Detecting cow oestrus to improve efficiency

The need

Efficient milk production on a modern dairy farm relies on the cows calving at regular intervals. As most are mated using artificial insemination, accurately detecting when a cow is in oestrus is a critical element of dairy herd management. Globally, it is estimated that missed oestrus detection results in losses of around $2bn a year in lost milk production alone.

Changes in cow movement patterns is a key indicator for many important aspects related to managing a dairy herd, including oestrus. ETS have developed a collar which is attached to the cow’s neck and contains a movement sensor. The information from the collar is transmitted via a wireless sensor network to a computer or mobile phone and a signal alert is sent from the collar when changes from normal movement patterns are detected, meaning farmers are updated in real time.

The "Silent Herdsman" improves profitability by boosting oestrus detection rates in a typical herd by between 25 - 30%. This provides substantial cost savings of around £15,000/year in a 100 cow herd through a reduced labour requirement and need for repeated matings, as well as increased milk production over a cow’s lifetime.

The Biosciences KTN assisted ETS to develop the technology particularly in relation to extending the range of management related aspects it can help dairy farmers to detect. Through assistance from the KTN, ETS have secured three new R&D grants to develop their technology to improve oestrus detection and other conditions such as lameness, health problems, and calving times.

These new developments will help ETS expand into new market applications which are estimated to provide additional sales revenues for ETS and their partners of £5m -10m in the next 5 years.

The results

Embedded Technology Solutions (ETS) is a UK based company that develop cutting-edge cow monitoring technologies for use primarily in dairy industries. ETS has developed a decision support platform that combines sensory, prediction and communications technology to help automate herd management. The technology monitors animal movement and has numerous potential applications, with the first being oestrus (or in heat) detection.

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Additional activity
Developing international opportunities - New Zealand Trade Mission

After being alerted to the opportunity by the Biosciences KTN, Professor Ivan Andonovic of ETS undertook a UKTI trade mission to New Zealand (NZ). NZ is a world leading centre for research and development of new technology for use in a dairy cattle industry. The trade mission led to on-going discussions about an extended trial with a NZ agricultural businesses.

Innovation through collaboration and networking
ETS have embraced a partnership approach to access cutting-edge expertise to develop innovation opportunities. They co-operate with leading academic groups to access animal science expertise, and partner with commercial organisations to access dairy industry expertise. By making use of consortium building and networking events organised by the Biosciences KTN, ETS have ensured that they are working with the right people to deliver their goals.

The Biosciences KTN assisted ETS to lead a consortium including NMR plc, The Harbro Group Ltd, Wm Morrisons Supermarkets plc, eCow, SAC and University of Strathclyde to win an award through the Sustainable Agriculture and Food Innovation Platform for a project worth over £1.3m in total. This project will bring together the whole milk supply chain to develop new technology.

Research and development
ETS are constantly looking for ways to improve and develop their technologies. To achieve this aim, the Biosciences KTN has assisted ETS to secure project funding from SMART Scotland and the Technology Strategy Board worth a total of £110,000 and £33,000 respectively.

Project Details

Project partners:
Embedded Technology Solutions Ltd
Scottish Agricultural College
NMR plc; The Harbro Group Ltd; eCow;
Wm Morrisons Supermarkets plc;
University of Strathclyde

Project investment:
Sustainable Agriculture and Food Innovation Platform project: £1,348,000
SMART Scotland project: £110,000
Technology Strategy Board project: £33,000
Total investment = £1,491,000

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Rumens and Ruminants Interest Group:
https://ktn.innovateuk.org/web/rumens-and-ruminants-interest-group

“With a large herd like mine I cannot afford the time to be standing over every single animal to observe heat detection. I was looking for an easy to use solution that could take care of this farm management issue for me. Silent Herdsman is the solution. It allows me to have more time to complete critical tasks on the farm over and above managing heat detection.”

Wallace Magowan,
Dairy Farmer - Bangor, Northern Ireland

Oestrus detection information transmitted via a wireless sensor network from cow-collar to mobile phone - updating farmers in real time.