



## A Few Words about Food and Health

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### Abstract

We cannot live without food. The body draws nutrients from the food to build cells. Food gives us the energy we need to do the activity. With food we satisfy our physical and physiological needs. In addition, food has a strong emotional effect. We don't just eat food because we are hungry. Food gives us a sense of satisfaction, comfort and happiness. In order for end users to eat healthy, food manufacturers and sellers must, among other things, meet some of the economic demands placed on them by today's market.

**Keywords:** Food; Health; Nutrition; Trade; Law

### Introduction

All the foods we eat are living matter made of cells containing enzymes, and many foods, especially those of animal origin, are inhabited by microorganisms [1]. Hence, food processing is necessary to prevent food decaying and to keep it safe for consumption. Food processing destroys the growth of microorganisms including pathogens (e.g. *Salmonella* and *Listeria*) and will inactivate autolytic enzymes and some natural toxins (e.g. trypsin inhibitors). The storage life of the food is increased, which means that it can be grown some distance from the point of consumption. This enables us to benefit from economies of scale by growing large quantities of food on the most suitable land. Not all processing involves food preservation, some also improves the appearance and flavour of foods and convenience. One of the major considerations of modern consumers is the ease and speed with which a meal can be prepared and more meals are now consumed away from the home. Food processing is essential to meet these consumer needs.

In the guessing game, "Animal, vegetable, or mineral?" nearly all foods are animal or vegetable or the two combined [2]. What we eat is other organisms, some of them—fruits and cereals—still viable. The basic material of our foods has an anatomy and a histology. It

is made of cells which contain numerous enzymes and biochemical compounds that are the same as or similar to those in the human body. Foods are also inhabited by microorganisms. These multiply after slaughter or harvesting and nearly all our basic foodstuffs deteriorate rapidly because of autolytic decay and microbial activity. Foods can become dangerous because of these unless we treat them in some way. Cereal grains are the major exception. They have a lower water content and normally keep for years when dry at ambient temperatures. The major early civilisations were built on this property, and even today the only staple foods that are kept in savings banks are the cereals. Insect activity also leads to appreciable losses of food.

Most health resources are focused on the care and treatment of individuals, but the health of a country partly determines its well-being and economic capacity [3]. Individuals may cope with modest degrees of disability, but countries may have to cope with a substantial demand for health care, which has an economic impact in terms of work capacity.

Factors such as fetal nutrition, birth weight, child growth and subsequent obesity, and disease are shaped by environmental and

material circumstances, such as poverty, that may be far beyond the individual's control. The demographic transition - from rural societies with low life expectancy at birth and families with many children to urban societies with higher life expectancy at birth and fewer children - is well known. The epidemiological transition that follows is also fairly well understood: the shift from nutrient deficiency and infectious diseases, mostly in early life, to chronic noncommunicable diseases in later life. In such situations, efforts to improve health by using health education methods alone have limited success.

All living things on this planet require nourishment to fuel and support vital operations [4]. For instance, plants get water, minerals and nitrogen from the soil and produce their own carbohydrate, protein, and fat. Meanwhile, animals consume other forms of life, such as plants and animals or their products, in order to survive. For humans, we consume animals and their products (for example, milk, eggs) and/or plants and their products (fruits, vegetables, cereal grains). Even eating some forms of microbes (or microorganisms) such as yeast and some bacteria can help us survive and promote vitality. Humans exist at the upper end of the food chain, meaning that a large variety of life-forms are food to us, but we are not regular food for other life-forms. Plants, on the other hand, maintain a position at the other end of the food chain as they are food for many life-forms, including insects, fish, and mammals.

### TRIPS

In 2001, trade ministers of the 148 member countries of the World Trade Organization (WTO) met in Doha, Qatar, to launch a new round of multilateral trade negotiations [5]. At the meeting, the ministers agreed to an unprecedented declaration on public health which clearly stated that the WTO trade rules on intellectual property (the Agreement on Trade-Related Aspects of Intellectual Property Rights, or TRIPS) should not prevent members from taking measures to protect public health. This joint declaration came after the unparalleled mobilisation of global civil society against the negative impacts of patents on access to essential drugs. It was this high-profile controversy that first placed trade policy onto the global health agenda.

