were publicized in 1991 by Alan Berg (in the Martin Forman lecture), including the widely-aired view that what was needed was "nutrition engineers"¹ They led in November 1994 to a Conference at the Rockefeller Centre in Bellagio, Italy, to identify actions now needed. Preparatory work was done by Dr J Levinson, currently of Tufts University.

¹ "Sliding Toward Nutrition Malpractice – Time to Reconsider and Redeploy". Martin Forman Memorial Lecture, June 24 1991

A New Initiative

In seeking to address the need for more effective programmes, the Conference identified a two fold challenge: (1) how to utilize existing knowledge in programs that affect communities and individuals, and (2) how to generate additional knowledge that can improve the impact of such programmes. There was also recognition that these training and research needs are highly interactive with programme operations and with one another.

Most importantly, the Conference proposed a new world wide effort designed specifically to encourage these approaches internationally.

The following specific actions were proposed:

- Programmes and institutions in Africa, Asia, and Latin America concerned with malnutrition will be invited to meet at the subregional level to consider means of participating in this initiative through new or expanded training, operationally-oriented research and resource and experience exchanges. They will be encouraged to identify means of encouraging community level participation in these initiatives as well as research and training opportunities emerging specifically from programme needs.
- Subregional organizations will be encouraged to establish small secretariats responsible for the overall management of these initiatives and specifically for:
 - the conduct of training needs assessments;
 - the monitoring of research and training activity which emerges from the initiative;
 - the dissemination of results throughout the region – and to a global focal point for purposes of international dissemination; and
 - the establishing of advisory groups responsible for the review of proposed training and research, and for ensuring that their methodologies and content are both state of the art *and* that they are tailored to country and programme needs.
- Donor agencies will be invited to consider the importance of this approach and provision of support for such subregional initiatives.

There was consensus in the meeting that such programme-related training and research represents a fundamental reorientation in that, for the first time, programme personnel and country-level policy makers concerned with malnutrition, and affected communities themselves, will have central roles in the identification of training and research needs. The Conference urged all members of the international community concerned with the alleviation of malnutrition in the world to join with them in promoting and supporting this new initiative. The Declaration from the Conference is given in the box on page 25.

Networks for Training and Research to Improve Nutrition Programmes

The proposals from the Conference are for action at regional, sub-regional, and national levels. The intention is to foster the development of networks at these levels to promote and collaborate in relevant training and operational research. The Bellagio meeting invited certain of its participants to form an interim steering committee to stimulate and guide the next steps. This committee convened briefly during the Bellagio meeting, and asked Dr M. Beaudry (UNICEF) to act as Chair. Secretariat support is being provided, during an initial stage, by IDRC and the ACC/SCN.

The next steps envisaged are regional needs assessments, meetings, and planning, including preparation of proposals for external funding. Some initial seed money has been provided by IDRC and UNICEF, to help start the work and to contribute to needs assessments in two regions.

It is proposed that those representing concerned programmes and institutions would benefit from participating in networks aimed at promoting operational research and training. The designation "Networks for Training and Research to Improve Nutrition Programmes" has been put forward by the interim steering committee. These would operate primarily at regional level, with focal points in each region; in addition, global networking between these will be promoted. To develop these networks, within and between regions, the interim steering committee aims to arrange for exchange of information, perhaps including regular bulletins (print and e-mail) to be circulated to all those involved. This information could include:

- methods of needs assessment, to relate these specifically to programme needs;
- examples of successful developments in operational research and training;
- institutional capabilities for different aspects of research and training, and training materials available;
- results of assessments, details of training and research activities as they develop, and related information; and
- analysis and comparative evaluation of such experiences, which will be promoted to identify the most effective procedures, and to contribute to sharing information on these.

Further Information

The report of the Conference, and more details of the proposed network, are available from the ACC/SCN Secretariat or the International Development Research Centre (IDRC). An insert in this issue of SCN News reproduces the declaration, and provides a form which can be mailed back – or see address on inside cover of this newsletter for ACC/SCN. The address of IDRC is: 250 Albert Street, PO Box 8500, Ottawa, Canada K1G 3H9. Fax: (1 613) 567 77148 Email: idrcnuttr@idrc.ca.

Zinc Nutrition and Public Health – UNICEF Sponsored Consultation

Of the forty or so nutrients essential in the human diet, deficiencies of only three, vitamin A, iron, and iodine, are generally thought to be of public health significance and targeted for prevention in development programmes. There is growing evidence, however, that zinc deficiency may also be important. Zinc is known to have many essential functional roles in the body, perhaps the most important being its involvement in multiplicative cell growth and mediation of the activity of growth hormone. Zinc deficiency is also thought to have close links with vitamin A deficiency – inhibiting the mobilization of vitamin A from the liver, and adversely affecting fat and vitamin A absorption. Sub-optimal levels of zinc are hard to detect, however, and proof that it is deficient depends at present on the observation of a beneficial effect of supplementation, and there is to date only limited knowledge about the positive health effects of intervention. SCN News No.9 (mid-1993) included an article by Roger Shrimpton of UNICEF entitled "Zinc Deficiency – Is It Widespread but Under-Recognized?" summarizing current knowledge on this topic, and where more detail may be found on the above. Subsequent to this UNICEF sponsored an informal consultation on "Zinc Nutrition and Public Health in Developing Countries". The consultation, organized by the Nutrition Program of the University of Queensland and held in Brisbane from 4–5 October 1993 was held in an effort to determine a consensus position on the public health significance of zinc deficiency in low income countries and possible strategies for its correction. The following are the Summary and Conclusions of the consultation.

1. Zinc deficiency is widespread in developing countries and is often closely associated with iron deficiency. The most vulnerable groups are infants and children and pregnant and lactating women. In children, zinc deficiency is likely to be an important but often overlooked factor in the aetiology of poor child growth, and

increased incidence and severity of infection. In addition, zinc deficiency may be a factor in impaired cognitive development. Zinc deficiency is also likely to be common in pregnant and lactating women in these countries and to contribute to complications during pregnancy and poor pregnancy outcome. Zinc deficiency impairs the mobilisation of vitamin A from the liver and may also decrease absorption of vitamin A and carotene, thereby contributing to vitamin A deficiency.

2. The richest sources of bioavailable zinc are flesh foods. The bioavailability of zinc is decreased by phytate in the diet. Thus, zinc deficiency is likely where intake of animal foods is low and the prepared staple is high in phytic acid. The dietary patterns leading to iron deficiency may also induce zinc deficiency. In populations in which maize, sorghum, millet, wheat or unpolished rice are the staples, total zinc intake may be adequate but zinc bioavailability may be decreased by the phytate present in these cereals. Where roots or tubers are the staples and the consumption of animal products is low, total zinc intakes will be low but bioavailability higher than for a similar diet when unrefined cereals are the staples. The bioavailability of zinc from legumes depends on the solubility of the phytate and the preparation techniques used.

3. In areas where zinc deficiency is common studies indicate clear benefit from zinc supplementation of young children and malnourished infants. The evidence for similar benefits from zinc supplementation in pregnancy, lactation, and apparently healthy infants in developing countries is less clear and further trials are needed.

4. Zinc intakes can be improved by supplementation, fortification, and dietary diversification/modification. There is little experience with zinc supplementation programs for children or women in developing countries and more information is needed on the optimal frequency of dose and the effect of other dietary constituents on absorption. Fortification with zinc is feasible, and should be considered together with iron fortification programs and the effectiveness evaluated. Dietary diversification/modification can also be used to improve the content and bioavailability of zinc and includes increasing the consumption of zinc dense foods and using food processing and preparation techniques to reduce the phytic acid content of unrefined cereals and legumes.

(Source: 1. Consensus Statement on Zinc Nutrition and Public Health in Developing Countries. Report of UNICEF Sponsored Consultation. Brisbane, Australia, December 1993.
2. Shrimpton, R. (1993). Zinc Deficiency – Is It Widespread but Under-Recognized? *SCN News No. 9*, 24–27)

Overcoming Malnutrition: A New Global Initiative A Bellagio Declaration

A group of 22 international nutrition specialists met at the Rockefeller Foundation Study and Conference Centre in Bellagio, Italy, from October 31 to November 4, 1994. The purpose of the Conference was to address shortfalls in the effectiveness of efforts to reduce global malnutrition, focussing specifically on the need for more responsive, programme-related training and research efforts. The following declaration was agreed on by participants after the Conference.

Participants all agreed that, despite the progress of recent years, concerted efforts are needed if new knowledge and the lessons learned from past successes are to affect the lives of the malnourished. Specifically, a twofold challenge must be met:

(a) how to better utilize existing knowledge and transfer new knowledge to programmes that reach communities and individuals; and

(b) how to generate additional knowledge that can improve the impact of such programmes.

Dynamic new approaches to operationally-oriented research and training to solve problems will be key to meeting these challenges and, therefore, must be fundamental to any such undertaking.

A New Initiative

Emanating from the conference will be a worldwide effort to use existing knowledge and technology and to undertake practical research to improve and expand programmes to combat malnutrition. This new initiative will encompass the following:

- Training and research will be intimately linked to programme operations, a fundamental reorientation.
- A new culture of inquiry will be developed through training and research that focusses attention on the identification and solution of problems.
- Regional partnerships and networks will be created to link individuals and institutions that often work in an uncoordinated way but that, collectively, can make a significant contribution to the reduction of malnutrition.
- Communities will be full partners in the training and research.
- A concern for the ethical dimensions of malnutrition will be brought together with training and research so that practice can inform – as well as become informed by – theory.
- Training and research activities will make use of new participatory approaches that enable learners to integrate new approaches with job responsibilities.

Programmes and institutions concerned with malnutrition and facing similar problems will be invited to meet at the regional or subregional level to consider means of participating in this initiative through new or expanded training, operationally-oriented research, and resource and experience exchanges, supported, as appropriate, by a consortium of donor agencies.

In launching this initiative, participants confirmed the need to address malnutrition, a major cause of human suffering in the world's low-income countries. Consider the following:

- Fully one-third of young children in these countries are stunted because of malnutrition.
- One half of all deaths among young children are, in part, a consequence of malnutrition.
- 40 percent of women in the developing world suffer from iron deficiency anaemia, a major cause of maternal mortality and low birthweight infants.
- One in four individuals is at risk for cognitive deficits or disease due to iodine deficiency.
- In many countries, particularly in Africa and South Asia, the number of malnourished individuals continues to grow.

These numbers reflect a legacy of poverty and wasted human potential that is fully preventable. Malnourished individuals are less likely to participate productively in the labour force, gain a basic education, and contribute to the development of their families, communities, and nations.

An Unparalleled Opportunity to Act

The world community has, in the last several years, committed itself to reducing malnutrition by half in this decade. National governments have expressed their commitment to this goal through the World Summit for Children and the International Conference on Nutrition. In addition, through ratification of the Convention on the Rights of the Child, states parties have explicitly recognized nutrition as a human right. However, these goals and expectations will not be met unless the rate of progress increases sharply.

Scientific progress, new understandings about the causes of malnutrition, and examples of programmes that have significantly reduced malnutrition in some regions represent important departure points for new initiatives. Yet much remains to be done, and economic growth alone will not lead to the elimination of malnutrition.

An Invitation to Participate

We urge all members of the international community concerned with the alleviation of malnutrition in the world to join us in promoting and supporting this new initiative.

(Source: Bellagio Conference: Addressing the "How" Questions in Nutrition: Unmet Training and Research Needs. Conference Report, 20 March 1995, available from ACC/SCN, Geneva.)

Universal Salt Iodization – Working with Small Salt Producers

Universal salt iodization (USI) by the end of 1995 in all countries where iodine deficiency disorders are a public health problem is one of the mid-decade goals for the health of women and children set jointly by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF). Most countries are on track to achieving this goal, but in some cases USI may be a more difficult target to reach. In some countries a large proportion of edible salt is produced by small or very small salt producers, and it is these countries which pose the greatest challenge.

Whilst the best strategy for achievement of USI in those countries with many small salt producers may be to facilitate the handing over of salt production to larger, more efficient salt producers, or to encourage the importation of salt, in reality the small-scale production of salt in some countries provides employment for large numbers of people who may not have access to other sources of income. For example, in India it is estimated that salt production by small businesses provides employment to around half a million people, and in Indonesia, there are over 6,300 small producers in the salt sector, and much of the labour of salt production is done by women. On the other hand, an approach which is so beneficial to small producers that it actually encourages more to appear would only intensify the problem of ensuring USI.

In order to address the case of the small salt producer and present potential solutions for achieving USI without causing more harm than good, the UNICEF Nutrition Section has produced a working paper entitled "Small Salt Producers and Universal Salt Iodization: Helping UNICEF Meet the Challenge". The paper has been produced as a response to numerous enquiries from UNICEF field offices on how salt produced by small scale producers can be iodized. A summary at the beginning of the paper outlines its contents: "Small scale producers are defined, and the relative importance of small scale salt producers in different regions is discussed. The nature of the salt market and the potential role that price and other market-oriented incentives as well as taxation policies may have on increasing the availability of iodized salt are noted. Several options for working with small salt producers are discussed – forming cooperatives or other types of groups, use of mobile iodization equipment, or the provision of individual iodization machines to small producers. A summary of recent experiences in the formation of groups of small producers is given, and a description of the types of machinery which small producers could use is provided."

Whilst the UNICEF document acknowledges that "it will be in the interests of sustainable and effective salt iodization for a country to encourage a long term trend towards consolidation of the salt industry" it also recognizes that "this will ideally be a slow process in which small producers who slowly find that they are unable to compete are able to find other viable means of livelihood. In countries where there are relatively few small salt producers and where there are plenty of other means by which such producers could earn a livelihood, a government strategy which discourages salt production by small producers may be viable. Where this is not feasible, UNICEF must look for ways of working with governments to support and assist small producers to iodize salt, and this paper suggests a number of ways in which this could be done."

For further information please contact: UNICEF Nutrition Section, UNICEF, 3 UN Plaza, New York, NY 10017, USA. Phone: (1) 212 326 7000 Fax: (1) 212 888 7465.

(Source: UNICEF (1994). *Small Salt Producers and Universal Salt Iodisation: Helping UNICEF Meet the Challenge*. Nutrition Section, UNICEF, New York, 16 November 1994)

PAMM Salt Iodine Analysis Offer

As part of the international goal of virtual IDD elimination by the year 2000, the Program Against Micronutrient Malnutrition Laboratory, located at the US Centers for Disease Control, Atlanta, Georgia, is offering countries a simple cross-checking service for salt iodine analysis.

When requested through a country UNICEF office, the PAMM laboratory will analyze, free of charge, up to 20 salt samples per country, for the purpose of cross-checking/validating the testing method and/or level of fortification being used in-country. If more than 20 samples are to be analyzed per country, the additional samples will cost \$US5 each.

For further information please contact: Warwick May, Program Against Micronutrient Malnutrition, Centers for Disease Control, 4770 Buford Highway, N.E., Mailstop F20, Atlanta, GA 30341–3724, USA. Tel: (404) 488 4088 Fax: (404) 488 4609.

(Source: PAMM leaflet, undated)

New Slides on Iodine Deficiency Disorders

A set of 24 training slides with accompanying text has been produced by ICCIDD (International Council for Control of Iodine Deficiency Disorders) and TALC (Teaching Aids at Low Cost). The set describes the disorders caused by iodine deficiency, explains how to recognize them and deals with different methods of control. The slides are available from TALC, PO Box 49, St Albans AL1 5TX, UK. Prices UK£6.20 (surface), £7.20 (airmail). Payment by UK£ or US\$ cheque or Visa or Mastercard.

(Source: Communication with ACC/SCN, 31 October 1994)

Vitamin A and Mother-to-Child Transmission of HIV-1

A study published in June 1994 in *The Lancet* appears to have found evidence of a link between maternal vitamin A deficiency and mother-to-child transmission of HIV-1 (human immunodeficiency virus type 1) – the virus which leads to Acquired Immunodeficiency Syndrome (AIDS).

Transmission of the virus from HIV-positive women to their children occurs in 10–40% of pregnancies (transmission rates are generally higher in developing countries) – and is thought to occur either in utero, during delivery, or through breastfeeding – the exact timing of transmission being unclear as infants can only reliably be tested for HIV-1 infection at 12 months of age. Risk factors already identified as being associated with transmission include preterm birth, birth order, breastfeeding and low maternal CD4+ lymphocyte cell counts (one of the earliest laboratory abnormalities recognized in patients with AIDS was the depletion of CD4+ cells. CD4+ cell count has since been shown to have some correlation with the severity of the disease, and to be a predictor of mortality in HIV-1 positive individuals).

It is thought that vitamin A deficiency may be an important risk factor because of its role in stimulating the immune system and in the maintenance of mucosal surfaces. Vitamin A deficiency has been linked to reduced T-cell and B-cell function which may contribute to higher viral loads or lower levels of maternal antibodies crossing the placenta. Deficiency may also compromise the integrity of the placenta, or make the birth canal more susceptible to trauma and exposure of infants to maternal blood. Vitamin A deficiency is also associated with higher viraemia in breastmilk.

HIV infection itself and pregnancy are risk factors for vitamin A deficiency. Episodes of opportunistic infection during HIV-1 infection may contribute to a decrease in vitamin A status, as may increased metabolism of vitamin A and effects of haemodilution during pregnancy.

The study took place in Blantyre, Malawi. HIV infected mothers and their infants born at Queen Elizabeth Central Hospital in Blantyre between November 1989 and August 1991 were included in the study that examined maternal serum vitamin A, height, weight, CD4+ cells, maternal age, and duration of breastfeeding. The aim was to investigate whether vitamin A could be isolated as a risk factor for mother to child transmission.

