ESTONIA

Farm's performance, restructuring & modernisation

Location
Märja, Tartu

Programming period
2014 – 2020

Priority
P2 – Competitiveness

Measure
M16 - Cooperation

Funding (EUR)
Total budget 451 039
EAFRD 349 112
Private 101 927

Project duration
2018 – 2022

Project promoter*
NGO Milk Cluster

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An EIP-AGRI Operational Group is developing a biosensor that will quickly identify mastitis infections in dairy cows and thus improve the efficiency of the sector.

Summary

Mastitis is a major health problem for dairy cows. It causes vast economic burdens for milk producers due to the increased costs for treating the infected animals, decreased quality and quantity of milk production, as well as premature culling of chronically infected animals.

The aim of the EIP-AGRI Operational Group (OG) called MAVAS is to test and prepare a novel biosensing system for commercial use. The biosensor is intended for on-farm rapid complex detection of the most common mastitis-causing bacteria in fresh milk and identification of dairy cows suffering from preclinical and clinical mastitis.

Results

The improved ability to diagnose on-farm will allow for more effective preclinical treatment, which will reduce further treatment costs and the number of serious infections.

The improved animal health will result in higher milk yields and increased economic results.

Reducing the use of antibiotics for animal treatment will have a positive environmental impact.

Improving the performance of the sector will help maintain jobs, while the use of new technologies will help attract new entrants into the workforce.

* The Project promoter/beneficiary is an EIP-AGRI Operational Group (https://ec.europa.eu/eip/agriculture/en)

Context

Mastitis is a major health problem for dairy cows. It causes vast economic impacts worldwide within the sector due to treatment costs, decreased quality and quantity of milk production and premature culling of chronically infected animals.

Estonia is among the top three countries in Europe for milk yield per animal. In order to further improve the sector's performance, it is necessary to reduce the number of sick animals. Improved diagnosis and preclinical treatment will reduce the number of infections and thus the amount of antibiotics used and associated costs. Achieving high levels of production also requires farming enterprises to have the best available production technology. Estonia has an explicit competence in biosensors, which coupled with the need for improved animal health, laid the groundwork for this project.

Objectives

The aim of this OG is to test and optimise a novel biosensing system for mastitis in dairy cows. The system will allow for rapid complex detection of the most common mastitis-causing bacteria in on-farm milk and consequently, the identification of animals suffering from preclinical and clinical mastitis.

Activities

The Estonian Dairy Cluster (EDC), established in 2015, is a collaboration between Estonian milk producers and processors that seeks to bring innovation into the sector. The EDC set up this OG by bringing together national and international researchers as well as Estonian milk producers and processors. EDC developed a four-year development plan to carry out innovation projects that would address the five most common issues faced by the dairy sector: breeding, animal health, milk quality, feeding and exports.

In December 2017, an international cooperation partnership was set up with the Finnish ÄLYREHU EIP-AGRI Operational Group led by Oulu University. It is the first such EIP action in Europe, born out of two Member States

issuing EIP-AGRI similar funding calls for OGs almost at the same time. The EDC is the lead partner in the Estonian project and is coordinating the international cooperation actions and communicating the project results. The funding partners in addition to EDC are the Kuivajõe Farmer Plc and the Kaiu LT Plc, and the research partners are TorroSen Plc and the Estonian University of Life Sciences.

The biosensor platform under development will allow for modification of the list of detectable bacteria by biosensors, but it will also allow extra pathogens to be added to meet the particular needs of different farms. The prototype biosensor was developed in 2017 and can detect the three most likely milk pathogens that cause mastitis, i.e. Staphylococcus aureus, Streptococcus uberis and Escherichia coli, within 15 minutes. However, the prototype was only ready for use in laboratories.

The EIP-AGRI Operational Group MAVAS will:

• compare the results of the biosensor and accredited methods, both in qualitative and quantitative terms;

• optimise the measurement protocols for the implementation of the method in on-farm conditions and determine the essential concentrations of pathogens in mastitis milk; and

• build a biosensor prototype for commercial use on-farm.

Main results

The improved ability to diagnose mastitis will allow for more effective preclinical treatment, which will reduce treatment costs and the number of serious infections.

The improved animal health will result in higher milk yields and increased economic results.

Reducing the use of antibiotics for animal treatment will have a positive environmental impact.

Improving the performance of the sector will help maintain jobs, while the use of new technologies will help attract new entrants into the workforce.

Additional sources of information

n/a