The TRIPS agreement, which was agreed to by WTO member countries in 1994, drew strong criticisms as it was perceived as a legal obstacle to the production of affordable generic drugs, i.e. it placed limitations on the capacity of national government to adopt

measures to override patent protection. The HIV/AIDS epidemic in sub-Saharan Africa highlighted the risks associated with the TRIPS agreement. For instance, TRIPS stipulates that the production of generic drugs under compulsory licences should focus only on domestic needs, making it difficult for countries producing generic drugs to export them to the sub-Saharan African countries with no manufacturing capacity to produce their own drugs.

There were also concerns about the impact of high patent protection on the price of pharmaceutical drugs, and access to health-related products like vaccines and medical supplies and equipment. While there is indeed strong evidence that patent protection leads to higher drug prices, proponents of strong patent regulations argue that without sufficient patent protection, the incentive to innovate, develop and manufacture new drugs is significantly reduced.

### Food law

Globalised rules on technical barriers to trade, sanitary and phytosanitary measures and trade-related aspects of intellectual property rights all have the potential to render EU food laws contrary to international commitments [6]. Measures introduced to protect human health or the environment must be scientifically justifiable to be capable of withstanding World Trade Organization (WTO) scrutiny. This can bring EU legislators into direct conflict with consumer groups who seek to minimise the negative impacts of the ever-increasing use of technology and innovation in food production.

Animal welfare, human nutrition and human rights considerations also have an important, yet much underused, role to play in shaping EU food law. In particular, the Community legislator has tended to overlook the need to ensure that the food that is produced and consumed continues to serve its primary function of providing nutrition and sustenance. Politicians have allowed the fundamental Community principle of the free movement of goods to underlie all key harmonising provisions in this area at the expense of health and consumer protection. Emphasis on safety in the aftermath of the 'food scares' has also resulted in the quality and nutritional value of food receiving less attention in new legislative initiatives. It is here contended that the future of EU food law lies not with the preoccupation with ensuring that food is safe, or at least that the possibility of 'unsafe' food entering the chain is minimised. Instead, attention now needs to be shifted onto a group of key factors, including production efficiency, nutritional value,

quality levels, ethical considerations, consumer protection and human health protection which, when combined, should result in the creation of a more unified and simplified body of rules that leaves more autonomy with the individual Member State in deciding what the consumer should be encouraged to eat, and what the consumer should probably be protected from.

Several of the WTO Agreements can impact upon EU food law. In addition to the General Agreement on Tariffs and Trade (GATT), the most significant of these are the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs), the Agreement on Technical Barriers to Trade (TBT), the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) and the Agreement on Agriculture [6]. Essentially, where any aspect of EU food law, be it a piece of legislation, a decision of the Court of Justice or the development of a Community policy, is deemed to be contrary to an aspect of one or more of these Agreements, another WTO member can initiate the dispute resolution mechanism. Given the way in which the WTO has developed thus far, it is most likely to be the United States of America that brings such a challenge, as was the case when the EU introduced a de facto moratorium on the marketing of genetically modified food. There are two reasons for this. First, the European Union offers a lucrative marketplace for American producers, where, given the level of exposure to American popular culture, there is already a degree of familiarity with their products amongst European consumers. Second, the production and marketing of food in the United States is answerable to a very different regulatory regime than that applied in the EU. The American Food and Drug Administration (FDA) tends to be far more liberal as regards the level of evidence of safety or security required to be presented prior to granting authorisation for the marketing of a new product. As a consequence, where European Union rules subject producers to more rigorous tests, or go further still and prohibit the sale of a foodstuff for precautionary reasons, this lucrative and familiar marketplace is inaccessible to others who have not been subject to the same procedure or whose products do not satisfy the standards set in the EU. In particular, where a prohibition is introduced, recourse to the DSB of the WTO may be the only option available to those whose products can be freely marketed elsewhere within the global trading system.

In its broadest terms food law is about protecting the public. Nearly everyone in modern society relies on someone else growing or making the vast majority of the food we eat. We trust this

food will not make us sick and will be exactly as declared on the label. In food we trust [7]. This protection against harmful products in the enforcement or postmarket surveillance context is known as adulteration. The safeguard against fraudulent products, those whose labels do not accurately describe what the product contains, are known as misbranded, in the enforcement context. Prior to an enforcement action, both are considered under a broader umbrella known as the premarket approval process. The overarching aim remains the same—protect the consumer. The primary mechanism to achieve this goal is to ensure that the agencies tasked with enforcing food safety laws can inspect facilities and use enforcement tools to remove harmful or fraudulent products from the market. The enforcement tools also act as a deterrent. Deterrence and inspection together build trust and allow consumers to shop with confidence. The two also protect a brand's reputation.

