

HACCP – Management System of Food Products Security

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Abstract

HACCP stands for good safety and self – inspection management system, where food safety is addressed through the analysis and control of biological, chemical and physical hazards, from raw material production, procurement and handling to manufacturing, distribution and (final) consumption of the end products.

People have the right to expect the food they eat to be safe and suitable for consumption. Foodborne illness and foodborne injury are at the best unpleasant; at worst, they can be fatal. But there are also other consequences. Outbreaks of foodborne illness can damage trade and tourism, and lead to loss of earnings, unemployment and litigation. Food spoilage is wasteful, costly and can adversely affect trade and consumer confidence.

International food trade and foreign travel are increasing, bringing important social and economic benefits. But this also makes the spread of illness around the world easier. Eating habits too, have undergone major change in many countries over the last two decades and new food production, preparation and distribution have developed to reflect this. Effective hygiene control therefore is vital to avoid the adverse human health and economic consequences of foodborne illness, foodborne injury, and food spoilage. Everyone, including farmers and growers, manufacturers and processors, food handlers and consumers, has a responsibility to assure that food is safe and suitable for consumption.

The Need for an Effective Food Safety Assurance Method

Food safety has been of concern to humankind since the dawn of history, and many of the problems encountered in our food supply go back to the earliest recorded years. Many rules and recommendations advocated in religious or historical texts are evidence of the concern to protect people against foodborne diseases and food adulteration.

However, in recent decades this concern has grown.

There are many reasons for this:

- Foodborne diseases remain one of the most widespread public health problems in the contemporary world, and an important cause of reduced economic productivity, despite progress in food science and technologies.
- The increasing incidence of many foodborne diseases, e.g. salmonellosis and campylobacteriosis, in many regions of the world.
- Increased knowledge and awareness of the serious and chronic health effects of foodborne pathogens.
- The possibility of detecting minute amounts of contaminants in food, due to advances in scientific and analytical methods.
- Emerging foodborne pathogens, e.g. *Listeria monocytogenes*, verocytotoxin producing *E. coli*, *Campylobacter* sp., foodborne nematodes, etc.
- An increase in the number of vulnerable people, such as the elderly, immunocompromised individuals, the undernourished, and individuals with other underlying health problems.
- Increased awareness of the economic consequences of foodborne diseases.
- Industrialization and increased mass production, leading to: i) increased risks of food contamination; and ii) the considerably larger numbers of people affected in foodborne disease outbreaks as a result.
- Urbanization, leading to a more complex food chain, and thus greater possibilities for food contamination.
- New food technologies and processing methods, causing concern either about the safety of the products themselves or the eventual consequences due to inappropriate handling during preparation in households or food service/catering establishments.
- Changing lifestyles, adopted by an increasing number of people eating outside the home, in food service or catering establishments, at street food stalls, or in fast-food restaurants.

Responsibility for food preparation shared between family members who are not always aware of food safety rules.

- Increased worldwide tourism and international trade in foodstuffs, leading to a greater exposure to foodborne hazards from other areas.
- Increased contamination of the environment.
- Increased consumer awareness of food safety.
- Lack of or decreasing resources for food safety.

It is this climate of increasing concern about food safety, the lack of sufficient resources, and the recognition of the limitations of traditional approaches to food safety assurance which have accentuated the need for a cost-effective food safety assurance method. The HACCP system has proven to be such a system.

The HACCP System and its Benefits

The HACCP system is a scientific, rational and systematic approach to the identification, assessment and control of hazards during the production, processing, manufacturing, preparation and use of food to ensure that food is safe when consumed (i.e. it does not present an unacceptable risk to health).

With the HACCP system, food safety control is integrated into the design of the process rather than the present ineffective system of end-product testing. Therefore, the HACCP system provides a preventive and thus a cost-effective approach to food safety.

The HACCP system can be applied throughout the food chain, from the primary producer to the final consumer. Its implementation should be guided by scientific evidence of risks to human health.

