Emerging Food-related Health Problems in Globalization

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Health, in the sense of human survival, well-being and productivity, needs two essential but somehow scarce ingredients: food and drink. Roots and water for the poorest *versus* lobster and champagne for the richest – this, however, represents a tremendous socio-economic and cultural gap. Culture and knowledge do play a vital role in matching - or mismatching – the need, supply and demand for what to eat and drink. Often this is a matter of life, suffering and death. Since ancient times, food production and consumption patterns have been modified by ever increasing world trade. Industrialization and still increasing urbanization introduced new shifts. The current globalization of exporting and importing goods and information and lifestyles, however, continues to change food and nutrition habits on a massive scale.

1 Background

1.1 Basic data on food- and waterborne diseases

Worldwide, malnutrition is a major risk factor for health, both directly and indirectly. The World Bank counts about 200 million years of life lost annually due to malnutrition, and 85

Global Burden of Disease and Injury Attributable to Selected Risk Factors

Risk factor	Deaths (mil)	% of total deaths	YLL (mil)	% of total YLLs	YLDs (mil)	% of total YLDs	DALYs (mil)	% of total DALYs
Malnutrition	5	11.7	199	22.0	200	4.2	219	15.9
Poor water, sanitation	3	5.3	85	9.4	8	1.7	93	6.8
Unsafe sex	1	2.2	28	3.0	21	4.5	49	3.5
Tobacco	3	6.0	26	2.9	10	2.1	36	2.6
Alcohol	1	1.5	20	2.1	28	6.0	48	3.5
Occupation	1	2.2	22	2.5	15	3.3	38	2.7
Hypertension	3	5.8	18	1.9	1	0.3	20	1.4
Inactivity	2	3.9	11	1.3	2	0.5	14	1.0
Illicit drugs	0.1	0.2	3	0.3	6	1.2	8	0.6
Air pollution	0.5	1.1	6	0.6	2	0.3	7	0.5

Legend: YLD = Years of Life Disabled; YLL = Years of Life Lost; DALY = Disability Adjusted Life Year

Source: [World Bank 1997]

million years of life lost due to poor water and sanitation. [See table; World Bank 1997]

The World Health Organization states: “It is believed that hundreds of millions of people worldwide suffer from diseases caused by contaminated food. Developing countries suffer the most from a wide range of diseases, including cholera, campilobacteriosis, Escherichia coli infections, salmonellosis, shigellosis, brucellosis, and hepatitis A. The annual incidence of some 1.5 billion episodes of diarrhoea in children under five years of age, resulting in over three million deaths, is an indication of the scale of the problem, since a significant proportion of the diarrhoeal disease cases are of foodborne origin.” [WHO 1997] “An estimated 1.8 million children under the age of five died of diarrhoeal diseases in 1999 and a large proportion of this illness is thought to originate in food and drinking water.” [WHO 2000c] Altogether, 1.2 billion people do not have access to drinking water. Alcohol, tobacco and illicit drugs, on the other hand, are increasing the disease and death burden of what people consume. According to the attached table of the World Bank, these account for up to 36.7 % of the life years lost annually worldwide. [World Bank 1997]

1.2 Food and health in poor countries

In developing countries, direct protein-energy malnutrition annually destroys about 15 million disability adjusted life years of children below the age of 16. [Nemer 2001] The more specific problems are:

- iron deficiency anaemia, that affects two billion people and comprises 1/5 of maternal deaths,
- iodine deficiency, affecting over 740 million people and causing brain damage to 50 million,
- vitamin A deficiency, causing blindness in a quarter to half a million children every year,

and many other diseases related to the lack of vitamin C, calcium, magnesium, zinc and other nutrients. [WHO 2000b] Among the poor, the main direct cripplers and killers are infectious diseases. They deplete the body of nutrients, aggravating a vicious circle between infection and nutrition. Insufficient food and poor diets increase the susceptibility to diseases. One can account for this synergistic interaction by arguing that far more than half of the diseases and deaths in the poor world are linked somehow to food and water. Lack of food, lack of nutrients, and the contamination of food and water are a major threat to survival, health, wellbeing and productivity, including the cognitive development of children. These problems can be traced back to inequality, wars, conflicts, politics, protectionism, environmental damage, and poverty with its concomitant powerlessness and voicelessness of the poor. Lack of knowledge and cultural barriers aggravate these man-made health problems.

