

Food, Safety, Quality and Nutrition in changing Environment

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Abstract

The protection of key elements of our environment is important for human health. The ability to breathe clean air, to have a wholesome supply of drinking water and to be protected against the harmful effects of things like waste and noise are fundamental to our well-being. Realizing the importance of conservation and awareness of surrounding environmental studies have been prescribed as compulsory component of foundation courses at degree level for each faculty. Every student of higher education should know the importance of environment and to do the needful activities to protect it. Higher education should take responsibility to awaken people about environmental crisis and its conservation. Much of the agricultural knowledge, science and technology needed to resolve today's challenges are available and well understood, but putting them into practice requires creative efforts from all stakeholders. This paper discusses about the major challenges, quality and nutritional value of the food and suggests measures leading towards changing environment.

Key Words: Exploiting, Eco systems, Bio-Diversity, Fossil Fuels, Natural Resources, Food born diseases, Biological hazards, Chemical hazards, Physical hazards

Food safety and nutrition

Historically agricultural development was geared towards increasing productivity and exploiting natural resources, but ignored complex interactions between agricultural activities, local ecosystems and society. The interactions must be considered to enable sustainable use of resources like water, soil, biodiversity and fossil fuels. Much of the agricultural knowledge, science and technology needed to resolve today's challenges are available and well understood, but putting them into practice requires creative efforts from all stakeholders.

In spite of these scientific and technological advances, and the world-wide overall improvement of food control systems, food-borne diseases persist as a cause of serious concern for the consumer. Food is the likely vector of multiple biological, chemical or physical hazards and certainly of several nutritional problems. Consumer perception is also evolving, with a perceived increase in the social unacceptability of food risks, at least in developed countries. Consumer perception also relates to access and availability to a healthy and nutritious diet.

Climate change and food safety

Climate risks is a major challenge of today and for the future. Climate-related disaster risk is increasing. The number of reported hydro-meteorological hazards (droughts, floods, wind storms, forest fires or landslides) has significantly increased in recent decades. Extreme climate events regularly affect multiple sectors including agriculture, food security, water resources and health. Climatic variability can trigger crop failures, shortages of water for irrigation, food insecurity and hunger. The potential effects of climate change on food borne illness, nutrition, and security are mostly indirect, but on a global scale, can result in large numbers of populations affected.

The emerging patterns of climatic hazard risk are presumably associated with climate change. It is expected, that global warming will enhance the hydrologic cycle, widen climatic ranges and lead to heavier rainfall events and more severe droughts. Increasing intensity of tropical cyclones as observed

in recent decades may be linked to increasing sea surface temperatures. Further encroachment of hazard prone areas is likely to enhance exposure of people, mainly the poor and their economic assets to climate-related losses unless their vulnerabilities will be reduced.

A changing climate impacts our health and wellbeing. The major public health organizations of the world have said that climate change is a critical public health problem. Climate change makes many existing diseases and conditions worse, but it may also help introduce new pests and pathogens into new regions or communities. As the planet warms, oceans expand and the sea level rises, floods and droughts become more frequent and intense, and heat waves and hurricanes become more severe.

The most vulnerable people children, the elderly, the poor, and those with underlying health conditions are at increased risk for health effects from climate change. Climate change also stresses our health care infrastructure and delivery systems. Steps can be taken to lessen climate change and reduce its impacts on our health and the health of future generations. Some of these steps can yield benefits for our health, environment, economy, and society at the same time. The federal government has called for efforts to support adaptation and mitigation of climate change to create healthier, more sustainable communities.

Climate-sensitive food and water-borne pathogens

Associations between higher temperatures and diarrhea have been found in many settings, although the precise mechanisms underlying this are not always well-understood, likely representing a combination of factors. For example, the incidences of two of the most common food-borne illnesses worldwide, Salmonella and Campylobacter, show clear seasonal trends, with more cases (particularly sporadic, ie. non-outbreak, cases) when temperatures are warmer. In India, higher rainfall and increased snowmelt have are associated both with lower water quality and increased cases of infectious gastroenteritis. *Vibrio cholerae* is the bacterium responsible for cholera, a severe illness causing vomiting, abdominal pain and severe diarrhea; if the resulting dehydration is not treated adequately, it can be fatal. Ingestion of contaminated shellfish, drinking water or crops are risk factors for contracting cholera, and the risk is influenced by temperature, rainfall and the chemistry of seawater, all of which are affected by climate change. In countries with endemic cholera, a strong positive relationship exists between temperature and incidence. Alongside bacterial infections, there is also evidence that higher temperatures increase the risk of viral infections: for example, typhoid and malaria and dengue fevers peak during summer in temperate and subtropical regions, whilst dengue peaks in rainy and winter seasons.