Of 567 HIV-infected mothers who delivered their infants at Queen Elizabeth Central Hospital during the specified time period results are reported on 338 HIV-positive mothers whose infant's serostatus was known. Mother-to-child transmission of HIV was 21.9% for mothers whose children survived to the age of one year. HIV positive mothers were divided into four groups according to serum vitamin A concentrations: less than 0.70µmol/L; 0.70 – 1.05µmol/L; 1.05–1.40µmol/L; and ? 1.40µmol/L (vitamin A deficiency in adults was defined as serum vitamin A less than 1.05µmol/L, because biological function is compromised below this concentration). The mother-to-child transmission rates for each group were 32.4%, 26.2%, 16.0%, and 7.2% respectively. Maternal CD4+ was also associated with increased mother-to-child transmission of HIV, independently of vitamin A concentrations. Maternal age, body-mass index, and breastfeeding practices were not significantly associated with higher mother-to-child transmission

Deficiency of vitamin A is only one amongst several specific nutritional abnormalities that have been associated with HIV infection – others include vitamins E, B₆, B₁₂, riboflavin, copper, and zinc. Therefore, as the authors of the study themselves caution "we cannot attribute these findings to lack of vitamin A alone,

since other micronutrient abnormalities may act as cofactors". The conclude, however, that "the temporal relation we find between low vitamin A in the second and third trimesters of pregnancy and increased mother-to-child nutrition is important, because it suggests that improving vitamin A during pregnancy may lower vertical transmission rates of HIV. Nutritional intervention may be a practical, inexpensive, and widely applicable option among several strategies that have been proposed to reduce mother-to-child transmission."

(Source: Semba, R. *et al* (1994). Maternal Vitamin A Deficiency and Mother-to-Child Transmission of HIV-1. *The Lancet*, **343**, 1593-1597)

Breastfeeding – Review of Effectiveness of Infant Feeding Policies in Maternity Wards

In May 1989, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) published a joint statement on the protection, promotion, and support of breastfeeding, with special reference to the role of maternity services. The statement describes in detail activities that every facility providing maternity services and care for newborn infants should undertake to encourage the initiation and maintenance of breastfeeding, and summarizes them as "ten steps to successful breastfeeding" as follows.

Every facility providing maternity services and care for newborn infants should:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff;
2. Train all health care staff in skills necessary to implement this policy;
3. Inform all pregnant women about the benefits and management of breastfeeding;
4. Help mothers initiate breastfeeding within half an hour of birth;
5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants;
6. Give newborn infants no food or drink other than breastmilk, unless medically indicated;
7. Practise rooming-in – allow mothers and infants to remain together – 24 hours a day;
8. Encourage breastfeeding on demand;
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants; and
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

These ten steps form the basis of a joint WHO and UNICEF undertaking, launched in 1991 in 12 "starter" countries, and worldwide in 1992, known as the Baby Friendly Hospital Initiative (BFHI). the aim of which is to encourage national action to promote and support breastfeeding in maternity wards, hospitals, and other facilities. To date almost 1000 hospitals have been designated baby friendly worldwide on the basis of their practice of the "Ten Steps to Successful Breastfeeding".



Where these recommendations have been translated into practice in hospital maternity wards, how successful have they been – have they actually led to an improvement in breastfeeding practice? This is the question a review published in the *American Journal of Public Health* has attempted to address. 65 articles on the relationship between maternity ward practices and lactation success published in English or Spanish between 1951 and 1991 were identified, of which 18 met the specified criteria laid down for inclusion in the review (hospital-based intervention, experimental design with randomization procedures, or quasi-experimental design with adequate documentation). The technique of meta-analysis – the quantitative synthesis of a large collection of summary statistics from individual studies on a single topic was used to explore the effects various maternity ward practices were having on breastfeeding.

The review provided strong evidence that several of the WHO/UNICEF infant feeding policies – the discontinuation of commercial discharge packs, rooming-in, and breastfeeding guidance – were successfully encouraging good breastfeeding practice in hospital maternity wards. The impact of encouraging breastfeeding on demand could unfortunately not be properly evaluated because of methodological problems in the studies. The review also found some evidence that early mother-infant contact might be related to lactation success, but unfortunately the meta analysis was not easily interpretable due to there being some inconsistencies between the studies.

The authors conclude "this review was restricted to infant feeding policies in maternity wards; we know almost nothing about the potential synergistic effect that these policies might have when combined with prenatal and postnatal breastfeeding interventions. It is important to fill these gaps in knowledge in order to tailor cost-effective interventions whose aim is to increase the chances of lactation success and ultimately improve infant health."

(Source: Perez-Escamilla, R., Pollitt, E., Lonnerdal, B. & Dewey, K. (1994). Infant Feeding Policies in Maternity Wards and Their Effect on Breastfeeding Success: An Analytical Overview. *American Journal of Public Health*. **84**(1), 89–97)

Breastfeeding and Neurological Dysfunction

Our knowledge about the beneficial effects of breastfeeding is constantly expanding. As well as the significant nutritional benefits of breastmilk over formula milk for infants, several studies have presented evidence which suggests that the method of feeding during early childhood can have a long-term effect on cognitive development. Other research has shown that slow cognitive development at nine years of age as measured by school failure and behavioural difficulties is linked to minor neurological dysfunction. Could breastfeeding then have a beneficial effect over formula feeding on neurological development later in life? A study in Groningen, the Netherlands, which investigated whether neurological development in a group of nine-year-old children was linked to how they were fed as infants appears to have found evidence that it does.

135 breastfed and 391 formula fed children, born at term in the University Hospital Groningen, between 1975 and 1979 were included in the study. A standard at-birth neurological examination was used to classify the infants as normal (247), slightly abnormal (213), or frankly abnormal (66). At nine years of age the children were reexamined and their mothers were asked to complete a questionnaire about how the children were fed as infants. After adjustment for factors which might also have affected neurological development, a small advantageous effect of breastfeeding on neurological status at nine years of age was found.

Three possible explanations as to why the method of feeding might be linked with neurological development are offered by the authors of the study: "firstly, the psychosocial aspect of breastfeeding seems to have a role, but its importance remains unclear...; secondly, maternal hormones (e.g. thyroid-stimulating hormone and thyroid hormones) and other biologically active peptides might reach the infant via breast-milk; and thirdly, some components of breastmilk may have a beneficial effect on brain development." According to the authors, there is evidence that "longer-chain polyunsaturated fatty acids, particularly arachidonic and docosahexaenoic acid, should be considered as essential nutrients for infants because they are present in structural lipids in brain and nervous tissue. At the time of rapid neural multiplication and development, the placenta enriches the foetal circulation with arachidonic and docosahexaenoic acids" – (see "Maternal Nutrition and Neurodevelopmental Disorders, SCN News No. 10, Late 1993, p22–23) – "the source for these fatty acids postnatally is breastmilk; few infant formulas contain detectable amounts of these acids".

The researchers conclude "our finding of a small beneficial effect of breastfeeding on postnatal neurological development shows the need for prospective research on this influence of breastfeeding and its consequences for the later behavioural and cognitive development of the child."

(Source: Lanting, C., Fidler, V., Huisman, M., Touwen, B. & Boersma, E. (1994). Neurological Differences Between 9-Year-Old Children Fed Breast-milk or Formula-milk as Babies. *The Lancet*, **344**, 1319–22)

Infant Nutrition and Breast Cancer

Researchers in New York have found evidence suggesting that early childhood nutrition – in particular bottle feeding – may be linked to breast cancer development later in life. A case-control study carried out in Western New York compared the method of feeding as infants of 528 women, aged 40 – 85 years, who had newly diagnosed primary, pathologically confirmed breast cancer, with 602 randomly selected women of similar age to the case group, and from the same community. After controlling for a number of other characteristics which may affect individual risk, the study found that women who had been breastfed *were* less likely to have contracted breast cancer than those who had not been breastfed as infants (adjusted odds ratio 0.74, 95% confidence interval 0.56 – 0.99).

(Source: Freudenheim, J. *et al* (1994). Exposure to Breastmilk in Infancy and the Risk of Breast Cancer. *Epidemiology*. **5**(3). 324 –331)

Homelessness and Nutrition in the United Kingdom

In Britain the level of homelessness has escalated dramatically over the past few years. Official figures from the Department of the Environment estimated that 145,800 individuals were homeless in 1991 – the number rising to 218,100 by June 1992. The actual figure is probably much higher, however, due to single homeless and childless couples not generally being recognized officially whilst priority is given to families with children, pregnant women, the elderly and the disabled.

Of those who are recognized officially, many are housed in temporary accommodation such as hostels or Bed and Breakfast hotels (B&B) – which are often cramped and lacking facilities. These temporarily housed low-income people are amongst the most deprived in Britain.

Existing evidence already clearly demonstrates the nutritional shortfalls low-income households in permanent accommodation suffer, but there has been little investigation into the diets of temporarily accommodated households. A study was thus carried out in Liverpool UK, and published in 1994, which looked at the diets, income, age, shopping habits, nutritional awareness, spending on food, and storage and cooking facilities of a sample of 30 B&B residents (both single and couples, but not their children). The nutritional value of the food consumed was assessed and compared with guidelines outlined in the UK Govt. Dept. of Health's 1991 Dietary Reference Values (DRVs) which give the recommended contribution various nutrients should make to total energy intake.

Energy intake itself was not insufficient in 25 of the 30 respondents. However, in all but two fat intake was excessive – with all consuming too much saturated fat. Only five respondents were consuming sufficient carbohydrates (as recommended by DRVs), and in all cases the contribution of "extrinsic" sugar to carbohydrate consumption was far in excess of DRVs due to consumption of large amounts of refined and manufactured foods such as cakes, biscuits, pastries, and soft drinks. Dietary fibre was well below the recommended value in all respondents, which, according to the authors of the study findings, was due to the minimal consumption of fruit and vegetables.

Intake levels of seven micronutrients are reported. Sodium intakes were found to be excessive in all respondents, even without accounting for salt (sodium chloride) added to food by respondents themselves. Five respondents were consuming too little vitamin A, vitamin B (riboflavin) and calcium, 25 too little vitamin B (nicotinic acid) and all too little vitamin C (some consuming less than a third of the DRV for this vitamin). Only certain groups of people are generally at risk of vitamin D deficiency as it is naturally synthesized as long as skin is exposed to the sun. Pregnant women *are* considered at risk, and all three respondents who were pregnant were consuming less than half of the DRV for this vitamin.

The types of food consumed by respondents which led to the reported deficiencies appeared to be dependent not only on income, but also on cooking facilities, food storage units, and preparation amenities – all of which are often minimal, if present at all, in the temporary accommodation assigned to homeless families, and which make the task of trying to eat healthily on a low-income virtually impossible (according to the report, respondents were as aware of nutritious foods as any other section of the population). When buying foods respondents therefore looked for food which was cheap, easily available, was quick and required little preparation and represented value for money – respondents relied on eating take-away and convenience

foods with little fresh fruit or vegetables. The report of the study concludes "the notion of choice in eating for the homeless is thus somewhat of a cruel illusion. With the money available to spend on food and the circumstances in which it must be eaten, the sample felt it unwise to purchase foods which are nutritionally healthy".

(Source: Stitt, S., Griffiths, G., & Grant, D. (1994). Homeless and Hungry: The Evidence from Liverpool. *Nutrition and Health*, **9**, 275–287)

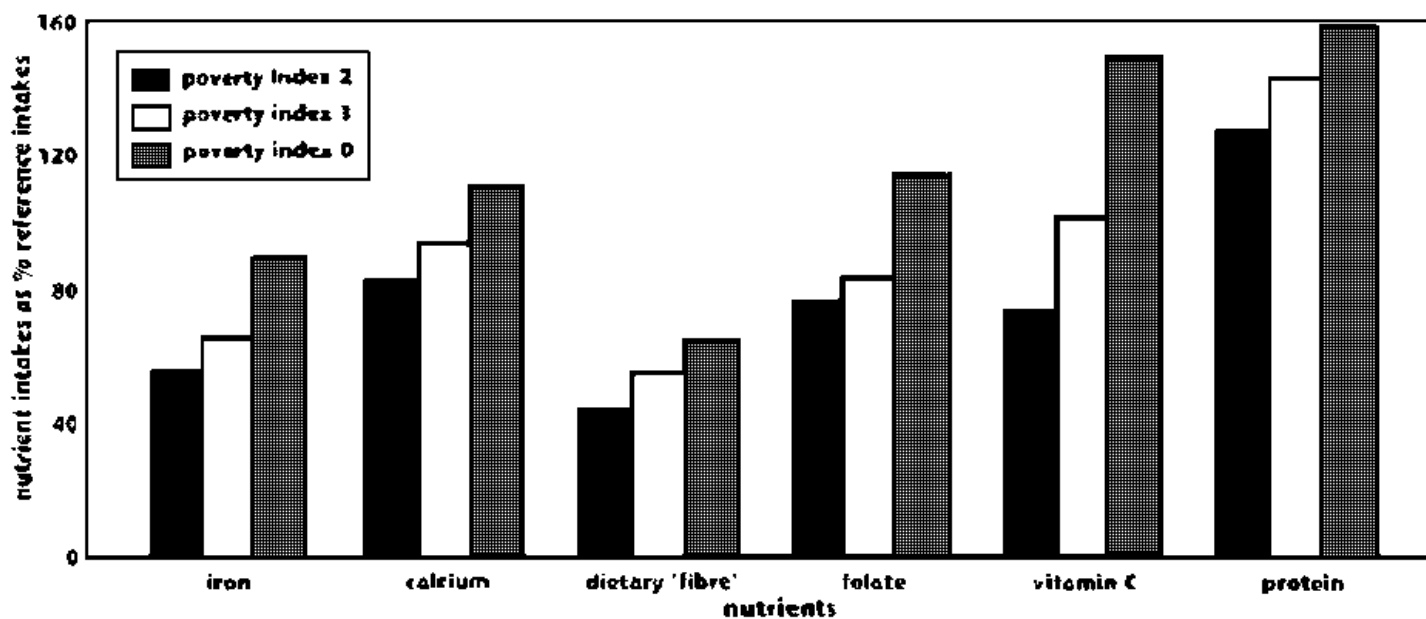
Diets of Lone–Parent Families in the United Kingdom

Findings have recently been published of a study in the United Kingdom into the diets of lone–parent families, many of whom are dependent on low levels of income. Elizabeth Dowler and Claire Calvert at the Centre for Human Nutrition, London School of Hygiene and Tropical Medicine, contacted a random sample of 200 lone–parent households in the greater London area during 1992/3. Food intake over three days was weighed for each lone parent and at least one child in each household. A food frequency questionnaire, used to assess both overall food variety, and variety within food groups such as fruits and vegetables, was also administered to parents and children – and a taped, semi–structured interview looked into how household income was managed in relation to food and health. 35% of the lone parents making up the sample were working full– or part–time. Nineteen of these were claiming supplementary income from the government, either in the form of Income Support or Family Credit, and for the other 65% of lone–parents studied, Income Support was the main source of income. For the majority of households studied money was very tight. In others money was not a problem, so internal comparisons could be made.

The study revealed the following about the diets in lone–parent households:

- Poor material circumstances, particularly when combined with severe constraints on disposable income through repayment of debt arrears, are the main factors associated with poor nutrition in lone parents and sometimes in their children.
- The poorest, most financially stressed lone parents in the study managed tight budgets in several ways, for example, buying stamps for future bills. As food was the most flexible item, this often led to poorer diets, particularly for the parent.
- Lone parents who aimed to shop for 'healthy', 'fresh' food did achieve better diets for themselves and their children than those who did not; nevertheless – despite any 'positive' approach – the diets of poorer families were still less healthy than those of better–off families.
- Parents who smoked had worse diets than those who didn't but any detrimental effect of smoking on diets was exacerbated in poorer families. However, the diets of smokers' children were hardly affected.
- Ethnicity is an important factor: those who shop for and eat diets that are typical of black British or Afro–Caribbean families by and large do better nutritionally than those eating meals typical of white families.
- Lone parents seem to protect their children from the worst nutritional consequences of poverty: where there is evidence of nutritional deprivation, it is the parents who tend to suffer it.

Adequacy of lone parent's nutrient intake 1992/3



Adequacy of lone parent's nutrient intake 1992/3

Note: poverty index 2 = long term unemployed council tenants, no holiday, and whose rent or fuel (and arrears) are automatically deducted from benefit, or paid via a key meter; poverty index 1 = either unemployed council tenants or with rent fuel deductions; poverty index 0 = neither category.

The authors concluded that "those who live for years on Income Support, in poor material circumstances, particularly with automatic benefit deductions for debt recovery, have difficulty obtaining a healthy diet, however hard they tried to shop and cook for health. The problem of affording sufficient fresh fruit and vegetables, in order to avoid increasing social differentials in morbidity and mortality is acute. Shopping in markets is not the answer – most already do it: more money to buy fresh produce in the markets is".

These research results have been published in the "Findings" series by the Joseph Rowntree Foundation – which describes itself as "an independent, non-political body which funds programmes of research and innovative development in the fields of housing, social care, and social policy. It supports projects of potential value to policy-makers, decision-takers, and practitioners. It publishes the findings rapidly and widely so that they can inform current debate and practice".

In the UK a national Nutrition Task Force was created in 1993 which recognized that "people on limited incomes may experience particular difficulties in obtaining a healthy and varied diet" and set up a Low Income Project Team in June 1994 to address these problems. The research described above will help inform their work.

A full report on the study entitled "Nutrition and Diet in Lone-parent Families in London" by Elizabeth Dowler and Claire Calvert is available, published by the Family Policy Studies Centre. 231 Baker Street, London NW1 6XE Phone: 0171 486 8179 Fax: 0171 224 3530 Price £9.50. For further information on the study, contact Elizabeth Dowler at the Human Nutrition Unit, Dept of Public Health and Policy. London School of Hygiene and Tropical Medicine; 2, Taviton Street. London WC1H 0BT. Tel: 0171 927 2143/2126.

