

Quality Management Programs to assure Meat Safety in Australian Domestic and Export Abattoirs

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Objective

This paper describes recent advances in Australia which progress meat safety beyond traditional macroscopic detection based systems to prevention systems. These control the risk to public health from microscopic contaminants by designing safeguards into production processes, and storage and distribution chains through the application of Hazard Analysis and Critical Control Point (HACCP) techniques. It also describes the various delivery mechanisms chosen for domestic and export meat production by the different authorities responsible for Veterinary Public Health under the Australian federal system of government. Historically there has been a number of different approaches employed in manufacturing industries, including the meat industry, to control the quality of goods and services that reach end consumers. These differences in design and implementation of QC and QA systems are also discussed.

Background

Contemporary meat inspection practices and procedures in Australia evolved through the need for macroscopic detection of lesions indicative of traditional animal conditions of public health significance. As a result of good animal husbandry practices and intensive national eradication and control programs for diseases such as bovine TB and brucellosis, the health of the national herd has significantly improved through the latter half of the twentieth century. Consequently, the emphasis on ensuring the safety of meat has now moved beyond mere detection of macroscopically visible lesions to concentration on the control of invisible contaminants. This is achieved by focusing on raw material control, processing methods, and designing facilities and equipment to prevent the spread, survival and growth of pathogenic microorganisms and other invisible contaminants of public health significance.

In Australia, individual State governments have responsibility for public health and the provision of meat inspection services. The Federal government, through the Australian Quarantine Inspection Service (AQIS), is primarily responsible for meat produced at export registered facilities. AQIS also carries out domestic inspection on behalf of some state authorities. Most authorities use some form of modified regulatory system based on recognition of the adequacy of controls incorporated in company quality management programs.

Quality Management

Traditional Quality Control (QC) systems are '*inspection oriented*' and are designed to detect nonconforming goods and services and separate them from compliant products for rework, downgrading or scrap as appropriate. QC systems are expensive to operate as costs include the original cost of production of defective items, the cost of intensive inspection activities to detect nonconformance, and the cost of rework. Such systems do not always protect the consumer unless 100% inspection is employed. Even then defective items may be missed. In addition, the practical means to detect some categories of defects may not be readily available. It is important to recognise that while QC systems may detect defective items, accept/reject inspection activities do nothing to improve the quality of product in subsequent batches.

Quality Assurance (QA) systems which are '*prevention oriented*' are conceptually different in approach. Improvements in quality and profitability are brought about by designing quality into products and processes. In essence, production processes are systematically analysed to identify potential obstacles to meeting required quality standards. The means of eliminating or controlling the problem are identified; planned and systematic preventive measures are put in place as part of the normal production process; and finally mechanisms are established to ensure that the planned preventive measures stay in place and achieve the intended result. The emphasis is on improving the process. This provides the necessary confidence that goods and services will reliably meet the required standards for quality. Monitoring programs are then aimed at auditing the process to ensure that designated control measures remain in place. Any deviation is quickly recognised and appropriate corrective action is taken *before* defective product is produced. If the design of the process and associated control plans provide adequate confidence then there is no longer a need to engage in intensive levels of product inspection. A small amount of product monitoring is still required to verify that established preventive measures are achieving their purpose. The primary use of the inspection data generated is to feed back information to the process on the adequacy of preventive measures so that the necessary adjustments can be made.

The Australian Meat industry, along with most Western industries, has relied heavily on QC style accept/reject inspection activities. In the past these systems have been reasonably compatible with visible defect criteria for quality. However, the shift in emphasis in commercial and public health requirements for quality means that such systems are no longer appropriate. Meat beneath an animal's hide at slaughter is practically free of microorganisms. The most appropriate way of assuring meat safety is to design controls into the process to prevent the spread, survival and growth of microscopic contaminants. HACCP is an ideal tool for designing safety into food production systems. Reliance on end product testing to meet microbiological standards on an accept/reject basis is impractical. Testing of this nature is most useful for verifying the adequacy of controls and should be aimed at producing trend information which can be used to initiate investigation of the process which in turn leads to timely corrective action.

Application to Meat Safety by Australian Regulatory Authorities

a) Export Systems

In 1989 AQIS introduced quality management technology in the form of Production Quality Arrangements (PQA) at export abattoirs whereby companies put in place systems to control aspects of hygienic meat production beyond primary ante/postmortem meat inspection. While serving the purpose for which they were originally introduced, PQA systems proved to be 'detection oriented' and focussed primarily on product monitoring for visible defects by company quality inspectors. With the benefit of knowledge gained through the implementation of these initial systems, AQIS and the Australian industry took a cooperative approach to reviewing and refining the original PQA concepts over a five year period. This resulted in a significant shift to a prevention oriented approach with particular emphasis on pathogen control through HACCP techniques. The new Meat Safety Quality Assurance system was introduced in September 1994 to supersede the existing PQA system.

The structure of the MSQA framework as a quality assurance system is closely aligned with the elements of the ISO 9000 series standards but is limited in application to those areas of the company's activities which have implications for the production, storage and distribution of safe, wholesome product and other mandatory legal requirements administered by AQIS. Process Control is built into the system through the application of HACCP techniques. These are modelled on the FAO/WHO codex alimentarius commission guidelines for HACCP as adopted by the US National Advisory Committee on Microbiological Criteria for Foods (NACMCF). Key elements of the revised systems are the provision of clear work instructions which address quality critical preventive measures, adequate education and training, and effective use of monitoring data to identify trends and to adjust and maintain the process before out of control situations can occur. AQIS has published a comprehensive guide and has conducted an extensive information campaign to assist industry implement the new system. AQIS's role under the revised system is an audit function to ensure that company controls are in place and working effectively through a validation program called "Check the Checker". There are no changes to AQIS responsibility for carrying out primary ante and postmortem health inspection at slaughtering plants.

A further system offered by AQIS is an Approved Quality Assurance (AQA) arrangement under which designated company officials carrying out some functions previously performed by AQIS staff. These are related to the storage, distribution and transport of fully packaged meat. These activities are conducted with the framework of a fully documented Quality System which is subject to periodic audit by AQIS.

b) Domestic Systems

A range of Quality Management systems operate in the delivery of domestic meat inspection under the control of various State government authorities. In some states AQIS conducts inspection on behalf of the State authorities and offers two QA based programs which include the performance of primary health inspection activities by qualified meat inspectors who are employed by the relevant company. Under the first, a PARTQA arrangement, the health inspection duties are shared with AQIS employed inspectors who retain final disposition authority. Under the second type, FULLQA, all health inspection duties are performed by company employed inspectors. Both systems must be supported by a system of controls in a Quality System framework, based on HACCP principles, which is audited periodically by AQIS.

In Queensland, the Queensland Livestock and Meat Authority (QLMA) administers a HACCP based system called Q-Safe. This is closely aligned in structure to the ISO 9000 series framework and extends to meat safety and wholesomeness through all aspects of meat processing, transport, distribution and retail sale. These systems again allow primary health inspection by accredited company personnel and are subject to periodic audit by QMLA meat safety officers.

The system employed by the Victorian Meat Authority (VMA) is similar in allowing health inspection by company employed inspectors, but varies in that auditing is conducted by a third party body contracted to the VMA to supply such services. South Australian authorities employ a system similar to Victoria.

Pertinent Literature

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