Local weather patterns – which are influenced by climate change – have significant influence on many food- and water-borne diseases, including several of the most important pathogens that cause diarrheal disease, such as cholera, salmonella and rotavirus; it is therefore a threat which must not be overlooked. Climate change and algal blooms Climate change has been described as a ‘catalyst for the global expansion’ of cyanobacterial algal blooms, interacting with increased nutrient loading from fertilizer run-off into water bodies. Harmful algal blooms not only produce toxins, but also deplete dissolved oxygen and alter aquatic food webs, and threaten both fishing and water supplies. Higher water temperatures, reduced vertical mixing of water, and increased droughts, storms and floods are all projected to increase as a result of climate change, increasing the incidence of harmful cyanobacterial blooms in nutrient-rich waters. Over the past three decades, such blooms have become more frequent and affected a larger area, and the incidence of illness associated with novel algal sources has also increased, although the reasons for this are multiple. Food safety and nutrition Climate change threatens food security and nutrition directly, through its projected impacts on food production of changing temperatures and rainfall; for example, approximately 25 million additional children are projected to be malnourished by 2050 as a result of climate change. Climate change is also expected to contribute to malnutrition indirectly, through impacts on food safety and diarrheal disease discussed previously. According to the WHO, “unsafe food creates a vicious cycle of diarrhea

and malnutrition, threatening the nutritional status of the most vulnerable. Where food supplies are insecure, people tend to shift to less healthy diets and consume more “unsafe foods” – in which chemical, microbiological and other hazards pose health risks.”² This may apply to various climate change scenarios; for example, to households turning towards alternative food sources such as bush-meat during times of food scarcity or following the collapse of alternative livelihoods, and the poorest are most likely to be affected. There is also a possibility that climate change could reduce availability of fuel, for example as a result of infrastructure damage following flooding, or if firewood is scarce following a wildfire, increasing the likelihood of inadequate cooking.

The potential increase of microbial food-borne diseases may be due to:

1. The genetic plasticity of micro-organisms and their adaptability to environmental changes.
2. The evolution of host susceptibility to infection, influenced in particular by age and immunosuppression, with the proportion of susceptible sub-populations increasing as a result of demographic change in populations. This is compounded by malnutrition, which, on a global scale, is probably the leading cause of increased host susceptibility to food-borne infections.
3. Changes in farm practices, animal husbandry, food transformation, food distribution systems, and in eating patterns or food related behaviours.
4. The dramatic increase in the international trade of foods, resulting in the spread of pathogenic micro-organisms outside a single country's borders.
5. Chemical hazards need to be evaluated and monitored with particular regard to :
6. The emergence of new issues in toxicology, such as allergic reactions, endocrine disruption, genotoxicity, immuno-toxicity.
7. The increased use of new sources of ingredients and of new components in food products.
8. The changes due to presence of food additives and of toxins.

For both microbiological and chemical hazards, technological factors may interact in two ways:

In the developed world, food processors are exploring new processing and preservation techniques. In spite of their benefits, new technologies may also bring new risks, in particular where the complex effect of new technological improvements on complex microbiological populations or on food composition have not been appropriately evaluated.

Specifically in developing countries, basic infrastructure or basic technological know-how of processes involved in pre-harvest, harvest, and post-harvest sectors may be insufficient or missing. This is a common place concern in poor countries, resulting in difficulties in securing or maintaining the safety of food products, as well as in food losses, food insecurity or restrictions to trade.

Human health

Despite the evident and complex links between health, nutrition and agriculture improving human health is not generally an explicit goal of agricultural policy. Agriculture can affect a range of health issues including under nutrition, chronic diseases, infectious diseases, food safety, environmental and occupational health. Ill health in the farming community can in turn reduce agricultural productivity and the ability to develop and deploy. Ill health can result from under nutrition, as well as over-nutrition. Despite increased global food production over recent decades, under nutrition is still a major global public health problem, causing over 15% of the global disease burden. Protein energy and micronutrient malnutrition remain challenges with high variability between and within countries. Food security can be improved through policies and programs to increase dietary diversity and through development and deployment of existing and new technologies for production, processing, preservation, and distribution of food.

Healthy food cannot be defined by nutritional quality alone. It is the end result of a food system that conserves and renews natural resources, advances social justice and animal welfare, builds community wealth, and fulfills the food and nutrition needs of all eaters now and into the future.

