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INTEGRATING THE HACCP CONCEPT AND TOTAL QUALITY MANAGEMENT ON A DAIRY FARM

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Ключевые слова: Принципы HACCP, ветеринария, мониторинг, управление рисками, молочные фермы, менеджмент качества.

Summary: There is an increasing tendency that livestock production is integrated into food production chains, from the farm level up to the consumer level. An important element in such production chains is that each link should provide the next link with safeguards regarding the product delivered. This article addresses the different quality control concepts as applied at dairy farm level.

Аннотация: В последнее время наметилась тенденция интеграции производителей продовольственного сырья в производственные пищевые цепи, от уровня производителей сырья к уровню потребителя. Важным элементом таких производственных цепей является то, что каждое звено при поставке на следующий уровень должно обеспечить гарантированную безопасность продукта. В данной статье рассматриваются различные концепции контроля качества, которые могут применяться от уровня изготовителей молочного сырья.

Food safety plays a paramount role in the consumer attitudes and concerns about the livestock industry and the products of animal origin. On the other hand, the general public puts increasing demands on the way that farmers produce. In this situation it is not food product safety that is referred to, but rather husbandry methods with regard to animal health and welfare, to

productivity and to environmental issues. Although the consumer perception of the livestock production sector appears to be highly biased by a lack of knowledge and although there is a large psychological gap between the farmers' community and the urban population in their mutual understanding, it has become clear to the farmers that the quality demands set by the general public have to be met. Livestock production has become market-driven and quality control is an important part of meeting the demands of the society. Certification and quality assurance programs have been introduced. Quality control can be conducted according to different concepts: Good X Practice codes (GXP), International Standardization Organization systems (ISO-9000), Hazard Analysis Critical Control Points (HACCP) and Total Quality Management (TQM) [1]. These concepts are extensively addressed in textbooks on quality control. Differences between GXP, ISO and HACCP with regard to on-farm application have been categorized as given in Table 1.

Table 1. A comparison between different quality control concepts with regard to animal health as a quality feature [2]

Feature	International Standardization Organization (ISO) system	Good Manufacturing Practice (GMP) codes	Hazard Analysis Critical Control Points (HACCP)
Approach	Top-down	Top-down	Bottom-up
Orientation	System	Process	Process/ product
Farm-specific	No	No	Yes
Simplicity level	No	Moderate	Yes
Health demonstrable	Yes	No	Yes
Fit for certification	Yes	No	Yes
Documentation need	High	Low	Moderate
Self-management level	Low	Moderate	High
Labour demand	High	Low	Moderate
Health demonstrable	Yes, general	No	Yes, specific

The starting issue was the question to what extent a quality control concept could be applied to animal health hypothesized as a feature of the quality of the production process. It is clear that HACCP can be regarded as the best choice for safeguarding and certifying animal health in dairy practice. However, before any action is to be taken to design and implement a quality control program, the appropriate attitude and mentality towards quality is necessary. This is the area of GXP codes. These GXP codes, where the 'X' can be replaced by any term like veterinary (V), hygiene (H), clinical (C), manufac-

turing (M) or farming (F), comprise general statements of attitude regarding the production process. Take for example the statement in the GHP code that the calving pen should be cleaned and disinfected after every calving. Such statements are not specific and do not refer to specified locations or steps in the production process.

The ISO concept refers to a whole systems approach, where all respective elements, suppliers and advisors are included in and elaborated by the system. This concept is far too elaborated to be practically feasible at farm level; it can function nicely in regular industries. Most quality control systems, like ISO, emphasize the need for creating a quality team before starting the build-up of a quality control system. The HACCP concept has been proposed as an alternative quality control system for dairy farms, because it addresses hazards and risks (exactly as is being done in disease control and disease management), and focuses on preventive risk management in a farm-specific setting. Its orientation is on the product (e.g. milk) by addressing the production process steps (e.g. risks).

Overall, many different types of hazards are often present at a dairy facility and the failure to be aware of these can lead to accidents and injuries. It therefore follows that potential hazards, in the first instance, need to be formally identified in order for them to be managed. The key steps in safety analysis are (1) the systematic identification of hazards that are present, whether obvious or latent, (2) the prioritization of hazards using a risk matrix approach, and (3) the management of hazards through the introduction of risk control or risk mitigation measures. Usually, these three steps are adequate for the majority of in-plant safety issues. Where greater issues that could pose significant risks not only to in-plant personnel but also to the neighboring communities exist, it may be necessary, in addition, to perform a Quantitative Risk Assessment (QRA) [3].