The address of the Joseph Rowntree Foundation is: The Homestead, 40 Water End, York YO3 6LP. Tel: 0904 629241 Fax: 0904 620072.

(Source: Dowler, E. & Calvert, C. (1995). Diets of Lone-Parent Families. *Findings*. Joseph Rowntree Foundation Social Policy Research Report No.71)

25 Years of Oral Rehydration Solution

In 1994 the Government of Bangladesh and the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B) celebrated 25 years of life-saving use of Oral Rehydration Solution (ORS) – a

combination of sodium chloride, sodium bicarbonate, potassium chloride and glucose which replaces fluids and electrolytes lost during the repeated heavy purging associated with diarrhoeal disease. Scientists working at ICDDR, B developed ORS in 1968/9, and in 1971 its value was clearly demonstrated when it was used to treat many thousands of refugees fleeing the war for independence in Bangladesh. Thanks to ORS, death rates from cholera were reduced from 50% to less than 3%. It is estimated that ORS now saves the lives of over one million children in over a hundred countries around the world each year. 95% of potentially lethal dehydrating diarrhoeas can be successfully treated using ORS.

(Source: ICDDR, B (1994) Information Release Accompanying Commemorative Stamp for 25 Years of ORS. ICDDR, B "Glimpse" Newsletter. Vol 16 (2&3). March–April & May–June 1994, p.14–15).

Malaria Vaccine Tested in Tanzania

Recently published results in *The Lancet* of a trial carried out in southern Tanzania to assess the efficacy of the antimalarial vaccine SPf66 have shown that it can reduce the occurrence of clinical malaria caused by the *Plasmodium falciparum* parasite by an estimated 31% in children aged 1–5 years living in an area of intense year–round malaria transmission.

The trial took place between February 1993 and August 1994 in the village of Idete in the Kilombero Valley region of Southern Tanzania. 586 children were randomly assigned to receive either three doses of vaccine or three doses of placebo. The vaccine reassuringly caused no severe side effects and no medical care was required for the mild side effects recorded. During the follow–up period after the third dose, the annual incidence rates of malaria were 0.25 in the vaccine group, and 0.35 in the placebo group. As already mentioned, the vaccine efficacy was estimated as 31% after adjusting for the confounding factors "age at episode" and "distance from dispensary."

Over 400 million clinical cases of malaria – the most dangerous form of which is caused by *P. falciparum* – are recorded each year, resulting in an estimated 1 – 3 million deaths annually.

SPf66, developed by Manuel Patarroyo at the Institute of Immunology in Bogota, Colombia, is the first synthetic vaccine shown in field trials to offer protection against malaria. The first published results of a field study of the vaccine appeared in *The Lancet* in March 1993, and showed that the vaccine could give almost 40% protection overall against Malaria in an at–risk Colombian population. However, malaria risk is comparatively mild in Colombia compared to the area of southern Tanzania where this more recent trial took place. Here, 80% of infants are infected with the malaria parasite by six months of age, and on average an individual suffers 300 bites from malaria–infected mosquitos each year. The Tanzania trial has thus been a tough test for the vaccine.

Whilst the trial confirms that SPf66 can reduce the risk of malaria among children in high–risk areas, the efficacy is lower than most vaccines used to provide protection against other infections. The World Health Organization (WHO) anticipates that clinical trials of 6 to 8 other *P.falciparum* malaria vaccine candidates may be carried out over the next two to four years, but acknowledges that "as no single tool will represent a panacea, an effective malaria vaccine is expected to be used in an integrated approach, together with other malaria control tools, including drugs, and insecticide–impregnated bednets".

The authors of the findings of the Tanzania trial themselves conclude that "the potential of SPf66 vaccine as a public health measure in Africa will be debated... however, since the burden of malaria morbidity and mortality is vast, measures with moderate efficacy merit development".

SPf66 is also currently undergoing trials in The Gambia, on infants 6–11 months of age, and on the border of Thailand and Myanmar on children 2–15 years old.

(Sources: 1. Alonso, T. *et al* (1994) Randomised Trial of the Efficacy of SPf66 Vaccine Against *Plasmodium falciparum* Malaria in Children in Southern Tanzania. *The Lancet*, **344**. 1175–81; 2. Brown, P. (1994) Guarded Welcome for Malaria Vaccine. *New Scientist*. 5 November, 14–15; 3. WHO Press Release, 28 October 1994)

Controlling Malaria with the Help of Coconuts

With funding assistance from the International Development Research Centre in Canada, researchers at the Alexander von Humboldt Tropical Medicine Institute in Lima, Peru have developed a simple way of helping

prevent the spread of Malaria, using coconuts to support the growth of bacteria capable of killing mosquito larvae.

Malaria, a viral infection spread by the bite of a mosquito causes fever, chills, nausea, and muscle pain, and can lead to severe complications and death. In countries where malaria is endemic, workforce and school absenteeism is high. Over 400 million clinical cases of Malaria result in 1 –3 million deaths annually and close to half of the world's population is at risk of catching the disease.

Chemical insecticides, such as DDT, have been used for many years to control malaria, but are expensive to use and can pose a threat to human health, and cause environmental contamination.

The method of control designed by the researchers in Peru has none of these drawbacks. It involves the use of the mosquito–larvae killing bacteria *Bacillus thuringiensis* var *israelensis* H–14 (Bti) – a naturally occurring environmentally friendly bacteria – harmless to humans and livestock. It is commercially available, but its cost can be prohibitive for developing countries. However, coconuts, which are plentiful, free, and often grow close to ponds infested with mosquito larvae, have been found to provide the environment required for growth of the bacteria. The technique involves the introduction of a small amount of Bti on a cotton swab through a hole drilled in a coconut. The hole is then plugged with a wisp of cotton and sealed with candle wax. The coconut's hard shell protects the Bti during incubation while the coconut milk contains the amino acids and carbohydrates the bacteria must eat to reproduce. After coconuts have fermented for 2–3 days they are broken open and thrown into an infested pond. Mosquito larvae eat the bacteria, and the Bti kills the larvae by destroying their stomach lining.



It is reported that in tests, the Bti killed nearly all the mosquito larvae in a pond and stopped breeding for 12–45 days. A typical pond needs 2–3 coconuts for each treatment.

(Source: IDRC (1994) *Malaria Control in a Nutshell*". from the International Development Research Centre's "Science in Action" series of brochures profiling IDRC projects worldwide. For further information contact: Public Information Program, IDRC. 250, Albert Street. PC) Box 8500. Ottawa, Ontario K1G 3H9. Tel: (613) 2366163 Fax: (613) 238 7230)

Integrated Management of The Sick Child

WHO, in collaboration with UNICEF and the World Bank, is developing an integrated approach to the management of five major fatal childhood illnesses: pneumonia, diarrhoea, malaria, measles, and malnutrition. The following is taken from the programme description.

Five diseases cause 7 out of 10 child deaths.

Since 1990, around 60 million children died before their fifth birthday. Forty two million of them were killed by diarrhoea, pneumonia, measles, malaria or malnutrition. Unless action is taken now an even larger number of lives will be lost before the year 2000. Inexpensive treatments would save most of those lives.

At least three in every four of the children seeking health care every day suffer from one or more of these five conditions. Since symptoms may overlap, it is not always easy to decide which conditions are present.

Standard treatment guidelines

Newly developed treatment guidelines for the sick child cover the most common potentially fatal conditions. The health worker assesses every child for:

- non-specific danger signs
- four main symptoms
- cough or difficult breathing
- diarrhoea
- fever
- ear problems
- nutritional status
- immunization status

The guidelines enable the health worker to classify each child's illness according to whether the child needs:

- urgent referral
- specific medical treatment and advice
- simple advice on home management

The child is given vaccinations as needed and other problems are assessed.

Guidelines for management of the sick child in outpatient settings are available on wallcharts and in booklets.

Integrated management of the sick child focuses on the child rather than on a specific disease. It makes identification of illnesses more accurate and avoids duplication of effort.

Training

Training of health workers is based on the treatment guidelines and emphasizes hands-on practice. The training materials must be adapted to local situations so that, for instance, local foods and drinks can be mentioned or locally appropriate drugs recommended.

Further guidelines and training materials will cover:

- improving health workers' performance
- managing drug supplies at the health facility
- assessing and changing family behaviours regarding the care of sick children
- hospital care of children with severe illness

Impact

According to the World Development Report 1993, management of the sick child is among the most cost-effective health interventions in both low and middle income countries.

It was assessed to be the intervention likely to have the greatest impact in reducing the global burden of disease.

The programme is coordinated by the World Health Organization Division of Diarrhoeal and Acute Respiratory Disease Control with Division of Communicable Diseases. Division of Control of Tropical Diseases. Action Programme on Essential Drugs. Global Programme for Vaccines. Maternal and Child Health and Family Planning. Nutrition, Oral Health, Programme for the Prevention of Blindness, and Special Programme for Research and Training in Tropical Diseases, in collaboration with UNICEF and the World Bank.

For further information please contact: The Division of Diarrhoeal and Acute Respiratory Disease Control (CDR), World Health Organization. 20. Avenue Appia, CH-1211 Geneva 27, Switzerland. Phone: (41 22) 791 2632 Fax: (41 22) 791 0746.

(Source: CDR, 1995)



(Source: UNICEF/94-0093/GIACOMO PIROZZI)

James Grant

On 28 January, 1995, the United Nations Children's Fund (UNICEF) announced, with great sadness, the death of its former Executive Director, James P. Grant.

Mr. Grant assumed office as the third Executive Director of UNICEF, with the rank of Under-Secretary-General of the United Nations, on 1 January 1980. He resigned on 23 January this year because of ill health.

Although Mr. Grant was diagnosed with cancer in May 1993, he continued to lead UNICEF with characteristic energy and commitment until he resigned. Over the last year, despite his illness, he met with more than 40 world leaders to seek their active support for the cause of children.

During his 15-year tenure as head of UNICEF, Mr. Grant was acclaimed for his tireless advocacy, and his unflagging commitment, vision and dedication to improving the lives of the world's least advantaged – the children of the developing world. Under his leadership, UNICEF has confronted and decried what Mr. Grant called "the silent emergency", the daily tragedy of millions of children caught in the relentless downward spiral of poverty, population, and environmental degradation. Each year these conditions cause the deaths of millions and result in many more stunted lives. During Mr. Grant's term, UNICEF has also responded to the "loud" emergencies, and worked to save the lives of women and children caught in disasters such as earthquakes, famine and war.

In the 1980s, UNICEF launched the Child Survival and Development Revolution, which to date, has saved the lives of an estimated 25 million children and prevented disabilities in many more. Its success was predicated on Mr. Grant's unique strategy to emphasize simple, low-cost and practical methods for child welfare – like immunization, oral rehydration and breastfeeding – and to inspire a world-wide movement by mobilizing the political will necessary to bring these remedies to the millions of children and mothers threatened by preventable disease and malnutrition. An unquenchable optimist, Mr. Grant always believed in the human potential for achieving what others considered impossible.

In his statement following Mr. Grant's death, United Nations Secretary-General Boutros Boutros-Ghali, said, "Very few men or women ever have the opportunity to do as much good in the world as James Grant; and very few have ever grasped that opportunity with such complete and dedicated commitment. He will be remembered as a most distinguished servant of the United Nations and as one of the greatest international public servants of his generation."

The President of the United States, Bill Clinton, in a personal note to Mr. Grant on his resignation, said, "I am writing to thank you from the bottom of my heart for your service to America, to UNICEF and most of all to the children of the world. You have set a permanent standard for energetic and committed global leadership. You can count on us to help sustain the momentum you have given UNICEF and to work as you have always done for a more just and caring world."

The World Summit for Children in 1990, the first meeting of its kind where world leaders met to address

serious social issues, stands out as one of the main highlights of his career. The Summit set 27 child health and welfare goals that have been incorporated into the national plans of more than 100 countries. In promoting the goals and targets of the Summit, Mr. Grant was able to show the world in the past five years, that its efforts for children did make a difference.

Mr. Grant's strategy of setting specific, measurable goals, lobbying tirelessly for their achievement, and monitoring and publicizing progress towards them, has been remarkably effective. In the decade and a half he spent as the head of UNICEF, he personally met with more than 100 Heads of State or Government to enlist their personal and political support for the achievement of specific goals for children. He always had a sachet of oral rehydration salts in his pocket, along with the latest figure of the number of children being killed and maimed by common and preventable diseases in the nation concerned.

Another milestone in his career was the 1989 United Nations Convention on the Rights of the Child – a Magna Carta for children. The Convention recognizes, for the first time, the economic and social as well as political rights of all children and is today the most widely ratified human rights treaty ever.

In 1980, soon after assuming office, Mr. Grant established the annual State of the World's Children report, which provides an assessment of conditions and prospects for children worldwide. The annual Progress of Nations report, established by Mr. Grant in 1993, serves as an important benchmark for the international community by ranking countries on their progress in meeting their basic health, nutrition and education needs.

In 1994, Mr. Grant received the Presidential Medal of Freedom – the highest civilian honor conferred by the President of the United States – for his "compassion and courage in his crusade for the world's children and his tireless efforts to alleviate suffering around the world." He also received national awards from many other countries around the world including Sri Lanka, Brazil, Mexico, Pakistan, Ecuador, Peru, Italy and Japan. The most recent award, the International Development Conference's Special Award, was presented on 17 January this year. All of these honors recognised Mr Grant's distinguished service and contribution to human progress and development.

Mr. Grant came to UNICEF from the Overseas Development Council, which he helped found in 1969, serving as its President and Chief Executive Officer. He had previously served with the United States Agency for International Development (USAID) as an Assistant Administrator (1967–1969) and as Director of the USAID programme in Turkey with the rank of Minister (1964–1967). He was Deputy Assistant Secretary of State for Near East and South Asian Affairs (1962–1964) and a Deputy Director of the International Co-operation Administration (USAID's predecessor) with responsibility for world-wide programming and planning (1959–1962). His overseas assignments included service as Director of the United States aid mission in Sri Lanka (1956–1958), and Regional Legal Counsel resident in New Delhi for United States aid programmes for South Asia (1954–1956).

Mr. Grant began his career in 1946 with the United Nations Relief and Rehabilitation Administration in China. His early experience in China, and the pioneering work in international public health of his father, Mr. John B. Grant, remained a lifelong influence. In particular, he based his efforts for children on the belief that medical advances do not reach the poor majority by any automatic process of diffusion, but must be made available by conscious and sustained efforts to bridge the gap between what science knows and what people need.

Born in Beijing on 12 May 1922, Mr. Grant received a Bachelor of Arts degree from the University of California at Berkeley in 1943 and a Doctorate in Jurisprudence from Harvard University in 1951. He is survived by his wife, Ellen Young, of Croton on Hudson, New York; three sons from his marriage to the late Ethel Henck Grant: John of Washington D.C., James of Fairfield, Iowa and William of Casablanca, Morocco; two step-daughters, Melissa and Sarah Young, a step-son, Andrew Young; and eight grandchildren.

Everyone who knew him sensed his vision: but everyone who worked with him also recognized an even rarer quality – the ability to translate that vision into practical action, often against great odds and on a massive scale, by inspiring many thousands of individuals and organizations to sustained action on behalf of children in virtually every country of the world.

Those who were privileged to work with him will always remember Mr. James P. Grant as a visionary and a determined champion for children. We shall miss his leadership.

(Source: UNICEF Press Release, 28 January 1995)

(see also *"Unfinished Business of the 20th Century"*, p. 50)

First 2020 Conference to be Held in June 1995

The "2020 Vision for Food, Agriculture and the Environment" is an initiative of the International Food Policy Research Institute (IFPRI) to develop and share information on how to meet future world food needs while reducing poverty and protecting the environment.

The first in a series of major 2020 Vision conferences to be held around the world will take place from June 13–15, 1995, in Washington, D.C. The conference will be co-hosted by IFPRI and the National Geographic Society and will be held in National Geographic's Gilbert H. Grosvenor Auditorium, 1600 M Street, N.W.

The conference will identify the most promising solutions to meeting the challenge of feeding a growing world population while protecting and preserving the environment. Sessions of the conference will present new research and suggest policy directions. Some 400 participants from dozens of nations around the world, including prominent policymakers, leading scientists and economists, and heads of nongovernmental organizations and aid agencies are expected to attend.

The 2020 initiative seeks to help sustain the momentum generated by major United Nations' initiatives held over the past decade by taking a fresh look at development issues through the lens of food and agriculture. It is also hoped that the outcome of the 2020 Vision initiative will be useful to the United Nations Food and Agriculture Organization's upcoming World Food Security Summit.

For further information and to obtain copies of the 2020 Vision Newsletter "News & Views" and/or the 2020 Vision discussion paper series "2020 Briefs" please contact: IFPRI, 1200 17th Street, N.W., Washington, D.C. 20036–3006, USA. Phone: 1 202 862 5600 Fax: 1 202 467 4439 Email: IFPRI@CGNET.COM.

(Source: International Food Policy Research Institute Communication, 6 March 1995)

Diploma in Reproductive Health in Developing Countries.

New Course Offered by the Royal College of Obstetricians and Gynaecologists, and the Liverpool School of Tropical Medicine, UK.

Starting in 1995, the Royal College of Obstetricians and Gynaecologists and the Liverpool School of Tropical Medicine will jointly run a ten week course from May to July each year, leading to the qualification of diploma in reproductive health in developing countries.

The following information is extracted from the course leaflet.

The focus of the course will be on reducing reproductive mortality and morbidity through an integrated community orientated approach, appropriate to developing countries.

Who is the course for?

- doctors from developing countries undergoing postgraduate training in obstetrics and gynaecology in the UK;
- doctors practising obstetrics and gynaecology in developing countries;
- community health doctors responsible for maternity services in developing countries;
- graduates of medical schools in the UK and other European countries preparing for work in the developing world; and
- nurse/midwives working in maternity services in developing countries, with an interest in other aspects of reproductive health relevant to their work.

