

HISTORY OF FOOD QUALITY STANDARDS

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Summary

Food laws can be traced back to times of the earliest societies. Ancient food regulations are referred to in Egyptian, Chinese, Hindu, Greek, and Roman literature. In the Middle Ages, the trade guilds exerted a powerful influence on the regulation of food trade and the prevention of falsification of food products. Later, the initiative in food control was taken on by the state, municipal, or other local authorities. The big changes in food production and distribution because of the industrialization and rapid growth of urban population, together with public health problems, resulted in the production of many food laws in industrialized nations during the latter part of the nineteenth century. Following examples of the introduction of early food control measures by developed nations, some of the larger, more established, nonindustrialized societies also took steps to set up measures of control. During the latter nineteenth and early twentieth centuries, a general consolidation of earlier rules took place, but more important, this period saw the creation of a separate branch of law relating to foods. Most of the national standards organizations were established in Europe in the 1920s. The need for improved health and food control and the rapidly expanding international food trade stimulated cooperation on an international level. After World War II, activity in international standardization started intensively in the framework of ISO. A Joint FAO/WHO Food Standards Program was established in 1962, and a joint subsidiary body was created: the

Codex Alimentarius Commission (CAC). The trend in the field of food regulation is characterized by growing efforts for harmonization at an international level.

1. Introduction

According to “Glossary of terms”—published in 1976 by FAO/WHO—food standards may be defined as a body of rules or legislation defining certain criteria, such as composition, appearance, freshness, source, sanitation, maximum bacterial count, purity, and maximum concentration of additives—which food must fulfill to be suitable for distribution or sale.

In public opinion, the word standardization is often connected to the trend of unification with an activity by which some people want to impose their ideas on others. However, this term covers a much wider and more colorful range of human activity.

As a matter of fact, standardization is the result of spontaneous development. Looking at uniformity, nature itself does a lot of “standardization” by offering a number of repetitions: days after days, seasons after seasons, and years after years, which are nearly equally short or long (but never exactly of the same length). They also provide us with an environment in which we see many different animals and plants, and all of them seem to belong to species or families of similar basic characteristics (but in which each individual has its own special features).

In the history of human development, mankind found similar solutions for recurring problems. When humans wanted to communicate with each other; they developed gesticulation, and produced sounds that could express meaning, such as fear, hunger, or pain. It took quite a long time before they could attribute a permanent meaning to a specific gesture or sound. A sound used repeatedly to indicate the same thing (e.g., danger), could be considered an intuitive form of spontaneous standardization.

This is the way speech developed, and the same tendency can be observed in the field of ceremonies, in the establishment of ethical rules, and in the organization of the life of tribes, which gave birth to juridical rules.

The transition from the spontaneous stage to conscious unification has been taking place over a long period. Along the way, measurement units were defined based on the human body; some of which are still used in various countries (e.g., foot, inch as measures of length, and so on).

Uniform and accurate weights and measures are essential to trade with any goods. About 2500 years ago, the prophet Amos denounced those who used a large weight for silver and a small container to measure the grain given in exchange for the silver.

Standardization in the field of food production and trade is part of the effort to protect the consumer.

The practice of food adulteration and the development of control services have drawn attention to the possibility of food control since the beginning of modern society. A review of past experiences, and an understanding of the lessons learned from history, will help to indicate how and why food laws have evolved and how best to deal with

emerging situations. A study of this type also indicates the spectacular changes and advances made in the fields of agriculture, food science, and technology, especially over the twentieth century, which are now helping to provide food for a rapidly expanding world population.

Food laws were among the earliest of enactments known to man. Governments over many centuries have endeavored to provide for the safety and wholesomeness of man's food by legal provisions and appropriate punitive action. Over the years also, rude forms of fraud, such as adding worthless substances to food or extracting valuable constituents from it, have been followed by sophisticated methods of adulteration more difficult to detect. The birth of modern chemistry in the early nineteenth century made possible the production of materials possessing properties similar to normal foods which, when fraudulently used, did not readily attract the attention of the unsuspecting purchaser. Later, better analytical methods were used in food control work to detect adulterants. When scientists demonstrated that some adulterants were dangerous to health, the aroused public demanded laws that would both protect their health and prevent fraud.

