Genomically testing heifers at Rerrick Park should identify potential and reduce any passengers

Genomically testing heifers is a natural progression

Genes to an end

Dairy heifers represent the future in any dairy herd but they also require significant outlay before you see a return, which means that if you are rearing a heifer it ought to be a good one. One Scottish producer is now genomically testing his heifers to make sure they have the potential to earn a place in the herd.

text **Angela Rhodes**

For Scotland-based producer Fergus McDowall this is the key reason why he is an advocate of genomic testing and an early adopter of NMR's GeneTracker service. So far he has tested around 400 heifers in his Rerrickpark pedigree herd, based near Kirkcudbright in Dumfries and Galloway, and the first of these are now in calf following screening.

"We have been using genomically tested young sires almost exclusively for the past six years and it seemed the logical progression to screen our heifers to identify those with the greatest genetic potential and to make the most efficient use of sexed semen," says Fergus.

GeneTracker may seem like an expensive 'upfront' investment, particularly when milk price is under pressure, but you only have to gain a month in herd life or a few days in calving interval to cover the cost on the animals you keep and the savings are even greater on the low genetic merit heifers you don't rear as a result of the test," he argues.

Identify potential

Following a decision to focus fully on his family's dairy business, Fergus has overseen a six-year expansion programme, which has included the amalgamation of three herds as well as importing Danish and Dutch heifers. The 1,000-cow dairy unit has been established on a greenfield site where the emphasis is on cow comfort, high health status and efficient production. The all-year-round calving herd is fed a TMR and is achieving yields of 10,854 litres, at 3.73% fat and 3.35% protein, on three- times-a-day milking.

Although performance is already high, Fergus and his herd manager Neil Graham felt it was important to put the same genetic selection pressure on the heifers as they apply to their AI mating sires. "With animals coming from different sources it was inevitable that there would also be a spread of genetic merit within the herd," says Neil. "We are now up to numbers and want to close the herd, so we need to identify the animals with potential and reduce the number of 'passengers'."

The genomically-tested heifers are screened primarily on PLI, lifespan and fertility index. "We no longer select on type but instead feel that using these management indices will deliver healthy, productive cows with good fertility and sound functional type," explains Fergus.

Fertility selection

The main screen is on £PLI with the top 60% initially selected and then any animals with negative fertility indices are discounted from the sexed semen AI

GeneTracker – unique genomic test for heifers

GeneTracker is available to all Holstein Friesian herds that record with NMR, CIS or UDF. The service can be used by non-pedigree herds as long as animals are sire and dam identified. GeneTracker is the first non-hair, non-tag sampling system for genomic testing as the DNA is extracted from a small notch of skin taken from the ear. Heifers can be tested from one month of age and results can be accessed online between six and eight weeks after samples are submitted.

The standard service costs between £30 and £35 per sample and provides genomic evaluations for 31 production, type and herd management traits, and genetic recessives such as polled and red coat colour. Genomic evaluation accuracy rate is between 65% and 70% depending on the trait compared to between 30% and 40% for normal parent averages.

GeneTracker – calves can be genomically tested from a month old

programme. These animals, plus the lower £PLI heifers, are then bred to natural service to fill a crossbred Wagyu beef contract.

"As heifer numbers build through sexed semen usage we can then be more selective about the ones we keep as replacements," he adds. "We have 300 rearing spaces so the priority is to fill these with our best genetics."

Although he is using fertility index as a selection criterion, to maximise sexed semen conception rates, Fergus is also building inherently better fertility into his herd. The current calving interval of 390 days and a pregnancy rate of 29% is good for such a high yielding herd, but he feels any genetic improvement will be a bonus on top of good management and nutrition.

Trust in the science

As a breeding enthusiast, Fergus has been surprised by some of the results and points out that the animal you rate highly on its pedigree may not always have the best genomic evaluation. "We have seen quite a spread on the indices, with up to £450 PLI points difference between the best and worst heifers," he says. On fertility the range has been nearly 20 points, which equates to a difference of 10 days in calving interval and a 5% difference in non-return rate.

Fergus McDowell (left) and herd manager Neil Graham

"Having seen the genomic proofs of the bulls holding up we now have the confidence to trust the science," adds Fergus. "This technology also gives us the chance to identify genetic outliers on both the male and female side, which should help to reduce our reliance on a narrow set of bloodlines and reduce potential inbreeding problems."

An additional advantage of using GeneTracker is the ability to tailor the selection criteria to specific breeding goals. "At the moment we are focussing on PLI, fertility and lifespan but if, in future, our milk buyer switched payments to milk solids then we could use the data to select animals with strong positives for these traits."

Team of four

The first genomically tested heifers are now in calf with the sire selection mating decisions based on the results of a mating programme that has been piloted at the farm and is due to be launched by NMR later this year.

The genomic evaluations are updated every month so even though the heifers will be tested at a month old the most up to date information can be used when the heifers are served at 12 months old. 'We select a team of four genomic sires on £PLI and lifespan and the complementary mating programme produces the best fit for each heifer," explains Fergus. |