

LOKROB - how to better attract dairy cows to milking robots

Farm automation creates fodder savings to increase the productivity of dairy farming in Flanders.

EAFRD-funded projects

Location: Flanders, Belgium

Programming period: 2014-2020

Priority: P1 - Knowledge transfer and innovation

Focus Area: Innovation and cooperation

Measures: M16 - Cooperation

Funding:	Total budget	172 531 (EUR)
	EAFRD	36 081 (EUR)
	National/Regional	36 081 (EUR)
	Private	69 429 (EUR)
	Other funding sources	30 940 (EUR)

Timeframe: 15/01/2020 - 31/05/2023

Project promoter: Flanders Research Institute for Agriculture, Fisheries and Food (ILVO)*

*The project promoter/beneficiary is an [EIP-AGRI Operational Group](#)

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Summary

The project 'LOKROB' involved robotic dairy farms and explored two alternative methods for feeding and attracting cows to milking robots.

Johan Vanhecke, a dairy farmer from Maldegem in Flanders, Belgium, tested two innovative ideas, one regarding the change in fodder provision, and the other concerning the use of sound to attract cows to a milking robot. The project built an installation that is suitable for the use of beets in milking robots by replacing dry matter concentrate. The installation increased the number of visits to the milking robot and savings in fodder purchases were achieved. However, the change of food had no effect on milk production.

The project also explored whether playing recorded calf sounds would attract cows to the milking robot. The research findings showed that this had no positive effect on the number of visits to the robot, nor the number of milkings, nor the milk production.

Project results

- One new feeding installation was developed and tested for milking robots and deemed efficient and suitable for a range of vegetables.
- The research into alternative feeding fodder was completed and showed that feeding fodder beets in milking robots increased the number of milkings per cow per day by 0.1 to 0.2 milkings per day.
- Cost savings were achieved in fodder purchase.
- The engineers of the participating companies were mostly young people, who gained valuable learning experience from working directly with dairy farmers on problem-solving tasks and testing the installation.

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Key lessons and recommendations

- Bringing people together who have the appropriate and complementary skillset of knowledge and know-how is vitally important, as it enables an effective conversion from innovative ideas to solutions.
- Farmers with interesting ideas and innovative potential can set up networks to jointly develop project ideas within EIP Operational Groups and through other opportunities from the CAP for cooperation.
- It was very effective to combine the EAFRD with the VLIF innovation support from the Flemish government, to increase the financial volume and range of activities of the project.

Context

Pelleted concentrate feeding in automatic milking systems or milking robots is the standard in today's dairy farming sector. It supports milk production in high-yield dairy cows and is an extra incentive for cows to go to the milking robot.

The cost of high-power feed provided by milking robots is variable and expensive and puts pressure on the profitability of robotic farms.

The farmers involved in this project LOKROB aimed to explore alternatives for these concentrates (e.g. fodder beet, potatoes, waste apples, pears) and research their feasibility and effects on the cows. In addition, the farmers were keen to develop an alternative reward system for cows visiting a milking robot.

To achieve the objectives, an EIP Operational Group was established, bringing together dairy farmers, researchers, advisors, machine builders, and milk installation manufacturers to collaboratively build and investigate potential solutions concerning a new mechanism through which different kinds of fodder could be provided in a milking robot. The question of whether the use of calf sounds would attract cows to come to the milking robot more frequently was also to be researched.

Objectives

The main objectives of this project were to:

- Improve profitability for dairy farmers.
- Conceive, build and test an installation that would automatically dispense chopped fodder beets in a milking robot.
- Explore the use of calf sounds to attract cows to the milking robot.
- Improve the work-life balance and work satisfaction of dairy farmers.

Activities

The project activities involved the following:

- Designing and building the feeding installation - this step included the conceptualisation, evaluation, refinement and testing of an automated installation mechanism that continuously provides chopped fodder beets (and potatoes) to a milking robot for cows. This required ongoing consultation, discussions, feedback, and collaboration between the collaborative partners.
- Testing the developed installation in practice to determine the impact of providing (1) chopped fodder beets, (2) the quantity of fodder beets, (3) the effects of chopped fodder beets (or possible alternatives) on milk production, milk composition, the number of milking sessions and the number of cows visiting the robot for milking, (4) and whether the provided quantity should be differentiated by the expected milking time.
- Conducting a literature review.
- Implementing practical tests of possible alternative reward systems for dairy cows in milking robots. Two tests with calf sounds were undertaken on pilot farms.





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- Conducting an economic assessment of the costs and benefits of the developed innovation in terms of investment costs, maintenance costs and its impact on the feed balance (feed costs and milk production).
- Analysing all findings and communicating and sharing the results of the project with the industry through a demonstration session and a video.

Main results

- One new feeding installation was developed and tested for milking robots. It was deemed efficient and suitable for a range of vegetables.
- The research into alternative feeding fodder was completed and showed that feeding fodder beets in milking robots increased the number of milkings per cow per day by 0.1 to 0.2 milkings per day.
- Cost savings were achieved in the fodder purchase. The research demonstrated that the feeding costs can be reduced by lowering the concentrate provision and replacing it with fodder beets.
- In a scenario where two milking robots were used, detailed calculations indicated that the investment proved profitable. However, this did not apply in cases where just one robot was used.
- A total of 60 stakeholders participated in the demonstration session, including dairy farmers, advisors, industry representatives, journalists and others.
- A further 55 dairy farmers were informed of the project results through a presentation to representatives from an earlier collaboration in the Interreg FWVL project Protecow.
- The research findings might inform further research exploring alternative approaches to encourage cows to approach milk robots more easily.

- The collaboration with the university and students provided additional insights for all involved.
- The engineers of the participating companies were mostly young people, who gained valuable learning experience from working directly with dairy farmers on problem-solving tasks and testing the installation.

Key lessons and recommendations

- Bringing people together who have the appropriate and complementary skillset of knowledge and know-how is vitally important as it enables an effective conversion from innovative ideas to solutions.
- Farmers with interesting ideas and innovative potential can set up networks to jointly develop project ideas within EIP Operational Groups and through other opportunities from the CAP for cooperation. The merit of such a project is to bring together relevant stakeholders with the appropriate (technical) know-how and problem-solving skills to foster a successful collaboration between the participants.
- It was very effective to combine the EAFRD with VLIF innovation support from the Flemish government, and to increase the financial volume and range of activities of the project.
- Additionally, it was helpful that the farmer Johan Vanhecke, was one of the seven Flemish pilot farms within the European R4D project.

“Thanks to the project, I was able to successfully turn my innovative idea into reality. With the help of the LOKROB partners, I built an installation in my Lely milking robot to provide chopped fodder beets continuously and automatically to my dairy cows. This method attracts the cows to the milking robot and increases the number of milking sessions.”

Johan Vanhecke, farmer

Additional information:

www.ilvo.vlaanderen.be

https://www.youtube.com/watch?v=m_v6-60DJgA

https://www.rundveeloket.be/studiedag_lokrob

https://www.rundveeloket.be/kenniscentrum/mechanisatie_automatisatie/robotmelken/kalvervocalisaties



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