Genomics plays role in top NMR herds' success

Genomic testing heifers is, for a growing number of producers, the missing piece in the breeding programme puzzle. We spoke to two producers to find out more.

TEXT KAREN WRIGHT

Genomic testing heifers is helping two top UK producers make more informed decisions when it comes to breeding and rearing the next generation of milkers. Both herds, which top NMR's recently published annual genetic rankings, have proven the technology's role – and value – in their herd management. Heading the latest NMR Annual Production Report national genetic rankings for the year ending September 2019 is Keith Davis' 120-cow pedigree Holstein herd. He's been genomically testing all heifers on his 51-hectare unit since 2013 and says that this has facilitated a significant change – for the better – in his breeding programme. It has allowed him to fine-tune, select and breed from only his very best replacement heifers. "I made breeding decisions based on parent averages before I began genomic testing. These genomic results show that we've never been too far off the mark, but we are now picking up some outliers – and that's very much what using this technology is about for me."

PLI obsession

Pedigree breeding and PLIs became Keith's passion back in 2001, when he restocked after losing his herd to foot-and-mouth disease. "I wanted stock with high scores because I decided that I wanted to have a herd in the UK top 1%. It became a bit of an obsession."

Selecting home-bred replacement heifers to breed from,

originally based on parent averages but now superseded by full genomic evaluations, has worked for Keith. Today the herd's average PLI stands at £371 and £422 for heifers. He believes in PLI and says it ensures that he breeds good functional animals that perform well.

Average milk yield on his Gloucestershire-based unit stands at 10,500 litres at 4.5% butterfat and 3.5% protein. Keith is frustrated that the industry, on the whole, has not adopted PLI and that producers still tend to buy pretty cows, rather than ones with good figures.

"A case in point was when I found out that the US' top PLI heifer, based on genomic data, recently sold for $500,000. I was at a Rosy Lane Holsteins presentation, in Worcester, and I told the speaker that I'd sold the third-highest ranking heifer in the UK for a typical heifer price. He was shocked and said that UK producers and breeders needed to 'wake up' to the true value of PLI."

But using genomic technology is not about commanding a better price for heifers. Keith says that it's predominantly to check that he's not missed anything and it has certainly revealed some surprises. "There have been a few heifers during the past six years that I'd overlooked – they didn't look much in the flesh or on paper. But their genomic data showed that they are exceptional cattle."

As far as genetic progress goes, he believes that it's allowed him to maintain the same pace that he'd achieved by being extremely selective with PLI. "We'd already made a lot of progress by using genomic sires and sexed semen. This was just the next 'fine tuning' step."

Prior to genomically testing heifers – 35 are contract reared each year on a nearby unit – all heifers were served with sexed semen and all cows were served with high PLI conventional semen.

Now he serves only the best 26 or 27 heifers, out of the 35, each year with sexed semen. The rest are served with Belgian Blue. And the top-10 cows, based on genomic ranking, from the milking herd are also served with sexed semen. "We use the highest ranking PLI sires we can get our hands on," says Keith. "We are only breeding and rearing the number of replacements that we need from the very best cows and heifers. There's no waste and we're maximising our rate of genetic gain."

Easy testing

Third on the 2019 genetic report list is Peter Cox's 120-cow herd. He's been using NMR's GeneTracker for the past 18 months, testing all heifer calves born at his 77-hectare Cornwall-based unit. "We did some female genomic testing four years ago but, when milk price dropped, we cut back. We started again 18 months ago and it's now an integral part of herd management."

Peter DIY milk records through NMR every eight weeks, using Uniform Pro Silver that's linked to his automatic milking system. The herd is milked through two DeLaval robots. He takes the tissue samples for GeneTracker when he fits heifer calves with DEFRA-approved tags. "So testing them is easy – it's almost automatic. We've always been a high yielding and PLI herd, and have been using genomically tested sires and sexed semen on the top end of our herd for a while, making breeding decisions based on parent performance. Genomic testing heifers has taken our breeding programme to the next level and taken some of the 'risk' out of it."

The value of the technology can be seen in his cows and

Keith Davis:

"Genomic testing ensures I don't miss anything and has revealed some surprises"

the herd's improved – and still improving – gPLI ranking. But Peter says that twin Supershot heifers really brought the value of genomic testing into sharp focus for him.

"Both were profiled and, when the results came back, there was a 60-point difference in their PLIs – one was £341PLI and the other was £405 PLI. It was surprising because they looked very similar as calves and even as first-calved heifers. But now they're in their third lactation I can see the difference in their qualities, which is backed up by their genomic test," he says.

Safe investment

"The top one is currently producing 70 litres a day and we got her back in calf easily – her fertility is excellent. The twin sister's yield isn't quite as good and we have struggled to get her back in calf. They both look physically similar from the front, but you see a difference in their udders. And, of course, on paper.

"With GeneTracker results I know that I'm breeding replacements from my top cows and heifers. I'm not just basing decisions on parent PLIs and performance."

Peter serves the top 30 of his herd, based on PLI, and all replacement heifers with sexed Holstein semen from the top-end PLI and best-matched sires available. "I know I'm investing in genetics that will produce a replacement heifer from my best cattle. It's money well spent."

The remainder of the herd, which is currently averaging 11,800 litres at 4.40% butterfat and 3.49% protein, is served with Belgian Blue to produce high-value beef calves. "It's a win-win. Genomics has enabled us to accelerate our genetic gain and add value to our beef cross calves."

Milking herd PLI is now high at £386PLI, up from £320PLI two years ago, and current heifer average is £486 with top heifers reaching £670PLI. In 2017 his heifer average was £283, in 2018 it was £367, and in 2019 it was £407. "The herd average should be close to £500 in just two years. That's an exciting prospect. Beef calf value is being maximised too, selling at 10 days old for between £160 and £220 per head."

These herds are good examples of the role that genomics can play in progressive herd management," says NMR's genomics manager Richard Miller. "Rearing a heifer costs the same, regardless of her potential. Genomic testing heifers, and breeding replacements from those meeting bespoke breeding goals, can add value by boosting herd efficiency and, ultimately, the bottom line." |

Peter Cox:

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