Application of electrolysed water as a substitute for iodophor disinfectants for the prevention of mastitis on dairy farms

Summary

Mastitis is currently the most common and the most worrying disease in the dairy cattle sector, as it represents almost 40% of all cow disease, being the main cause of economic losses, in both farms and the industry as a whole. In terms of production, these losses can represent up to 60-70% of total farm losses.

The main factor causing mastitis is poor hygiene during the milking phase. For this reason, it was decided to maximise hygiene of the teats in this phase. So far, the sanitisation and disinfection technique has been carried out using chemical products, especially from the iodophor group. The main problem is this increases the iodine content in the end product. There is a positive correlation between the increase in iodine content in milk and the use of iodine preparations pre- and post-dipping.

Thus, a strategy is required to reduce the source of iodine in milk and avoid disrupting the welfare of the cattle. This project consisted of carrying out experiments based on the use of electrolysed water to control mastitis, determining the technical and economic feasibility of using it as a sanitising and disinfectant agent for teats during milking, as a substitute for chemical products such as iodophors.

Objectives

The main objective of the project is to use an alternative method (electrolysed water) as a substitute for the iodine disinfectants used in pre- and post-dipping on farms to disinfect cow teats and prevent mastitis.
More specifically, the project proposes:

- Initial characterisation and subsequent monitoring of overall mastitis infection levels in the dairy farm.
- Validating the effectiveness of the new technology on the dairy farm during the pre- and post-dipping phases throughout the different seasons of the year.

Description of the actions carried out in the project

The following actions were carried out during the project:
- Initial characterisation and periodic monitoring of mastitis rates (both clinical and subclinical) in the whole dairy farm herd). In the case of subclinical mastitis, diagnosis was confirmed by somatic cell count analysis in milk. Microbiological monitoring of the teats was also carried out in order to check the sanitising effect of electrolysed water.
- Establishing a new disinfectant application process. To do this, the equipment for producing electrolysed water was designed and, in the second phase, the maximum ideal concentration of electrolysed water to apply was determined.
- Validation of the efficacy of electrolysed water over a one-year period. Monitoring was carried out over a long period to check that its application could control mastitis levels regardless of environmental conditions (temperature and relative humidity).
- Transfer and dissemination of the operation and results obtained after validating and establishing the new protocol for teat disinfection with electrolysed water.

Final results and practical recommendations

The main results obtained from the project are:

- The use of electrolysed water helps reduce levels of somatic cells in milk, with mastitis incidence rates remaining the same as with the use of iodised disinfectants.
- Iodine content in milk is reduced by about 58 µg/L in cows disinfected with electrolysed water compared to cows treated with iodised disinfectants.

Conclusions

As a general conclusion to the project, it may be said that the use of electrolysed water on teats and subsequent drying is a safe, efficient and cost-effective alternative to current methods of disinfection with iodine products. As well as being manufactured on site (from very basic raw materials such as water and salt) and not depending on an external disinfectant product; it is a much more resilient products, especially in times of supply crisis and price increases.

Leader of the Operational Group

ORGANISATION: GURISAT, SL

Coordinator of the Operational Group

ORGANISATION:

Other members of the Operational Group (not recipients of the grant)

ORGANISATION: University of Girona

Geographical area(s) of application

PROVINCE(S)	REGION(S)
Girona	Gironès

Dissemination of the project (publications, conferences, multimedia, etc.)

The project was disseminated over the company website, where information on the project operational group and a video explaining the problems studied in the project were posted.

Project website

http://gurisat.com/projecte.asp?lang=ca

More information on the project

PROJECT DATES	TOTAL BUDGET
Start date (month-year): July 2020	Total budget: €138,872.84
Completion date (month-year):	DACC funding: €73,602.61
Current status: Under way	EU funding: €65,270.23
	Own funding: €59,516.93

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