

Automatic system takes leg – and guess – work out of heat detection

In-line milk progesterone test detects heats

A parlour upgrade has allowed one Cambridgeshire-based producer to take a more automated approach to heat detection, by using in-line milk progesterone testing.

We spoke to them to find out more.

text **Rachael Porter**

An analyser on the wall is where it all happens: Cambridgeshire-based producer Fran Bell refers to it affectionately as the ‘pizza oven’. But, in truth, this box is playing a key role in helping to manage her family’s 165-cow herd.

Based at Gaynes Lodge Farm, near St Neots, the herd calves all year round, so heat detection and getting cows back in calf continuously. And, as with any dairy unit, it’s a skilled and time-consuming task.

A robotic milking system was installed at the unit 18 months ago. Three DeLaval robots replaced the 10:20 swing-over parlour. “We’ve been really pleased with the new system,” says Fran, who farms in partnership with her father Kevin Herdman, her uncle David and her cousin Henry. “We’ve seen a milk yield increase of two litres per cow per day since we switched to robotic milking. The cows are being milked more often and, crucially, when they want to be milked.”

Analysing equipment: the wall-mounted system is key to heat detection



Fran Bell: “We’re missing fewer cows in heat since we began using the system”

Herd average is now 11,920 litres at 3.64% butterfat and 3.18% protein.

The robots came with a herd management platform, called DelPro. As well as collecting data from the robots, it also gathers information about each cow’s performance, reproduction, health, feed intake and a myriad of other parameters from DeLaval’s Herd Navigator. One feature of Herd Navigator is in-line milk progesterone testing, which aids heat detection. “This was added six months after the system was installed,” says Fran. “It meant we could learn to walk before we could run. But also, because the system relies on gathering data about individual cows, six months in is a good time period for plenty of information about each animal to be collected.”

Sufficient data

DeLaval’s Kieran FitzGerald agrees: “We could install this feature from the start, but best practice is to add it after six months. By then, sufficient data about what’s ‘normal’ for each cow will have been collected by the system and, also, the operator will be more familiar with the system and how it works. Too much data can be overwhelming – even for the most technical minded producers.”

So the in-line system was installed on the family’s unit in January 2017. Prior to that, heat detection was done through observation. This was typically when cows were waiting in the collecting yard





Automated milking: yields have increased by two litres per cow per day since the robots were installed



Next generation: healthy heifer calves at Gaynes Lodge Farm

and during milking, and Fran would also set aside time to observe the herd twice a day when housed during the winter or when at grazing in the summer.

“This was time consuming and, as you can imagine, we also missed bulling cows and heifers,” she says. That said, the calving interval 18 months ago was a respectable 396 days. Today, thanks to in-line milk progesterone testing, it’s down to an impressive 378 days and Fran thinks it could fall further. The percentage of cows with an interval of less than 365 days has fallen from 51% to 60%.

“The beauty of this system is that the information that we need is there in black and white. We’re not looking at cows and interpreting what we see, after comparing it to their calving date and other fertility and health history. This test cuts to the chase. If there’s been a sharp dip in her milk progesterone level, then she’s in heat.”

Fran adds that it’s also picking up silent heats, which no amount of observation could pick up. “And if we see a cow displaying bulling behaviour we can then check this against the report after

milking, so see if she really is in heat.” For the first six weeks after installation, the system collates data on each cow so it can determine the ‘normal’ progesterone levels for that cow and then detect any deviation. “The system needs to identify a progesterone pattern for each cow and, once it’s done that, it’s able to detect when progesterone levels fall and flag up that a cow is in heat. It’s simple, but extremely effective. And it saves us a huge amount of time.”

Analysis equipment

Fran says that once a cow has been confirmed in calf that the in-line system will continue to measure progesterone levels, to ensure that they remain high, for 55 days. “Again, this flags up any cows that reabsorb their embryos. And it tells us early on that they’re no longer pregnant,” she explains.

So, back to the box on the wall. This contains all the analysis equipment needed for the in-line milk progesterone testing and all Fran has to do is ensure that the test cartridges are changed regularly. The system then generates a list of cows after each milking that have

shown a dip in milk progesterone, which identifies that they are in heat. “And these cows are then served between 36 and 48 hours later,” says Fran.