"Food Laws" in one form or another, such as religious tenets or prohibitions, were inherent in all ancient civilizations and have come down to us from early times. It was not until the late nineteenth and early twentieth centuries—with the urbanization of societies and the depopulation of rural areas—that food laws, as understood today, were prepared. This process was hastened by pressure that developed as the public rebelled against the generally unhygienic conditions of the period.

Since the end of World War II, there have been major changes in the food industry, and this development continues today; at the same time, our knowledge of the risks, actual and potential, has considerably increased. Reorientation and further consolidation of food laws have therefore become necessary to protect the health of the consumer from the many new risks to which he has become exposed and over which he has little personal control. Some of these new dangers include:

Chemical hazards:

- (a) Food additives (direct and indirect)
- (b) Pesticides and herbicides
- (c) Veterinary drugs
- (d) Radiological hazards
- (e) Toxins of natural origin
- (f) Other chemical contaminants

Biological hazards:

- (a) Increased hazards from microbiological agents
- (b) Growing of and use of genetically modified organisms
- (c) Centralized large-scale production of food
- (d) Expanded food trade
- (e) Increased tourism

As the production of food stepped out from family homes and restaurants, and more and more became a new sector of the industry, many other aspects of foods came to public attention. Food producers demanded generally accepted technical descriptions of the important properties of their raw materials, intermediate, and final products. They wanted to receive guidance related to the storage conditions and as adequate methods for the prediction of the acceptance of their products. These industrial demands have led to the development of standardization, first at the national level, later at regional and international levels.

2. Early History

Consumer protection, in the field of adulteration and falsification of food, represents one of the earliest forms of government regulation of commercial enterprises. Mosaic and Egyptian laws included provisions to prevent the contamination of meat. In excess of 2000 years ago, India had regulations prohibiting the adulteration of grains and edible fats.

The Laws of Moses contain decrees on food that are similar to certain aspects of modern food laws. Books of the Old Testament prohibited the consumption of meat from animals that died from other than slaughter. They also regulated weights and measures in foods and other commodities. Other ancient food regulations are referred to in Chinese, Hindu, Greek, and Roman literature. In early records, classical writers also referred to the control of beer and inspection of wines in Athens, “to ensure purity and soundness of these products.” Rome provided for state control over food supplies and, according to records available, protected consumers against bad quality and fraud. This form of food control apparently endured in Rome until the end of the seventh century.

Cato in his treatise *On Agriculture* included a method “to determine whether wine had been watered.”

Under Roman civil law, the rules concerning the sale of food were as complicated and detailed as modern legislation. Documentation relating to the first century AD describes the falsification of olive oil by a product made from wood, leaves, and berries of trees, and the falsification of wine by a substance made from a variety of plants. Probably this is the origin of the term “made wine,” which is used in the common nomenclature that classifies products for customs purposes.

Arab scientists, such as the physicist and chemist Al Chazini, paid attention to the control of commodities, including food. He constructed a high-sensitivity balance for measuring purposes.

Early food laws were designed to protect purchasers from fraud; this was the predominant legal concern. It was fortunate, therefore, that health protection happened, in many instances, to be almost synonymous with protection against fraud. Any action taken against offenders, however, was based specifically on fraudulent transactions; there was no stated intention to protect public health.

Although most traders prefer to deal honestly and fairly, history has shown the need for laws to protect purchasers and honest traders against those who refuse to adhere to accepted codes of good practice. It has been found, as with most other commodities, that when a food was scarce and demand for it great, fraudulent practices were prevalent. Although bread, fish, milk, wines, beer, and some other foods were known to have been adulterated, information is also available on other foods that were extended with cheaper or less nutritive substances.

3. The Middle Ages

In the Middle Ages, some European communities formed trade guilds, which exerted a powerful influence on the regulation of commerce. These were groups of tradesmen of particular specialties whose purpose was to provide control and general supervision over the honesty and integrity of their members and the quality of their products. Trade guilds strengthened the position of honest butchers, fishmongers, and bakers, and during the thirteenth and fourteenth centuries, regulations were drafted to prevent the adulteration of foodstuffs. Bread was among the items for which detailed manufacturing procedures were stipulated. An example of early Anglo-Saxon law on this subject is the "Assize of Bread," promulgated in England during the thirteenth century, under which "bakers producing badly made bread, or giving short measures" were heavily penalized. During the Middle Ages, pepper and spices were adulterated with ground nutshells, local seeds, and olive pits. Bread was frequently adulterated for financial gain, common adulterants being mashed boiled potatoes, chalk, and alum. In 1419 a proclamation was issued prohibiting the adulteration of wine or the mixing of wine from one geographical area with wine from another geographical area.