Aim

To contribute to the reduction of reproductive mortality and morbidity in developing countries. The course aims to equip participants with additional up-to-date skills and to bring about this reduction in mortality and morbidity.

Learning Objectives

At the end of the course participants should: –

- have developed an awareness of, and commitment to, reducing reproductive mortality and morbidity through a multi-dimensional and team approach. This would include exploring the possibilities of, and developing ideas for interventions to meet identified reproductive health needs.
- have increased their capabilities to plan, implement and evaluate programmes.
- appreciate the skills and techniques involved in staff motivation, training, supervision and leadership.
- be able to understand and explain the basics of epidemiology and simple research strategies, leading to the ability to critically analyse research papers and reports.
- be capable of applying the principles of health economics, medical audits and cost effectiveness in health care.
- have received an introduction on how to use a microcomputer and have acquired appropriate computing skills.

For further information about the course, please contact: Course Secretary (DRH), Liverpool School of Tropical Medicine, Pembroke Place, Liverpool L3 5QA. Fax: 0151 707 2885 Phone: 0151 708 9393.

(Source: Diploma in Reproductive Health in Developing Countries. Course Leaflet. September 1994)

5th International Course on Food Processing

The International Agricultural Centre (IAC), based at Wageningen, the Netherlands, is organizing two course programmes on Quality Assurance and Marketing, and on Food Fortification Management as part of its International In-service Training Course on Food Processing (ICFP). The following information about the courses is extracted from the course booklet.

The course on Quality Assurance and Marketing (ICFP-QAM) is intended for professionals from: business advisory, training and support institutions; technical and technological services for formal small and medium scale food processing enterprises; and entrepreneurs in small and medium scale enterprises. This programme aims to broaden participants' views on problems of small and medium scale food processing, to upgrade participants' knowledge concerning the analysis of problems and the selection of appropriate technologies, and to impart techniques for the implementation of selected technologies, focusing on quality assurance and marketing. The course will take place from August 13 – November 18, 1995.

IAC participates in the Program Against Micronutrient Malnutrition (PAMM), a global network based in Atlanta USA, that is working towards the virtual elimination of iodine and vitamin A deficiency disorders and a one-third reduction or iron deficiency anaemia by the year 2000. Assistance for the development of interventions includes support for dietary supplementation, food diversification and fortification of common foods with physiological amounts of micronutrients.

Fortification is the most sustainable long-term strategy to control iodine deficiency disorders. It is also an important short and medium-term strategy to combat vitamin A deficiency and iron deficiency anaemia. A six week international course programme on Food Fortification Management is offered by IAC, Wageningen. It provides information on fortification technology and processes, appropriate food vehicles that may be fortified, and fortificants that convey micronutrients

The programme is intended for candidates who have been selected by their governments to be members of a multidisciplinary national PAMM team and who have a direct relation to the realization of a national food fortification strategy component such as: government employees with an advisory role to the food processing industry; industry employees in-charge of food fortification processing; and private consultants, hired as advisors on technical and operational questions on food fortification by government and/or industry. This programme aims to provide participants with insight and views on how to develop or refine the skills to

manage the fortification of foods with micronutrients for national programmes and to create acceptance of fortification among groups concerned. The strategic focus is to assist governments in the development and strengthening of own capability to achieve and sustain the elimination of micronutrient malnutrition. This course will take place from October 8 – November 18, 1995).

For further information contact: IAC, PO Box 88, 6700 AB Wageningen, The Netherlands. Phone: 31 8370 90111 Fax: 31 8370 18552 Email: IAC@IAC.AGRO.NL.

(Source: Courses Leaflet, undated)

Short Course on Participatory and Rapid Appraisals for Management of Health, Nutrition, and Family Planning Programmes. London School of Hygiene and Tropical Medicine

Participatory and rapid appraisals and evaluations which involve local people are increasingly gaining interest amongst programme managers in health development programmes as a way of enhancing both the acceptability and sustainability of health, nutrition, and family planning programmes. Such appraisals and evaluations depend on the obtaining of appropriate information, and the objective of the above course – which will take place from 4–22 September 1995 – is to familiarize participants with the tools and techniques needed to provide timely and appropriate information as well as facilitate participation of local people in the planning process.

According to the course leaflet, at the end of the course participants should be able to:

- begin to apply a range of tools and techniques for appraisals and evaluations with community people,
- identify the appropriate tools/techniques to carry out participatory and/or rapid assessments involving local people.
- identify community problems using both qualitative and quantitative methods; and
- develop a proposal for solving planning problems systematically and with the use of methods which are relevant to the identified question.

The course is designed for people who: 1. are working in the field as programme managers; 2. are training people to use methods for participatory and rapid appraisals based on community involvement; and 3. are using or planning to use these approaches and methods for research.

For further information please contact: the Assistant Secretary (Welfare & Services), Short Courses, Registry, London School of Hygiene & Tropical Medicine, Keppel Street (Gower Street). London WC1E 7HT, UK. Phone: 0171 927 2074 Fax: 0171 323 0638.

(Source: Course leaflet. January 1995)

Second European Congress on Nutrition and Health in the Elderly – Preliminary Announcement

This Congress will take place in Elsinore, Denmark, from May 9–12 1996, and is expected to focus on the following themes as they relate to health and ageing: body composition; obesity; growth hormones; malnutrition; osteoporosis; antioxidants; meal patterns in Europe; elderly as consumers; and oral health and ageing. Any suggestions for the programme of the congress are most welcome.

For further information please contact: The Congress Secretariat, CONVENTUM Congress Service, Hauchsvej 14, DK-1825 Frederiksberg, Denmark. Phone: 45 31 31 08 47 Fax: 45 31 31 06 14.

(Source: Preliminary announcement of the Second European Congress on Nutrition and Health in the Elderly, undated)

Conference on Dietary Exposure to Contaminants and Additives. Noordwijkerhout, The Netherlands, 12–13 June 1995

Organized by the TNO Nutrition and Food Research Institute and the WHO Collaborating Centre for Nutrition, Ziest, The Netherlands, under the auspices of the WHO Regional Office for Nutrition, a conference on Dietary

Exposure to Contaminants and Additives will take place in June 1995 at the Leeuwenhorst Congress Centre, Noordwijkerhout, The Netherlands. The aim of the conference will be to provide a forum for researchers and policy-makers to exchange knowledge and opinions on the health risks of xenobiotics in the diet and methods to assess dietary exposure to contaminants and additives. Toxicological data will be combined with information on dietary intake and results from epidemiological studies. Participants will include representatives from the food industry, European public health authorities, nutritionists, toxicologists and epidemiologists. The official language of the conference will be English.

For further information please contact the conference secretariat: Ms Hanny Leezer, TNO Nutrition & Food Research Institute, PO Box 360, 3700 AJ Zeist, The Netherlands. Tel: 31 3404 44751 Fax: 31 3404 57952.

(Source: Conference Announcement, undated)

7th Asian Congress of Nutrition, Beijing, China, October 7–11, 1995

Scientists, practising nutritionists, clinicians, biologists, nutrition educators, agriculturalists, food industrialists, and policy-makers in food and nutrition will be amongst the participants at the 7th Asian Congress of Nutrition to be held in Beijing, China, from 7–11 October, 1995. The Congress is being organized by the Chinese Nutrition Society under the auspices of the Federation of Asian Nutrition Societies. Co-sponsors of the congress are: the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and the National Natural Science Foundation of China.

The scientific program will consist of plenary lectures, symposia, free communications, and posters covering a wide range of topics in nutrition. Plenary lectures will be on the following: A Forum on the Current Food and Nutrition Situation in Asian Countries; A Global View of Food Supply, Access to Food and Nutrition Adequacy; Trace Elements in Health and Disease; Antioxidants in Food and Chronic Degenerative Diseases; and Genetic Variation and Nutrition.

For further information please contact: Mr Ma Shi-liang, Chinese Academy of Preventive Medicine, 27 Nan Wei Road, Beijing 100050. China. Phone and Fax: 86 1 3022960/86 1 3170892.

(Source: 7th Asian Congress of Nutrition, Second Announcement, undated)

The Leeds Course in Clinical Nutrition 1995

The above course will take place from 5–8 September, 1995 at the St. James's University Hospital, Leeds, United Kingdom. The itinerary and themes for the four days will be: day 1 –Metabolism in Disease; day 2 – Clinical States Associated with Nutritional Problems; day 3 – Symposium on Nutrition in the Management of Renal Disease, and The Treatment of Nutritional Problems I; and day 4 – The Treatment of Nutritional Problems II. In addition, there will be an exhibition of related products from the pharmaceutical, equipment and food industry.

For further information please contact: Mrs Hilary L Thackray, Department of Continuing Professional Education, Continuing Education Building, Springfield Mount, Leeds, LS2 9NG. Phone: (0113) 233 3233 Fax: (01–13) 233 3240.

(Source: Course Booklet, undated)

Sweden – Symposium on Iron Nutrition in Health and Disease

The Swedish Nutrition Foundation and the Swedish Society of Medicine are organizing a Symposium on Iron Nutrition in Health and Disease, which will take place in Stockholm, Sweden, from 24–27 August 1995. The purpose of the meeting is to describe and discuss the present state of the art of research regarding the importance of iron in nutrition, and to identify areas where there is still disagreement in opinions and interpretations of data. The overall aim is to obtain a new platform for further research and for the development of programmes to optimize iron nutrition.

For further information please contact: Anita Laser Reutersward, Symposium Coordinator, The Swedish Nutrition Foundation, Ideon, S–223 70 Lund, Sweden. Phone: (46) (0) 46 18 22 80 Fax: (46) (0) 46 18 22 81.

(Source: Symposium Information Leaflet, undated)

Notice from Barrie Margetts, International Committee, Nutrition Society, 10, Cambridge Court, 210 Shepherds Bush, London W6 7NJ, United Kingdom

Our Society is interested in making formal and reciprocal links with other Nutrition Societies, particularly those in 'developing countries'. For more details please contact me at the above address.

(Source: as above)

Post-Graduate Training in Human Nutrition

Compiled by the International Committee, Nutrition Society, 10 Cambridge Court, 210 Shepherds Bush, London W6 7NJ, UK

This list aims to give prospective students an overview of many of the training programmes available and addresses from which to obtain up-to-date details. All the courses are taught in English and claim to be relevant to students from developing countries.

Entry qualifications vary but most require an undergraduate degree. Some programmes can suggest sources of funds. Organizations which may be able to advise on funding are Ministries of Education, British Council, WHO, USAID, World Bank and the Regional Development Banks. European Union nationals should write to the Educational Grants Advisory Service, 501-5 Kingsland Rd, Dalston, London E8 4AV. Overseas students wanting to study in UK can contact the Overseas Student Affairs, 60 Westbourne Grove, London W2 5FG.

The list was prepared from data collected in 1993 and 1994. We thank everyone who supplied information and would be pleased to receive additions and corrections so we can keep the list updated.

The order of the data given is: **Institution, Name of course**, Qualification offered, Duration, Address for more details.

AFRICA

University of Mansoura, Egypt *Human Nutrition* MSc 2yr. Also PhD. Details from Dean, Food Science and Technology Department, Mansoura University, 35516 El-Mansoura, Egypt

University of Ghana *Human Nutrition* M.Phil 2yr. Also PhD. Details from Head, Department of Nutrition & Food Science, University of Ghana, Box 134, Legon, Ghana

University of Nairobi, Kenya *Applied Human Nutrition* MSc 2yr. Also PhD. Details from Head, Applied Human Nutrition Programme, Department of Food Technology and Nutrition, University of Nairobi, Box 41607, Nairobi, Kenya

University of Calabar, Nigeria *Nutrition and Dietetics* MSc 2yr. Details from Course Co-ordinator, University of Calabar, PMB 1115, Calabar, Nigeria

University of Ibadan, Nigeria *Human Nutrition* MSc 1yr. Details from Course Co-ordinator, Department of Human Nutrition, University of Ibadan, Ibadan 412668, Nigeria

University of Nigeria, Nsukka *Nutrition* MSc 2yr. Details from Course Co-ordinator, University of Nigeria Nsukka Campus, PO Box Nsukka, Nigeria

AMERICAS

University of Guelph, Canada *Nutritional Sciences* MSc 2yr (thesis), 1yr (course work). Also PhD. ***Applied Human Nutrition*** MSc 2yr. Also PhD. Details from Graduate Secretary. Dept of Nutritional Sciences, University of Guelph, Guelph, Ontario. Canada N1G 2W1

University of Toronto, Canada *Community Nutrition* MHSc 1½yr. ***Nutritional Sciences*** (research) MSc. Also PhD. Details from Co-ordinator of Graduate Studies, Graduate Department of Community Health, Room 6, McMurrich Building, University of Toronto, Toronto, ON M5S 1A8, Canada

Institute of Nutrition of Central America and Panama, Guatemala *Food and Nutrition* MSc 20mth. Details from Course Co-ordinator, INCAP, Box 1188, Guatemala City, Guatemala

University of California, USA Nutrition MSc & PhD. Details from Interdepartmental Graduate Groups. College of Natural Resources, 146 Morgan Hall 642–2879, Berkeley, CA 94720, USA

Cornell University, USA Nutrition Masters in Professional Studies 1yr. MSc 2yr. Also PhD. Details from Graduate Faculty Representative. Field of Nutrition, 305 MVR Hall, Cornell University, Ithaca, New York 14853–4401, USA

Harvard School of Public Health, USA Epidemiology/International Nutrition and Nutritional Biochemistry PhD. Details from Assistant Director, HSPH, 677 Huntington Ave, Boston, MA 02115, USA

University of North Carolina at Chapel Hill, USA Human Nutrition MPH & PhD. Details from Student Services Manager, CB7400 McGavran–Greenberg, Chapel Hill, NC 27599–7400, USA

Tufts University, USA Human Nutrition Sciences MSc 2yr. Also PhD. **Social Sciences of Food Policy and Applied Nutrition** MSc 2yr. Also PhD. Details from School of Nutrition, Tufts University. 132 Curtis St, Medford, MA 02155, USA

For a complete list of USA programmes see *Peterson's Guide to Graduate Programs in the Biological & Agricultural Sciences* 1993 from Peterson's Guides. Box 2123. Princeton, NJ 08543, USA (probably available in USIS libraries)

ASIA

National Institute of Nutrition, India Applied Nutrition MSc 9mth. Details from National Institute of Nutrition, Indian Council of Medical Research, Jamia–Osmania P.O., Hyderabad 500 007, India

University of Calcutta, India Nutrition Diploma 9mth. Details from Faculty of Medicine, University of Calcutta, Senate House, Calcutta 700 073, India

Avinasilingam Institute, India Human Nutrition MSc 2yr. Details from Course Co–ordinator, Avinasilingam Institute for Home Science & Higher Education for Women, Saradalaya, Coimbatore, India

Punjab University, India Nutrition & Dietetics Diploma 1yr. Details from Home Science College, Punjab University, Chandigash, Punjab, India

University of Indonesia, SEAMEO–TROPMED Applied Human Nutrition MSc 2yr. **Nutrition** MSc 1yr. Also PhD. Details from Directorate SEAMEO–TROPMED Center Indonesia, University of Indonesia, 6 Salemba Raya, Jakarta 10430, Indonesia

Mahidol University, Thailand Nutrition MSc & PhD. Details from Director, Institute of Nutrition, Mahidol University at Salaya, Putthamonthon 4, Nakhon Pathom, 73170 or Director Research Center at Ramathibodi Medical Faculty, Ramathidodi Hospital, Rama 6 Rd, Bangkok, 10400 Thailand

Mahidol University, Thailand Food and Nutrition MSc. Details from Director, Institute of Nutrition, Mahidol University at Salaya, Putthamonthon 4, Nakhon Pathom, 73170 Thailand

Philippine Women's University Nutrition MSc 2yr. Details from Course Co–ordinator, Philippine Women's University, 1743 Taft Ave, Manila B–406, Philippines

University of Philippines Public Health (Nutrition) MSc 2yr. Details from Course Co–ordinator, College of Public Health, 625 Pedro Gil, Ermita, Manila 1000, Philippines

University of the Philippines at Los Banos Regional Training Programme on Food and Nutrition Planning MSc 17mth (Asian and Pacific nationals). Details from FNP College, Laguna 3720, Philippines

AUSTRALASIA/SOUTH PACIFIC

Deakin University, Australia Human Nutrition Diploma 1yr (available by distance learning); MSc (by course work 2yr, by research 1yr). Also PhD. **Nutrition Education** Diploma 1yr (available by distance learning). **Nutrition & Dietetics** MSc 2yr. Details from Course Co–ordinator, School of Nutrition & Public Health, Deakin University, Geelong, Victoria 3217, Australia

University of Queensland, Australia (with Universiti Kebangsaan, Malaysia & Mahidol & Khon Kaen Universities, Thailand) *Community Nutrition* MSc 1yr. Details from The Director, Nutrition Program, University of Queensland, Royal Brisbane Hospital, Brisbane, Queensland 4029, Australia

University of Queensland, Australia *Nutrition* MMedSc 2yr. Also PhD 3yr. Details from The Director, Nutrition Program, University of Queensland, Royal Brisbane Hospital, Brisbane, Queensland 4029.
Metabolic Biochemistry & Nutrition Diploma 1yr fulltime, 2yr part-time. Details from The Post-Graduate Co-ordinator, Department of Biochemistry, Brisbane, Queensland 4072, Australia

University of Sydney, Australia *Nutrition & Dietetics* MSc 2yr. ***Nutritional Science*** MSc 2yr. Details from Course Co-ordinator, Human Nutrition Unit, Department of Biochemistry, University of Sydney, NSW 2006, Australia

University of Wollongong, Australia *Nutrition & Dietetics* MSc 1yr. ***Nutrition*** MPH, MSc and PhD. Details from Nutrition Course Co-ordinator, Department of Public Health & Nutrition, University of Wollongong, Northfields Ave, Wollongong, NSW 2522, Australia