### Food trade

Food has been traded for thousands of years [8]. Basic to everyone's survival, food was also one of the first items that some people were able to produce in surplus, enabling them to sell it on for other goods. There is a compelling logic for trade in food: political borders do not coincide with the land required to support each given national population. Some countries do not produce enough food to meet their needs and depend on imported food to maintain food security. Other countries produce more than they need and look to export because the domestic market is not sufficient to absorb the supply. Countries might also forgo domestic production to import food that is produced more cheaply abroad, or sell abroad rather than in domestic markets because foreigners will pay more for the production.

Trading food also makes sense because food production is precarious, dependent on the weather and slow to adjust to changes, whether in growing conditions or prevailing prices. Agricultural output depends on arable land, sufficient freshwater, the right number of frost-free days and sunlight, as well as on demand, price, storage, roads, credit and technical know-how. No matter how rich and savvy, Americans, for example, can only grow domestic bananas in Hawaii. It makes economic and environmental sense to import instead from next-door Mexico, Central America and the Caribbean.

The ever growing world population (nine billion by 2050) with its simultaneous increase in longevity, places substantial demands on agricultural production, the food industry as well as on the agri-

cultural and food trade [9]. Added to this, are the growing middle classes in many countries in the world with changing demands and consumer preferences regarding qualitative supply and high quality food. The future central task of agriculture to provide food for a growing world population in sufficient and differentiated measure will become all the more important by reason of this increased quantitative and qualitative demand for food. Here, food security and food safety are intertwined to a high degree. From a fundamental perspective, the universal human right to food norm must be referred to. This includes the basic security of human existence with food (food security) as well as guaranteeing that no health risks emanate from food, including from drinking water (food safety).

### Food safety

The concept of food safety can take many forms [10]. Perhaps the most commonly thought of notion related to unsafe food is the acute illness that follows from foodborne contamination threatening the health of all users of the product. Food might also be unsafe if it contains an undisclosed ingredient that is harmful to a portion of the population, such as a common allergen. Another type of unsafe food might occur when an ingredient is unsafe to consume over time, such as trans fat, or becomes unsafe at high levels, such as caffeine. Finally, certain production practices may result in food of questionable safety, subject to inquiry and debate by scientists, as occurred with the addition of growth hormones and antibiotics to food-animal feed.

Globally, food safety issues are of top priorities to the food industry, government food safety regulators, and consumers as a result of a significant increase in the number of foodborne disease cases and outbreaks reported worldwide in the 20<sup>th</sup> century [11]. These issues led to the proliferation of several food safety programs designed to reduce the incidence of foodborne illness. Although a number of producers and processors have implemented a variety of food safety programs, the occurrence of foodborne illness from emerging and existing pathogens remains a challenge to the food industry and food safety regulators. Food safety begins on the farm and continues through processing, transportation, and storage until the food is consumed. Food safety programs such as Good Manufacturing Practices (GMP), Sanitation, Food Quality, and Safety Tests, and Hazard Analysis Critical Control Points (HACCP) are examples of food safety programs that are commonly used to control and monitor microbial contamination of food.

The three main categories of food safety concerns in the food industry include microbiological, chemical, and physical hazards. The microbiological hazards are those involving foodborne pathogens; chemical hazards include concerns related to antibiotics, pesticides, and herbicides; and physical hazards are those related to foreign objects in foods that can result in injury or illness when consumed with foods.

A small, but vocal, minority of commentators contends that free market processes and mechanisms can, by themselves, ensure that the public is protected from food-borne hazards [12]. They argue, for example, that merchants who sell foods which are unsafe or unpleasant will readily gain an undesirable reputation, and therefore be unable to sell their wares. Unfortunately, however, the real world does not always conform to that simple model. Selling an unsafe or undesirable product does not always or necessarily have an adverse impact on a merchant's reputation. An adverse effect on consumer health may not be immediately apparent, and by the time a consumer becomes ill it may be impossible to trace the dietary components responsible. The adverse impact on a merchant's reputation is, moreover, little comfort to those people whose health suffers as a consequence of eating noxious products, especially if, for example, they succumb to fatal bacterial or chemical poisoning. In an unregulated market, it would always be possible for small producers who have justifiably gained a poor reputation to relaunch their products under a fresh brand name, thereby concealing the identity of the firm responsible. Such considerations have persuaded consumers, responsible traders and governments that a statutory regime is essential.