Fertility issues

She says that fewer cows are being missed since they began using the system: “And we’re also picking up cows with fertility issues. Cows with luteal cysts, for example, will excrete high levels of progesterone, as if they are pregnant. Cows with follicular cysts will continually appear to be bulling, and again we can quickly call in the vet and deal with that.”

The in-line milk progesterone testing – indeed the robotic milking system’s many cow sensors and monitors – also allow for more flexible working, according to Fran.

“We can give the cows that need our attention more time – we’re not tied to the milking parlour for four hours, twice a day. And we’re also able to pick up any cows that have potential health or fertility issues, often before any clinical signs can be seen. We can be more proactive and that saves time and money, as well as improving cow health, fertility and productivity.”

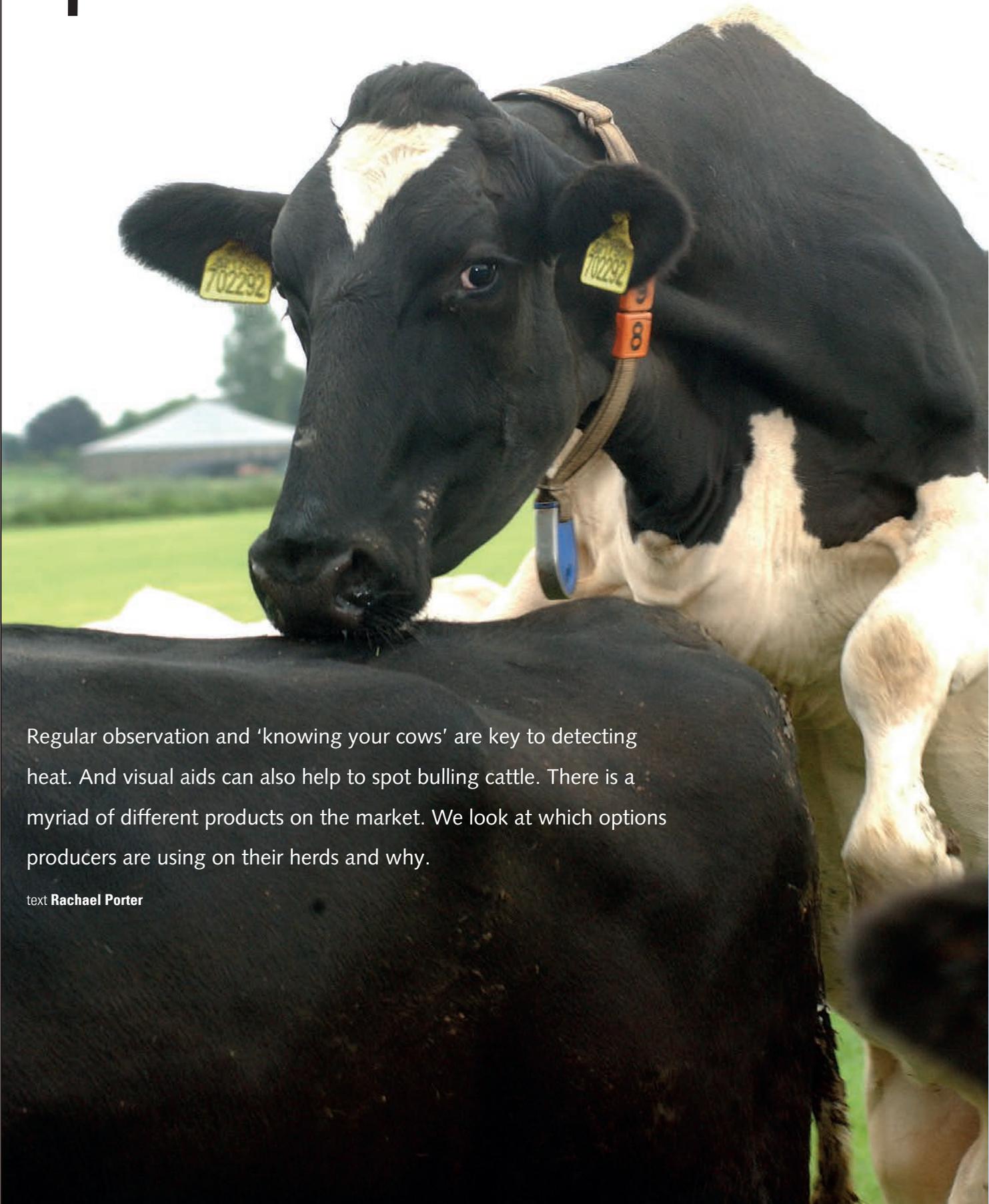
Adding the system has been well worth the investment: “It’s given us an edge. And the tech is there and it’s compatible with our system – why wouldn’t we make use of it? It’s a great piece of kit and it’s given us peace of mind.” |