University of Otago, New Zealand *Human Nutrition* Diploma 1yr; MSc or MCApSc 2yr. ***Community Nutrition*** Diploma 2yr (available by distance learning). Details from Course Co-ordinator, Department of Human Nutrition, University of Otago, Box 56, Dunedin, New Zealand

CARIBBEAN

University of West Indies, Jamaica *Human Nutrition* MSc 2yr. Details from Course Co-ordinator, Tropical Metabolism Research Unit, University of West Indies Mona, Kingston 7, Jamaica

EUROPE

University College Cork, Ireland *Nutrition* MSc 2yr; Diploma 1yr. Also MSc/PhD (by research). Details from Course Co-ordinator, Department of Nutrition, University College, Cork, Ireland

International Agricultural Centre, The Netherlands *International Course on Food Science and Nutrition* Diploma 6mth. Details from International Agricultural Centre, Box 88, 6700 AB Wageningen, The Netherlands

Uppsala University, Sweden *Human Nutrition* MSc 3yr or >3yr (sandwich). Also PhD. Details from Department of Human Nutrition, Uppsala University, Dag Hammarskjöld väg 21, S-752 37 Uppsala, Sweden

University of Aberdeen, UK *Human Nutrition and Metabolism* MSc 1yr; Diploma 44 wks. Details from Course Organiser, Department of Medicine and Therapeutics, University of Aberdeen, Polwarth Building, Forresterhill, Aberdeen AB9 2ZD, UK

University of Glasgow, UK *Human Nutrition* MSc/Diploma 1yr. ***Human Nutrition*** PhD/MSc (by research). ***Clinical Nutrition*** MSc/Diploma (medical graduates only) 2yr. Details from Postgraduate Course Coordinator, Department of Human Nutrition, University of Glasgow, Yorkhill Hospitals, Glasgow G3 8SJ, UK

University of Keele, UK *Health, Population and Nutrition in Developing Countries* MBA 1yr. Details from Programme Director, MBA Programme, Centre for Health Planning and Management, Science Park, University of Keele ST5 5SP, UK

University of London, Centre for Human Nutrition, UK. *Human Nutrition* MSc 1yr. Also PhD. Details from Registrar, London School Hygiene and Tropical Medicine, Keppel St, London WC1E 7HT, UK

University of London, King's College, UK *Human Nutrition* MSc 1yr. Diploma 7mth. Also PhD. Details from Admissions Tutor, Department of Nutrition and Dietetics, King's College, Campden Hill Rd, London W8 7AH, UK

University of London, Institute of Child Health, UK. *Mother and Child Health* MSc 15mth. Diploma 9mth. Details from Institute of Child Health, 30 Guildford St, London WC1 1EH, UK

University of Nottingham, UK *Nutritional Biochemistry (Human)* MSc 12mth. Also PhD/MPhil. Details from Course Co-ordinator, Department of Applied Biochemistry and Food Science, University of Nottingham, Sutton Bonington, Loughborough LE12 5RD, UK

Oxford Brookes University, Centre for the Science of Food & Nutrition, UK *Human Nutrition* MPhil/PhD. Details from Course Co-ordinator, School of Biological and Molecular Sciences, Oxford Brookes University, Gypsy Lane, Headington, Oxford OX3 0BP, UK

Queen Margaret College, UK *Community Nutrition* MSc. 45 weeks (full or part-time). Also Certificate & Diploma. Details from Department of Dietetics & Nutrition, Queen Margaret College, Clerwood Terrace, Edinburgh EH12 8TS, UK

University of Sheffield, UK *Human Nutrition* M Med Sci 12mth. Diploma 4mth. Details from Course Co-ordinator, Centre for Human Nutrition, University of Sheffield, Sheffield S10 2TN, UK

University of Southampton, UK *Human Nutrition* PhD/MPhil. Details from Course Co-ordinator, Department of Human Nutrition, University of Southampton, Southampton SO9 3TU, UK

University of Surrey, UK *Human Nutrition* PhD. Details from Course Co-ordinator, School of Biological Sciences, University of Surrey, Guildford GU2 5XH, UK

University of Ulster, UK *Biomedical Sciences with option in Human Nutrition* MSc 1yr. Diploma 1yr. Also MPhil/DPhil. Details from Senior Course Tutor, Department Biological and Biomedical Sciences, University of Ulster, Cromore Rd, Coleraine BT52 1SA, UK

References and Sources of More Information

- Institute of Biology 1991 *Training of Nutritionists* from Nutrition Society, 10 Cambridge Court, 210 Shepherds Bush, London W6 7NJ
- International Child Health Unit 1993 *Directory of Training Courses 1994 in NU #3* from ICH, University Hospital, S-751 85 Uppsala, Sweden
- UNESCO (with IUNS) 1992 *Compendium of Higher Education Programmes in Family and Home Economics, Nutrition, Food Science and Technology and Health Sciences* for Africa, Asia and Pacific, and the Arab States from Division of Basic Education, UNESCO, 7 place de Fontenoy, 75700 Paris, France
- WHO/SEARO 1990 *Overview of training courses in Nutrition* SEARO/WHO, New Delhi

PROGRAMME NEWS

Agencies and Governments report on their activities in nutrition.

CANADA

Canadian Foreign Policy Statement

Following a year-long consultation with Canadians on every aspect of Canada's international relations, the Canadian Government has issued a foreign policy statement entitled "Canada in the World", which sets out three key objectives to guide Canada's foreign policy: promotion of prosperity and employment; protection of global security; and projection of Canadian values and culture.

On the subject of international development assistance, to which a section of the statement is devoted, the Government emphasizes that "International Assistance is a vital instrument for the achievement of the three key objectives being pursued by the Government. It is an investment in prosperity and employment. It connects the Canadian economy to some of the world's fastest growing markets – the markets of the developing world. And, in the long-run, development cooperation can help lift developing countries out of poverty. This means that it contributes to a stronger global economy in which Canadians, and other peoples, can grow and prosper. International Assistance also contributes to global security by tackling many key threats to human security, such as the abuse of human rights, disease, environmental degradation, population growth and the widening gap between rich and poor. Finally, it is one of the clearest international expressions of Canadian values and culture – of Canadians' desire to help the less fortunate and of their strong sense of social justice – and an effective means of sharing these values with the rest of the world".

The statement lays out the purpose and six program priorities of Canada's Official Development Assistance (ODA) Program:

"The purpose of Canada's ODA is to support sustainable development in developing countries, in order to reduce poverty and to contribute to a more secure, equitable and prosperous world.

To achieve this purpose, Canadian ODA will concentrate available resources on the following six program priorities:

Basic Human Needs: to support efforts to provide primary health care, basic education, family planning, nutrition, water and sanitation, and shelter. Canada will continue to respond to emergencies with humanitarian assistance. Canada will commit 25% of its ODA to basic human needs as a means of enhancing its focus on addressing the security of the individual.

Women in Development: to support the full participation of women as equal partners in the sustainable development of their societies.

Infrastructure Services: to help developing countries to deliver environmentally-sound infrastructure services, with an emphasis on poorer groups and on capacity building.

Human rights, democracy, good governance: to increase respect for human rights, including children's rights; to promote democracy and better governance; and to strengthen both civil society and the security of the individual.

Private Sector Development: to promote sustained and equitable economic growth by supporting private sector development in developing countries.

The Environment: to help developing countries to protect their environment and to contribute to addressing global and regional environmental issues."

The statement also emphasizes the Government's commitment to working with partners both in Canada and the rest of the world. "A wide range of development partners in Canada, along with a large number of international organizations and, most importantly, the people and institutions of developing countries, play a vital role in the development of policy and in the planning and delivery of Canada's ODA. Their contribution is essential to providing the range of expertise, knowledge and resources required to meet the many diverse challenges of international development... The Government is committed to strengthening these partnerships and, to do so, undertakes the following commitments:

In consultation with Canadian partners the Government will:

- sharpen the development focus of private sector linkage programs, including the Canadian International Development Agency – INC (CIDA–INC), while ensuring greater coordination among DFAIT, CIDA, the EDC and other departments and agencies by holding regular project-by-project consultations on CIDA–INC activities;
- develop a framework for a renewed relationship between CIDA and Canadian voluntary organizations based on the principle of complementarity of action;
- expand the number and range of personnel exchanges between CIDA and its Canadian partners, especially NGOs;
- seek ways to ensure the effective participation of Canada's academic and professional communities in development assistance programs; and
- improve coordination among government departments at the federal, provincial and municipal levels.

With international partners the Government will promote reform that helps to:

- better integrate objectives such as respect for human rights, poverty reduction, social and gender equity, and environment into the work of multilateral institutions;

- increase accountability and transparency; and
- improve developmental and cost effectiveness.

With developing country partners the Government will:

- work with developing countries and their people to help them participate more fully in the international system and global economy; and
- establish new ways to build longer-term linkages between Canadians and developing country partners to enhance their self reliance.

Copies of the Statement, and the Canadian Government's Reponse to the Recommendations of the Special Joint Parliamentary Committee reviewing Canadian Foreign Policy are available, in English or French, by contacting: 1. The InfoCentre: for hardcopy publications (inside Canada only) – and to speak directly to an individual phone 1–800–267–8376 or (613) 944 4000; 2. the Faxlink system for publications by fax dial (613) 944 6500 from a fax machine; 3. The InfoCentre Bulletin Board (IBB) for electronic publications dial (613) 944 1581 from a computer modem; and 4. The Foreign Policy Bulletin Board (FPBB) for electronic publications via INTERNET (<http://gsro.carleton.ca:4001/>). The contact address for CIDA is: Public Communications Branch, Canadian International Development Agency (CIDA), 200 Promenade du Portage, Hull, Quebec K1A 0G4. Tel: (819) 997 6100 Fax:(819) 953 6088.

(Source: Government of Canada (1995). *Canada in the World*. Government Foreign Policy Statement.)

FAO

Most FAO activities aim at promoting and ensuring the nutritional well-being of populations. The range of action encompasses the whole food chain from production to consumption. FAO is increasingly stressing the overall problem of food security which is still paramount in many countries and has to be urgently addressed in the long-term view of development. Seventy-eight countries, with an estimated total population of 3.5 billion people have been identified as "Low Income Food Deficit Countries" (LIFDCs) where growth in food production is lagging so far behind growth in food requirements that they have to rely increasingly on food imports to feed their population. FAO is launching a Special Programme to assist these LIFDCS to rapidly increase food production in order to stem the growing incidence of food insecurity and undernutrition on their people.

From another perspective, the consequences of the GATT agreement on food trade and food prices and on the overall food trading area will have a relevant impact on the nutritional status of many populations. FAO, especially through its quality control activities and the Codex work, is assisting the developing countries to comply with these new requirements.

The emphasis on food security parallels the assistance provided by FAO to over 100 countries in developing their National Plan of Action for Nutrition (NPAN) as called for by the World Declaration on Nutrition. To date 33 NPANs either in final or draft form have been prepared and made available to FAO. Approximately another 20 NPANs are expected to be available by the end of 1994. These NPANs provide an appropriate and articulated framework for stimulating the multisectoral activities required to improve the nutritional well-being of the populations in the developing countries.

Linked to the development of these NPANs, FAO has provided support to the Geneva-based NGO Working Group on Nutrition to develop a document entitled "Promoting the Role of NGOs in Nutrition, Guidelines for Implementing the International Conference on Nutrition (ICN)" in order to foster the involvement and activities of NGOs in the follow-up of the ICN and the implementation of NPANs. The document illustrates activities of several NGOs throughout the world undertaking effective food and nutrition projects that address the different themes of the ICN and thus contributes to reach the goals set by the World Declaration on Nutrition.

Other more specific activities include the work on Fats and Oils which provides updated information on the topic. The Food and Agriculture Organization of the United Nations and the World Health Organization convene expert consultations to provide advice to developing and developed countries. "Fats and Oils in Human Nutrition: Report of a joint expert consultation" reviews the most recent scientific information on this crucial topic and presents the experts' recommendations. Key issues which may influence consumption, health, food production and processing, food marketing and nutrition education are discussed. The report

contains recommendations about desirable minimum and maximum intakes of fats; maternal and infant nutrition; essential fatty acids; saturated, unsaturated and isomeric fatty acids; antioxidants; and scientific and programmatic needs, an extensive bibliography is included. The English version of the report will be available early 1995 while the French and Spanish versions will be available later during the year.

In response to the request expressed by the countries during the March 1994 Tunis meeting, FAO is strengthening its programme on food composition. The importance of food composition work in order to provide accurate and reliable data for government, industry and international agencies work and planning in food and nutrition is paramount. FAO organized a meeting, jointly with the UNU, in September 1994 in Accra, Ghana, to promote the involvement of African countries in food composition work. In 1995, other meetings will be organized to discuss the formulation of national food composition programmes in different countries and to prepare and implement projects aiming at strengthening the regional cooperation concerning food composition activities.

In the field of food quality and safety, FAO's programme includes policy and technical advice to member countries in the assessment of the effectiveness of their food control systems and activities in assuring consumer protection and in promoting the production and trade of good quality and safe food. It also covers the provision of technical support to developing member nations in strengthening their capabilities in food quality control with particular emphasis on training of food control managers, inspectors and analysts and in the orientation of food handlers and consumers on hygienic practices in food processing and preparation. Over 30 field projects are currently being executed by FAO in this field in various parts of the world.

The social, economic and nutritional significance of street foods and their quality and safety problems have been the subject of several studies carried out by FAO with a view of assisting member countries in their evaluation of this informal sector and in promoting appropriate practices in the handling, preparation and vending of street foods. More recently FAO organized a Sub-regional Workshop on Street Foods for French-speaking African Countries (Cotonou, Benin 24-28 November 1994) during which the street food situation in this sub-region had been reviewed and analyzed and specific recommendations were made to improve the quality and safety of street-vended foods.

The Codex Committee on Food Labelling is currently elaborating Guidelines for Use of Health and Nutrition Claims in view of the need for harmonization in this area, in order to prevent consumer deception regarding the nutritional quality or health-related effects of foodstuffs and nutrients and to help the consumer to make an informed choice. The Committee is also considering Recommendations for the Labelling of Foods which may cause hypersensitivity reactions (allergy and intolerance).

The Codex Committee on Nutrition and Foods for Special Dietary Uses is elaborating an Annex on the Iodization of Salt to the Codex Standard for Food Grade Salt and will be reviewing the Standard for Formulated Supplementary Foods and in Particular Processed Cereal Based Foods for infants and young children, with special emphasis on the need to facilitate the preparation of such foods from locally available raw materials in developing countries.

Guidelines for Dietary Supplements (especially vitamins and minerals) are also under consideration, while the Provisions for Vitamins and Minerals in Codex standards are under review, as well as the Guidelines on Inclusion of Nutrition Provisions on Nutritional Quality in Food Standards.

Concerning nutrition education activities, FAO is presently preparing documents and materials for a nutrition education programme. The campaign will bear the title "Get the Best from your Food". An "Expert Consultation on Nutrition Education for the Public" to be held in Rome in September 1995 is under preparation. With regard to the FAO Guidelines for Participatory Nutrition Projects, these are now also available in a French Language version. The Spanish language version is in print and will become available early 1995.

(Source: FAO. 1994)

50th Anniversary of the Founding of FAO

From October 11 to 13, 1995, in Quebec City, some 1,500 people, approximately two-thirds of whom will be coming from abroad, will share their knowledge and agree on the steps to be taken to feed the planet throughout the next century. Those attending will include decision makers and practitioners who are concerned about world food security.

The Symposium commemorating the 50th anniversary of the founding of FAO is a practical event, resolutely facing the future. Participants will be able to examine case studies and share experiences in an atmosphere that is conducive to devising concrete solutions. The innovative aspect of this meeting lies in the fact that it is bringing business people and representatives of non-governmental organizations (NGOs) together with political figures, scientists and academics, all working in the fields of agriculture, fisheries or forestry. Such a gathering will inevitably provide numerous opportunities for conducting business.

The Symposium's program includes keynote speeches by renowned specialists and workshop discussions where cases drawn from the five continents will be studied in small groups. Three sub-themes will be considered separately: managing natural resources, managing markets, and managing know-how and technology.

From October 11 to 14, an exhibition will be presented in conjunction with the Symposium. Here, businesses and NGOs will have the opportunity to demonstrate their know-how and also their products and technologies in the field of sustainable agricultural, fisheries and forestry development.

For further information please contact: 1995 FAO Symposium Secretariat, 65 Sainte-Anne Street, Suite 100. Quebec, Quebec, Canada G1R 3X5. Phone: (418) 691 7849 Fax: (418) 691 7815.

(Source: Symposium Brochure, undated)

Italy

Adult Malnutrition: The Forgotten Dimension

Adult malnutrition is increasingly recognised as of major functional and health importance in many developing countries. There is a high prevalence rate of underweight in many Asian and African countries, e.g. India, Pakistan, Bangladesh, Vietnam, Ethiopia and Somalia. An IDECG-appointed task force developed in 1988 new criteria for identifying adult malnutrition. The condition is assessed by specifying different degrees of under-weight expressed as the body mass index ($BMI = \text{weight (kg)}/\text{height (m}^2\text{)}$). Three grades of chronic energy deficiency were specified, marginal ($BMI\ 17.0\text{--}18.4$), moderate ($BMI\ 16.0\text{--}16.9$) and severe ($BMI < 16.0$). A recent IDECG workshop, hosted and co-sponsored by FAO in Rome, has reviewed in great depth the functional correlates of chronic energy deficiency of the adult. Underweight adults have recently been found to have immunological deficiencies both of skin-mediated immunity and lymphocyte function, these changes being related to the BMI. Now, in collaboration with Prof. James of the Rowett Institute, Aberdeen, researchers at the National Institute of Nutrition in Rome have extended the 3 categories of underweight to 5 so that extreme and life-threatening cachexia can be defined. These new categories are suitable for use in prioritizing those in urgent need of refeeding when communities are exposed to famine conditions and food relief is limited. The BMI cut-off points are 18.5, 17.0, 16.0, 13.0 and 10.0. A further development has involved the generation of new standards for the mid upper arm circumference (MUAC) in adults living in the Third World. MUAC correlates with the BMI and the -1, -2, and -3 S.D. values correspond to BMIs of 16, 13 and 10; the MUAC values suitable for rapid screening are sex-specific.