### Malnutrition

'Malnutrition' is a general term for a medical condition caused by an improper or insufficient diet [13]. The term usually refers to generally bad or faulty nutrition and is most often related to undernutrition. According to the World Health Organization (WHO), malnutrition is the 'cellular imbalance between supply of nutrients and energy and the body's demand for them to ensure growth, maintenance and specific functions', and is the greatest risk factor for illness and death worldwide. It can be associated with both undernutrition and overnutrition. Malnutrition and the state of deficiency or excess of energy, protein and other nutrients lead to measurable adverse effects on tissue, body function and appearance and clinical outcomes.

Anorexia, inadequate food intake or lack of food supplies and loss of appetite are probably the most common causes of malnutrition worldwide, especially in developing, but also in developed, countries. Anorexia can result from pathophysiological, psychological and general social problems. Different types of chronic and inflammatory diseases such as cystic fibrosis, chronic renal failure, stroke, Parkinson's disease, respiratory and orthopaedic problems, childhood malignancies, chronic inflammatory bowel diseases, fatigue, muscle weakness and difficulties with tasting, chewing and swallowing can lead to reduced food intake and malnutrition. Also, nausea and vomiting, which may result from certain diseases, and the use of certain drugs or specific treatments (chemotherapy, radiotherapy) may have a negative effect on appetite. Also, psychological factors such as anxiety and depression or the presence of dementia can cause malnutrition. Finally, malnutrition can have social causes, such as the institutionalisation of individuals (e.g. in hospitals, nursing homes), poverty and famine, poor food hygiene, inappropriate food supplies and the early cessation of breastfeeding.

The effects of the nutritional and health status of adults on labor productivity in developing countries are of utmost importance from a policy standpoint [14]. If, for example, adults are severely under-nourished and cannot earn an adequate living, then all household members, including children, will be at severe risk of malnutrition. Moreover, under-nourished adults have reduced immunity to infections, and may not be able to perform strenuous tasks for long periods. Even for individuals in less strenuous occupations, nutrient deficiencies and poor environmental conditions, such as lack of sanitation, can increase sicknesses, thereby leading to productivity loss.

Malnutrition handicaps people for life [15]. It can retard mental and physical development. Malnourishment also heightens vulnerability to other illnesses and almost always has serious physical and mental effects. Brain cells do not develop, bodies are stunted, blindness and diseases become rife, limiting potential and condemning the hungry to a marginal existence. Children are stunted and do not grow properly if they do not receive adequate food, in terms of both quantity and quality. A child may be receiving sufficient calories, but if he lacks micronutrients, he will suffer from stunted growth, infections and other disabilities, including impaired mental development. What the United Nations Children's Fund (UNICEF) calls 'hidden hunger' is undernourishment and/or

malnutrition between birth and the age of five, and it has disastrous effects: A child suffering from undernourishment and/or malnutrition in the first years of life will never recover. He cannot catch up later and will be disabled for life.

### Food chooses

There can be no denying that in the course of a human lifetime, the decision whether to ingest a particular food item lies ultimately with the individual (except in cases of forced or tube feeding). Infants are particularly adept at exercising the right to reject food [16]. But the power to decide what food items are made available for the selection process, and in what form, frequently lies beyond the individual. For the baby, the mother usually decides what should be offered, starting with the decision of either breast milk or formula. But her choice on behalf of the baby is usually influenced by advice from female relatives, or health professionals. In the case of the former, this permits a family tradition of infant feeding to be passed on, compatible with the beliefs of the family's ethnic group and with their religious affiliation. A nurse's or doctor's advice will normally reflect the society's prevailing scientific paradigm concerning infant nutrition, for example, that solids should not be introduced until a certain age or that certain foods should be avoided.

