Industry and food safety

The safety of food products depends on a partnership between manufacturers, regulatory agencies, international organizations, scientific bodies, and consumers. How each of these parties can contribute to maintaining and improving standards in this field, so vital for health and the quality of life, is discussed below.

It is a moral obligation of industry to provide safe foods to consumers. It is the right of consumers to expect that the foods provided by industry will be safe and in compliance with the law. Governments, consumers and others play a role in ensuring food safety but, without a strong commitment by industry, this cannot be attained. In order to achieve food safety, consideration has to be given to pathogenic and toxigenic microorganisms, additives, chemical contaminants, and naturally occurring ingredients; furthermore, communication between producers and consumers is important.

Commercial enterprises, by their nature, aim to achieve consumer satisfaction. Without this there is no profit. Companies with brands to protect must provide safe products of high enough quality to meet consumer expectations and needs—or risk disaster.

A failure in this area involved a soup company in the USA, which produced canned vichyssoise soup contaminated with Clostridium botulinum that led to the death of a consumer. Inspection of the processing facility by the Food and Drug Administration showed a number of violations of good manufacturing practices, including gross underprocessing, poor record-keeping, and inadequate training of retort operators. Heat penetration studies had not been performed on a newly-introduced formula. Other violations were found, and it became clear that the company's products and processes were not under control. It lost the confidence of its customers and filed for bankruptcy. Later, to avoid extreme penalties under the law, the company went out of business. Another failure, also in the USA, concerned Mexican-style cheeses that were linked to over 80 deaths caused by listeriosis. It was found that pasteurizing equipment was operated without proper time and temperature controls and that improper cleaning procedures were used. Some finished cheeses contained raw

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unpasteurized milk. The company was permanently closed by the health authorities and its president and a vice-president were given jail sentences.

Admittedly, these were extreme cases. However, the point is that the companies failed the consumers and paid the price. In order to be successful and to continue in business, companies must provide their customers with products that are safe for their intended use.

The food industry encompasses anyone involved in growing, manufacturing or distributing food—from farmers to street vendors. This article, however, will deal with the processed packaged food industry in which goods are marketed under brand names clearly identifying both companies and products. A brand informs consumers and government officials as to who is responsible for the product to which it is attached; consequently, it is an important element in consumer protection.

**Combined efforts**

While the central role in food safety belongs to industry, others must play a part. Governments provide a framework that enables companies to measure their own product protection programmes. Every nation needs an effective control service so that a safe and honestly presented food supply can be promoted (1). There should be a legislative base and an infrastructure for the implementation of laws at national level (2). Governments should set reasonable standards and guidelines that are sufficiently flexible to meet the needs arising from rapid changes in the technology of the food industry. Inputs from industry, the scientific community, and the public should be allowed for. There should be recognition of the needs of industry. It is a government responsibility to apply rules equally and honestly. National authorities should concentrate their attention on companies that do not have satisfactory quality assurance programmes. This is important for the protection of reputable companies and the public against unfair practices of irresponsible manufacturers who might otherwise deceive consumers on such matters as contents or composition, safety and quality.

Many countries do not possess adequate infrastructures for food control. It is therefore important for both governments and industry to support and implement the standards, guidelines and codes of practice developed by the Codex Alimentarius Commission; of particular interest is the *Code of ethics for international trade in food* (3). These internationally developed standards provide a basis on which governments can build their food control systems; they also serve as bench marks against which companies can judge their own programmes.

Self-regulatory initiatives by business constitute one of the most effective means of consumer protection. By establishing rules

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of fair conduct in the marketplace, they complement the efforts of public service organizations and often obviate the need for government regulations. The strength of
sectoral self-regulatory codes lies in their acceptance by industries in an association that has agreed to monitor compliance. Enforcement comes about through peer pressure and considerations of public goodwill.

Consumers should make known their desires in matters of food safety, and mechanisms should exist to help them to do so. By selecting some products and rejecting others, consumers send a strong message to companies about their needs and preferences. By providing its name and address on product labels, a company encourages consumers to register their complaints and needs. Reports of consumer comments and concerns are transmitted to management, which responds with appropriate action. Both industry and government should make every effort to keep consumers informed of their activities. In particular, when a major food safety incident occurs the public should be informed without delay.