The scientific data supporting this environmental nutrition approach, which expands the definition of healthy food beyond measurable food components such as calories, vitamins, and fats, to include the public health impacts of social, economic, and environmental factors related to the entire food system.

Adopting this broader understanding of what is needed to make healthy food shifts our focus from personal responsibility for eating a healthy diet to our collective social responsibility for creating a healthy, sustainable food system.

We examine two important nutrition issues, obesity and meat consumption, to illustrate why the production of food is equally as important to consider in conversations about nutrition as the consumption of food.

The health care sector has the opportunity to harness its expertise and purchasing power to put an environmental nutrition approach into action and to make food a fundamental part of prevention-based health care.

An environmental nutrition approach shifts our focus from personal responsibility for eating a healthy diet to our collective social responsibility for creating a healthy, sustainable food system. The individual exhorted to eat broccoli and blueberries for cancer-fighting antioxidants under a traditional nutrition model is seen from an environmental nutrition perspective as just one tiny node in a complex food system that is shaped primarily by public policy, agribusiness practices, and cultural values. Although an individual can commit to eating a healthy diet, one person cannot control systemic material flows that govern the relationship between food, health, and the environment, such as widespread use of pesticides and toxics that trespass into our bodies, ongoing soil erosion that degrades agricultural land, and the emission of greenhouse gases from agricultural activities that contribute to climate change.

Health care institutions have an important role to play in creating a healthier food system due to their substantial foodservice budgets, their role as trusted authorities on health issues, and their mission-driven interest in preserving wellness.

Environmental nutrition, therefore, is a useful tool for critically analyzing the wide-reaching environmental, social, and health impacts of industrial agriculture. Without the comprehensive lens of environmental nutrition, crucial aspects of the interconnections between food and health fall outside of our range of vision.

Safe food and nutritious diets can no longer be the luxury of the rich, it is the right of everybody. Enhancing the safety and quality of food requires political will and investment. Societies have to decide the level of those investments according to their current situation and based on cost-benefit considerations. Providing safe and nutritious food to consumers everywhere requires a commitment to quality throughout the food chain. Food producers, handlers and marketers have the opportunity to benefit from investment and technical development in food safety and nutrient quality to meet the consumer-driven demands on the sector. The opportunity exists to reap better returns for value-added products and to reduce quantitative and qualitative losses.

Farm to the Table

Agriculture is the main crop in our country. It is the primary occupation. Many farmers work very hard to yield and improve the production. Private partners include producers and importers, processors, marketers, food services, trade organizations, professional societies and private organizations. Within the overall food production chain, the private sector has the primary role of bringing food to the tables of consumers. It should ensure that the food produced meets the food safety requirements established by public authorities while giving due consideration to consumer

concerns and expectations. To be effective in these tasks, the private sector must maintain close interaction with the public sector and with the consumers. Private partners need to be involved in the institutional debate about food safety issues. They have an essential role in bringing appropriate information to, and sharing information and data with, other partners in the food chain and with other stakeholders, in order to participate in the development of appropriate policies.

From a more technical point of view, primary producers should use good agricultural practices, understand safety issues, follow sanitary provisions and develop, in relationship with public authorities and with private partners, on-farm control programmes. Processors, marketers and distributors should recognize the need for effective control of food-borne hazards, and integrate their efforts with those of other private partners, academic research and governments to address food safety concerns. Private industry can contribute to the shaping of an effective and comprehensive food safety system. They can develop and implement new technologies, develop model partnerships, develop and maintain good practices and procedures while facilitating technology transfer, use quality assurance and control programmes expanded to include food safety provisions.

Consumers

Consumers have an important and critical role in a comprehensive food system. Consumer awareness of food safety issues, as well as knowledge of good practices to protect their food through preparation, storage and consumption, is essential. Consumers also play an important role in expressing their need to have simple, credible and reliable information related to food and nutrition that will promote nutritional wellbeing by avoiding the consequences of both under and over nutrition. They can also be powerful forces that can direct the market place to provide access and make available fresh and processed food that constitutes a healthy diet.

Conclusion

Awareness of the linkages between food, nutrition and health are crucial in enabling consumers to play their important role in ensuring appropriate food systems in both developing and developed societies. Consumer organizations play a crucial role in advocacy of food safety, quality, nutritional and related matters and assist greatly in providing education and information. Consumers waste lot of food either cooked or uncooked. They have to raise to the occasion so as to throw the food waste in a proper manner, because the garbage also causes the primary role in changing the environment thereby affecting the Ozone layer. These help in creating a green environment where people can live happily without any complaint.

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