In 1649 a Commonwealth statute was enacted to regulate the quality of butter. At that time whey butter was being mixed with cream butter. Around the same time, provisions designed to prevent fraud and the evasion of customs and excise duties were introduced into English law.

In France the most interesting and complete economic document of the Middle Ages available on the subject is the *Livre des M^{ét}iers*, which, in the thirteenth century, outlined a code of the comparative practices of the trade guilds of Paris. In this work, all practical provisions were made for protection of the consumers' material interests and health, and for ensuring the good reputation of the trade guilds, which were similar to those referred to in England of the same period. Reference was made in this work to the facts that bakers, innkeepers, brewers, butchers, cooks, and retail dealers of fruits and vegetables were subject to specific manufacturing and trade regulations. "Everything that may be harmful to the public . . . all that may cause deception and falsification . . . especially to those ignorant in the matter" must be prevented or suppressed.

In Hungary, the first collection of regulations concerning prohibition of production and trade of adulterated foods was published in 1431. In addition, individual trade guilds had specific regulations. It was prescribed that any slaughterhouse must be located near a stream, that no diseased cattle, swine, or sheep should be slaughtered and its meat held, sold, or offered for human food.

In France penalties imposed for violations included fines, confiscation, expulsion from the Guild, or corporal punishments which, under Louis XI in 1481, were especially harsh: pillorying of a vendor of rotten eggs at whose head the eggs were then thrown; exposure “before a fine large fire” of a seller of butter “containing turnips, stones and other things,” with the butter placed upon his head until it melted; condemnation to consume watered wine or watered milk. “Any man who sells watered milk shall have a funnel placed in his throat and the said watered milk poured down until a doctor or a barber declares that the man cannot swallow any more without danger.”

An interesting test of milk authentication was described by Domenico Romoli in his *La Singolar Dottrina* in 1560. A droplet of milk is placed on a thumbnail. If a compact, sharp form is observed, the milk is good for drinking. If the droplets spread and become flat, the milk is spoiled and dangerous.

For five centuries, the corporations in France continued to expand their food control rules, improving the specific points to be observed and tightening their professional discipline, but the Revolution of 1789 in France swept away the guild masterships and hierarchies, and freedom of industry and trade was proclaimed.

By the seventeenth and eighteenth centuries, chemistry was being used as an analytical tool in the fight against food adulteration. Robert Boyle, using the principles of specific gravity, established the foundation for the scientific detection of the adulteration of food.

Not a lot has changed, just the degree and level of sophistication of fraud, and the analytical techniques used to detect it.

In many countries, the initiative in food control was taken by state, municipal, or other local authorities. In The Netherlands, for example, the Municipality of Amsterdam in 1694 prohibited the addition of annatto, or other products, to butter to prevent very pale, yellow, stable butter being sold as “May Butter,” which was a deeper yellow and in much greater demand. In Germany, apart from the appointment of wine inspectors in 1488 in Schwaben and in Alsace, no organized food inspection system was started until the first Food Act in 1879 was passed.

Throughout this time, both crude and more sophisticated adulteration of foodstuffs were not only practiced, but also were expected and taken for granted. For example, in England, the Grocers’ Company—an Association for the maintenance of the level of quality and fair dealings—appointed men whose principal duty was to inspect parcels of spices offered for sale, and to remove the more obvious impurities that could be readily identified (stones, worthless dust, and so on).

4. Industrial Revolution in the Nineteenth Century

Although there were some sporadic standardization activities in ancient cultures and during the Middle Ages, standardization developed in the second half of the nineteenth century. That was the period when industry reached a state of development where some unification was indispensable for large projects such as railways. In this time initiatives

were made to find some uniform measures for length and weight, but the meter and kilogram were not accepted as those standards until 1872.

