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Accessing of slaughterhouse information to livestock production systems

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ABSTRACT

A proposal for the development of a three-stage computer-based system for the acquisition and retrieval of disease and defect data for lambs slaughtered in export premises is described.

Stage 1 is an extension of the existing manual ticketing and administrative routine. A slaughter-line computer keyboard would allow continuous collection of data on an individual flock basis, as well as significantly decreasing meat inspector, processor and information servicing workloads. The data base would also provide a statistical base for regulatory decisions and assist the processor's quality control programme.

Stage 2 is a vertical integration of the inspection service with other agencies involved in the livestock production system. Long-term aims are promotion of producer efficiency and payment by quality. By accumulating both individual and regional flock health profiles, differential cost-effective processing and inspection programmes can be applied. Production and market-related disease and defect data has wide application as a commercial resource.

Stage 3 is an integrated meat inspection system with a national disease and residue surveillance centre.

Keywords Meat inspection; integration; information technology; cost-effectiveness.

INTRODUCTION

The meat inspection programmes administered by many Controlling Authorities are not efficiently utilised as an information resource. Limited feedback of slaughterhouse information and the inability to institute action on the farm, reduces the effectiveness of inspection programmes as a means of improving the economic viability of the livestock production systems they service. Lack of integration of ante- and post-mortem inspection information with production-related information generated by the processing company is also an inefficient use of information resources.

The concept of a vertically-integrated disease and defect data collection system is not new (Christiansen and Hellstrom, 1980; Skovgaard, 1981 Goodhand, 1983). In Denmark, the State Veterinary Service administers the National Pig Health Scheme, a national programme which monitors the health and disease of baconer pigs supplied to co-operative slaughterhouses (Petersen, 1965). Data are supplied to a centralised computer system and decentralised control efforts are applied in problem herds. By controlling multifactorial disease problems at the herd level, economic losses to the producers and to industry are minimised.

This paper describes the proposal of the Meat Division of the New Zealand Ministry of Agriculture and Fisheries for the development of a computer-assisted data collection and transfer system for lambs, being the largest and most homogenous class of stock slaughtered in New Zealand.

PROPOSAL

Stage 1: Computer-assisted Recording System for Diseases and Defects

The current disease and defect recording system in lambs is based on manual identification of carcasses with the appropriate tickets. At high line-speeds, manual ticketing and operation of a detain switch for retention of carcasses can represent a significant proportion of an inspector's work effort. Servicing of ticket dispensers and collation of disease and defect statistics by supervisory staff is also a manual operation. In addition, disease and defect statistics are not available on an individual flock basis.

The basic component of an integrated information system is the accurate and efficient recording of data, however the current system has inherent inaccuracies and inefficiencies. Limited sources of error are not particularly important with respect to nationally-aggregated statistics as only an overview is required. However, such errors would be vitally important with respect to data from individual flocks and an integrated meat inspection system must supply information that is relevant at this level.

A computerised recording system using a multi-channel keyboard would reduce the identification, application of ticket (s), and detain rail switching for a diseased or defective carcass to a single function.

The disease and defect data for each flock would be continuously entered into the local data base, thereby eliminating inefficiencies associated with manual recording and retrieval of information. By

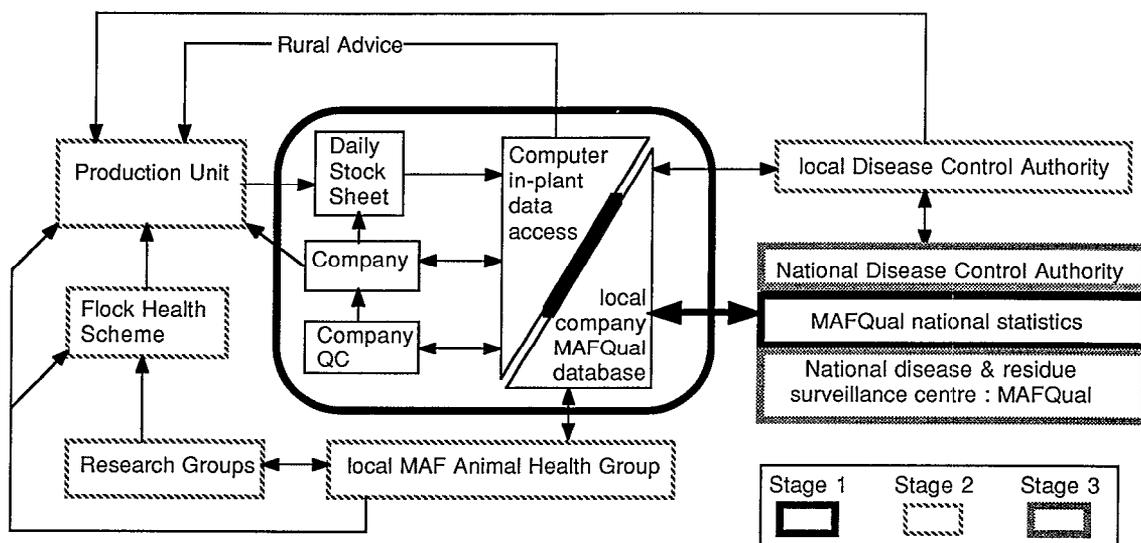


FIG. 1 A vertically-integrated meat inspection system for lambs slaughtered in export premises.

extending manual recording to a continuous on-line function, consistency in regulatory decision-making based on statistical data, could also be achieved. Defects such as contamination can be continuously plotted using a Cusum package, with the data being available to both the inspection service and the processor's quality control personnel. When trigger levels are approached or exceeded, immediate action can be taken at the appropriate critical control points.