The causes of underweight could be many but the paucity of food stores and the dependence of families on the daily procurement of food seem to be documented by monitoring changes in adult BMIs. The recognition that low BMIs signify food insecurity also now allows a new approach to policy making in relation to childhood malnutrition. A new approach has been developed linking children's and maternal anthropometry where households with an underweight child are identified as malnourished with food insecurity specified as the cause when the maternal BMI < 18.5. Where maternal BMI exceeds 18.5 then maternal care, immunisation and other sanitary or public health factors seem to be the dominant contributors to childhood malnutrition.

These studies on adults are continuing with further analyses of energy needs, agricultural development and the role of micronutrients. A new perspective on global nutritional problems is however emerging as we overcome the longstanding neglect of adult malnutrition.

Seasonality and Malnutrition: The Dimension of the Phenomenon

Climatic conditions remain to these days the main determinants of the periodic exposure of Third World farmers to seasonal energy stress. Researchers at the National Institute of Nutrition, Rome, Italy have developed an agro-pedo-climatic index which proved to be highly correlated with seasonal weight loss of adults in rural Third World. This index has allowed the estimation of the distribution and the prevalence of individuals at risk of seasonal energy stress. The estimate has been based on the combined use of an Index

of Agriclimatic Seasonality and the anticipated biological damage associated with a given weight loss.

The order of magnitude of seasonal weight loss observed in most Third World rural communities is rather modest, as the seasonal drop in BMI is normally on average less than 1 kg/m² and only in exceptional cases it approaches 2 kg/m². This might cause one to consider the exposure to seasonal energy stress as being of little biological significance.

Any weight loss involves both fat and lean tissue, however the quantity of lean tissue that is wasted depends also on the size of the body fat stores. Thinner, malnourished people, losing more muscle mass and other lean tissues than normal and obese persons, can withstand smaller body weight losses and a functional impairment is likely to occur earlier. Adults living in rural areas of Third World tend to have low BMI values. This places them in a precarious position and provides good reasons for suspecting that even a modest seasonal weight loss might have undesirable nutritional and functional implications.

Based on the above mentioned considerations, the expected seasonal loss of weight in each agro-climatic zone was predicted and the amount of weight loss tolerated at each BMI level without risk of functional impairment was estimated. On these grounds we calculated that, at the world level, the functional integrity of 408 million adults was periodically at risk because of seasonal energy stress.

Biochemical Markers of Growth: New Perspectives for Research on Stunting

Stunting is a condition strikingly common in poor areas of the world. It is associated with increased morbidity and mortality in childhood and leads to reduced physical work capacity in adulthood. Surprisingly, the physiopathology of the condition is still incompletely understood, and resources invested in research have been inadequate. The increased awareness about the importance of appropriate skeletal size and composition for long term health, stimulated by the high social cost of osteoporosis in the developed world, has provided an opportunity to expand our knowledge of skeletal growth and development. A major impediment in research on stunting is the unavailability of sufficiently early indicators. A lag time of several days to several weeks is in fact required before growth impairment can be detected by usual anthropometric measures. Missing the early stages of minor disturbances of bone metabolism that, in the long run, lead to stunting, makes it difficult to appreciate the causes and understand the mechanisms. Substantial advances in the field of biochemical indicators of bone metabolism should now allow the early diagnosis of metabolic abnormalities and the assessment of the response to nutritional, hormonal or pharmacological stimuli, with suitable sensitivity and specificity. Several markers of bone resorption and formation are currently available and potentially applicable to growth research.

Among the latest resorption markers, the crosslinking molecules of mature collagen pyridinoline, contained in bone and cartilage, and deoxypyridinoline, contained in bone and dentin, have been tested in a series of studies in children with normal and abnormal growth. In healthy children, the urinary output of collagen crosslinks follows a pattern that parallels the height velocity curve and is related to height velocity measured over short term periods. In severely malnourished children undergoing nutritional rehabilitation the rate of height gain could be predicted by a multiple regression equation, including the age, the weight for height and the urinary output of crosslinks at admission.

(Source: Contributed by Anna Ferro-Luzzi, Francesco Branca, and Gianni Pastore, WHO Collaborating Centre for Nutrition, National Institute of Nutrition, Rome, Italy)

IUNS

16th IUNS International Nutrition Congress

IUNS would like to announce that the 16th IUNS International Congress of Nutrition will be held in Montreal, Quebec, Canada from July 27 to August 1, 1997. IUNS officers met with the Canadian International Congress of Nutrition (ICN) representatives in Montreal on September 22, 1994. The representatives included the Chairs of the Executive Committee, Scientific Programme Committee and other local supportive committees.

The scientific program will include 4 plenary lectures on global nutrition interest; 8 to 12 inter-disciplinary symposia based on themes presented from multi-perspective on each nutrition topic in order to integrate knowledge from a wide variety of disciplinary interests; and 16 to 20 sub-speciality symposia which will focus on leading-edge sciences in specific areas of nutrition that emanate from topics developed in the interdisciplinary symposia.

In addition, there will be 12 to 15 workshops per day for the first 3 days, debates by invited scientists on controversial nutrition and food science topics; and poster presentations.

Lectures such as McCollum will also be in the program. The Chair, Dr Atkinson, of the Scientific Programme Committee welcomes any suggestions/comments and scientists interested in submitting a proposal to organize a workshop or/and poster presentation to contact the Scientific Programme Committee at the following address: Dr Stephanie A. Atkinson. Chair. Scientific Programme Committee, 16th IUNS/ICN International Congress of Nutrition, Dept. Paediatrics, McMaster University, Hamilton, Ontario, L8N 3Z5, Canada.

IUNS Officers' Meeting

IUNS officers' meeting was also held in Montreal, Canada on September 21, 1994. Those in attendance were the IUNS Vice–Presidents, who are in charge of three commissions. The included: Dr. Vinodini Reddy (India) representing Commission I, Dr Stan Berger (Poland) for Commission II, and Dr Alain A Rerat (France) for Commission III. The three commissions have identified most of the chairpersons required for each of the commission's many committees. These chairpersons will work with the three Commission Vice–Presidents to nominate committee members, who will be knowledgeable about the committee's subjects and who represent the different regions. It is expected that the IUNS committees will be officially announced and begin scheduling activities in early 1995.

(Source: Communication with Dr Aree Valyasevi, President. IUNS. 21 November 1994).

The Netherlands

First Steps: Policy Memorandum on Children in Developing Countries

Following the World Summit for Children in 1990, a Policy Memorandum on Children in Developing Countries has been published (dated April 1994) by the Development Cooperation Information Department. Ministry of Foreign Affairs, The Netherlands to set out a specific policy for children in the developing world. The following foreword taken from the memorandum, contributed by the Netherlands Minister for Development Cooperation, describes its context and outlines its content.

Throughout the world there are children who can take little pleasure in their childhood. Children are exploited, ill cared for, mistreated or abused: millions live on the streets and from them, suffer physically and mentally from the consequences of war, endure hunger or die of diseases that are readily preventable or treatable. Even so, other than in the charitable sphere, children are everywhere neglected as an explicit target group in multilateral and bilateral development cooperation, the general assumption being that they too benefit in full from international development efforts.

With this policy memorandum the Netherlands is one of the first countries to set out a specific policy for children in the developing world. Its title, First Steps, is in part a reference to this initiative in the international context. Children's right to a decent life, personal development and protection is fully recognised and promoted in Dutch policies for international development. Education, health services, personal and spiritual freedom, respect for the individual, opportunities for play and recreation: all these are pre–conditions for the realisation of that right. But children also have the right to be protected from exploitation, abuse and physical and sexual violence. The goal of policy must be to strengthen children's self–confidence and human dignity. Children must have a full place in society, while society in turn must be encouraged to abandon stereotypical views, prejudices and mistaken perceptions in respect of children.

This memorandum has as its foundation the declaration on the rights of children. In this context the Dutch government lays great stress on equality of rights between boys and girls. A central and recurring theme of this statement is resilience: children are able to survive very difficult situations. They can speak for themselves, and at the very least we must listen to what they have to say.

While this memorandum was drawn up in the first instance for the staff of the Ministry of Foreign Affairs, both at the ministry in The Hague and Dutch embassies abroad, it covers matters which are also of interest to the personnel of non–governmental organisations in the Netherlands and perhaps to others concerned with the fate of children in developing countries. A number of general areas of concern are considered; the intention is that these be incorporated into projects and programmes geared to the needs of children in developing countries. In addition each chapter includes concrete recommendations.

A section of the memorandum deals specifically with food and nutrition and includes the following policy proposals.

Current policies on food security, nutritional improvement, the qualitative aspects of food aid and the Food Security and Nutritional Improvement through NGOs Programme (VPO) will be maintained.

Emphasis will be placed on:

- nutritional supplements for breastfed children;*
- monitoring young children's growth to detect malnutrition at an early stage;*
- additional food and care during and after infectious illness;*
- remedying micronutrient deficiency problems;*
- nutritional education; and*
- better nutrition for women.*

Programmes geared to the local production of low-cost, high-quality children's food will continue to receive support. Educational activities should figure in large in such programmes.

Additional help will be provided for programmes to promote and support breastfeeding. The introduction of restrictions on the marketing of infant formula is highly desirable and will be pursued. Attention will be focussed on the countries of the former eastern bloc, where breastfeeding is coming under pressure from the unregulated marketing of infant formula.

Activities concerned with health care for schoolchildren will focus more closely on the provision of food (snacks and lunches) and micronutrients such as iodine and iron in areas where they are deficiency. School curricula need to put greater stress on food and nutrition.

When emergency aid is given the quality of the whole aid package must be carefully considered and improved. Guidelines are also needed for breastfeeding and the use of infant formula in emergency situations requiring humanitarian aid. Compliance with the Dutch guidelines for milk and milk products in food aid must be improved.

For further information please contact: Development Cooperation Information Department, Ministry of Foreign Affairs, PO Box 20061, 2500 EB The Hague, The Netherlands. Phone: (070) 348 6486.

(Source: The Government of the Netherlands (1994). *First Steps. Policy Memorandum on Children in Developing Countries*. Ministry of Foreign Affairs, The Hague.)

UNRISD

UNRISD Social Development News – Available Free to Interested Readers

UNRISD Social Development News is a bi-annual newsletter available free from the United Nations Research Institute for Social Development (UNRISD). The newsletter, published in English, French, and Spanish editions, highlights the latest findings of UNRISD research programmes and international conferences, and provides summaries of newly released publications.

UNRISD is an autonomous research organization that engages in multi-disciplinary research on the social dimensions of contemporary problems affecting development. Current research themes include Crisis, Adjustment and Social Change; Socio-Economic and Political Consequences of Illicit Drugs; Environment, Sustainable Development and Social Change; Integrating Gender into Development Policy; Participation and Changes in Property Relations in Communist and Post-Communist Societies; Ethnic Conflict; and Political Violence. UNRISD research projects focused on the 1995 World Summit for Social Development include Rethinking Social Development in the 1990s; Economic Restructuring and New Social Policies; Ethnic Diversity and Public Policies; and The Challenge of Rebuilding Wartorn Societies.

In order to be added to the mailing list for UNRISD Social Development News, send your name and address to: Reference Centre, UNRISD, Palais des Nations, 1211 Geneva 10, Switzerland.

(Source: UNRISD Press Release, June 1994)

USAID

OMNI

The Opportunities for Micronutrient Interventions (OMNI) Project was initiated in September 1993, with funding from USAID's Office of Health and Nutrition. During its first year, OMNI responded to the technical assistance needs of USAID Missions and Bureaus throughout the world, while simultaneously carrying out project planning and start-up activities. The majority of technical assistance requests were received from Latin America, with most countries expressing an interest in OMNI's technical support for developing comprehensive micronutrient policies and programs. Preliminary visits were undertaken to over a dozen countries to determine OMNI's potential role in assisting Missions and governments to develop micronutrient programs. These visits fostered a greater understanding of technical assistance needs and, in some countries, have led to the initiation of activities. In other countries, planning and discussions are moving toward commencement of program activities in the second year of the project. Short-term technical assistance, provided in this first year, has laid the foundation for the development of long-term programs in several countries. Below are examples of the diverse technical assistance that OMNI provided in its first year.

In Bolivia, OMNI developed a pilot project for the regional manufacture and distribution of sugar fortified with vitamin A.

In El Salvador, OMNI helped produce a comprehensive micronutrient strategy, which included plans for fortifying sugar with vitamin A. OMNI also organized a micronutrient donor committee meeting to coordinate micronutrient activities.

In Eritrea, OMNI worked with UNICEF and the government to review the Action Plan for Salt Iodization and recommended steps to improve the salt iodization system, particularly in the area of monitoring and quality assurance.

In Nepal, OMNI strengthened the biannual vitamin A capsule distribution campaigns and assisted in the development of a long-term strategy. Capsule distribution coverage of the October 1993 campaign (8 districts), the April 1994 campaign (12 districts) and the October 1994 campaign (16 districts) was reported to be 90% or better.

In Nicaragua, OMNI assisted in the preparation of a micronutrient country profile and conducted a feasibility study and review of legislation for vitamin A fortification of sugar.

In Sri Lanka, an OMNI team of experts designed a program for the iron fortification of wheat flour, which will be implemented in early 1995.

In Tajikistan, OMNI conducted an assessment of iodine deficiency and a feasibility study of salt fortification with iodine in collaboration with the Micronutrient Initiative (MI).

OMNI also conducted several comprehensive micronutrient training programs, established linkages with key stakeholders in the micronutrient arena; developed electronic networks for global communication and information dissemination through The World Bank's electronic population, health and nutrition publications; participated in or sponsored individuals to various international conferences to capitalize on information sharing opportunities; and funded over 70 individuals to the XVI International Vitamin A Consultative Group (IVACG) meeting that was held in Chiang Rai, Thailand, this past October.

For further information please contact: The OMNI Project, c/o John Snow Inc., 1616 North Fort Myer Drive, Arlington, VA 22209, USA. Phone: 703 528 7474 Fax: 703 528 7480. Email: omni_project@jsi.com.

(Source: OMNI Communication. 2 February 1995)

WHO Regional Office for Europe

10 Years of the Nutrition Programme of the European Region

1994 marked the tenth anniversary of the Nutrition Programme of the WHO Regional Office for Europe (EURO). The following paragraphs, which look back over 10 years' work and achievements, are extracted from a contribution by Dr Elisabet Helsing, Regional Advisor for Nutrition, EURO in the EURO WHO Collaborating Centres for Nutrition Newsletter.

What did we set out to do?

In 1984 it seemed important to focus on how existing scientific knowledge about food and nutrition in the Region and outside could be made available to food policy makers in a reasonably systematic fashion. So food and nutrition policy formulation and implementation became the focus of our work, leading to the 1990 First European Conference on Food and Nutrition Policy in Budapest, a formal WHO Regional Conference with representation from the agriculture and food industries.

What has happened in this period?

In the 1970s only one country in the European Region actually had a food and nutrition policy. This was Norway, and Norwegian experiences doubtless contributed to the way in which we defined and worked with nutrition policies in the Regional Office. In the course of the 1980s, six more European countries joined the club: Denmark, Netherlands, Sweden, Malta, Finland, and Iceland. They all formulated national policy papers which were adopted by Parliament or Government, and which explicitly were aiming at influencing health by means of public health nutrition.

In the 1990s, it seems as if the investment of our first years of work is paying off. In July this year, we sent a questionnaire to all 50 Member States in the Region, asking each of them whether they had a formally adopted nutrition policy, very narrowly defined – in the country. This was done as follow-up to the 1992 International Conference on Nutrition and its Plan of Action for Nutrition. To our surprise and delight, out of 30 responders, 26 stated that yes, they had such a formally adopted policy. We do not know what is behind this explosive growth, but we believe that the International Conference on Nutrition and its preparatory conferences also did a lot to stimulate interest in the issue.

Where do we go now?

Having a policy is one thing, implementing it is quite another. Our analysis of the situation in the European Region has led us to conclude that priority number one in Europe at this point in time is to improve and increase advanced education in nutrition. If we compare Europe and the Americas, or Europe and Asia for that matter, we find that this Region has a very uneven pattern of education in nutrition. There are a number of countries on this continent where the current possibilities for an advanced education in nutrition are nil, to say nothing about public health nutrition. There are less than ten countries out of fifty in the Region where a young person wishing to make a career in this science can get a basic university level education and a specialization.

At the same time, the science as such is advancing very rapidly, and food consumers are as interested as ever in improving their health through eating a good diet. The public's thirst and hunger for information about nutrition, and the thin spread of nutrition scientists, has in fact created a market in the Region, where many amateur nutritionists are operating freely and happily, and where "health foods" claiming miraculous properties are making their unscrupulous producers rich.

In this situation your Regional Adviser has for the last five years advocated strengthening of teaching institutions, and creation of new ones, especially in the eastern part of the Region. We have started, in a modest way, to do our own consciousness-raising efforts through "hands-on" surveys of nutrition and food intake, the so-called Rapid Assessments of Nutrition, which are conducted by Eric Poortvliet (Consultant in the Nutrition Unit) who is working for us thanks to generous extrabudgetary support from the Netherlands. Here we combine courses in anthropometry and dietary assessment, the core methods of nutrition science, with surveys providing us with data on population groups of strategic importance for policy-making.

