Research towards successful application of PLF in dairy farms

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A wide range of sensors and technology is available for dairy cattle. Yet, only a limited amount of developments become real Precision Livestock Farming (PLF) applications in practice. This paper aims to give an overview of what possibly impedes the use of PLF systems in dairy farms. Furthermore, this paper gives examples of ongoing and future national research projects that test the proposed hypotheses and of national actions that purport to close the gap between technology developers and dairy farmers.

First, preferences of the farmers towards sensors are often overlooked. Conjoint analysis reveals that Dutch farmers want, at least for a mastitis sensor, a high level of specificity (low amount of false positive cases) and a small time window (no more than 24 h between alarm and onset of the disease, so no early detection). A discrete choice experiment is ongoing to reveal Flemish farmers' preferences for lameness and heat detection. Knowledge on preferences can be used when new sensors are developed, but also specific communication campaigns can be set up (e.g. to stress the benefit of early detection). A Flemish information platform (www.koesensor.be) focusses on the spread of information concerning the use of sensors and technology.Once a sensor is incorporated in a dairy management, the appropriate use can be questioned. For example, for mastitis detection only 3% of the generated alarms are checked by the farmers. The lack of standard operation procedures informing what to do after an (early) alarm might explain this low response rate. Considering this, a new research approach is amplified where the focus shifts from (early) detection of the disease towards detection of risk factors for the disease. Instead of focusing on the whole stock, detection systems can be developed to identify the cows at risk. Doing so, no longer symptoms, but risk factors are being automatically measured. In case of an alarm, cow specific preventive measures can be (automatically) applied. Finally, the use of technology will also depend on the net economic benefit. Therefore, ongoing research focusses on reducing production costs of sensors by downscaling. However, farmers don't see the real disease cost and the benefit of early treatment is unknown. Ongoing and future research aims to demonstrate real benefit of early lameness detection and cost-benefit analyses will be performed.

Thorough collaboration with research and industry would allow to increase the scale of the experiments and will undoubtedly contribute to the accessibility of PLF application in European dairy industry.

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