An individual farm data base is also necessary so that defective stock can be processed and inspected at an appropriate cost, and residue monitoring and surveillance programmes can be operated with an on-farm component.

A computer recording system with facilities for the acquisition and retrieval of individual flock data would require the following elements (Fig. 1):

- (a) Stock identification (processors daily stock sheet coupled to inspection service micro-computer).
- (b) Slaughter-line computer keyboard.
- (c) Slaughter-line ticket printer and applicator.
- (d) Re-assessment of disease and defect ticketing categories.

Stage 2: Integration of Inspection Service Information Resource with Other Agencies

Ante- and post-mortem inspection of animals is not designed to detect human health hazards unless the hazards are detectable through clinical symptoms or observable lesions. In addition, inspection programmes are not geared towards solving infectious agent, defect or residue problems at the first point of entry into the food chain on the farm.

A vertically integrated inspection service can use computer technology to link and share information resources with all agencies involved in the inspection system (Figure 1) thereby enhancing the usefulness of inspection service activities and accessing valuable productivity-related data. Long term aims are for the promotion of producer efficiency and payment by quality.

By accumulating both individual and regional flock health profiles differentiated cost-effective processing and inspection programmes can be applied. Computer monitoring will establish when a line of lambs is outside statistically-defined and acceptable disease and defect parameters for the region and increased workloads will incur additional processing and inspection costs. On the other hand decreased inspection and increased line speeds are a real possibility when the prevalence of diseases and defects is low with little statistical variation such as early in the slaughter season. Flock residue accreditation incorporating monitoring on the farm, as well as the slaughterhouse, is also a possibility.

Slaughterhouse data bases have not as yet been considered a commercial resource. Flock health schemes that are reliant on sophisticated production related information are increasing in importance as a means to improve the economic viability of farms. Computerised slaughterhouse recording will contribute to this end by documenting sub-clinical disease and defects, a major cause of wastage. An integrated system would also allow a flock manager to access a request for specific post-mortem diagnoses on individual animals or groups. It is noteworthy that the predictive aspect of flock management packages is one of their most important

uses and slaughterhouse data must be included in calculation of medium and long-term gains in meat production systems.

Provision of facilities to conduct low-cost case control studies using definitive post-mortem data and computer networking will also be extremely useful. By involving inspection staff in extended information servicing and the possible extension of inspection service activities beyond the slaughterhouse, job interest and professionalism would be markedly increased. Specific requirements for nationally coordinated disease control programmes could also be met on an individual flock basis.

A vertically-integrated inspection service information resource would include:-

- (a) A modular micro-computer system capable of linking a range of operating systems in one software environment.
- (b) Software programmes with well-defined terminologies.
- (c) Co-ordination of objectives with all agencies involved in the integrated network.
- (d) Maintenance of producer confidentiality.

STAGE 3: National Disease and Residue Surveillance Centre

A desirable objective of an integrated meat inspection system is the participation in nation-wide computer-based surveillance of health and disease. Notwithstanding some problems associated with sampling bias, slaughterhouse monitoring remains the only means of acquiring information on a disease or condition that may be in a large population, if the massive expense of on-farm visits is to be avoided (Richards and Norris, 1986). As eradication programmes progress, it is increasingly important to rapidly detect and take action on breakdowns. Another contribution of nationally co-ordinated

monitoring is the identification of new trends in production and market-related diseases so that research initiatives can be correctly channelled.

A centrally co-ordinated system for managing the total residue problem is also desirable. With computer networking extending to a local level, sampling requirements could be accessed direct to the inspection point, and tracebacks could be directly actioned. Information servicing with respect to residue suspect lists and species verification could also be included.

Development of software that is appropriate to New Zealand meat inspection systems would allow national evaluation of inspection programmes and would provide a statistical basis for legal decisions on national standards.

REFERENCES

- Christiansen K.H.; Hellstrom J.S. 1980. The collection of data from New Zealand abattoirs and slaughterhouses. *Proceedings of the 2nd International Symposium on Veterinary Epidemiology and Economics*. Canberra p. 158-176.
- Goodhand R. (1983). The future role of meat inspection in the field of meat hygiene. *Journal of the Royal Society of Health* 103 : 11-15.
- Petersen B.K. 1965. Nation-wide computer-based abattoir surveillance and follow-up at the herd level. In *International symposium on meat and poultry inspection in a dynamic world*. Ministry of Agriculture and Fisheries of the Netherlands, Den Dolder, Netherlands.
- Richards M.S.; Norris R.J. 1986. Surveillance of infectious diseases using abattoirs. *Proceedings of the Society of Veterinary Epidemiology and Preventive Medicine*. Edinburgh, 2-4 April. p. 133-140.
- Skovgaard Meat hygiene: Preslaughter problems and trends. *Proceedings of the 8th International Symposium of the World Association of Veterinary Food Hygienists*. p. 3-10.