The period beginning with the Industrial Revolution was a time of tremendous expansion in many fields, which had a particular bearing on food production, food regulations, and food control services. Changes from a rural to an urbanized society, and from a domestic to a factory production system, with concentrations of populations, placed a strain on food production and distribution. The period created many public health problems, particularly in the industrialized centers, which were ill prepared to accommodate the masses that flocked to them. There was much poverty, and the uncontrolled development of industrial towns led to appalling conditions much like those which can still be seen in urban areas in some parts of the world. Calls for reform and improvements in matters relating to public health control were frequent and strong, and were closely followed by, or coupled with, demands for similar controls over scarce and essential food supplies within the crowded and unhygienic industrial centers. In England in 1820, Friederich Accum's *A Treatise on Adulteration of Foods and Culinary Poisons* highlighted the fraudulent practices that endangered public health. Unfortunately, at that time, the knowledge and understanding of hygiene and the dangers of food adulteration was so low and limited that this work was not considered. Many earlier papers that tried to draw attention to the adulteration of some foodstuffs had also been disregarded.

During the nineteenth century, however, legislation and other means to control the composition of various foods did appear. In 1858 a municipal service was set up in Amsterdam for the control of foodstuffs and beverages. This was followed in England by the enactment of the first comprehensive modern food law in the world. This was an Act of 1860 for "Preventing the Adulteration of Food and Drink." In addition to its being the first such act, it provided for a scientific approach to food problems by the appointment of an analyst whose sole duty, in terms of the Act, was "to examine the purity of articles of food and drink."

In Budapest, Hungary, a municipal service was set up for control of drinking water in 1867. Some years later an institute for control of foods was founded.

An important change brought about by the Industrial Revolution was that many people who became town dwellers could no longer produce their own food and began to rely exclusively on food produced and sold by others. The food shortage, and the great demand for food in these urban areas, created fertile ground on which adulteration could, and did, flourish. As food problems became more involved and specialized, laws enacted for consumer protection required continual updating to keep pace with changing needs. This situation was responsible for the production of many food laws in industrialized nations during the latter part of the nineteenth century. Simultaneously, the development of laws in relation to food control became complex and piecemeal. Legal provisions were therefore difficult to follow, to locate, and often difficult to apply because of this dispersion, particularly if enforcement responsibility was in the hands of different agencies.

Despite positive progress with the production of laws following this period, suitable backup services, so essential for effective control, failed to keep pace. Many laws appearing shortly after this time continued to be primarily directed toward the prevention of fraud and ensurance of value for money, although consumer health also benefited indirectly from this approach. In 1810 in France the following punishable acts were included in the Penal Code:

- knowingly selling any commodity, the nature of which is not in accordance with that declared (Article 432)
- selling any drink made harmful by adulteration (Article 318)

These provisions were later revised by laws of 1851 and 1855. Similar provisions were made in the Penal Code in The Netherlands when, in 1881, the following acts were made punishable offenses. Whosoever knowingly sells:

- foodstuffs injurious to health and life and conceals this danger; or
- foodstuffs and beverages that are adulterated and conceals this fact

These provisions were difficult to apply since it was often impossible to prove that the offences were “knowingly committed.” The English Act of 1860, which was voluntary and did not work, was replaced by a new Act in 1875, which was mandatory and placed absolute liability on the food traders covered by the Act. Germany, in addition to its Food Act of 1879, created Food Inspection Bureaus, the first of which was established in 1884. In many of these laws, provision was made for the appointment of analytical chemists to determine with accuracy the extent of adulterations. This was another important advance in the continuing war against adulteration.

During this period, similar types of laws appeared in Belgium, Italy, Austria, Hungary, and the Scandinavian countries. This was also a period of the foundation of institutions serving food inspection and food quality control. To give an idea of the volume of activity of such institutions, it may be mentioned that, according to a report from the Food and Drug Inspection of the State Board of Health of Massachusetts, since the passage of the law in 1882 until 1907, more than 176 000 food samples were controlled, and more than 11 000 were found to be adulterated.

Although the main food control activity at this time was in the industrialized nations of Western Europe, many other progressive countries also enacted food laws. Apart from European countries, laws were produced in Australia, Canada, the US, and elsewhere. Australia did not enact a national food law: this was a function of each state and has remained so even today.

The second half of the nineteenth century produced clear recognition of the importance of food control services, and nations legislated accordingly. The dangers of food adulteration were accepted, and these enactments formed the basis for more modern laws.

A major issue of the times was the recognition of the need and value of the food analyst. With a food law and a public analyst, two main requirements in any food control service

became available. The third essential for a comprehensive service was still missing—unbiased inspection and sampling procedures.

