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Private Sector Systems for Providing Quality Assurance: From "Good Practices" to HACCP to Total Quality Management

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Abstract

In recent years, there has been a marked evolution in private sector approaches to managing product quality. The food industry has been moving away from the traditional, largely reactive approach, focusing on end-product testing and "fire-fighting" to deal with quality problems, to a total quality approach emphasizing prevention and involvement of all personnel in providing customer satisfaction. A major quality objective is that of food safety. The set of tools for establishing food safety management systems include the "Good Practices" guidelines, "Hazard Analysis and Critical Control Point" (HACCP) principles, and various guidelines for total quality management, such as the International Standards Organization (ISO) 9000-2000 set of standards. These can be seen as successive steps in implementing a food safety management system. Increasingly, these principles – and particularly the HACCP approach – are being taken into account by regulatory agencies, and incorporated into food safety legislation. This trend is relevant for developing country food suppliers, as they aim to satisfy customer requirements of food safety for local and export markets.

Introduction

"Good Practices" form the foundation for all food safety management systems. They are general rules that pay attention to suitable environmental conditions for food production, handling and processing, as well as practices that ensure hygienic procedures and controlled working conditions. "Hazard Analysis and Critical Control Point" (HACCP) is a systematic approach to hazard identification, assessment and control. It is a more structured approach for the control of food safety, from the farm to the fork, than traditional inspection and quality procedures. By building on the foundation of Good Practices in the commodity system, hazards identified at specific process steps are identified, monitored and controlled, thus guaranteeing product safety. International Standards Organization (ISO) 9000-2000 is a guide for establishing a total quality management system, to ensure conformity with customers' requirements. Once the safety attributes of a product have been identified, and the food safety management system established, an overarching quality management system can be established.

The benefits and constraints of developing systems to manage food safety and quality will be discussed during this workshop. This paper provides an overview of the essential steps required in establishing a food safety management system.

Good Practices

Good Practices rules and guidelines are available in three key areas of the food production process. Good Agricultural Practice (GAP) relate to activities at the farm level and Good Manufacturing Practice (GMP) and Good Hygienic Practice (GHP) to activities at the level of processing, including, for GHP, food handling at the final distribution stage in restaurants and shops. Together, the Good Practices guidelines cover all activities necessary for the effective, clean and safe operation of the food system (CODEX ALIMENTARIUS, 1997).

Good Agricultural Practices

For quality control to be effective, Good Practices must start at the primary production site. These include: proper storage of chemicals on the farm and application of chemicals, good farming practices, good harvesting practices, good storage and transportation practices, training and record keeping.

Good Manufacturing Practices

General requirements for food premises are that they must be kept clean and maintained in good repair. GMP provisions include: supplier programs, transport, cleaning and disinfecting, calibration, routine maintenance, water supply, policies on glass, metal and pests, training and record keeping.

Good Hygienic Practices

All food handlers should have a working knowledge of personal hygiene and understand the role of food in the transmission of food-borne illness. GHP includes: personal hygiene, production hygiene, changing rooms and facilities, protective clothing, training and record keeping (HMSO, 1990; EEC, 1993).

Personal Hygiene
Every person should maintain a high standard of personal cleanliness and wear suitable clean and, if necessary, protective clothing (coats, hats, hairpieces, boots or overshoes, gloves, as appropriate). Protective must be worn in processing areas, and must not be washed at home. Entry to and exit from production areas should be through the changing facility. All illnesses must be reported to line managers. Personnel suffering from, or known to be a carrier of disease, must not be allowed to work in any food handling area in any capacity, as there is a likelihood of contaminating food with pathogenic microorganisms. There should be no eating, drinking, smoking in food preparation areas, jewelry should not be worn and hands must be washed after using the toilet. Production hygiene should be maintained through a 'clean as you go' policy, and regular breaks included in production schedule for cleaning utensils and workers' hands as appropriate.

Training Records
Records should be kept of all training that employees undertake as part of their duties. It is important that all staff understand their role and responsibility in contributing to the hygiene and safety of the product.

Hazard Analysis and Critical Control Point

The concept of Hazard Analysis and Critical Control Point (HACCP) was first introduced during the mid 1960s when a fail-safe method with zero tolerance was required for the production of food for the US space program. HACCP has been successfully applied in the control of quality and safety in low-acid canned foods in the USA, and many food companies in Europe and the USA have adopted the approach. Increasingly, regulatory bodies have recognized the usefulness of this concept and it has been incorporated into legislative requirements by both the EU and the Americas.

Until the introduction of HACCP, end-product testing, with measurement of physical properties, microbiological testing and chemical analyses, were used as a means of assessing safety. A number of limitations to this approach were recognized: (i) the problems associated with the design and implementation of appropriate sampling plans; (ii) the time required to obtain results; and (iii) the cost.

The HACCP approach to quality assurance moves away from testing of the final product, and instead emphasizes the importance of controlling hazards associated with the food system. Control is taken out of the laboratory and into the food system. HACCP provides a structured and critical approach to the control of identified hazards and involves:

- Identification and description of the product and its' intended use. Assessment of hazards associated with all stages of product handling and processing.
- Identification of critical control points (CCPs) at which the identified hazards must be monitored.
- Monitoring the CCPs, ensuring that procedures are in place to correct the system if the CCP is moving out of control.
- Verification and validation.
- Documentation and records.

