

Next generation of electronic heat detection brings new levels of accuracy

Boost for heat detection

A new heat detection system is soon to be available to UK producers from NMR. Developed through the University of Strathclyde, on-farm results are showing impressive levels of accuracy compared with similar but older systems. This is down to improved motion detection technology and more 'intelligent' software and hardware equipment.

text **Karen Wright**

Silent Herdsman is the electronic heat detection device soon to be available from NMR. It combines a tough, hard-wearing collar with a high performance processor, an accelerometer that monitors motion behaviour and

a wireless radio that communicates with an on-farm PC. This provides the stockman with action lists of cows that have come into heat.

So far it may sound similar to other products on the market but there are

distinct differences that contribute to its success in farm trials.

Firstly, the collar has a processor that analyses all motion behaviour and gestures – not simply a sensor that records nods in one plane. The cow's behaviour is measured using a solid state motion detector, known as an accelerometer, similar to that used in air bags and the Wii games console. Apart from its well-proven accuracy and reliability, this motion detecting device has the ability to monitor 3D movement and all manner of behaviour, replacing more dated motion technology that records only movement in one plane.

Wireless

Secondly, the collar processor communicates with a farm base station by radio – wirelessly – and relays



Silent Herdsman collars put through rigorous tests at SAC Acrehead

information when there is a change in behaviour. The selective relay of information enables the collar to create a robust link with the farm PC to ensure that all the analysed information is transferred and no data is lost.

This is a huge advantage over the infra-red devices used in the past where information is passed to a base unit from the collar when the cow passes through the detector, typically placed in the parlour. Consequently, information is only relayed twice or at best three times a day and, if the collar is dirty or twisted, there is a risk that the information is lost.

"These two features contribute to Silent Herdsman's enviable accuracy levels and we are confident that it will bring significant advantages to fertility management in many of our herds," says NMR's managing director Andy Warne. "Movement technology has advanced considerably and, at the same time, heat detection is becoming far more challenging. Our high production cows do not always show strong signs of heat and, coupled with larger herd sizes, it is not surprising that many producers struggle with fertility issues. "Priced competitively alongside other electronic heat detection systems, Silent Herdsman is a system that producers can use with confidence."

Silent Herdsman has been trialled at SAC's Acrehead farm in Dumfries under the watchful eye and close monitoring of principal research technician Ainsley Bagnall.

SAC trial

Silent Herdsman collars were used from December to early March 2010 on the 170-cow Holstein herd. Calving all year, collars were put on a group of recently calved cows that were housed permanently. These cows were progesterone tested – the gold standard against which any heat detection device can be compared with. At the same time, Silent Herdsman was compared with two other electronic heat detection products. Once animals were PD'ed positive the Silent Herdsman collars were switched on to newly calved cows.

Results were analysed by the University of Strathclyde. During the course of the trial the accuracy rate was 86% confirmed by progesterone sampling, between 10% and 20% higher than previous devices that the researchers have investigated.

Also contributing to the accuracy,



Principal research technician Ainsley Bagnall (left) shows off the robust Silent Herdsman collars to NMR's Jonathan Davies and Chris Keys (right)

according to Mr Bagnall, is the robustness of the collars. "We looked at a few prototypes but this latest trial was on a collar that the Strathclyde team felt was sturdy and reliable enough to be viable."

Robust test

"We have put it through its paces – in our cubicle yards and on cows using metal yokes. And for the sake of testing their durability we have had 150 cows with collars for a prolonged period and we haven't had one problem. It has been designed to stay firmly on the animal with minimum movement ensuring data is captured on an on-going basis." Craig Michie from the University of Strathclyde explains: "A key advantage of Silent Herdsman is that it takes less than half the time for the collar to calibrate – two or three days compared with seven days on the devices that use infra-red technology. This means that we have a 'normal' movement pattern for the cow quickly and any changes can be picked up from then on. And so oestrus can be picked up at least two days earlier than in other electronic systems.

"And the automatic data transfer to the PC makes the latest details available for processing and alerts the stockman to oestrus detected in a simple and reliable format."

In addition, Silent Herdsman has a bi-directional communications capability. "This means that data can be transferred both from the collar to the farm PC and

from the farm PC back to the collar. So we can upgrade or add new features automatically through the farm PC without the need to remove the collar from the cow."

From June, NMR plans to supply the package of collar, base station and PC with the Silent Herdsman software. Included in the one-off cost will be the installation, which includes the secure fastening of the base station to a wall or pillar in the cubicle housing. Data downloads take place when the cows are within 30 to 50 metres of the base station so grazing animals will download their data when they come in to be milked.

Link to InterHerd

NMR will also carry out start-up training as well as a support line to deal with queries. Looking ahead, NMR plans to link Silent Herdsman to its dairy management programs like InterHerd – a fairly simple development according to the Strathclyde team.

Silent Herdsman was developed by the University of Strathclyde with funding from ITI Techmedia, a Scottish Enterprise project set up to explore key technologies.

Embedded Technology Solutions (ETS), a spin out company of which the University is a shareholder, is responsible for taking the new technology to market. ETS is developing the UK market through NMR and will also look to take Silent Herdsman into the global marketplace. |