1.3 Food and health in rich countries

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About 1 billion of mankind is underfed, about 1 billion overfed. Lack of some nutrients and oversupply of others affect the health of people in the rich world, as much as food contamination does. Here, the main health problems are heart diseases and cancer, and they seem to be related to excess or deficiency in certain nutrients, even if the studies could not yet control for all possibly confounding variables. “In industrialized countries, the percentage of people suffering from foodborne diseases each year has been reported to be up to 30%. In the United States of America (USA), for example, around 76 million cases of foodborne diseases, resulting in 325,000 hospitalizations and 5,000 deaths, are estimated to occur each year.” [WHO 2002] Diseases, lack of productivity, early retirement and avoidable death are impacts of poor and unbalanced diets. In Germany it is estimated that these cost 21 billion US$ per year. [Mackenthun 2002] “In the USA, diseases caused by the major pathogens alone are estimated to cost up to US $35 billion annually (1997) in medical costs and lost productivity.” [WHO 2002] Many of these problems can be traced back to ignorance and a lack of a basic understanding of the personal responsibility for health and nutrition. Eating too much, too sweet, too salty, and fast and junk food comprise a main aspect of the feeding culture.

1.4 Résumé and guiding questions

“Over half of the world’s disease burden can be credited to unhealthy and inadequate diets”. [Pelepussey 2000] Even if our knowledge about the relationship between food and health is still far from complete: Is it due to the supply of food, or to the demand? What roles do urbanization and globalization play? How best can food requirements be addressed? And by whom?

2 Supply

2.1 Purported risks of global food chains

Globalization brought an incredible diversification of the food supply, no longer restricted to seasonal production, even for many minorities, wherever they live; food retailing in the hands of a few multinational supermarkets brought down the prices. Nevertheless, globalization is also considered to be a risk factor for food supply. Increasing world trade, in the absence of worldwide applied and enforced food standards, seems to be a major risk. International food chains are getting more and more complex and diversified. Pesticides and insecticides that have been banned in rich countries are sold to poor countries; from the soil their residues, such as nitrofen, with its carcinogenic and feto-toxic risks, return to the food chain. Some fungicides such as pentachlorphenol are totally banned in some rich countries, though quite in use in others. Metabolites of nitrofuran were detected in poultry from Brasilia and Thailand, and in shrimps from Vietnam, China, Indonesia, Bangladesh and India. Contaminated strawberries from Guatemala and México brought hepatitis A and cyclosporiasis to the USA. Ingredients for animal feed were outsourced, and what came back was waste from a drug company in Ireland. Pharmaceutical companies use material from cattle raised in countries

with a known risk of mad cow disease. Some countries liberally use antibiotics for human beings and in animal feed that "contribute to the emergence of antibiotic-resistance among strains of pathogenic bacteria" [Chan 2003], whereas others are quite conservative in this respect. Antibiotic and hormone residues in meat are subsequently causing cross-Atlantic conflicts. The great diversity of labelling laws internationally and the resulting lack of transparency about the actual contents of imported foodstuffs call urgently for extensive research. The carcinogenic and toxic health impact of liberal and global food chains definitely seems to pose some serious threats. "Parasites may acquire similar status; they are found in meat, vegetables, marine fish and snails. If vegetables are eaten raw or are used as condiments, the risk of acquiring these parasites gets higher". [De Leon 2003]