A thorough understanding of the whole process is required in order to identify the most appropriate means of monitoring CCPs. Tests where results are obtained quickly are preferable to ensure that a CCP is under control, e.g. measurement of pH level instead of counting for bacteria which produce acid. For some stages visual or sensory evaluation may be required, e.g. the quality rating of fresh fish. It is therefore important to assemble a team of specialists who can look at the whole food system from the point of view of their own area of expertise, and who can contribute to the overall HACCP plan.

Food safety has been the principal aim when applying the HACCP concept to a process. The technique was originally developed for control of microbiological hazards but it can just as easily be applied to other areas such as chemicals and foreign bodies. GMP and GHP activities must be in place before a HACCP system can be implemented successfully, and it will often be the case that GAP are also prerequisites to such a program.

Total Quality Management

The traditional view of quality is that:

- Any improvement will be expensive to introduce and maintain (a reactive culture).
- If something goes wrong during production, then everyone rushes around to save the product (fire fighting).
- Items are manufactured to meet acceptable quality levels.

- If something goes wrong, then who is to blame? One or a group of the workers of course!

To make sure a product conformed to the required quality or safety level, there was a system in place to check a proportion of production for errors or faults. This included end-product testing, where only a small percentage of product is tested to ensure that it meets both safety and quality standards.

Alternatively, the "total quality approach" considers that quality pays for itself. Any investment to improve the quality and safety of a product will contribute towards improving the company's reputation with their customers. Total Quality Management (TQM) is a preventative system; the system is analyzed and any potential problem areas are identified. Monitoring procedures are put in place to ensure that the process does not go out of control. By using TQM, the system aims at a defect-free product or service through continuous improvement. Everyone in the company understands their role in the system, so that meeting with customers' specifications is the target of the whole workforce. Nobody can be blamed if something does go wrong, as workers would have received training and be able to act promptly to bring the process back into control. TQM ensures that production is right, first time and every time, and that the customer receives the product when required and at the right cost.

Human beings are not infallible and there is a wide spectrum of causes of human failure. However, if personnel have received the right amount of training for their job and they are working within the system, errors will be minimized. If a problem does occur then this can be very costly to a company. For example, for a serious problem where human life was at risk, the company may become bankrupt and go out of business. At a minimum, if a specific brand is linked with an outbreak of food poisoning, sales will drop and a lot of re-advertising of the product, coupled with investment to win back the confidence of the public, will be required.

How can quality be achieved?

- First a company needs to identify a specific customer's needs.
- Discussions must be held to determine exactly what product specification is required, so that the product is manufactured to meet these requirements.
- Plan to do all jobs right first time: spend time planning production and ensuring that all raw materials meet with your specifications.
- Agree with the workforce on expected standards of performance and monitor these during production.
- Recognize achievements of the company and the workforce.

It is important to eliminate weaknesses in a factory. A change of working culture will be necessary, but this needs to be done sensitively. This can be achieved by consulting with the members of the workforce when procedures and work instructions are being prepared. If they have contributed to the production of their new work instructions, they will feel confident in using them.

All members of staff should receive an appropriate level of training so that they are able to:

- EVALUATE a situation, to be able to:
- PLAN their actions to fully achieve their objectives;
- DO: be able to implement the plans;
- CHECK that objectives have been achieved;
- AMEND as necessary, *i.e.* take CORRECTIVE ACTION if targets are not being met.

The ISO 9000-2000 Quality Management System

The European Norm (EN) ISO 9000-2000 standard is a set of internationally recognized standards that should be used as a guide to implement a Quality Management System (QMS). Once the documented system has been implemented at a business, it can be assessed by external auditors to achieve registration to EN ISO 9001. The revised standard consists of three documents: ISO 9000, which includes the fundamentals of quality management; ISO 9001, consisting of 8 chapters, 5 of which describe the requirements for a QMS; and finally ISO 9004, which is a guide for performance improvement. QMS should be designed to be easy to use and support the day-to-day work of all staff members. A documented system, supported with records from an internal audit program, demonstrate that a company has a quality management system in place. This can be recognized at a national or international level by becoming registered with a third party registration body. Examples of internationally recognized registration bodies are: The British Standards Institute, Lloyds Register Quality Assurance Ltd. Additionally there are often national or regional bodies who can provide local support in implementing a quality management system.

The Relationship between ISO 9001–2000 and HACCP

Increasingly, HACCP is becoming a legislative requirement by many national and international bodies, whereas registered quality management systems remain voluntary. However, the structures of ISO systems are complementary to those of HACCP, as can be seen from the following excerpts from the ISO guidelines (ISO 9001, 2000):

Clause 4 Quality Management System: This clause states the requirements for a documented system. Requirements for establishing the quality of the product link in with the requirements for safety.

Clause 5 Management responsibility: This clause states the requirement for management commitment to the maintenance and improvement of the Quality Management System. The same level of commitment is required for a HACCP system to work efficiently.

Cause 6 People: This clause includes a requirement to demonstrate the competence, awareness and training of all staff, at levels commensurate with their duties.

Clause 7 Product realization: The preparatory stages for HACCP fit neatly into clause 7.3., while the process plan is included in 7.1.3. Clause 7.1.3.2 also covers process inputs, outputs and review, and monitors the process of production from purchasing the raw materials through to end-product. A requirement for review of the HACCP plan is also a requirement of this clause.

Clause 8 Measurement, analysis and improvement: Records are required to demonstrate that the product meets the customer's requirements. The way that CCPs are monitored should be included under this clause, as well as corrective action plans. Claude 8.0 covers methods for documenting corrective actions taken and handling the non-conforming product in the event of a problem during the production process.

A well-documented HACCP system will facilitate regulatory inspections. When used within the ISO 9001–2000 framework, it will demonstrate management commitment to both product safety and quality.

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