

# Implementation of herd health programs in Estonian dairy farms

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## Introduction

Until now, there were no systematic herd health management programmes (HHP) covering all areas of the herd and of a preventive nature in dairy cattle farms in Estonia. Also, little was known about the economic impact of the program's implementation on the company. In order to implement herd health management programmes and to assess the accompanying economic impact and changes in herd health, NGO Estonian Dairy Cluster (MTÜ Piimaklaster) ordered a two-year pilot study (April 2017 thru March 2019) from Estonian University of Life Sciences that has formed appropriate group including herd health veterinarians and experts of economic studies. Suitable herd health protocols, including Hazard analysis and critical control points (HACCP) system mechanisms for Estonian dairy farms were developed and tested in five Estonian dairy farms of different sizes: one undertaking with approx. 100 cows, three farms with 600-800 cows, and one herd with approx. 1800 cows. To evaluate the effectiveness of the project, the dynamics in health and production indicators and economic performance of the herds were analysed over 16 months period.

## What are the herd health programs and how to carry out HHPs?

Herd health management programmes refer to certain systematic practices in the herd aiming to maintain the health and productivity of animals at the highest possible level of efficiency, thereby ensuring the competitiveness and profitability of the farm. Herd health management programmes are complex, meaning that all fields are under observation simultaneously – **youngstock health, udder health, milk quality, reproduction, feeding and metabolism, and hoof health**. (Scheme 1) Each of these areas is characterized by certain performance indicators, the comparison of which with target values help to identify problem areas. Accordingly, the prerequisite for carrying out HHPs is continuous and objective data collection and registration of health and production-related data. Most of the data is collected at the individual animal level, but aggregated to the herd level to assess herd health and performance. The summary reports created by [Estonian Livestock Performance Recording Ltd](#) were of great help in the analysis of herd indicators (normative animal performance data). Analysing data from various fields, the strengths and weaknesses of the farms were identified. Based on the areas in which the farms were distant from the target values, a thorough risk factor analysis was carried out identifying the impeding factors inhibiting the achievement of results. Farmers were provided a detailed advice to improve the conditions and follow-up activities were planned. Even in those areas whose performance indicators were satisfactory to the farm, data was continuously monitored. With this, it is possible to detect problems and intervene even in the case of small deviations, i.e., the core part of the HHP was the prevention and discovering the arising herd health problems before these cause economic loss to the farm. For example, prevention involves reducing the risk of introducing new infectious diseases into the herd, which is why biosecurity programs are an important part of

HHPs. Since HHPs are accompanied by improvements in animal health and thus welfare, their implementation also contributes to meeting consumer expectations. HHPs should be a natural part of the company's quality control system in the future. According to the assumptions, HHP has a favourable effect on the economic indicators of the company, because a healthier herd uses feed more efficiently and produces more and higher quality production.

### **Who makes up the herd health team?**

The herd health management programme is a team job, in which the important parties are the employees of the farms themselves, led by the farm manager, and the veterinarian(s) responsible for providing advice concerning the herd. It is definitely important to include all involved parties (e.g., agronomists, feeding consultants, breeding advisor, etc.) in the herd health management programme. Where appropriate, important external consultants are included in the process.

### **What is required from the farm when carrying out a herd health management programme?**

Effective implementation of a herd health management programme requires, in particular, excellent cooperation and trust between team members. The farm manager, or other individual associated with the programme, must complete a monthly questionnaire in which the indicators concerning the health and productivity of the herd are consolidated (Annex 1). This data is important when it comes to identifying problem areas in farms, as well as assessing the performance of the programme. The veterinarian(s) responsible for carrying out the herd health management programme generally visit the farm once per month, during the course of which the strengths and weaknesses of the herd are mapped with the aid of the questionnaire including performance parameters as well as with the help of the motivational questionnaire (Annex 2). The latter is important to order the works and activities based on the priorities of the farm. This is followed by the analysis of the problems by the veterinarian – the factors causing problems at the given farm are identified and a plan of action is prepared for the farm, which helps the farm to achieve the set goals.

### **Why are herd health programs needed?**

An increasing proportion of Estonian dairy cattle is concentrated into large farms - in 2021, approx. 72% of Estonian dairy cows were already kept in farms with 300 or more cows. Estonian dairy farms are predominantly intensive production enterprises, where updated technologies are used. In connection with this, the nature of veterinary services has also changed. In addition to treating sick animals, veterinarians must prevent and control disease at the herd level. In the variety of options, the farmer must make several decisions in cooperation with the veterinarian, which must serve the goal of better health and welfare of the animals, while also being economically justified.

## **Methodology**

### **Young stock health, the calves**

In order to reduce the incidence of the most prevalent diseases of calves - diarrhoea and respiratory disease - the main efforts were made to improve the transfer of passive immunity obtained through colostrum, blocking the transmission routes of infections on the farm, improving hygiene and

controlling infectious diseases. Treatment regimens for calf diseases were reviewed, their pathogen-based nature and antimicrobial sensitivity of the disease-causing pathogens were revealed. Achieving the positive impact of HHP depended largely on the ease of making changes in calf management practices, as well as on the possibilities to restrict the circulation of the infections in the herd or eradicate those. Some infections cannot be eliminated from the farm, but certain activities can be used to control their spread on the farm. The effect of the reduction of infectious diseases associated with multi-year control cannot yet be taken into account in the project. In two companies, the incidence of diarrhoea significantly decreased, and in one, the occurrence of respiratory disease. The use of antimicrobials decreased significantly in two companies, primarily due to a decrease in their use as prophylactic treatments. The so-called overtreatment with antimicrobial agents was observed primarily in the case of diarrhoea in calves.