2.2 BSE and food-and-mouth diseases

One example of a globalized food threat has been the so-called mad cow disease. "Unconventional agents, such as the agent causing bovine spongiform encephalopathy (BSE, or 'mad cow disease'), is associated with variant Creutzfeldt-Jakob Disease (vCJD) in humans. "'Prions' are abnormal proteins in the form of filaments in animal and human brain that cause a novel type of fatal brain disease including BSE, sheep/goat scrapie, wasting disease in deer and elk, encephalopathy in mink, CJD and kuru in man." [Chan 2003; see also Zúñiga-Quiñónez 2002] Consumption of bovine products containing brain tissue is the most likely route for transmission of the agent to humans. [WHO 2002] "Other means reported to get CJD include use of prescribed growth hormone isolated from human cadavers' pituitary glands, from surgery using dura matter or a patch of brain sheathing, and the ancient practice of tribes in Papua New Guinea to eat the brain of their dead loved ones." [Chan 2003] BSE was detected especially in cattle and sheep. "The major route of transmission of BSE in cattle was through infected ruminant-derived meat-and-bone meal (MBM) in animal feed." [Food Standards Agency 2000] The slaughtering of millions of cattle and a ban on MBM feed was imposed to end this health risk. Solid and reliable evidence on vCJD is still missing, however. Up to now there have been somewhat more than 100 definite and probable human victims of vCJD, mainly in Great Britain and Ireland; they succumbed to rapid and massive brain degeneration. During the heat of the discussions, a maximum of 136,000 cases was estimated for Great Britain, [Ghani 1997] or even 10 million victims by the year 2010 if vCJD should turn out to be very infectious [Dealler 2000]. Foot-and-mouth disease (FMD) is another example of a globalized food threat that affected consumer confidence worldwide in 2002, even though it is not a direct risk to human health.

2.3 Risks of globalized food processing

The risks associated with the production, processing and distribution of food within the internationally growing food chains have to be carefully assessed. Even natural and home-grown food can be harmful for health. One of the most highly carcinogenic toxins, aflatoxin, is produced by a mould, or fungus, *Aspergillus flavus*, which grows on bread, sausages, cheese and incompletely dried rice and peanuts, and also can be found at measurable levels in

many staple foods. The most toxic poison, botulinus, is a natural substance that is thirty thousand times more toxic than the highly disputed Seveso Dioxin TCDD. Even garlic contains the carcinogenic isothiocyanate. The toxic nature of tobacco is, of course, well-known. [Mackenthun 2002]. Carefully selecting and processing plants is an old cultural wisdom that has evolved over thousands of years. The cumulated stock of trial-and-error-based knowledge of human beings is a kind of food-and-nutrition culture. Home processing of food through the addition of vinegar, salt or sugar has been done over the centuries for the sake of good health. Pasteurization of milk, introduced about 100 years ago, reduced the occurrence of milkborne diseases that were widespread at the time. [WHO 1999] Food is now being industrially designed, prepared, engineered, produced, processed, refined, fortified, enhanced, preserved, irradiated, sweetened, coloured, flavoured, cosmetically modified, antidetoxicated, waxed, wrapped in papers treated with fungicide or packed otherwise, transported in sprayed containers, handled at intermediary and final markets and shops until finally reaching the consumer as a *compositum mixtum* with ingredients from many countries from around the world. Already, globalization can be observed and tasted every day, even at the breakfast table! Genetic modification is just adding a new technology to three revolutionary changes that took place in the last century: a mechanical one, a chemical one with fertilizers and pesticides, and a biological one with the green revolution.

2.4 Comparative risk assessments

These revolutionary changes were quite beneficial to mankind, but have not been without risk. Among the benefits are: resistance to pests, removal of allergens from food, increased production, prolongation of durability. Contamination, however, is a risk that *could* be chemical in nature (pesticides and veterinary drug residues, food additives, lead), biological (hormones, methylalcohol) and/or microbiological (salmonella, diarrhoea-producing viral and bacterial elements). Pollution of air, water and soil, industrial contaminants, and exposure to cadmium, lead and mercury add to the risks involved. Assessing and comparing the purported risks and the harmful impact for mankind and the environment is certainly a part of the professional culture of all the sciences involved. Nevertheless, only few full-fledged risk assessments of the impact of these factors on human beings have ever been done. Testing the carcinogenic effects of residues in animals with high and long experimental exposures, and adding very high security margins for extrapolating the risk on human beings is state-of-the-art for a scientific risk assessment; nevertheless it tends to jar consumer confidence. Consumers generally prefer a scientifically certified zero-risk that a professional can rarely ascertain. “Risk-factor-phobia” (an over-exaggerated aversion to any risk-taking), “healthism” (over-emphasis on being healthy) and the “forbidden-fruit-phobia” (condemnation of pleasurable “bad” behaviour) – are fashionable ideologies. Comparing what is not comparable – apples and peaches – may be a common-sense remedy: [Mackenthun 2002]