Table 1: Herd performance before and after installation of in-line milk progesterone testing system

year	2015	2017	2018 so far
conception to 1st service (%)	42	49	50
pregnancy rate (%)	17.3	21.8	25.9
services/conception	2.4	2.1	2

Heat detection by sight can be made easier by using the latest visual aids

Spot the difference



Regular observation and 'knowing your cows' are key to detecting heat. And visual aids can also help to spot bulling cattle. There is a myriad of different products on the market. We look at which options producers are using on their herds and why.

text **Rachael Porter**

What's wrong tail-painting? Nothing at all, according to Carmarthen-based producer Cerith Williams. He swears by traditional tail paint when it comes to spotting bulling cows; he's been using it for his 310-cow spring-block-calving herd for many years: "It's a tool that works really well for us – our tight calving interval is proof of that." He says that using a water-based paint is important. "I have tried oil-based paints, but our cows just don't seem to rub it off well enough. There's a fine line between the paint being too flaky, which can result in false positives for bulling, and not flaky enough. The latter could mean that some cows are missed, so we stick with water-based paint."

Heat-detection patches

A spring calving herd, Cerith's New Zealand Jersey cross-bred herd's AI period starts in late May. He's just used some heat-detection patches, for the first time, on a group of cows. "I was going away for a few days and thought it would make it easier for other people to spot and draft the cows on heat."

He bought them from Livestock Improvement (LIC) and says that they're similar to Kamars. Designed in Australia and extensively trialled in New Zealand, they were introduced to the UK market in 2017. And, according to LIC's John Williams, they have really taken off. "Once 'triggered' they are easy to spot, particularly for new or inexperienced staff, because they 'bleed out' very clearly and brightly," he says.

Mr Williams adds that the heat patches, which come in either bright red or pink and are all pre-glued, are also accurate at detecting 'true' heats. Cerith will know that for himself in a week or two, but for now he's pleased with how easy they were to attach to the cows and how well



Sensor technology: FlashMate is a recent addition to the heat-detection-aid market

they worked 'in the field'. "I think the patches reduced the number of false positives and I would use them again," he adds.

At around £1.25 each, Cerith says that they do seem more expensive than tail paint. "A bottle of paint, costing around £14, will be enough for around 60 cows. But tail paint needs to be topped up and it's also labour intensive. And there can also be more false positives. So the heat patches could be comparable with tail paint, when you factor in the savings in time and semen."

Scratch-card solution

Scratch cards are another heat detection innovation, designed to give away the tell-tail signs of standing bulling behaviour. Jo and Nick Ranson have been

using scratch cards on their 300-cow herd, based near Guildford in Surrey, for the past five years.

And they say that the devices have been integral to keeping the British Friesian herd's autumn-calving block as tight as possible.

The couple buy the 'Estroprotect' scratch cards from their vet in bulk, to keep the cost down to around 84p per card – about two thirds of the recommended price. Prior to their use, Jo and Nick would observe the cows at least six times a day, for 20-minute periods, during AI season. But the scratch cards make bulling cows easier to spot and they observe the herd just five times a day now.

"The cards are an extra set of eyes and they also make you take a closer look at your cows," says Jo.

Sensor triggered by prolonged direct contact

Another recent import from New Zealand is Shropshire-based KiwiKit's FlashMate. This is a tail-head heat detection device that, as its name suggests, begins to flash when triggered by mounting cows. Invented by Fraser Smith, who runs FarmShed Labs in New Zealand, the units cost £7 each and should last for a season.