Schoolchildren and mothers

We have looked at schoolchildren in Kiev, Almaty and two sites in Moscow for three successive years, 1992, 93 and 94. We have just compiled data on women of reproductive age in Tadjikistan, Kazakhstan, Turkmenistan and Arkhangelsk. The project will continue in eight new countries next year. As the project progresses, we have the pleasure of seeing critical thinking being stimulated in the participating teams, and we find that our colleagues who carry out the studies are themselves continuing their activities beyond the modest inputs we were able to provide.

Breast-friendliness is spreading

In the past year we have together with UNICEF with whom we collaborate closely, had the satisfaction of seeing a significant increase in the number of countries with Government-supported activities in this field, improving the quality of maternity services by introducing small but significant changes in their routines, again underpinned by the scientific findings of the last few decades. We have data to show that it works in eastern Europe too.

WHO has over the years repeatedly been admonished by Member States in the World Health Assembly to take assertive action in breastfeeding promotion. Norway has now not only voiced this opinion, but also provided financial support for the Nutrition Programme in our efforts to bring the Baby-Friendly Hospital Initiative to all parts of the Region.

For further information please contact: WHO Regional Office for Europe, Nutrition Unit, Scherfigsvej 8, 2100 Copenhagen. Denmark. Phone: 45 39 17 13 62 Fax: 45 39 17 18 18.

(Source: WHO Collaborating Centres for Nutrition Newsletter No.5, WHO Regional Office for Europe. 1994)

World Bank

Madagascar Nutrition and Food Security Project

Although attempting to measure changes in malnutrition is difficult in the short term, malnutrition in Madagascar villages appears to have dropped from 28 to 16 percent in the first year of the Nutrition and Food Security Project there, according to the project administrators. An interesting indicator of the penetration of that project to poor remote areas is the refusal of automobile rental companies to rent any more to staff travelling for the project, since tires routinely were punctured on trips to the innermost bush. The \$32 million project features both a community nutrition effort, and income-generating activities in the same communities – both of which are needed to deal with Madagascar's severe food and nutrition problems.

Rwanda Emergency Recovery

A \$50 million Emergency Recovery Credit for Rwanda, with a social fund-type framework, that will include a large nutrition component, has recently been approved. This is on top of the \$20 million emergency grant to UNICEF, WHO, FAO, and UNHCR in August for their emergency operations there. A third of UNICEF's \$10 million allocation is for a Nutrition and Food Security component (supplementary and therapeutic feeding, micronutrients, and seeds; additional seeds are included in the FAO and UNHCR projects).

Forthcoming Projects

New Bangladesh Nutrition Project

The Bangladesh Nutrition Project will be addressing the alarming insight (by Philip Gowers of the Dhaka Resident Mission) that food deprivation over the years may be leading to a smaller-sized population. (He found that the heights of average rural Bangladeshi 11-year-olds, for instance, had dropped steadily, at four points over four decades, from 134 to 127 centimeters. The same for weights.) In the pilot work leading up to this project, data showed that with nutrition interventions child size can be increased substantially. In what probably is an even more important achievement for later body size, the number of low-birthweights declined markedly as a result of the pilot interventions. In 1992, 52 percent of children in the pilot area weighed less than 2.5 kilos at birth. This figure was reduced to 43 percent in 1993 and to 36 percent in 1994. The work was financed by UNICEF, the World Bank's collaborator in this project, and carried out by BRAC, the Bangladesh NGO. A unique feature in this project is BRAC's large implementation role in certain geographic areas. Their results will be compared to operations conducted through government channels in other areas.

IDD in China

China is a country that takes seriously the notion that iodine deficiency affects IQ – and that a downward shift in IQ of the 37 percent of the population (425 million) who are at risk of iodine deficiency means that children do worse in school and lack the creativity and mental capacity to deal with the country's challenges. In response, an Iodine Deficiency Disorders (IDD) Control Project that would more than double China's salt iodization capacity, to eight million tons a year will be considered in June this year. Existing facilities would be modernized and additional capacity created. The project will be implemented by the China National Salt Industry Corporation and is the first Bank-assisted nutrition operation task-managed by industry division staff. (It also will be the Bank's first nutrition project dealing solely with micronutrients.) Total project cost will be \$116 million. Again, UNICEF played an important role in preparation. Of worldwide iodine deficiency disorders, 40 percent are in China. If the project objective to eliminate IDD is met, China figures it could gain 480 million IQ points by the year 2000.

Mexico Essential Services Program

Nutrition plays a large part in a \$1 billion Essential Services Program to assist Mexico in its current crisis. Being considered are expansion of the successful basic nutrition services to the rural poor that were launched under a 1991 Agricultural Sector Adjustment Project, already-tested targeted food subsidies for the urban poor, and a school nutrition program.

For further information please contact: The Population, Health and Nutrition Department, The World Bank, 1818H Street, N.W., Washington, D.C., USA. Phone: (202) 473 3782 Fax: (202) 522 3234.

(Source: World Bank (1995). *New and Noteworthy in Nutrition No.25* (Office Memorandum), February 17, World Bank, Washington, D.C.)

PUBLICATIONS

Including reviews of:

The State of the World's Children, 1995

Water and Sanitation in Emergencies

Food: Multidisciplinary Perspectives

How Third World Rural Households Adapt to Energy Stress:

The Evidence and the Issues

plus selected announcements of new publications

Reviews

"The State of the World's Children, 1995"

(1995) James P Grant, UNICEF. Published by Oxford University Press. 89 pages.

This sixteenth report in the annual series sets out two alternative visions for the year 2050. The first of these shows what is likely to happen if no new international effort is made to overcome the worst of poverty and underdevelopment, and present trends of inequality continue. Total world population will be about 12 billion, and rising; social divisions and ethnic tensions have increased, democracies are giving way to demagogues and dictators, and the military consume more and more resources. The second vision shows what could happen if a determined effort is made to restructure Government expenditures and aid programmes to invest in jobs and basic social services. Total world population has peaked at about 8 billion, and is set to decline; states have drawn back from the brink of collapse, and resources have gradually been shifted from military and peace-keeping budgets to investments in economic development, social progress, and environmental protection.

This report points out that the choice between these two futures must be made not in 50 years time but today. "Development now has a deadline. Failure to meet it will bring consequences not just for the poor but for all. Implementing today's development consensus is therefore becoming not only a moral minimum for our civilization but a practical minimum for ensuring its survival."

The report was prepared as a contribution by UNICEF to the World Summit for Social Development in Copenhagen In March 1995. As such it has two components. The first is a restatement of UNICEF's consistent and persistent advocacy for putting the needs and rights of children at the centre of development strategy. Childhood is the period when minds and bodies and personalities are being formed and during which even temporary deprivation is capable of inflicting lifelong damage and distortion on human development. "The growing minds and bodies of children must... be given priority protection. There could be no greater humanitarian cause; there could be no more productive investment; and there could be no greater priority for real development."

The second component is an account of UNICEF's experience since the World Summit for Children in 1990 of how putting children at the centre of development strategy is not only a logical proposition but also a practicable one. At the 1990 Summit the international community agreed on a series of specific and measurable goals for the protection of the lives, health and normal growth and development of children. It was subsequently agreed that a set of intermediate goals should be achieved by the end of 1995. The report examines the successes and failures of translating these goals into reality, and concludes that "a majority of the goals set for 1995 are likely to be met by a majority of the developing nations."

The third chapter, "Words into deeds", argues that "the question of implementation, of giving declarations and resolutions some grip and purchase in the real world, is the most important, the most difficult, and the least discussed of all the issues in the development debate." It goes on to discuss the strategies by which the commitments entered into at the World Summit for Children are being translated into reality. The main strategies are:

- * breaking down broad goals and objectives into 'do able' and measurable propositions;
- * securing high level political commitment, and simultaneous mobilisation of media and public support;
- * mobilisation of a wide range of social resources;
- * demystification of knowledge and technology to empower individuals and families;
- * reduction of procedures to relatively simple and reliable formulas, allowing large-scale operations and widespread use of paraprofessionals;
- * deployment of expertise and resources of the United Nations system and bilateral agencies in close support of agreed goals, including close monitoring and publicizing of progress and appropriate response.

These strategies have been described by Dr. Richard Jolly, in a lecture in 1994 at Cambridge, as constituting "a new paradigm for development action... of widespread applicability."

But by themselves they will not be adequate. The report goes on to discuss how the way forward is obstructed by political and economic vested interests and by the politically unattractive 'pain now, gain later' nature of many of the necessary policies. Ultimately, the report argues, "it is democracy itself that must provide the corrective to persistent distortions and injustices", and it cites the example of Kerala, with its effective health services, low child death rates, low fertility, and near-universal primary and secondary education for girls: despite its problems and poverty, Kerala for many decades "has been one of the world's most vibrant democracies."

The final chapter of the report – Unfinished business of the 20th century (see box on page 50 for excerpts) – puts forward the case against pessimism, arguing that extraordinary achievements during the last 50 years give grounds for hope that the historic struggle to restructure societies "in the interests of the many rather than the few" may indeed be well on the way to completion by the turn of the century. Thus, who would have thought that, "within far less than a decade, President Lech Walesa would be sending a telegram of congratulations to President Nelson Mandela"? It is "the power of concerned and committed people, and their organizations, that can bring what needs to be done within the bounds of what can be done."

In this 50th year of the United Nations it is salutary to consider how the spirit behind the opening words of the Preamble to its Charter – "We, the peoples of the United Nations..." can be recaptured: perhaps the clue lies in the "new dynamic between the UN system and 'the peoples of the United Nations' reflected in various popular movements "(Renewing the United Nations System. Erskine Childers with Brian Urquhart, Development Dialogue 1994:1). Above all the tone of this final chapter reflects the insatiable optimism, inspirational vision and unwavering commitment of UNICEF's Executive Director, James P. Grant, whose report this is. Within weeks of its publication he was dead. It is said that a favourite quotation of his was the one from "Man and Superman" with which he concluded his report (see last para in box): no man could have a finer epitaph.

"The State of the World's Children, 1995" can be obtained from the Oxford University Press, Walton Street, Oxford, OX2 6DP, United Kingdom. Oxford University Press also has outlets in New York, Toronto, Delhi, Bombay, Calcutta, Madras, Karachi, Peealing Jaya, Singapore, Hong Kong, Tokyo, Nairobi, Dares-Salaam, Cape Town. Melbourne, Auckland, and associated companies in Beirut, Berlin, Ibadan, and Nicosia. The book is priced at £4.95 (UK) and \$8.50 (USA).

J. Peter Greaves

Unfinished Business of the 20th Century

(Extracts from the final chapter of UNICEF's "State of the World's Children 1995")

Summary: The effort to achieve social development goals is part of a historic struggle to restructure societies in the interests of the many rather than the few. Only in this century has that ideal begun to make significant practical headway. The successes that have been achieved so far have been brought about by a conscious effort – led less by governments than by people – to make morality march with advancing capacity. The involvement of even larger numbers of people in this struggle is the best hope for fundamental change, for implementing today's development consensus, and for bringing what must be done within the bounds of what can be done.

The needs and the rights of children should become the common cause and common cry of action groups and people's movements the world over. Protecting and investing in the physical, mental, and emotional development of all children is the foundation of a better future, the end and the means of development, the very foundation for economic development, social cohesion, and political stability. And unless this investment is made, all of humanity's most fundamental long-term problems will remain fundamental long-term problems.

Whatever the particular cause, be it democracy or human rights, development or equity, gender equality or environmental protection, the growth, development, and education of children is central to long-term success.

The principal technologies for meeting children's needs at relatively low cost are already available. The social capacity is largely in place. And the financial cost is frankly negligible in relation to what humanity has at stake in this race. It has been estimated by UNDP, UNFPA, and UNICEF, for example, that the total cost of providing basic social services in the developing countries, including health, education, family planning, clean water, and all of the other basic social goals agreed on at the World Summit for Children, would be in the region of an additional \$30 billion to \$40 billion a year, two thirds of which could come from the developing countries themselves. The world spends more than this on playing golf. The United States share of this bill would be less than is spent, nationally, on advertising tobacco. The private sector has been known to mobilize \$30 billion for a single major construction project – a dam, a tunnel, an airport. Governments find such sums as a matter of course: the United States spends \$25 billion a year on its prison service alone, Germany finds more than \$30 billion each year to meet the social costs of reunification; Japan is about to invest approximately ten times as much in an optical fibre network for the next century.

Meeting children's needs depends not just on social services but on their parents having jobs and incomes. The cost of a major effort to bring about land reforms, invest in small producers, and create large numbers of jobs would be very much more than \$30 billion a year. Double it: it is still less than the world spends on wine. Triple it: it is still far less than the world spends on cigarettes.

In the post-cold war era, the world annual expenditure on military capacity, on missiles, tanks, aircraft, fighter planes, remains at a level that is four times the combined annual incomes of the poorest quarter of the developing world's people – the one billion absolute poor, those who are without the basics of life, those without education and jobs, those without clean water or basic health care, those whose children die and become disabled in such numbers, those who are forced to ruin their own environments and futures for the sake of staying alive today.

A people-led change in the climate of ideas, in what is considered acceptable or unacceptable in the relationships between people and nations, is the best hope that the great changes to come will be changes for the better.

But if the race against time is to be won, then where there have been thousands of organizations there must be tens of thousands, where there have been tens of thousands of people, there must be many millions.

And by becoming involved in this struggle, in whatever way and on whatever front, it may be that an answer will also be found to the problems which today beset so many of those, in all nations of the world, who are the principal beneficiaries of the progress that has been achieved in this century. For it may be that the being involved in a cause larger than oneself is a deep human need from which we have been diverted by the particular direction that progress has taken in recent times. If so, it is a need of which George Bernard Shaw has left us a powerful reminder:

"This is the true joy in life, the being used for a purpose recognized by yourself as a mighty one. I am of the opinion that my life belongs to the whole community and as long as I live it is my privilege to do for it whatever I can. Life is no brief candle to me. It is a sort of splendid torch which I have got hold of for the moment, and I want to make it burn as brightly as possible before handing it on to future generations."

(Source: J.P. Grant (1995). *Unfinished Business of the 20th Century* Chapter 5 in: *The State of the World's Children 1995*, UNICEF, New York.)

"Water and Sanitation in Emergencies"

(1994) Good Practice Review #1. Relief and Rehabilitation Network, Overseas Development Institute, London.

This is a concise and practical handbook on strategies and technology for providing safe water and sanitation in emergency situations, typically where substantial numbers of displaced people are concentrated in a limited geographic area. It examines the rationale for giving high priority to safe water and sanitation in such circumstances and goes on to explore the different operating environments in which such interventions are required. It addresses needs assessment, service planning, coordination of inputs and the importance of contingency provision. To enlighten the inexperienced reader, a range of emergency scenarios are described and the requirements for successful intervention are examined in each case; these include the provision of services in arid and drought-affected areas, in hilly and mountainous terrain and in response to sudden-onset emergencies, such as drought, floods, cyclones and earthquakes. A series of case-study boxes provide examples of special situations which presented unique problems and required unconventional solutions; these vividly portray the complexity of past emergencies and demonstrate the continuous need for innovative thinking and operational flexibility. Also included are a series of technical annexes which provide practical operational guidelines and basic technical specifications for water supply and sanitation. This handbook is conveniently printed in A5 format and should be recommended in flight reading for all members of out bound response teams.

To order a copy of the book please contact: The Relief and Rehabilitation Network, Overseas Development Institute, Regent's College, Inner Circle, Regent's Park, London NW1 4NS. UK. Phone: (44 171) 487 7413 Fax: (44 171) 487 7590.

John Kevany

"Food: Multidisciplinary Perspectives"

(1994) Edited by Barbara Harriss-White and Sir Raymond Hoffenberg Published by Basil Blackwell. 243 pages.

This book represents a compilation of the 1992 Wolfson College, Oxford lectures that aimed to "forge connections between the applied sciences of medicine, nutrition and food science... and economics, politics and anthropology" as Barbara Harriss-White's excellent introductory summary explains. While the spectrum of food-related issues covered is wide –spanning dietary evolution, food requirements, culture, symbolism, gender, production, poverty, malnutrition, famine, international relations and rights – the analysis is never superficial and often insightful and provocative.

Particular highlights, from a social nutrition perspective at least, include Michael Lipton's chapter on food production and poverty, Ann Whitehead's on gender and the family and Onora O'Neill on hunger, needs and rights.

In the chapter "Not enough Food: Malnutrition and Famine", Phillip Payne re-visits the 1980s "small but healthy?" debate between malnutrition "maximalists" who tend to opt for higher figures for malnutrition and the "minimalists". When this chapter was written several years ago, there existed a body of evidence that suggested there was little functional impairment associated with mild or moderate levels of stunting or underweight among young children, but that the problem was *severe* stunting – hence the minimalist view. However, strong evidence (albeit unreferenced in this chapter) has since emerged that points to functional disadvantage conferred by moderate and even mild anthropometric deficits – not least, the finding by Pelletier¹ that in most studies he reviewed 46–80% of all *nutrition-related* deaths were in the mild-to-moderate category. Payne rightly suggests that sustained nutritional gains require not only food but free, feminized and decentralized health services and primary and basic education, despite the contradiction with the chapter's title. The various revolutions in nutritional science are ably charted by Philip James, although

towards the end we are told that "the principal nutritional problems of the Third World are perceived to be deficiencies of iodine, iron and vitamin A"! Perceived by whom – nutritional scientists or poor third world communities'? We should be told.

¹ Pelletier, D.L. (1994). The Relationship Between Child Anthropometry and Mortality in Developing Countries: Implications for Policy, Programs and Future Research. *The Journal of Nutrition (of the American Institute of Nutrition)*. **124** (10S), 2047–2081.

The book concludes with a strong chapter by Onora O'Neill which – while destroying illusions that the development of an ethical theory of obligation, essential for deriving obligations to those nutritionally deprived, will be easy – argues that movement in this direction nevertheless can and should now be made.