- unhealthy nutritional habits cripple many more people than residues in food do;
- hundreds of thousands die every year of heart disease and cancer, far more than from mad cow disease;

- nitrofen and dioxin residues harm the relatively few exposed workers much more than consumers en masse;
- not using pesticides in agriculture is much more harmful than pesticide residues in food;
- not using drugs may be more unhealthy than accepting and overcoming the many side effects;
- drinking alcohol is much more toxic than eating food with chemical residues;
- the acidity of Coke and Pepsi is strong enough to dissolve teeth and bones, to clean a toilet, and to affect the normal functioning of the human kidney;
- decontamination of dioxin reduces the cancer risk of food far less than changing nutritional habits.

Such lines of reasoning should not deny or belittle the real dangers of globalized food production and marketing, which ought to be monitored independently and enforced by regulations, laws and real penalties for criminal providers including those that "smuggle food items as frozen meat and vegetables into a country without the benefit of standard quarantine inspection" [Chan 2003]. But it should lead to realistic relative and comparative risk assessments. In rich countries, the prevalence of food-related anxiety and risk-phobia seems to be much higher than the prevalence of real food-related risks to health. The risk of asbestos in Berlin in 1991 was assessed to be one, compared to 13,272 deaths due to smoking, alcohol, malnutrition, overweight and car accidents. [Mackenthun 2002] The more than 100 vCJD cases altogether caused by BSE are to be compared with 12 million yearly deaths due to nutritional deficiencies, lack of drinking water, poor sanitation, alcohol, tobacco and illegal drugs.

3 Demand

3.1 Nutrition in poor countries

In subsistence economies people consume what they produce or collect – consumption is complementary to production and collection. In situations of poverty just a few elements compose a meal. A simple way to verify indigency in the Philippines is to ask whether a family has more than one complete meal a day, "complete" meaning rice and fish, not just rice and some drops of oil. [Schwefel 1995] In Guatemala the diet of the poor combines mainly beans and maize or Indian corn. Such diets with insufficient vegetables and no or few costly animal products are short in terms of nutrients essential for good health, especially vitamin A, iron, zinc, riboflavin, vitamin B-12, vitamin B-6, and calcium. [Diaz-Bonilla 2001] This stark lack of micronutrients gives rise to many leading diseases of the poor: the lack of iron leads to anaemia, lack of vitamin A to blindness, lack of vitamin C and iodine hamper the development of the fetal brain. The most severe problem, "protein-energy malnutrition, (PEM) affects every fourth child worldwide: 150 million (26.7%) are underweight while 182 million (32.5%) are stunted." [WHO 2000b] The cause is poverty – 2.8 billion people live with less than 2 dollars a day – in combination with the almost worldwide culture of discrimination against women, children and the elderly. [World Bank

2001] Partly, too, the ignorance of options is to blame, especially because of the lack of educational opportunities for girls and women; after all, it is they who usually decide in the kitchen.

3.2 Nutrition in rich countries

"The Germans eat too much, too fat, too sweet, and too salty." [Mackenthun 2002] Such typical dietary patterns in rich countries are reflected in specific disease patterns. "Notably, nutritional factors and inactive lifestyles are implicated in

- between 30-40% of cancers
- at least one third of premature deaths from cardiovascular diseases (CVD) in Europe
- the pan-European 'epidemic' in obesity and overweight, which in turn is linked to maturity onset diabetes mellitus, increased risks of CVD and certain cancers, and premature death
- osteoporosis and its consequences, including the increasing number of hip fractures in the elderly." [Kafatos 2000]

Calorie-rich and nutrient-poor diets are the result of an ever emerging and expanding junk food culture that is paralleled by a high consumption of soft drinks whose nutritional value is very low. Traditional local and regional food patterns and lifestyles are changing very quickly because of a rapidly increasing globalized demand for produced food items in supermarket chains and in fast-food restaurant chains such as McDonald's. Some call it the "Cocacolarization and McDonaldization" [Sanders 2002] of globalized food demand.