The device uses sensing technology and responds to direct contact from other cows. It measures spikes in bulling,

head resting and nudging behaviour, according to KiwiKit's Rob Massey. "Touch sensing is game changing for heat detection because inert objects, such as fences, trees, rain or hail, are invisible to the sensor," he says.

As soon as the sensor identifies a clear pattern of heat, it 'flashes' for 26 hours, which is the viable window for insemination. "After this time, the light will turn off. And if the cow returns to heat a new alert will be triggered. The

device will set off an alert for multiple return heats," explains Mr Massey.

He says that the sensor will also alert producers to 'quiet' and even 'silent' heats, where the cow won't stand to be ridden. "This is because herd mates will still show interest in that cow by chin resting to test receptiveness and attempts to mount.

"The device will detect a clear pattern to this behaviour, which can be identified accurately, and it will begin to flash."



Bright sight: the scratch cards' day-glo colours are easy to spot

"You still have to interpret 'how' the silver has been rubbed off the card. A bulling cow's sticker will have very little silver left on it and will be 'rubbed clean' in a particular way, as opposed to being rubbed off against a wall for example. Once you get your eye in, so to speak, you know what you're looking at and that's where the stickers really come into their own. Typically, we're looking for both sides, along the tail head, of the card to be scratched."

All cows are housed three weeks before AI starts to observe bulling. Anything not seen bulling is examined by the vet to pre-empt reproduction issues and a sticker is put on. After that initial three-week period, cows and heifers are given a scratch card and, once true heats are spotted, DIY AI – carried out by Nick

– begins. "You can't miss a scratched card – the day-glo colours underneath the silver are so bright," says Jo. "They really stand out and cows are easy to spot, even from a considerable distance." Cow submission rate was 94% with a conception rate of 70% in the first three weeks. Heifers submission rate was 98%, with a 97% conception rate, again for the first three weeks.

Extra glue

Jo Ranson is really pleased with the cards, but stresses that they do use extra glue to attach them. "We spray on a little Evostick before we apply them – that keeps them in place. But even with that extra glue, it's still quick and easy to just walk through the herd and attach a sticker when it's needed. Much less hassle – and less messy – than, say, tail paint."

Ben Redman also uses scratch cards,

which he buys from KiwiKit, on some of the cows in the 380-head autumn-block-calving herd. The herd, which he manages near Faringdon in Oxfordshire, is AHDB's strategic dairy unit for autumn block calving. He's also in the process of expanding the herd and creating a spring calving group.

"We started using the scratch cards on the spring calvers and they worked well," he says, although he agrees with Jo Ranson's issue with glue. "We brush the cows tailhead to get rid of any loose hair before spraying on a little Bostick and applying the card. The glue on the cards just isn't strong enough. We also get the cards up to body temperature using the AI gun warmer before we apply them. Again, this helps them to stick better."

Ben is pleased with the scratch cards and plans to use them on spring calvers next year. "It's ideal for when cows are outside, and you very quickly learn to recognise a standing heat 'rub', compared to a 'scratch' from a tree branch or a swishing tail," says Ben.

Visual aid

"We'll continue with tail paint on the autumn calving block and we're also installing SenseTime, which uses neck collars to monitor activity and detect heat. That will, again, save time and act as a second pair of eyes for heat detection, rumination patterns and other changes that may be due to a health or herd management issue."

So why continue with the tail paint? "It's an invaluable visual aid. We literally paint a picture of what's going on in terms of our herd's fertility," says Ben. "We paint everything red three weeks prior to the start of AI, in mid-November. Anything seen bulling is then painted blue and then inseminated when next seen in true heat. Cows staying 'red' are seen by the vet," he explains.

"After first service, we use green tail paint and after second service we use yellow. And after third service we're back to red again.

"Red is a signal colour for us – a warning, if you like. We don't like to see a lot of red towards the end of the AI period and all our cows are a little rainbow coloured come Christmas!"

With an array of heat detection devices available, observation is still key to helping producers identify the ideal AI window. Getting cows in calf is all about timing and it can still be a case of 'blink and you'll miss it'. |