In providing safe products, management requires an organized way of defining and controlling the interrelationships of the critical quality factors involved in the total system, which embraces the concept of the product, the manufacturing and distribution processes, and receipt by satisfied customers (4). The strategy to accomplish this must focus on a system of quality assurance with particular emphasis on the “hazard analysis critical control point” (HACCP) approach (1,4). If all critical control points are in fact controlled, then a safe product of high quality is the result. To fulfil its mission of providing safe products, industry focuses on three broad areas:

— quality assurance;
— scientific and technological support;
— communication with consumers.

Quality assurance

Quality assurance comprises the organization and coordination of a variety of activities directed at maintaining and/or improving the quality and safety of products. At the same time, manufacturers’ reputations are protected, as are their brands and customers. Quality assurance begins with the design and development of products and continues with the selection of raw materials, purchasing, processing, packaging, distribution and commercialization. Quality assurance programmes are tailored to meet governmental regulatory requirements wherever companies do business.

Quality assurance programmes should be designed with particular emphasis on an HACCP approach as well as the implementation of accepted food standards. This approach consists of the following elements:

— assessment of hazards associated with growing, harvesting, processing/manufacturing, distribution, marketing, and the preparation and/or use of a given raw material or food product;
— determination of the critical points at which to control any identified hazard;
— establishment of procedures to monitor critical control points.
This method is preferable to more traditional control options. It can be applied at a comparatively favourable cost-benefit ratio, since it is based on a more systematic and logical approach to the avoidance of food hazards and is applicable to all such hazards. The approach has been extended to food service operations and is also applicable to preparation in the home.

Attention should also be given to good manufacturing practices (5,6). Companies should develop the systems necessary to control the critical quality factors inherent in particular operations. Quality control involves testing how well the systems are working. More broadly stated, it is the activity that specifically evaluates the quality of raw materials, ingredients, packaging materials, processes and finished products. Quality means conformity to specifications defined in quality assurance programmes.

In order to verify compliance with specifications, quality control must implement statistically valid sampling plans and make sure that procedures are followed. Unless the latter happens consistently, the systems in place will fail. Changes should only be made in a carefully planned way and not on an ad hoc basis by operators during production. It is important to remember that testing cannot create quality in a product. Quality, and thus safety, must be “designed in”, and this is done using quality assurance procedures.

The aim of all quality assurance systems is to produce safe products that meet manufacturers’ predetermined specifications and to prevent unsafe or poor quality products reaching the marketplace. Prevention is the most cost-effective way to deal with these responsibilities. However, when a system fails, procedures should be in place for removing products from the market as expeditiously as possible so that the health of consumers and the brands affected are protected to the greatest possible extent (6). The recall of products may become necessary because of critical problems:

- that affect the health of the consumer in an irreversible way;
- that affect the health of the consumer temporarily;
- that do not affect the health of the consumer but violate local regulations;
- that do not affect the health of the consumer or violate local regulations but do affect the image and/or quality of the product in the marketplace.

The control of the quality and safety of a company’s products is vital for the continuing success of the business. Personnel involved in quality assurance should have a high sense of responsibility and should perform their functions unambiguously and impartially. They should not be influenced by outside pressures or short-term goals; they should always abide by quality policies that support the interests of the company and protect its customers. In order to carry

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out their tasks, personnel responsible for quality should have the committed backing of management at all levels. This support should begin with the chief executive officer and be clearly reflected by all managers.
Scientific and technological support

Since industry is responsible for providing safe products, it has to undertake the task of securing the necessary scientific data base, technological support, and analytical control procedures. Others have a role to play here, including regulatory authorities, international organizations, scientific bodies, and consumer groups. Scientific data are required in respect of new or significantly modified products or processes before they are introduced into commerce, as well as for existing ones.

One example of industry's role here concerns the provision of data on food additives. These have been under continuous toxicological evaluation since 1956 by the Joint Expert Committee on Food Additives of the Food and Agriculture Organization and the World Health Organization. The Codex Alimentarius Commission has established maximum permitted limits for the safe use in foods of evaluated additives. Specifications for the identity and purity of food additives have also been published by the two Organizations to ensure that only those of food-grade quality are used. Since 1963 a series of joint meetings of the

organizations have reviewed pesticide residues in food. Recommended limits for residues of pesticides in agricultural produce, and practical limits for these residues in foods, are established by the Commission. In this connection, careful attention is given to good agricultural or husbandry practices. The pesticides are evaluated toxicologically for their safety in food. Many of the data on which decisions in this field are based are supplied by manufacturing and user industries in close cooperation with national governments. By using already available toxicological evaluations, governments that do not have the infrastructure in place to make their own evaluations could apply their resources to controlling other aspects of food safety.