The successful application of HACCP requires the full commitment and involvement of management and the workforce. It also requires a multidisciplinary approach. This multidisciplinary approach should include, when appropriate, expertise in agronomy, veterinary science/medicine, production, microbiology, public health, food technology, environmental health, chemistry, and engineering, according to the particular study.

The HACCP principles can be applied in a variety of ways:

- The HACCP system is a system used as a method of food safety assurance in food production, processing, manufacturing and preparation.
- The HACCP system is amenable to effective food control. It allows for more efficient inspection of food operations, as the role of food inspectors is centered on the assessment of the HACCP plan and confirmation that it is properly designed and operating effectively.
- The HACCP concept can also be used to study food preparation practices, and to identify and assess hazardous behavior, which should be the focus of health education interventions.
- The HACCP concept can also be used in the management of overall food safety programmes to identify those problems all along the food chain which are of greatest risk to public health, and in order to prioritize interventions.

The additional benefits of the HACCP system can be summarized as follows:

- The HACCP system overcomes many of the limitations of the traditional approaches to food safety control (generally based on 'snap-shot' inspection and end-product testing), including:
 1. the difficulty of collecting and examining sufficient samples to obtain meaningful, representative information, in a timely manner and without the high cost of end-product analysis;
 2. reducing the potential for product recall;
 3. identification of problems without understanding the causes;
 4. limitations of 'snap-shot' inspection techniques in predicting potential food safety problems.
- The HACCP system allows for the identification of conceivable, reasonably expected hazards, even where failures have not previously been experienced. It is therefore particularly useful for new operations.
- The HACCP system is sufficiently flexible to accommodate changes introduced, such as progress in equipment design, improvements in processing procedures and technological developments related to the product.
- The HACCP system will help target/direct resources to the most critical part of the food operation.
- With the HACCP system one can expect an improvement in the relationship between a) food processors and food inspectors, and b) food processors and consumers.

The HACCP system provides a scientifically-sound basis in order to demonstrate that all reasonable precautions have been taken to prevent a hazard from reaching the consumer. This way, it encourages confidence in the safety of food products and thus promotes both confidence in the food industry and stability of food businesses.

- Collected data facilitates the work of food inspectors for auditing purposes.

The HACCP system is applicable to the whole food chain, from the raw material to the end-product, i.e. growing, harvesting, processing or manufacturing, transport and distribution, preparation and consumption.

The application of HACCP systems can promote international trade by increasing confidence in food safety.

The HACCP system can be readily integrated into quality management systems, e.g. Total Quality Management, ISO 9000, etc.

The International Status of the HACCP System and Recent Developments in its Concept

The World Health Organization has recognized the importance of the HACCP system for prevention of foodborne diseases for over 20 years and has played an important role in its development, harmonization and implementation. One of the highlights in the history of the HACCP system was in 1993 when the Codex Guidelines for the Application of the HACCP system were adopted by the FAO/WHO Codex Alimentarius Commission.

The Codex Code on General Principles of Food Hygiene has also been revised and it presently includes recommendations for the application of the Codex HACCP Guidelines. In due course, all relevant codes of hygienic practice will need to be revised to include the HACCP system.

The work of Codex, i.e. through its standards, guidelines and recommendations (including the Guidelines for the Application of the Hazard Analysis Critical Control Point system), has played an important role in facilitating the international trade and has influenced the national health legislation for the protection of consumers.

However, since the successful conclusion of the GATT Uruguay Round of Multilateral Trade Negotiations in April 1994, and the establishment of the World Trade Organization (WTO) in 1995, the work of Codex plays an even greater role in matters related to health and trade.

The reason is that in the WTO's Agreement on the Application of Sanitary and Phytosanitary Measures, the work of Codex is recognized as the reference or 'yard stick' for national requirements in food safety.

This implies that Members of the WTO involved in food trade need to take the work of the Codex Alimentarius into consideration, and adapt their national legislation to the provisions provided by the Codex Alimentarius.

In the future, they could be required to provide justification for food import restrictions based on national legislation that is stricter than the Codex standards, guidelines and recommendations.