To order a copy of the book please contact: Blackwell Scientific Publications Ltd., 25 John Street, London WC1N 2ES, UK. Phone: 0171 404 4101. Fax: 0171 831 6745.

Stuart Gillespie
UNICEF, India

"How Third World Rural Households Adapt to Energy Stress: The Evidence and the Issues"

(1994) by Payne, P., M. Lipton, R. Longhurst, J. North, and S. Treagust, *Food Policy Review 2*, IFPRI, Washington, D.C. 134 pages.

This monograph considers two basic questions by literature review. First, what biological and behavioural mechanisms do individuals, households and larger population groups use in adapting to the challenge of different sources, intensities and durations of energy stress? Second, when individuals are not able to adapt successfully, what costs are incurred and who suffers most of these? Chapters are devoted to the timing, source and type of energy stress, biological and behavioural responses to the stress environment and who is stressed and who adapts. A final chapter of conclusions includes proposals for research.

The review showed that the combinations and timing of stresses and responses vary widely, differing according to types of livelihood, family structures and stage of development, ecological setting and cultural traditions. The rich diversity of patterns of responses makes the subject of adaptation important for policy. The strategies that families normally adopt to live with undernutrition have to be understood in order to find effective ways of helping them with the adoption. Also, the review suggests, that without understanding such strategies, it is very difficult for policy makers to, allocate scarce nutritional and health resources in the public domain efficiently, as this requires an estimation of the places, times and situations in which emergency stress causes damage to health or livelihood.

To order a copy of this book please contact: IFPRI, 1200 17th Street N.W., Washington, D.C., 20036. USA. Phone (202) 862 5600 Fax: (202) 467 4439

Richard Longhurst

New Titles

In this section we include selected publishers' announcements and information on new publications: these are not independent reviews, but are included to draw attention to new relevant material.

"Improving Feeding Practices During Childhood Illness and Convalescence"

(1994) by Ellen Piwoz. SARA Project, Academy for Educational Development, Washington, D.C. 32 pages.

The purposes of this paper are: 1. to review the available literature on feeding practices during childhood illness and convalescence in Africa; 2. to summarize information on the design, results, and costs of programs to improve child feeding practices in eight African countries; and 3. to provide recommendations for future educational efforts to improve child feeding during childhood illness and convalescence on the continent. It is intended to be used as a resource document by funding agencies and by program managers and policy-makers in Africa.

Illness adversely affects children's nutritional well-being through increased nutrient requirements and losses, and child-driven reductions in dietary intake (anorexia). In Africa, the effect of illness on nutrition is

exacerbated by children's poor nutritional status, due to large deficits in their nutrient intakes during convalescence and post-recovery, financial, time and food availability constraints, and mothers' reluctance to encourage their children actively to eat.

Mothers' reluctance to take an active role in child feeding stems from a traditional view that learning how to eat the family's staple food is part of a child's socialization process. It is generally believed that the purpose of eating is to till the stomach, and that a child knows best when he is hungry and when he is full. Providing too much guidance is thought to spoil a child and cause him to be greedy for foods that are not available to everyone. When children are ill, however, African mothers are usually willing to prepare special foods and more actively encourage their children to eat.

The programs reviewed in this paper all included intensive community-based, formative research prior to the design of interventions to improve feeding practices during and following child illness. The formative research included ethnographic studies, nutritional assessments, and household trials of new behaviors and food recipes. The resulting interventions focused on providing mothers with specific guidelines on feeding frequency, food quantities, and recipe preparations. This information was intended to build mothers' self-confidence and it was used to encourage mothers to take an active role in child-feeding interactions.

Results of household trials indicated that mothers were willing to change their feeding practices if they perceived positive benefits for their children and themselves. The most frequently accepted behavior changes involved small modifications of existing practices, such as enriching a traditional weaning porridge, or increasing the quantity and/or frequency of feeding other solid foods. However, when new foods or practices were adopted they often replaced rather than complemented the traditional diet (e.g. breastmilk, snack foods). Obstacles to trying new behaviors included perceived time and other resource constraints. Mothers' continuation of the new practices was usually determined by their children's reactions to them.

Once programs moved from formative research (i.e. household trials) to implementation (i.e. community-based education) their results have been less encouraging. For example, mothers in Cameroon had improved knowledge but few measurable improvements in feeding practices after less than one year of program implementation. Within two months of being trained, more than 50 percent of mothers in Nigeria knew how to prepare *eko ilera*, but fewer than 20 percent indicated that they would prepare and feed it on a continuous basis.

The failure of programs to live up to the promise suggested by the household trials, and to result in changes in feeding practices, is believed to be due to a combination of factors. Mothers were willing to adopt new practices during the trials because of the individualized care and attention provided by the field-workers, and because they were active participants in the process of deciding what behavior changes to adopt. During implementation, however, the intensity and personalized nature of these interactions were not sustained. Mothers who received individual counselling were more likely to have improved feeding knowledge, yet this knowledge may not have resulted in the adoption of new practices without mothers' active participation in deciding what those practices should be.

In addition to the above explanation, it is generally believed that changing behavior in a population is a long-term process that requires continuous promotion and encouragement. Whereas some members may adopt a new practice immediately after it is introduced, there are others who will accept it only after it is already well established in the community. The programs examined may not have produced measurable changes in feeding practices because promotional campaigns were of short duration and/or because evaluation designs did not examine changes in behavior over the appropriate (long-term) time intervals.

Developing effective programs to improve feeding practices during illness and convalescence requires knowledge of health providers', mothers' and other caretakers' beliefs and practices, available and acceptable foods, and the nutritional quality of the local diet. Research should also determine practical feeding changes, how mothers can be motivated to adopt them, and how they can overcome resistances from their children to pursue them. The information required to improve providers' group and interpersonal counselling skills must also be gathered.

Although the results from nutrition education programs utilizing formative research were not compared to other types of educational programs in this paper, the experiences of the projects reviewed support the contention that formative research is feasible to implement in Africa. It is important, however, to streamline the formative research process so that greater time, energy, and resources can be focused on training and implementation of programs to improve child feeding during illness and convalescence in Africa.

"Improving Feeding Practices During Childhood Illness and Convalescence" is available (in French and English) free of charge from: The SARA Project, Academy for Educational Development. 1255 23rd Street, N.W.. Washington. D.C. 20037, USA. Phone: (202) 884 8700 Fax: (202) 884 8701.

(Source: "Improving Feeding Practices During Childhood Illness and Convalescence" *Executive Summary*.)

"The International Organization of Hunger"

(1994) by Peter Uvin. Kegan Paul International, London & New York. 334 pages.

What are the internationally dominant principles and norms regarding the causes of hunger and the ways to eradicate it? Following this 'hunger regime', what activities do the main international actors undertake to fight world hunger? What kinds of programs do they adopt to advocate? And finally, what is the impact of these programs on the incidence of hunger in the world?

This book analyzes the international organization of hunger as well as its effects on the incidence of hunger. It is an international political economy study, situating itself in the theoretical debates of the discipline. Yet, to analyze its subject matter, it uses a variety of other disciplines, such as trade and development economics, demography, international finance and political science.

To order a copy of this book please contact the publishers: Kegan Paul International Ltd, PO Box 256, London WC1B 3SW, United Kingdom.

(Source: information extracted from inside cover of "The International Organization of Hunger")

"Hunger 1995: Causes of Hunger. Fifth Annual Report on the State of World Hunger"

(1994) edited by Marc J. Cohen, Bread for the World Institute, Silver Spring, MD, USA. 141 pages.

Causes of Hunger: Hunger 1995 probes the reasons behind the most profound moral and spiritual contradiction of our age – the persistence of hunger in a world of plenty. Nearly a quarter of the world's population is chronically or periodically hungry, and more than 1 billion people live on less than the equivalent of a dollar a day.

Causes of Hunger argues that hunger can be dramatically reduced by expanding existing programs that work; that more durable solutions require linkages with parallel efforts for peace, justice, economic opportunities, and environmental protection.

Causes of Hunger analyzes powerlessness; violence and militarism; poverty; population, consumption, and environmental degradation; racial, ethnic, gender, and age (young and elderly people) bias.

The report suggests short- and long-term responses. It also calls for ethical choices –empowerment and justice, stewardship of resources for the common good, and affirmation of diversity and community.

In addition to essays on these topics, Causes of Hunger includes timely updates on hunger-related developments around the world, statistical tables, a bibliography, and a glossary.

Causes of Hunger can be ordered from: The Bread for the World Institute, 1100 Wayne Avenue, Suite 1000, Silver Spring, MD 20910, USA. Phone: (301) 608 2400 Fax: (301) 608 2401. Price \$14.95 for BFW members, and \$17.95 for non-members plus \$3.00 postage & handling.

(Source: "Causes of Hunger: Hunger 1995" information sheet. Bread for the World Institute, Silver Spring, USA.)

"Vitamin A Deficiency: Key Resources in its Prevention and Control"

(1994) compiled by Jenny Cervinskas and Mahshid Lotfi, The Micronutrient Initiative, Ottawa, Canada.

This document aims to provide those working to eliminate vitamin A deficiency (VAD) with a listing of key resources on what the latest significant publications and resources are, and where they can be obtained.

While those working directly in the planning or implementation of vitamin A interventions are the main audience for this document, it is expected that it would also be of value to researchers or indeed anyone who needs to consult only the key available resources (e.g. teachers of medical, public health and nutrition students, consultants, technical officers in development assistance agencies.) The scope of coverage of the resources is wide, touching on the variety of aspects related to programs dealing with VAD elimination and control. In deciding on the selection of resources to include, we tried to include resources that are: technically sound and up-to-date, available (i.e. still in print), recent, and low-cost. Resources listed are available only in English unless otherwise indicated.

To obtain a copy of the book, please contact: The Micronutrient Initiative, PO Box 8500. 250 Albert Street. Ottawa. Ontario. Canada. K1G 3H9.

(Source: "Vitamin A Deficiency: Key Resources in its Prevention and Control" preface. Micronutrient Initiative. Ottawa, Canada.)

"Educability before Education: A Nutrition-Health Education and Sensitization Handbook for Senior Implementors of the Mid-Day Meal Programme in Gujarat – 1994"

(1994) by Tara Gopaldas and Sunder Gujral, Tara Consultancy Services, Baroda, India.

This booklet has been prepared, keeping in mind the top-level officials planning, implementing and monitoring the Mid-Day-Meals (MDM) programme at the Commissionerate and District levels of Gujarat.

Primary Education and its universalization is high on our nation's agenda. Primary Education to be successful has to pay equal attention to the three legs of its tripod which consist of infrastructure (buildings and teachers), a good primary school curriculum or curriculae, and most importantly the Educability of the Schooler. All the efforts that are being put into primary education cannot succeed unless we have Actively Learning Children.

Over a decade's research in this area by my research group in Gujarat, has clearly indicated that most of our under-privileged schoolers in Gujarat are not in this desirable state of being Actively Learning Children. Most of them especially in the rural and tribal areas come to school on an empty stomach which has been shown to directly interfere with their attention span. A large number of them are infected by an array of intestinal worms that again interfere with digestion and absorption and therefore depress their growth and development. Nutritional anemia is rampant and has been shown by us as by others to affect cognition in many ways; so also physical work capacity and ability to participate in sports and perform well on the playing grounds. Most of these children are also deficient in vitamin A which not only is the vision vitamin but is also the morbidity vitamin. Surat and Bharuch districts are known to be iodine deficient as well. Iodine deficiency again clearly interferes with school learning. Hence, it is imperative that our underprivileged schoolers wherever they are get these anthelmintic and micronutrient inputs whether or not they get the MDM/

This booklet has been organized into seven topics based on several consultations with the Commissionerate of MDM, Government of Gujarat. The topics selected are:

1. Food, Nutrition and Health;
2. Common Nutritional Deficiencies in Schoolage Children;
3. Low Cost Measures for the Correction and Prevention of Nutritional Deficiencies in Schoolage Children;
4. Non-invasive Procedures for Monitoring the Health/Nutritional Status of Schoolage Children;
5. Role of Supplementary School Feeding in Improving the Nutritional Status of Schoolage Children;
6. Hygienic Measures in Food Handling; and
7. Community Involvement in the MDM.

We hope it will be a practical and useful guide for not only Gujarat but for other States and Union Territories in our country as well.

Prof. Tara Gopaldas
Director
Tara Consultancy Services

To obtain a copy of this guide please contact: Tara Consultancy Services, "Sharan", 1, Alkapuri Road, Alkapuri, Baroda – 390 005, India.

(Source: preface to "Educability before Education", Tara Consultancy Services, Baroda, India)

"Enriching Lives: Overcoming Vitamin and Mineral Malnutrition in Developing Countries"

(1994) The World Bank, Washington, D.C.

Unlike most treatises on the subject of micronutrient malnutrition, *Enriching Lives* is not an exhaustive description of the size of the problem or its causes. Instead, this highly readable book passes along lessons learned from project implementation to address malnutrition.

The book has many nuggets of wisdom for policy and program design. For instance, it discusses why food fortification has been the single most effective means of addressing micronutrient deficiencies in the industrial countries, how to target supplements to the neediest, and the fact that the most important action to take is changing the behaviour of policymakers and consumers. One of the most remarkable pieces of information passed along is that micronutrient malnutrition robs many countries of 5 percent of their gross domestic product through death and disability, yet addressing this problem could cost as little as 0.3 percent of GDP.

The message is clear: the problem is huge, solutions are "on the shelf, and few countries can afford *not* to address micronutrient malnutrition.

To order a copy of "Enriching Lives" please contact: The World Bank, 1818 H Street. N.W., Washington. D.C., USA. Phone: (202) 473 3782 Fax: (202) 522 3234.

(Source: information taken from the cover of "Enriching Lives". The World Bank, Washington, D.C.)

"Nutrition in the Nineties: Policy Issues"

(1994) edited by Margaret Biswas and Mamdouh Gabr. Oxford University Press, Oxford.

This book presents a discussion of major policy issues with regard to nutrition which have been evolving during the last decade. The major issues for the nineties were arrived at in consultation with members of the IUNS Committee on Nutrition and Development. The members include some of the leading world experts on nutrition policy and planning.

The major realization that emerges from the book is the need for education in general, and for nutrition and health education in particular, especially in developing countries in order to solve nutrition problems. More research is also required to establish what an ideal diet is in different cultures and ecological environments in all countries. It is not generally realized that agricultural development in industrialized countries such as the United States and Japan was accompanied by a parallel development in education that has not taken place in developing countries.

Although this is a policy book, it contains considerable original information as some chapters are the product of major studies. The contributors to the book are well-known in their fields with considerable experience in policy, planning and implementation. The book is of interest to policy-makers, programme administrators, scholars, and individuals interested in nutrition policy. It addresses issues relevant to industrialized as well as developing countries, and will also be useful as a reference text for university courses on nutrition.

Margaret R Biswas, Editor, *Nutrition and Development* (OUP, 1985), is presently Director, Biswas and Associates, Oxford, UK and Chairman, Committee on Nutrition and Development, International Union of Nutritional Sciences. She has conducted research on food, nutrition and environment policies, and has been

an advisor to various governments and UN agencies. She is the author of four books and numerous research papers.

Mamdouh Gabr is Professor of Pediatrics, Cairo University, Egypt, and President of the International Pediatric Association. He is also President of WHO's Global Advisory Committee on Health Research, and was Minister of Health for Egypt. He is the recipient of High Order of Sacred Treasure of Japan. He is the author of two books and over a hundred papers.

To obtain a copy of the book please contact: Oxford University Press, Walton Street, Oxford, OX2 6DP, UK. Fax: 01844 865 56646 price: £14.95 for hardback, £12.95 for paperback. In India please contact: c/o Dinesh Sinha, Oxford University Press, New Delhi. Fax: (91 11 373 2312) price: Rs 275; \$9.00 (US) plus mailing.

(Source: Information Release on "Nutrition in the Nineties, Policy Issues", undated.)

Printed by The Lavenham Press Ltd., Lavenham, Suffolk, England.

UNITED NATIONS – ADMINISTRATIVE COMMITTEE ON COORDINATION – SUBCOMMITTEE ON NUTRITION (ACC/SCN)

The ACC/SCN is the focal point for harmonizing the policies and activities in nutrition of the United Nations system. The Administrative Committee on Coordination (ACC), which is comprised of the heads of the UN Agencies, recommended the establishment of the Sub-Committee on Nutrition 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 role of the SCN is to serve as a coordinating mechanism, for exchange of information and technical guidance, and to act dynamically to help the UN respond to nutritional problems.

The UN members of the SCN are FAO, IAEA, IFAD, ILO, UN, UNDP, UNEP, UNESCO, UNFPA, UNHCR, UNICEF, UNRISD, UNU, WFP, WHO and the World Bank. From the outset, representatives of bilateral donor agencies have participated actively in SCN activities. The SCN is assisted by the Advisory Group on Nutrition (AGN), with six to eight experienced individuals drawn from relevant disciplines and with wide geographical representation.

The Secretariat is hosted by WHO in Geneva.

The SCN undertakes a range of activities to meet its mandate. Annual meetings have representation from the concerned UN Agencies, from 10 to 20 donor agencies, the AGN, as well as invitees on specific topics; these meetings begin with symposia on subjects of current importance for policy. The SCN brings certain such matters to the attention of the ACC. The SCN sponsors working groups on inter-sectoral and sector-specific topics.

The SCN compiles and disseminates information on nutrition, reflecting the shared views of the agencies concerned. Regular reports on the world nutrition situation are issued, and flows of external resources to address nutrition problems are assessed. State-of-the-Art papers are produced to summarize current knowledge on selected topics. SCN News is normally published twice a year. As decided by the Sub-Committee, initiatives are taken to promote coordinated activities – inter-agency programmes, meetings, publications – aimed at reducing malnutrition, primarily in developing countries.