In contrast to the steady development of food control and general economic prosperity in industrialized countries—particularly since the Industrial Revolution—the situation in many of the developing nations remained relatively stagnant. Food control was unknown in most areas, except possibly in some larger nations, and there was little evidence of social or economic development. First, for historical reasons, nations did not benefit directly from the Industrial Revolution. In some ways this could be looked upon as beneficial for the local consumer, because he was not affected by the monetary economy and the general socioeconomic structure remained static. A subsistence economy remained in force, as it had done for many centuries, and a measure of consumer protection arose from the fact that the consumer would either produce his own food, or barter within the village where he lived and worked. Second, there were no food processing plants and no modern techniques of intensive agricultural production or animal husbandry.

Although many nations were not directly affected by the Industrial Revolution, there were side effects on some. The industrial nations, finding that farm labor had moved to the more profitable urban areas—often resulting in a reduction of essential food supplies at a time of population increase—turned to overseas markets to make good the shortfall. Many nonindustrialized nations found ready markets and increased potential for export in the production of the particular foods for which they were climatically suited. In concentrating on these exports, the national food economy was neither sufficiently diversified nor balanced to meet local, national needs. The expansion of export crops continued alongside the more primitive barter systems where local people continued to work smallholdings for their immediate needs or for local barter. At the same time, a situation arose where the developed and the nonindustrialized societies became dependent on each other in the production and purchase of various foods.

Following examples of the introduction of early food control measures by developed nations, some of the larger or more established nonindustrialized societies themselves took steps to set up measures of control. For example, in India, the influence of English thought could be seen, where, as early as 1860, the adulteration of foodstuffs was prohibited under the Penal Code, and later under the provisions of some municipal acts.

5. The Twentieth Century

Most national standards organizations were established in Europe in the 1920s, usually as voluntary associations of engineers. Some work had to be started immediately at the international level, for example, in the telecommunications field because of the need for telegraph networks. The International Telegraph Convention was signed in 1865, and the International Telegraph Union (ITU) was set up. The other field where standardization started at the international level at an early stage was electricity. Electricity represents an inherent danger, a danger that remains hidden and requires safety rules. Another reason for standardization was that electrical appliances can only work if there is an electric net in the country, with specified voltage characteristics. These are the reasons the International Electrotechnical Commission (IEC) was

established in 1906. The International Organization for Standardization (ISO), which deals with all other issues except telecommunication and electricity, was established in 1946. Its predecessor, the ISA (International Federation of the National Standardizing Associations), was founded much earlier, but its work could not develop because of the World Wars I and II. The trio of ISO, IEC, and ITU are still the most important international organizations that develop and issue standards and recommendations as one of their main activities.

There are nearly 30 or so international standards-developing bodies outside the ISO/IEC/ITU system. Each of these bodies works in a specific area, usually with a UN mandate. The Codex Alimentarius Commission (CAC) is such a standardization body in the field of agricultural and food products. ISO and IEC together produce about 85% of all International Standards, and the other specialized bodies account for the rest.

The twentieth century saw remarkable advances in all areas of food technology. These changes have in turn required greater flexibility in legal controls to adequately protect the consumer from newly emerging hazards, and to assist the food trade in its development. Too rigid a law can stifle enterprise. Many developed nations, and some now emerging, have either completely reviewed and updated their laws or provided new laws to meet the new situations. Some examples of these are Sweden, the Federal Republic of Germany, Kenya, and Zambia—there are others. It should be noted that the main purpose behind the Swedish review was to reorganize the all-important administrative arrangements and, from January 1972 on, the National Food Administration became the main supervising authority for foodstuffs in Sweden, becoming responsible for some duties previously carried out by other ministries and agencies.

Modern food laws must be more precise in their application, more specific and complete in content, and take account of situations beyond national borders. Protection of the consumer has been extended to the control of false descriptions of products, nutritional declarations, and misleading claims in labeling and advertising. Trading partners now require a working knowledge of each other's food laws. It is sad to see that, even today, some countries have either unsatisfactory food laws, no food laws at all, or laws which for one reason or another they do not or cannot apply. Where national enactments are available, it is interesting to note that in their development they have followed reasonably similar courses that, despite individual progress over many years, have emerged with differences, but also with broad similarities and closely related timing.

During the latter nineteenth and early twentieth centuries, a general consolidation of earlier rules took place, but more important, this period saw the creation of a separate branch of law relating to foods. This period is one of large change also taking place in many countries outside of Europe and North America.

Although in 1997 in India less than 2% of agricultural resources were processed, this rate continues to grow. Many Indian women are joining the workforce, and consequently have less time to cook for the family, so they are increasingly turning to semiprocessed and ready-to-eat foods. This sector is growing at a rate of 20% annually.