3.3 Urbanization and globalization as intervening factors in nutrition changes

There is a host of factors that can predict changing patterns in the quantity and quality of nutrition, many of which are interlinked with increasing urbanization and globalization [World Food Programme 2002; Diaz-Bonilla 2001]:

- dependency on precarious cash income following of the spread of urbanization and the reduction of rural livelihoods that included partial subsistence economies;
- low wages and fluctuating income, from insecure and temporary jobs in urban labour markets squeezed by globalized competition for low-income jobs;
- higher food prices for the urban poor, and food price fluctuations that inhibit the formation of a stable food and nutrition pattern in families;
- large numbers of women working outside the home, because of the reduced income opportunities or absence of other or missing family members;
- weakened social networks within broken or fragmented structures of urbanized households, whose members are nationally and internationally dispersed;
- loss of traditional knowledge about 'rational' food production, preparation and consumption once the domain of matriarchal wisdom;
- intra- and interurban, and international migration resulting from legal obstacles, including insecure land and housing tenure;

- increasingly insecure access to safe water, sanitation, health and other public goods inadequately provided by heavily debt-ridden local administrations and governments;
- direct and indirect food promotion through the suggestive presentation of fashionable life styles in the mass media;
- increasing changes in life styles as a result of higher mobility and the processes of adapting to new living and working environments;
- reduced physical activity patterns for people sitting long hours in cars and in front of computers and television sets;
- individualized as opposed to familial food consumption of at least one meal per day outside the home, especially for the working, work-seeking and school population; and,
- the lack of impartial information and education on food and nutrition, as well as on the rational spending of income, and/or the negligence to comply with already known information, particularly on food storage and preparation at home.

These factors can be condensed into four main topics: poverty, social relations, culture, and knowledge or information.

3.4 The knowledge base of nutrition

The last item mentioned – information and education – is directly related to health problems. An analysis of US cancer registers found that food that is improperly chosen and prepared at home comprises the most important risk factor for cancer. Some estimate that about one-third of cancer cases can be attributed to excessive consumption of salted, smoked, grilled and fatty food, and insufficient fiber, fruits and vegetables. Food poisoning and its main agent, salmonella, are often rooted in inadequate kitchen hygiene, such as not cooling eggs, storing food improperly, and insufficient cleaning of the kitchen and utensils. The way that food is handled at home is a key determinant of health. Food handling is a difficult balance between too much and not enough boiling, cooking, frying, baking, roasting, freezing, high-pressuring, grating, mincing, fermenting, acidifying, salting and sugaring. In the proper dosage these steps may lead to beneficial physicochemical processes that kill pathogens and unhealthy organisms in food; otherwise, especially if the food is under- or overdone, unhealthy consequences or side-effects may result, such as the formation of acrylamid, a potential carcinogen, at temperatures above 175° Celsius. Lack of information and/or lack of compliance with basic food preparation practices are very significant causes of food-related health problems. This brings back into the discussion the options of individual versus industrial food preparation in the sense that at least there ought to be a rational supply if no rational demand existed, or that demand should be rationalized by proper information, education and compliance.

3.5 The cultural background of changing nutrition patterns

Traditional food and nutrition patterns or cultures once provided a framework that was widely regarded as ‘rational’. It was based on the accumulated knowledge stemming from the ancestors. Over the centuries, all societies observed and discovered what could be eaten, and

selected what should be eaten. It was learnt that a diversification of food, and the preservation of foodstuff for periods of scarcity, can be healthy. Early globalization processes enhanced the daily fare with salt, spices and other exotic and colonial foods and fruits. Regional, religious and ethnic food and nutrition cultures are now struggling for survival in these times of the internationalization of nutrition habits. Through the power of globalized transnational food chains and pharmaceutical companies, food and nutrition traditions are increasingly being displaced by the supply of and demand for preserved tin food, standardized receipts in fast-food chains, cheap micronutrients and vitamin drugs, or by the sometimes obligatory fortification of staple food or salt with certain nutrients. Nutrition habits and demands are now being shaped by the globalized promotion of new and fashionable 'food' products. For instance, vitamin tablets are nowadays considered to be essential drugs in Guatemala, especially for pregnant women. Nobody insists on diversified fruits that are too expensive and would interfere with land-tenure patterns and power structures. The traditional wisdom of the local diets is rapidly vanishing and being supplanted by a new nutrition culture promoted by the mass media even amongst the poorest of the poor. Pepsi Cola and convenient junk-food snacks are available in the most remote areas of the world, and television and radio are promoting their consumption as part of a modern lifestyle. The diversity of food and nutrition cultures is being drastically reduced with the globalization of today.