The maintenance of an effective quality assurance programme based on the HACCP approach requires increasingly sophisticated analytical methodology and instrumentation. Analytical chemistry contributes a great deal to our ability to control food products and provides important information on the nutritional composition of our foods. As needs change, industry plays a leading role in meeting the requirements of scientific progress in analytical chemistry so that the safety of products can be upheld.

An example of the contribution that industry makes is found in the control of aflatoxin in the United States food supply. This is of particular interest because it is based on cooperation between industry and government. Within weeks of the discovery of aflatoxin in 1960, the food industry in the USA began to tackle the problem in close cooperation with the Department of Agriculture and the Food and Drug Administration. The programme covered the improvement of crop growing, harvesting, and storage conditions, precise control of raw material selection, and manufacturing procedures for the removal of materials contaminated by aflatoxin in all food products. Among the earliest analytical methods for measuring aflatoxin was one developed in an industrial laboratory (7) and
adopted by the Association of Official Analytical Chemists (8). With the assistance of industry, much additional progress has been made over the years in developing and applying good agricultural and manufacturing practices to reduce aflatoxin levels in the food supply. This, coupled with a realistic and effective regulatory programme, has made the problem manageable.

Communication with consumers

Among the more important methods used by companies to communicate with their customers are advertising and product labelling. Advertising is generally a paid form of communication using the mass media and specialized media. It is meant to influence and persuade, to secure the attention of the consumer, to make known the availability of products, to inform the consumer of their benefits, and to give reasons for buying products or trying them out. Labelling is any written, printed or graphic material affixed to a product, or appearing on a product package, or made available at the point of purchase. Labelling enables the consumer to make a purchasing decision at this point. It is for careful reading and understanding. It identifies the manufacturer and gives instructions on safe and effective use, and provides information on contents, ingredients, health and safety features, preparation, and storage (9). Both advertising and labelling relate to particular companies and their brands, their purpose being to generate or maintain consumer interest and loyalty. In short, they are very product-specific.

Government or regulatory agencies should, in consultation with manufacturers, establish a framework of product standards and of claims that may be made about products. Governments may choose to educate the public about issues pertaining to the consumption of products or safe food preparation. In virtually all instances this should not be the responsibility of manufacturers, since they are engaged in the business of selling legal products that are acceptably safe. Societies with modern economies have evolved a long way from pure laissez-faire. Manufacturers accept the need for a degree of regulation. Of course, it should always be borne in mind that excessive regulation can cause economic damage.

What more can industry do?

It is clear from the preceding paragraphs that industry can contribute further in the area of technology transfer and support and in that of public education.

Technology transfer and support

In controlling its own products and processes, industry develops a great deal of expertise that can be transferred to other areas. For example, it was recently recommended that governments should train their food control personnel in applying the “hazard analysis critical control point” approach. This is an area in which industry can provide experts to assist in training programmes. In fact, the first training of staff of the United States Food and Drug Administration in hazard analysis techniques was conducted by a packaged food company.
(10). Assistance could well be expanded to include other areas such as quality assurance, good manufacturing practices, and analytical techniques. Comparatively small local industries might be given the same opportunity for training. The control of mycotoxins, pesticide residues, and microbiological contamination has been dealt with in industry-sponsored conferences or workshops in various countries. This is in the interests of industry, since a safe food supply contributes to consumer confidence and health, thus improving overall market conditions.

Public education campaigns

Advertising and labelling are not, as a rule, suitable vehicles for educating consumers in the general principles of food safety. However, the experience gained by industry in communicating with customers can readily be applied in assisting national governments to fulfil their public education responsibilities towards families, health workers, educators, leaders of consumer movements, government officials, and others. Many voluntary initiatives by companies and industry associations have successfully provided public service information for such groups: for example, media campaigns have been conducted against drunken driving and drug abuse. Brochures and other promotional literature are also used to inform consumers about health, nutrition and food safety.

In cooperation with governments and others, companies can assist in the use of these and other techniques to carry effective messages to the public. Methods of reaching food service personnel could in part be based on similar approaches.

To succeed these initiatives require an atmosphere of trust and cooperation among the various groups. The needs and goals of each must be taken into consideration but above all the focus must be on improving the health and the quality of life of consumers.

References