Consequently, similar situations will arise concerning food quality, food control, and standardization as exist in industrialized countries.

In India, as early as 1919, when the portfolio of health was transferred to the provincial governments, most of the provincial authorities made special provisions in municipal acts for the prevention of food adulterations. There was, however, little uniformity either in the field of standards or in the mode of enforcement. To reconcile the divergent laws of the various provinces and to fix uniform standards of purity of food articles, the Department of Health of the Government of India in 1937 set up a Central Advisory Board of Health. The Board appointed a Committee to go into the question of food adulteration in the country, with particular reference to the varying food standards and legislations then in force. This Committee was the Food Adulteration Committee. In pursuance of the recommendations made by this Committee, a Central Committee for Food Standards was formed in 1941, under the aegis of the Central Ministry of Health. This Committee functioned as an advisory body along the lines of the Society of Public Analysts in the UK. After India's independence in 1947, more serious thought was given to the problem of food adulteration. It was soon realized that provincial food acts were not only outdated for India's purpose, but they also hampered trade and industry. To ensure the purity of articles of food sold throughout the country, the central government enacted the Prevention of Food Adulteration Act of 1954. This Act, with its later amendment, is still in force.

In the Far East, food control was slow to appear, and it was not until the 1940s or as late as the 1960s that measures were introduced. Japan, with its rapid industrial development, was one of the exceptions. Malaysia's first food laws appeared in 1952. Thailand's current Food Industry Control Act of 1964 replaced earlier acts of 1941 and 1959, and both The Philippines and Indonesia had no food laws, as such, until the 1960s.

Iran had started food inspection in 1940. Powers for this were embodied in the Epidemic Disease Act, and analysis of products was carried out in the laboratory of the Teheran Municipality. The food law of Iran was passed in 1965, and is supported by laboratories and a General Department of Foods, Beverages, Cosmetics, and Sanitary Commodities. In Iraq, food laws were available in 1930, with sampling conducted by officials of the Ministry of Health; there is also a separate standards organization in Iraq.

In Latin America in the last decades of the nineteenth century and the first years of the twentieth century, agricultural production (cattle, meat, bananas, and coffee) increased significantly. When the worldwide depression between 1930 and 1940 diminished the demand for such exports, some of the more advanced countries there began industrialization. The period between the World Wars I and II was also marked by demands for social legislation. Many Latin American countries enacted food laws during that period, although Mexico had some food control provisions as early as 1891. In two of the four nations with a federal system—Argentina and Brazil—food laws were enacted by state or provincial governments, as in Australia. Because the differences in laws of the states often hampered trade within these nations, Argentina and Brazil enacted national food laws. Although the legal systems of most Latin

American nations are based upon those of Spain and Portugal, significant differences have developed in their food laws. Efforts are now being made to harmonize these differences.

With a few prominent exceptions, such as Argentina and Brazil, Latin American legal provisions concerning food hygiene are generally embodied in Sanitary Codes, which deal with most aspects of human and animal health; these are administered by the Ministry of Health. Often, however, authority to elaborate food standards is delegated to a separate agency that is responsible for developing standards for many things other than foods.

Food laws in Africa were of little significance until the second half of the twentieth century. Independent states that started to emerge since the late 1950s were influenced in many matters, including food control services, by the European countries with which they had been closely associated. French territories, for example, had developed French food enactments, British territories followed British procedures, and so on. Food legislation, where it existed at all, was often inherited in total by the newly independent states, and required major adjustments for situations quite different from those for which the enactments had originally been designed. Local efforts to update and adjust the many variations and discrepancies in previously existing legislation have led eventually to the decision by some countries that a completely new food law was the only way in which the local situation could be adequately dealt with. The legislation available to most countries at the time of independence was overtaken and swiftly outdated by the tremendous advances made in the food industry after independence.

Developing countries have many pressing problems, not the least of which is a great lack of skilled or trained personnel. There is not the local staff available to draw up food laws suited to the nation's particular circumstances, or the scientific or technical staff necessary for food analysis, sampling, and efficient inspection. There is also a shortage of materials and equipment, and many other problems connected with the inauguration and operation of an effective food control system.