### **Hoof health**

Good hoof health is a prerequisite for good health status, well-being, reproductive capacity and productivity of cows. Therefore, hoof health has a diverse and extensive economic impact. The overall goal of the hoof health program is to increase the proportion of non-lame animals in the herd. First, lameness assessment maps the lameness status of the entire herd - the presence of the problem and its extent. Next, the organization, quality and data recording of the prophylactic hoof trimming and treatment were analysed. On the basis of the registered data (correct diagnoses), an analysis was made as to whether infectious or non-infectious diseases prevail in the herd. Thereafter, the most important risk factors of the given farm were clarified. The well-being of the animals, the maintenance of cubicles, walkways, feeding and milking areas and the work organization of the farm were assessed. It is important to emphasize that all the activities described above must be carried out as a single complex - if there are deficiencies in any activity, the movement towards the goal (healthier and more productive herd) is significantly slowed down.

### **Udder health and milk quality**

One of the objectives of the udder health section is to reduce the spread and occurrence of udder infections in the herd, resulting in improved milk quality. The activities of the program are to find out the risk factors of udder infections related to milking, milking equipment and the farm environment, and to eliminate the deficiencies found. Pathogen-based and cost-effective mastitis treatment guidelines were developed, the implementation of which reduces inappropriate use of antibiotics and treatment costs. During the project, the cost of mastitis treatment and the number of milk-free days have decreased in all farms. The risk factors for udder infections vary from farm to farm, but a common risk factor for udder infections has been the conditions of the milking parlours and farrowing barns.

### **Reproduction**

Optimizing the reproductive performance of cows and heifers deals mainly with issues related to conception (oestrus detection, synchronization schemes, insemination techniques, etc.), reducing diseases during and after calving (mainly metabolic and limb diseases), as well as reducing environmental stress and optimal feeding. In general, the change in reproduction parameters in the test farms was favourable - the calving interval in one company was on target (less than 400 days)

already from the start of the project, two farms reached the goal during the project, and two companies moved considerably closer to the goal.

### **Economic impact of herd health programs**

In connection with ensuring the health of the herd and animal diseases, dairy farms incur a number of different costs (besides medicines and other preparations). Treatment schemes must take into account the period of milk ban, when the produced milk cannot be sold, although costs are incurred for its production. The high age at calving of heifers results in additional feed costs without producing milk for sale at the same time. With a long calving interval in cows, the end phase of the lactation is prolonged entailing a prolonged period with suboptimal milk production. Poor conception of heifers and cows' results in additional costs for semen and insemination services. As a result of diseases, milk production often decreases and the protein and fat content of milk decreases. As the health of the herd improves, the need for so-called forced culling decreases and it is possible to sell more heifers.

The 16-month weighted average cost of herd health per 1 ton of milk produced by the five farms participating in the project was 22.2 euros (Table 1). Of this, 36% was the direct cost of medicines, 49% unsold milk and discounts for milk fat and protein content lower than the basic levels, and 16% costs related to reproduction. In many cases costs of herd health can be much higher and our pilot results may not reflect the sector average level.

Table 1. Herd health costs as a weighted average of the farms participating in the project

	Weighted average, EUR/ton of milk	Share
Cost of medicines	7,9	36%
The value of discarded milk	7,5	34%
Calving age of heifers	1,7	8%
Calving interval	1,3	6%
Sperm and insemination service	0,5	2%
Mark-up/discount on fat and protein content	3,2	15%
Total	22,2	100%

Although the farms' monthly herd health indicators were fluctuating, based on the data of 16 months, it can be concluded that in four out of five farms, costs related to herd health decreased by 7-8 euros per 1 ton of milk produced (about 300€ per ton that time). Thus, the implementation of HHP has helped to improve the health and welfare of the herd, decrease the use of medicines and increase the economic efficiency of the farms.

### **In conclusion**

Herd health programs have an important place in today's dairy cattle farms, and they are finding their way to Estonian farms. According to our experience, achieving results is primarily related to the team's motivation and good cooperation on the farm. During the HHP the company is given guidelines to move towards the goals, but the real activities must be carried out by the people working on the farm.

Achieving expected results depends on the starting point and the risk factors causing the specific problem and their manipulability. It is already clear that on the basis of the developed HHP, it is possible to find an individual action plan suitable for each farm, and its implementation will have a positive effect on both animal health and the company's economic results.

Secondly, developed knowledge will be further applied not only through consulting the following companies, but also continuing education for veterinarians and consultants, as well as additions to the Estonian University of Life Sciences veterinary and animal husbandry curriculum. Thirdly, current pilot study has been valuable input to Estonian Rural Development Plan (RDP) 2030 animal health & wellbeing strategy. As of 2023 RDP will support the implementation of HHPs in Estonian farms by new support measures.

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