3.6 The social base of changing nutrition patterns

Even in rural societies there is no food solidarity within larger family units. In most societies food is not shared fairly among all members of the family. Younger girls and the elderly tend to be discriminated against. [Messer 1997; Wandel 1995] Thus, undernutrition and malnutrition are aggravated and sustained by the power structures within families. Urbanization and international labour markets tend to break down traditional family ties even more. Nowadays, fragmented, broken, small single-parent families are no longer the exception. In this context of increasing individualization, food preparation and consumption patterns are changing as well. Ready-made fast food in small doses is a choice during work and school breaks, and during the restless search for cash money wherever it might originate. Precarious housing conditions in man-made shelters, or in the smallest low-budget housing in overcrowded cities, and the increasing cost of energy affect the food preparation and storage options of poor households. Non-existent or inadequate sanitary conditions make hygienic food preparation and storage even more difficult. Criminality adds to the problems of food storage at home. In many households, siblings are made responsible for the feeding of their younger brothers and sisters during the absence of working single parents. The provision of nutritious food at the workplace and in canteens is often not planned according to need, and moreover tends to be overpriced. Increasingly debt-ridden city administrations quite often cancel school-feeding programs that might have ameliorated some of the problems mentioned above. The social arrangements for improved food and nutrition in urbanized living conditions, and in globalized food and labour markets, are in a precarious situation; food demand and choices are very much influenced by these social constellations.

3.7 The income base of changing nutrition patterns

In this time of globalization, loss of income affects considerable parts of the world population. In terms of income, only a fourth of the world population is better off after the last two decades, whereas a fifth is poorer than before. [Wissenschaftlicher Beirat 1999] A drastic example is the rise in the incidence of poverty in Central Asia from below 10% to above 50% in the wake of globalization developments. [Narayan 2000] In rural areas, periodic pre-harvest shortages of income as well as seasonal mini-inflationary tendencies used to be quite normal. Temporary unemployment and the lack of a regular income, however, are increasingly becoming the norm in the globalized labour markets. Permanent or temporary scarcity of income is another main factor affecting the (non)choice of proper foodstuffs, especially healthy food, e.g., vegetables, fruits, fiber and meat in appropriate amounts. Micro- and macroeconomic crises and shocks brought on by decreasing income and purchasing power have important nutritional consequences often leading to inadequate, unbalanced and unhealthy diets, in particular for the poor. This chain of unfavourable circumstances was diagnosed many decades ago among poor populations. [Castro 1946] 'Rational' adaptations to those crises include shifts to secondary staple foods – e.g., from rice to cassava; increases in the prices of secondary staple food are early warning indicators of impending food and nutrition crises. Shifts towards tertiary staple foods such as roots, hay and bark, and towards tertiary protein sources such as birds, cats and rats, had long been observed during the many famines in Europe's history. [Riedl 1993]

3.8 Dangerous 'food'

Alcohol, illegal drugs and tobacco are additional ingredients of 'food' in a wider sense. Without going into details here, it can be concluded that these items add to the emerging health burdens resulting from the food and nutrition problems attendant on urbanization and globalization.