6. The International Situation and Perspectives

As mentioned earlier, the Industrial Revolution created many public health problems, which were partly connected with the low level of hygiene and control in food production and trade. Realizing the seriousness of the deteriorating situation, several international congresses on public health, hygiene, medicine, pharmacology, and chemistry were held, notably in 1879 in Amsterdam, in 1884 at The Hague, in 1885 in Brussels, in 1887 and 1891 in Vienna, and in 1903 in Berlin. It was in Vienna in 1887 that the congress on public health appointed the members of an international commission who were also responsible for the "International Review on Adulteration and Analysis of Foodstuffs," which was published in the years 1887–1916. The need for international food laws was relatively unimportant until about the time of the Industrial Revolution, when, as already noted, large concentrations of people left rural areas to settle in rapidly expanding centers. The urgent need for improved public health and food control became more apparent. However, efforts made at the international level during the early part of the twentieth century (when the international food trade was rapidly

expanding) to stimulate international cooperation proved fruitless. The tremendous technological advances following World War II further stimulated world food trade and created a demand that the situation be reassessed. Groups of nations once again considered international problems of food additives and pesticide tolerances, but these discussions, which provided a valuable springboard for further talks, failed to produce positive international or regional harmonization of food standards.

With the increasing volume of trade among countries, difficulties arising from the independent establishment of laws and standards in different countries are becoming evident. Variations in the procedures of national food control systems involving monitoring and sampling, detection, and analytical methods, application of standards and food safety requirements can give rise to trade restrictions. On some occasions countries have developed standards that were not based on science and in effect were nothing more than nontariff barriers to trade. It has become obvious that there is a need to harmonize food requirements globally, and there is a growing need for international guidelines and rules. These guidelines and rules are now provided within the framework of the World Trade Organization (WTO), established in 1995. The main instruments to assist countries in the harmonization of food standards are the ISO and the CAC. As mentioned earlier, the ISO was established in 1947 and its activity in the field of harmonization of food standards started in the same year. Member governments of FAO and WHO following procedures dating from 1958, established a Joint FAO/WHO Food Standards Program in 1962 and created a joint subsidiary body, the CAC.

The principal difference in the approach of the task between the two organizations is that CAC is a governmental organization and ISO is a nongovernmental organization. Therefore, CAC primarily deals with regulation and ISO with standardization. The ISO Directives distinguish between these two activities as follows, "In general, studies of commercial categories or grades and criteria of fitness for use are standardization aspects, whereas the regulatory aspect covers the requirements from the point of view of safety, wholesomeness, and public health in general, below which a product should not be allowed to be sold on the market." Elsewhere find more details concerning activities of ISO and CAC (see *International System of Food Quality Standards*).

The Uruguay Round trade negotiations in 1994 led to two binding agreements relevant to food regulations: the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) and the Agreement on Technical Barriers to Trade (TBT Agreement). The SPS and TBT agreements set important parameters governing the adoption and implementation of food quality and safety measures. The SPS agreement calls for a program of harmonization of national requirements based on international standards.

Glossary

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| Adulteration of food: | The addition of substances of a lower value and/or quantity above amounts required for normal or accepted processing or product formulation, and without informing the consumer. |
| Authenticity of food: | type/variety, protected geographical origin, species, year of production, method of production, declared content of a |

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| | specific ingredient. |
| Chemical contaminants: | Any chemical substance not intentionally added to food which is present in food as a result of production, processing, or environmental contamination. |
| Codex Alimentarius (CA): | Codex Alimentarius is a collection of internationally adopted food standards. |
| Codex Alimentarius Commission (CAC): | The CAC is a subsidiary body of the Joint FAO/WHO Food Standard Program of the UN, the purpose of which is “promoting coordination of all food standards work undertaken by international governmental and nongovernmental organizations” (according to statutes of the CAC). |
| Falsification of food products: | Falsification is defined as willful misstatement or misrepresentation, the act of falsification; making a claim that is not true. |
| FAO: | The Food and Agriculture Organization of the UN. |
| Food additive: | Any substance not normally consumed as food by itself and not normally used as a typical ingredient of the food, whether or not it has nutritive value, the intentional addition of which to food—for a technological (including organoleptic) purpose in the manufacture, processing, packaging, and storage—results in it becoming a component affecting the characteristic of such food. |
| Food hygiene: | The conditions and measures necessary for the production, processing, storage, and distribution of food designed to ensure a safe, sound, wholesome product fit for human consumption. |
| Food quality control: | A programmed and coordinated activity of authentic organizations to maintain and improve the quality of food products. |
| Food law: | The body of law of a country that governs the production, handling, and marketing of foods. |
| Food safety: | The absence of any biological, chemical, or other natural or synthetic toxic component in a food product which may be a risk for human health. |
| Food standards: | A body of rules or legislation defining certain criteria—such as composition, appearance, freshness, source, sanitation, maximal bacterial count, purity, maximum concentration of additives, and so on—which food must fulfill to be suitable for distribution or for sale. |
| GMO: | A genetically modified organism a plant, animal, or microorganism modified using recombinant DNA technology. |
| ISO: | International Standardization Organization. |
| Pesticide: | This term includes any substance intended to prevent, destroy, attract, repel, or control any pest, including unwanted species of plants and animals during the production, storage, transport, and distribution of food, agricultural commodities, or animal feeds for the control of ectoparasites. |
| Pesticide residue: | Any specified substance in food or agricultural commodities resulting from use of pesticides. |