The Codex Guidelines for the Application of the Hazard Analysis Critical Control Point (HACCP) system published in 1993 have been revised and the revised text entitled Hazard Analysis and Critical Control Point (HACCP) system and Guidelines for its Application was adopted by the Codex Alimentarius Commission in June 1997 in the document "Codex Alimentarius Commission. Report of the Twenty-Second Session of the Codex Alimentarius Commission, Geneva, June 1997".

Considerations for the Implementation of HACCP

The successful implementation of a HACCP programme requires for consideration of the following points:

The Need for HACCP

To successfully implement HACCP in the food supply system, authorities responsible for food safety must first be aware of the need to move to a system such as HACCP.

Until this need is acknowledged, it is unlikely that a commitment at any level can be expected.

Motivations for adopting HACCP may include the need to:

- reduce the incidence of foodborne disease;
- ensure a safe food supply for the population;
- promote (facilitate) trade in food products;
- promote tourism.

The Responsibility for HACCP Implementation

The main responsibility for the implementation of a HACCP-based approach to food safety lies with:

- industries involved in all stages of the food chain;
- policy makers and planners who have the mandate to facilitate the adoption of HACCP systems;
- government authorities, including legislators, regulatory food control officials and health education bodies.

In addition to this, the following groups also have an important say in the successful introduction of HACCP systems:

- academia, training and research institutes;
- nongovernmental organizations;
- consumers.

The Role of Those Responsible for Implementation of HACCP Systems

Industries 'own' the HACCP systems, and it is vital that all the key players recognize this fact and tailor their involvement accordingly. Specifically, the roles for industry and government are:

1. Industry considerations

- The need to take ownership of the HACCP system;
- The need to have a clear understanding of the principles of the HACCP system;
- The need for commitment on the part of both management and staff towards the implementation and maintenance of the HACCP system;
- The need to allocate the resources necessary for HACCP implementation;
- The need to provide sufficient resources for training;
- The need to share experiences with other sectors to ensure that adequate provision is made for food safety.

2. Government considerations

- The need to provide leadership based on understanding and commitment;
- The need to provide appropriate legislation and policies that promote and enhance the adoption and implementation of HACCP principles;
- The need to define and establish nationally-acceptable levels of food safety risks;
- The need to ensure that, when HACCP is implemented, regulatory food control officials are able to confirm that the system is correctly designed and conducted;
- The need to provide sufficient resources to train regulatory food control officials;
- The need to enforce any legislative requirements that have been adopted;
- The need to develop appropriate strategies to implement and monitor the progress of HACCP;
- The need to liaise with representatives from all sectors of the food chain, including consumers, on issues of food safety, appropriate control mechanisms and HACCP in general;
- The need to liaise internationally on all aspects of HACCP for its harmonization and development.

For Romania, the 1st of January 2007 will represent the adherence to the European Union. Among all the conditions that should be fulfilled, it is also the adoption and implementation of the Community Aquis. This holds – along with the harmonization of the legal domain – the adoption of the European standards for all the economic domains, which especially envisage the health and safety of food and of population nourishment.

HACCP is an English source acronym - “HAZARD ANALYSIS AND CRITICAL CONTROL PROCESS” and it is a system for identification, evaluation and control of the risks associated to food products. HACCP system is the most efficient method for the administration and control of the dangers associated to food products, not only during preparation process, but also during handling, having the advantage of being generally accepted by legal institutions, control organisms and professional associations from the food industry.

The guiding lines for implementing HACCP system have been adopted at the XXth session of the Codex Alimentarius Commission (1993). These guiding lines have been addressed to the member states as well as to the associated members of FAO and WHO, they have a consultative character, and the decision of using the HACCP system or not, belongs to each government.

Implementing HACCP system is compulsory according to the Romanian law and it is mainly meant to be used by companies that produce and sell food products and also equipment for food industry (e.g. companies producing food products, distributors, vendors, restaurants, various public food facilities and their suppliers, including those that produce packing).