4 Need

4.1 Need parameters

There is a huge gap between the perceived and the normative nutritional needs. Even if all the details are not yet fully known, science can show quite clearly what is required for healthy nutrition in terms of daily calories, proteins, vitamins, minerals, aminoacids, and other nutrients and ingredients. Taking into account such needs in terms of quantitative targets for nutrients, and comparing these with the nutrients in food items available in a specific geographical area, optimization procedures can calculate the most cost-effective diet. A technocratically rational food budget for Peru, for example, would be a diet of just five food items, including milk, beans, vegetable, sugar, tuber, and – to be complete – water. Such a diet would cost a fraction of what is usually spent for food and nutrition. [Schwefel 1976] In

times of globalization and with huge economies of scale, the industrial production of basic foodstuffs could effectively keep costs quite low. Theoretically, therefore, and in terms of a pure supply rationality – construed here as a theoretical yardstick – there is no scarcity of food in the world. The main problem, rather, is a human demand that, in this theoretical context, could be labelled ‘irrational’ or ‘irrationalized’, for it is spawned by inequities, ignorance, poverty, powerlessness and the voicelessness of the poor.

4.2 Interventions

The main millennium goal of the world community to halve the world’s poverty by the year 2015 in terms of income figures (which are commonly used for measuring poverty) would not halve the occurrence of undernutrition and malnutrition. Education, information and culture as well as social arrangements are required to rationalize demand. Subsequently, this should be flanked by a rational supply. Market forces and the demand of consumers will not be sufficient to rationalize supply; standards and powerful control mechanisms are needed to sustain and improve it.

4.2.1 Demand-oriented interventions

Health and nutrition education are crucial to shape a rational demand for food and nutrition according to specific environments and constellations. Hardly anyone feels responsible for it, however. Ministries of agriculture tend to deal with food and not with nutrition. Ministries of health very seldom assign priority to information on health, or to health education. Ministries of education do not position health and nutrition in the forefront of life-skills training. ‘Education vaccine’, nevertheless, is a must when addressing the shaping of demand for good food and nutrition. The best indirect measures are contained in a good basic education for girls. They are the ones, after all, who when adults decide on the family’s food and nutrition preferences. Demand-oriented interventions have to focus on incentive-giving campaigns that inform, motivate, and mobilize people. [Schwefel 2001] Specific interventions on smoking, drinking, and drug use are to be continued. Such information and motivation campaigns have to be embedded in a good cultural understanding of habits and preferences, taking into account the nature of the social relationships of the clients. Much needs to be done in this deplorably neglected area of concern. Basic education in health and nutrition, as well as the continuous training of basic life and survival skills must be on the agenda, not only for poor people in poor countries. Empowerment of people and informed self-help are the main issues at stake.

4.2.2 Supply-oriented interventions

In this well-established area we distinguish between micro-, collateral and macro-approaches. Micro-approaches consist of adding specific missing nutrients to the diets, either in pharmaceutical applications, e.g., multivitamin capsules, or through the fortification of foods, i.e., adding micro-nutrients such as iodine, iron, calcium, folic, zinc, vitamin A to staple

foods, salt, sugar, or even to biscuits and cookies. Food supplementation involves the distribution of needed food items to risk groups, e.g., school children. This could be milk, but also "healthy junk food" such as deep-fried carrot chips that would be effective against vitamin A deficiency. Collateral approaches typically consist of public-health measures, e.g., to improve sanitation: 'like sanitary toilet construction and proper garbage disposal, control of mechanical vectors like flies and cockroaches, distribution of antihelmintic drugs in schools, and health advocacy through health education' [Chan 2003] Macro-approaches refer to the selection of cost-effective nutritious food items in the market, and to economic incentives to promote them, or on disincentives – 'sin taxes' – for unhealthy food.

4.2.3 Need oriented interventions

Left alone, the globalized food market will produce for the public not good food, but rather profitable food with a high (irrational) demand.

- A first step towards need-based global nutrition is the Codex Alimentarius Commission of the United Nations Food and Agriculture Organization and the World Health Organization. This Commission issues standards, guidelines and recommendations for food safety, which are considered by the World Trade Organization's Agreement on the Application of Sanitary and Phytosanitary Measures to be an international consensus about the requirements of food safety in international trade, and for protecting human health from foodborne diseases. [WHO 1998; WHO 1999a; Diaz-Bonilla 2001] These rules are important for the increased import and export of food in times of globalization.

