CHAIN QUALITY INFORMATION MANAGEMENT IN PORK CHAINS – SUPPORTING INFORMATION NEEDS OF DIFFERENT CHAIN ACTORS

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Introduction

Specialisation in the agro - food sector has led to an immense growth of productivity. However, it has also led to an increase of complex supplier-buyer relationships in agro-food chains. To maintain and improve consumer trust in the quality and safety of food, legislative actors have induced new framework conditions on food production: The EU General Food Law (EU 178/2002) demands traceability, transparency and a "stable to table"-approach throughout agricultural production while public food safety inspection is currently under reorganisation towards a „control of control"-principle. EU has consolidated its food hygiene legislation into a consistent set of four new regulations, often referred to as the "Hygiene package" (EU 852, 853, 854 and 882/2004). They include specific rules for the documentation of products and processes and information sharing between chain actors. This new legal environment provides a unique chance to boost innovation and to improve chain wide cooperation.

Methodology

The theoretical framework of this study focuses on two models: (1) The relations between actors in chains and networks; (2) the description of common tasks within quality management. A netchain has been defined as a set of networks comprised of horizontal ties between companies within a particular industry or group, such as these networks (or layers) are sequentially arranged based on the vertical ties between firms and different layers (Lazzarini et al., 2001). In the agro-food sector, a variety of network and supply chain structures exist, forming different netchains with a broad diversity of inter-enterprise relationships between its mostly legally independent links. It renders chain wide information management activities rather challenging.

Quality Management is a structured system for satisfying internal and external customers and suppliers by integrating business environment, continuous improvement and maintenance cycles. EN IS0 9000:2000 has been widely accepted as a framework for implementation of quality management systems and demands amongst others for the following principles towards improved performance:

– process approach,

– continual improvement,

– factual approach to decision making,

– mutually beneficial supplier-buyer relationships,

formulating the cornerstones for a chain wide cooperation and coordination of quality management activities.

A quality management system encompassing the horizontal and vertical dimension of a netchain can provide a means to better steer its complexities. Driving force is the recognition that each organisation in a netchain can enhance its performance and the product quality by integrating its goals and activities with other organisations to optimise the results of the entire chain (Van der Vorst, 2000). This approach highly depends on knowledge- and information exchange between the various actors of a netchain (Schröder, 1999; Petersen et al., 2002). Effectively implemented and supported by innovative information technology it can assist to improve productivity, raise consumer confidence and result in higher profits. (e.g. Amelung et al., 2002; Petersen, et al. 2002).

Existing (ICT-) applications are mostly used as operational data bases with little effects for improved quality management and implemented in highly integrated chains. Pork production is organised under very heterogeneous contractual arrangements. Information systems that are useful for wider parts of the pork industry have to take this fact into account; they should provide a flexible and cost effective system that can adapt to the given reality (Petersen, 2003). The improvement potential of more precise decision making in pork chains is expected in the fields of animal breeding, animal health management, improved cooperation between abattoir and meat processing and supporting meat inspection services to carry out a risk based meat inspection (Schulze Althoff et al., 2005).

It is apparent, that research and development on inter-organisational issues can better be addressed through collaborative activities of the different actors involved in chains. To meet this demands the international public private network GIQS (German abbreviation for "Trans Border Integrated Quality Assurance") was founded in 2001. Mission is to support chains and networks through international research and development projects that strengthen chain oriented quality management. In a Dutch-German research and development project in the border region of both countries, GIQS together with its partners combines existing ICT solutions with chain management concepts and develops practical tools for quality management in pork netchains (Petersen, 2003). In one of its sub-projects a comprehensive implementation guideline for a chain quality information system in a pork netchain is

developed. It shall enhance implementation time and reduce costs when implementing or improving a system.

Results

To organise a centralised data management including data on the converging and diverging product flows, relevant data has to be specifically processed before it can be made available for the various actors. Relevant quality information is selected from a variety of sources along the whole production chain. The selected data is centrally stored and structured for decision support purposes. Through specific access rights and internet based interfaces information is made available to various end users, who can use it in their individual context (Devlin, 1997).

Efficient decision support tools are of high importance to make use of the newly available information, even from distant links of the chain. A key driver is the aim to reduce uncertainty in decision making, through prior knowledge on emerging decision alternatives at control points. The data warehouse supports decision making in organisations. It is structured to enable a variety of analyses, including elaborate queries on large amounts of data that can require extensive searching. Through its long term availability the data warehouse enables better comparisons and prognostic views on the available information. With Business Intelligence tools the data can be specifically prepared for information needs of the various chain stakeholders (Strauch, 2002):

−   as standard reports that provide chain actors with regular information in a fixed format;

−   as easy-to-use interactive reports that enable users more flexible views on specific information;

−   for ad-hoc analyses and queries through multi dimensional analyses of available chain information.