HACCP is a system of evaluating the risks inside hygiene management systems (according to 93/43 CEE Directive, LHMV, BRC, DS 3027, IFS). Romanian companies may, in the near future, be confronted with two situations :

- prosperous business if they align to and implement the new European standards;
- or, loss of their market share ,if they ignore the standards , even bankruptcy in some cases.

Implementing HACCP means respecting 7 basic principles :

1. Identifying the risks associated with obtaining or harvesting the raw materials and ingredients, processing, handling, storing, distributing, preparing and consuming food products.

2. Determination of critical points through which the identified risks may be held under control.
3. Establishing the critical limits that have to be respected in each critical control point.
4. Establishing the corrective actions that will be taken when, following the monitoring of the critical points, a deviation from the critical limits is found.
5. Organizing an efficient system of keeping the records that constitute the HACCP plan documents.
6. Establishing the procedures used for verifying whether the HACCP system works correctly or not.

The standards issued by The Codex Alimentarius Commission, adopted and used for implementing HACCP in Romania, are :

- **SR 13462- 1: 2001 – Agri-food hygiene** This standard follows the track of food from primary phase of the producing processes, up to the final phase, when it reaches the consumer, it establishes the necessary hygiene conditions for producing a safe and adequate for consumption product.
- **SR 13462-2: 2002 – Agri-food hygiene. The analysis of risk and critical points of control system (HACCP) and the implementation guide for it.** Through this standard the risk analysis principles and principles of the critical points of control are established ,and also given the ways of identifying these specific risks and the control measures in order to ensure food safety
- **SR 13462 – 3: 2002 – Agri-food hygiene. Principles of establishing microbiological criteria for foods at any level from the food chain, from primary production to final consumption.** This standard specifies the principles of establishing and implementing of the microbiological criteria for foods. The ensuring of food safety is made through: source control, process control and applying the adequate hygiene practices during production, preparing, handling, labeling, distributing, storing and selling of foods.

These General Principles lay a firm foundation for ensuring food hygiene and should be used in conjunction with each specific code of hygienic practice, where appropriate, and the guidelines on microbiological criteria.

As for hospitality industry, in restaurants and food processing units, the general principles of HACCP plan, envisages the next problems:

- Visual analysis of the general aspect of the restaurant (structure, circuits, functionality, endowment, storage capacities and functions, service);
- Organoleptic examination of culinary products during different phases of the technological process : raw materials checking on delivery, cold or hot storing, primary preparation, thermic treatments applied, finishing, delivery;
- Laboratory investigations on products found in different phases of preparation and on culinary products, inside the critical points with high risk potential;
- The establishing of the measuring units and the periodicity of investigations;
- Insuring that the personnel of the location respects the hygiene standard set;
- The permanent implication of the managers in implementing the quality and the food-safety standards;
- The establishing of direct responsibilities for the staff ;
- Training sessions and training programmes on hygiene and food-safety for the staff.

The principles of HACCP system are at the base of international standard ISO 22 000, Standard for insuring security of food chains all over the world.

ISO 22 000 specifies the standards for insuring food safety, a standard where the organization should :

- prove abilities in controlling food quality;
- aim in fulfilling the requests of consumers by controlling on safety and quality of food.

Instead of Conclusions

For companies that apply the HACCP system, undisputable advantages may be observed, such as :

- integration of modern procedures of risk analysis and of the prevention concept regarding the protection of the consumer's health in the existent management system;
- significant improving of communication and a raise in trust level among clients, suppliers and surveillance authorities;
- improving the company's image and a competitive advantage on the market;
- companies activating in food and hospitality industries become competitive on the international market;
- fidelity from the clients and confidence in products' quality;
- certified hygiene and sanitary quality;
- significant reduce of losses and of clients' complaints.

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HACCP – Sistem de gestionare a securității produselor alimentare

Rezumat

HACCP este un sistem de gestionare a securității produselor alimentare, orientat spre analiza și controlul riscurilor biologice, chimice și fizice, de la producerea, promovarea și manipularea materiei prime, până la producerea, distribuirea și consumul produsului finit.