- A second step is a consumer-oriented food regulation within countries, i.e., the legislative control of licensing and of food purity in terms of composition, additives, contamination, labelling, etc., and its enforcement, as well as the national acceptance of the international recommendations of the Codex Alimentarius. National consumer protection must be on the agenda. In Germany it took quite a long time for consumer protection to gain a fragile political power, and only fairly recently at that.

- These two steps, by themselves, would not be sufficient to solve the emerging food-related health problems under globalization, nor the unfinished agenda of under- and malnutrition of the billions of poor people in the world. *In principle*, all those working nationally or internationally in the 'public' interest, for public health and other public goods, must work as watchdogs for better living and the improved nutrition of their clients who pay them through their taxes. They should debate openly about any reasonable doubt regarding the safety of health and food, and should give recommendations for improving the supply of nutritious food and the demand for it. This, in principle, is a duty of all publicly paid professionals who are imbued with professional ethics. *In practice*, however, relatively few public professionals stand by their public responsibilities. This might therefore be the agenda for the avant-garde among them, in alliance with some public institutions, civil-society organizations, and

interest groups. Quality assurance of food supply and demand ought to be tackled by such alliances, inter-nationally and cross-nationally. It should be a topic for a discipline called ‘International Public Health’. Indeed, there are already some success stories of such cross-national pressure groups against such problematic practices as acrylamid-producing food preparation, or against the malpractices of large food corporations such as Nestlé. A globalized and professionally specialized section of the civil society can and must take this agenda into its own hands. A globalized world needs a civilized society.

5 Conclusion

Urbanization and globalization have a tremendous impact on food and nutrition. Food and nutrition are too important an issue to be left to the free interplay of a Leviathan world market and Lilliputian national governments. The globalization of the civil society and its avant-garde – this is a positive feature of globalization that contributes very well to our freedoms, according to Amartya Sen [Sen 1999a] – can help to control food supply issues; in Germany Warentest [Warentest 2003] and Foodwatch [Foodwatch 2003] – a public and a private institution – are part of this hopefully growing avant-garde. Attacking poverty requires an aggressive but at the same time civilized avant-garde. A rational demand for food and nutrition should be the offspring of culturally diversified information, education and motivation campaigns to empower people to take health and nutrition into their own hands, and to accept responsibility for a rational nutrition. Alliances between ministries of health and education should place consumer protection and consumer education plainly and openly on their agenda. This is one of the best investments in brains and bodies – health and education – which are and should be the basics of a development with a human face. Investments in health and education will bring incredible economic and social returns. Leading development economists do confirm, increasingly, the strategic importance of health and education – brains and bodies – for economic development. [Sachs 2001; Sen 1999b] It is investments such as these that would soften the impact of the food-related health problems that emerge with globalization.

Literature

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Summary of the article on “Emerging Food-related Health Problems”

Poor water and insufficient or imbalanced diets cause nearly half of the world’s disease burden. Globalized food chains in liberalized world markets and weak consumer protection pose further risks. The ‘mad cow disease’ caused the confidence of consumers in rich countries to sink even lower. Comparative risk assessments on the toxic, carcinogenic and health impacts of a globalized food supply and on the lack of compliance with culturally developed or scientifically available knowledge about the ‘rational’ demand for healthy food and nutrition hint at the urgent need to empower consumers to take food and nutrition into their own hands. Consumer protection and education ought to be supported or controlled by globalized alliances of an avant-garde of ‘public’-minded professionals who keep in mind the unfinished millennium agenda to eliminate the hunger and malnutrition that ruins the lives of billions of poor people. Investments in brains and bodies – i.e., education and health – bring incredible returns.

About the author

Detlef Schwefel obtained a Ph.D. in sociology and specialized in socioeconomic evaluation and in health-systems research and management. For more than 20 years he did research on and consultation and management in 34 developing countries with long-term stays in Chile, the Philippines and Guatemala and more than 100 short-term consultancies. He spent 13 years engaged in health-systems research in Germany and advised the World Health Organization and the European Community on public health and health economics in European countries. He has authored and co-authored 17 books, edited and co-edited an additional 20 and written more than 130 articles. Currently he is enjoying the part-time early retirement plan of the German Development Cooperation (GTZ) and freelancing part-time as a development consultant. He teaches at the Free University of Berlin, Germany.

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