- Veterinary drug:** Any substance applied or administered to food-producing animals (cattle, dairy cows, swine, poultry, fish, bees, and so on) that is used for prophylactic or diagnostic purposes, or for modification of physiological functions or behavior.
- WTO:** World Trade Organization.

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Biographical Sketches

Radomir Lásztity, D.Sc., Professor of the Department of Biochemistry and Food Technology at Budapest University of Technology and Economics, was born in 1929 in Deszk, Hungary, and finished his studies in 1951 at the Faculty of Chemical Engineering of the Technical University of Budapest. Dr. Lásztity received his M.Sc. degree in Chemical Engineering in 1951 and his D.Sc. degree in Chemical Science in 1968.

Dr. Lásztity is honorary president of ICC (International Association for Cereal Science and Technology). He was acting chairman of the Codex Committee on Methods of Analysis and Sampling of the FAO/WHO Food Standard Program in the period 1975 to 1988. Dr. Lásztity is a member of the Food Division of the Federation of European Chemical Societies and a member of the editorial boards of several international scientific journals. He was acting Vice-Rector of the Technical University from 1970 to 1976.

Among other awards, he has received the Bailey and Schweitzer Medal of the ICC, the State Prize of the Hungarian Republic, and the Golden Medal of the Czech Academy of Sciences.

Dr. Lásztity's main research activities are chemistry and biochemistry of food proteins, food analysis, and food control. The results of his research work were published in more than 700 papers in international and Hungarian journals. He is the author of more than 20 books and textbooks (among them: *Chemistry of Cereal Proteins*, First and Second Editions in 1984 and 1996, respectively; *Amino Acid Composition and Biological Value of Cereal Proteins*, 1985; *Use of Yeast Biomass in Food Production*, 1991; *Gluten Proteins*, 1987; and *Cereal Chemistry*, 1999).

Dr. Márta Petró-Turza, a chemical engineer, graduated in 1996 and received her doctor's degree in 1975 at the Budapest Technical University, Hungary. Between 1966 and 1990 she has worked as a researcher for the Central Food Research Institute, Budapest. In the last 13 years of this period, she was the head of the Analytical Chemistry Division of the Institute. Her main research areas were flavor research and the detection of adulteration of fruit juices. Between 1990 and 1995 she was the director of quality assurance of the Canning Research Institute in Budapest.

Since 1996 she has worked for the Hungarian Standards Institution as secretary of the ISO Technical Committee, TC 34, "Food Products," and its Subcommittee, SC 4, "Cereals and Pulses."

Tamas Földesi was born in 1920 in Budapest, Hungary. An electrical engineer, he graduated in 1942 at the Technical University in Budapest. He worked at a design office, then in foreign trade, and since 1957 in the Hungarian Office for Standardization (transformed in 1995 into the Hungarian Standards Institution, MSZT). He retired in 1983 but continued to work at the same office as a senior advisor. In the meantime, from 1974 to 1980, he worked at the ISO Central Secretariat in Geneva, dealing with standardization and certification issues. Back in Budapest, from 1983 to 1991, he was responsible for the secretariat of the Hungarian National Committee for EOQ.

During the past five years Dr. Földesi's activities were focused on training in the fields of standardization, quality, certification, and accreditation. He is a certified quality system manager, author of numerous articles and some textbooks on standardization, quality, and certification. He won the IIASA-Shiba award in 1998. IIASA is the International Institute for Applied System Analysis.

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