The HACCP concept appears to be the best choice so far for the farmer who wants to act according to quality control principles, not in the least where animal health is considered a quality feature. Key issues in the HACCP concept are the design of a production process decomposition diagram, the identification of hazards, risk assessment, definition of critical control points and critical management points, the monitoring of the production process, planning of corrective measures, and the risk management procedures. Hazard identification means that major disorders and potential threats are identified as well as the risk factors contributing to their occurrence.

Risk factors are obtained through either literature analysis, observational analytic field surveys, or adaptive conjoint analysis procedures, as has been

reported in literature. These risk factors are assigned to the respective sites in the production process where they have their impact. Critical control points (CCPs) and critical management points (CMPs) then need to be defined on the basis of these risk factors. The CCP is a measuring point, a condition or a sequence in the production process which is related to the hazard, for which the control is crucial and where deviations can be detected by comparison with accepted target and tolerance levels, for which corrective measures are available which after loss of control in their turn lead to full restoration of control.

In more business-like conditions, TQM can be integrated with veterinary herd health and production management programs (HHPM). The latter are focused on operational and tactical management support with regard to decision-making on health, reproduction and productivity of the herd according to standard protocols. The ultimate objective of HHPM is to reduce operational costs and/or to increase farm income. These programmes have three major characteristics: (1) the basis is routine monitoring and surveillance of animals, farm conditions and information during regularly planned farm visits, (2) the analysis of herd problems and related risk conditions in order to solve those problems, and (3) the prevention of disorders by monitoring, eliminating or reducing risk conditions. During biweekly or monthly farm visits the monitoring leads to early signals of possible deviations, on the basis of which farm-specific plans of action are designed, implemented and followed up by the veterinary surgeon at subsequent farm visits. Examples of routine monitoring are presented in Table 2.

Table 2. Examples of routine monitoring activities in a Herd Health and Production Management (HHPM) program [4]

Cow/herd level	Farm environment	Farm information
Body condition score	Milking technique	Performance figures
Rumen fill score	Hygiene procedures	Milk recording data
Faeces score	Nutrition and Milk quality data pasturing	Milk quality data
Claw score	Housing conditions	Roughage analysis
Teat end score	Climatic factors	Soil analysis
Reproductive examinations	Boiler temperature	Surface water quality
Growth measurements	Rodent/insect control	Quality audit reports
Clinical cow examination	Other managerial activities	

This farm monitoring can be regarded as an overall farm inspection, the prestige of problem analysis or an epidemiological survey wherein risk factors for disorders are searched for in order to provide means for elimination or control of that disorder. In every organization it is necessary that the manager is able to assess the current situation and has insight into the past herd performance.

The HACCP concept has gained wide acceptance because it provides a logical, structured approach to prevent, eliminate or reduce hazards in foods. The system is designed to detect loss of control and, thereby prevent suspect food from reaching consumers. This is an essential component of the food safety system because deviations can and will occur during the normal course of operation. Preventing repetitive deviations for GHPs and CCPs is a desirable goal but may be difficult to achieve in some food operations. Each food operation should strive to prevent repetitive loss of control by implementing a continuous improvement program to achieve greater reliability for controlling GHPs and CCPs within the food safety system [5].

The Codex Alimentarius Committee on Food Hygiene provides international food safety standards (FAO/WHO, 2003). In 2006, the European Union mandated that all food operators adopt procedures based on the seven principles of HACCP. Additionally, HACCP has been adopted in Canada, Australia and Japan [6]. Recently, the Eurasian Economic Union has mandated HACCP for all food operators according to the technical regulations «On food safety».

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**ПРИНЯТИЕ НА ПРЕДПРИЯТИИ КОНЦЕПЦИИ МАРКЕТИНГА –
УСЛОВИЕ ЭФФЕКТИВНОГО ВНЕДРЕНИЯ СИСТЕМЫ
МЕНЕДЖМЕНТА КАЧЕСТВА**

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Ключевые слова: система менеджмента качества, стандарт СТБ ИСО 9001-2009, концепция маркетинга, нужды потребителей, интегрирующая и координирующая функция маркетинга, процессы.

Key words: quality management system standard ISO 9001-2009, the concept of marketing, customer needs, integrating and coordinating the marketing function, processes.

Аннотация: В данной статье раскрывается значения и необходимость принятия маркетинговой концепции на предприятии как главное условие эффективного функционирования системы менеджмента качества.

Summary: This article deals with the importance and the need for a marketing concept enterprise as the main condition for the effective operation of the quality management system.

Совершенствование систем менеджмента качества (СМК) диктуется, прежде всего, острой необходимостью организации на предприятиях такого производственного процесса, в ходе которого отлажена цепочка, т.е. выявление, сокращение и, что наиболее важно, предупреждение выпуска некачественной продукции.

Используемые на многих белорусских предприятиях системы менеджмента качества в преобладающем своем большинстве в настоящее