The generic approach of inter-enterprise data warehouse technology takes into account existing organisational set ups and integrates data from available sources along the netchain. It is flexible to be applied in the multitude of differently organised pork netchains. The GIQS backbone (as the chain quality information system has been named in the project) is implemented in the three pilot chains. To meet the information needs according to the specific objectives of the different chain actors a variety of data sources have been integrated.
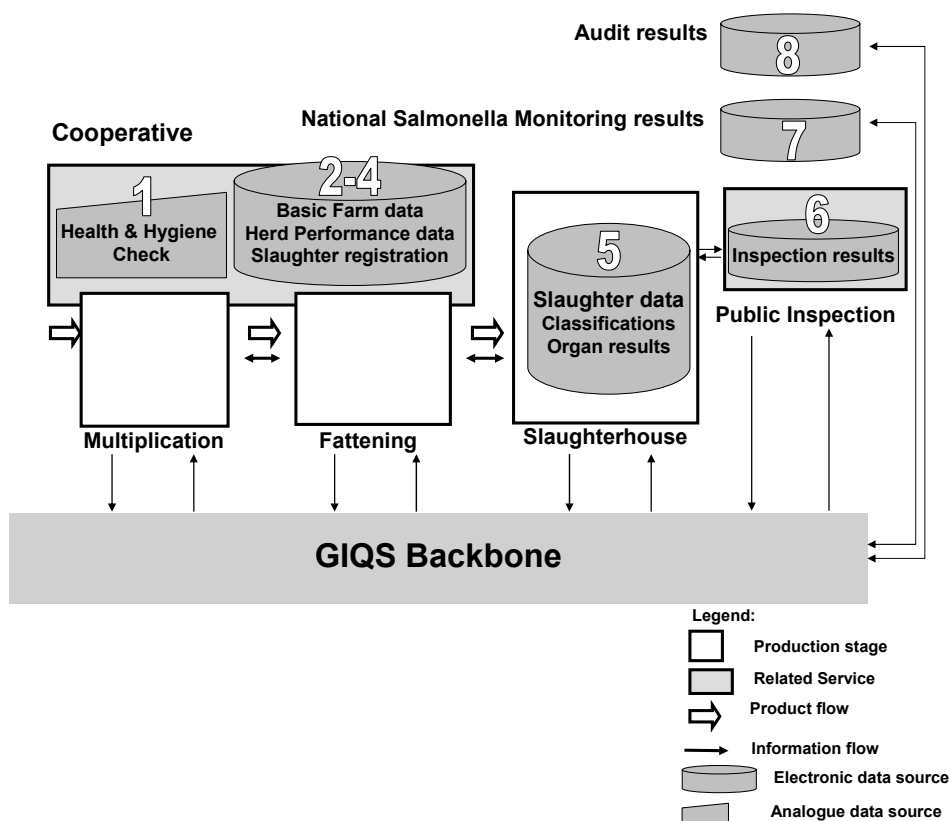
Figure 1: The GIQS backbone obtains information from eight sources

As an example the implementation of the GIQS Backbone is described in one of the pilot chains. To meet the purpose to support the new information requirements of public inspection services in regard to the risk based meat inspection and improve animal health management and on-farm advisory services the cooperative, slaughterhouse and public meat inspection services defined their information requirements (Poecker et al., 2004, Schulze Althoff et al., 2005).

Discussion

The combination of the netchain model of LAZZARINI et al. (2001) with the process model from ISO 9000:2000 provides a theoretical framework to describe the general structure of a chain quality information system in the heterogeneous world of pork production. To set up a cost effective quality information system, which meets the above described demands, existing information sources should be linked or integrated into a comprehensive database. This paper shows that an integration of data from different sources in the chain is feasible.

The integrated data can now be processed in new ways. Additional information does not necessarily lead to knowledge gain. For an efficient use of a central information system, available data has to be specifically processed and made available according to the information needs of the netchain actors. Data warehouse technology is a means to integrate

information from different data sources. It supports effective information exchange, continuous improvement process and provides an added value for all actors in a chain.

Acknowledgement:

More Information: www.giqs.org

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