The growing child has little control over the household menu, though at certain times (such as illness or the celebration of milestones in development), the person responsible for food acquisition and preparation will deliberately produce an item known to be the child's favourite. In some cultures, gender and position in the family may affect what is offered to each child in both quantity and variety. Similarly, the menu selected for the household may be strongly influenced by the preferences of a senior adult member. In societies where it is traditional for women to cook for their families, the desire to please their husbands may dictate the dishes they prepare for the whole household. Finally in old age, any former control over the menu may be lost through institutionalization or displacement from the kitchen by a younger household member. Thus, for many humans, selection of food is subject to significant constraints for much of their lifetime, despite the apparent freedom of the individual to eat as they choose.

This approach to diet and health is based on two well-documented principles of evolutionary biology [17]. One is that humans, as is the case with other animal species, are genetically best suited to the types of food that were available in the ecological niche where

they developed. The foodstuffs in our case were mainly meat, fish, shellfish, vegetables, fruits, nuts, insects and roots, in highly variable proportions and with great variety of plant foods. Conversely, the intake of dairy products, grains, rice, edible fats and refined sugar was negligible, even though these foods now make up the majority of the calories in a typical Western diet. Choosing foods in the first category appears to be the biologically correct way to maintain good health.

The other principle is that all species, even the plants and animals we consider food, have developed efficient systems to support the spread of their genes over the course of evolution. This includes toxins and other bioactive substances which are part of a plant's defence systems. Animals that we want to eat have been able to flee or counter-attack, and therefore they do not have the same need to poison their attackers as plants do. The seeds in fruits, on the other hand, increase their chances of germinating if the fruit is eaten; however, this assumes that the seed passes intact through the intestines. In order to reduce the intake of phytochemicals, our staple foods should preferably not be seeds, grains and beans, and should vary between different types of vegetables and root vegetables.

### Health services

Trade in health services is associated with three public health concerns [5]. The first is 'health tourism' which takes place when a patient travels abroad to receive health care. Health tourism has increased significantly since the 1990s, especially to Asia. It includes American patients without health insurance travelling to India to receive care they cannot afford at home, Japanese patients travelling to Thailand for annual health examinations and high-income patients coming from low-income countries where sophisticated health services are not available. The patterns of such trade are still evolving, but some policy implications have emerged. For instance, in Thailand, health tourism has drawn health professionals away from rural and public establishments towards large private urban hospitals which cater to foreign patients. To deal with the problem, the Thai government adopted mitigating measures to limit the negative impacts of such an internal 'brain drain'. The second type of trade in health services is the temporary movement of health professionals abroad to provide care. This phenomenon is distinct from the permanent migration of health professionals, but nevertheless raises the concern that greater temporary mobil-

ity of health professionals could worsen the existing 'brain drain' of physicians and nurses from developing countries (especially sub-Saharan Africa) to developed nations. A third type of trade in health services is when a foreign investor establishes a commercial establishment, such as a clinic or a hospital, to offer health services or health insurance services. The policy implications of foreign investment in health care services are similar to some of the concerns associated with private financing and delivery of health services (such as increased inequity in access to services). For instance, research on foreign investment in health establishments in China highlights how the coastal regions, already better served in terms of availability of facilities and services, have received all of the foreign investment in the establishment of specialised clinics.

Medical tourism is a concept that encompasses travel primarily motivated by the use of medical services (a greater or lesser degree of complexity) - dental, surgical, rehabilitation etc [18]. In recent decades, the emergence of a greater number of people motivated by the use of medical services began to travel beyond the borders of their own state, meta phenomenon has become a focus of media interest and has sparked a stronger expansion of intermediaries in the provision of relevant services (agencies), as well as the expansion of commercial medical service providers that are more or less focused on users from abroad. Combination of different factors - high cost of health care outside the public health system in developed countries of the West, lack of access to certain medical services outside the public health system and/or obligatory/commercial insurance systems, ease and lower prices for international travel, faster development of medical technology and standards care in some countries, have led to an increase in the popularity of such travels.

### Conclusion

A healthy or proper diet is one that provides the body with an optimal intake of calories, vitamins, minerals and fluid, and an optimal ratio of proteins and carbohydrates to meet the body's needs for building, energy and protective substances. Medicine and Nutrition are increasingly revealing the great impact of a proper lifestyle and diet on the overall health of the population. Applying tips on a healthy, balanced diet can improve a patient's health, and a healthy lifestyle and diet can be a precondition for combating many chronic and degenerative diseases.

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