

Who's your father?

320

Accurate parentage testing now a reality

by Anne Lee

THE HIGH profile murder trial of American footballer O J Simpson has thrown into sharp relief the science of DNA testing as a genetic identification tool.

But it's not just the legal system which can make use of this high tech procedure.

The New Zealand deer industry is leading the world in genetic research using DNA testing.

And from early next year a new DNA parentage service will be available to deer farmers.

Invermay AgResearch already offers the world's only deer parentage testing service through its company GenomNZ, formerly known as the Invermay Blood Typing Service.

The current test uses blood proteins to identify parents. This method takes at least two weeks for each result and is not as accurate as DNA testing. To make the new service more efficient AgResearch is investing \$500,000 in DNA sequencing technology which will be used to produce a DNA profile or unique barcode for each animal.

The test will be more accurate, more efficient and give faster results than the current parentage test being offered.

GenomNZ is the only company in the world offering a parentage test for deer and has 100 overseas clients from Australia, Europe and Canada as well as more than 200 New Zealand clients.

GenomNZ manager Ian Woodhouse says gene mapping work being carried out by AgResearch scientists based at Otago University's Biochemistry department is providing the information which will

make DNA parentage testing possible.

The research is a world first and geneticists are still working to gather the information which will be needed for the tests.

Briefly, DNA testing works by identifying segments of the DNA strand which are unique to individual deer. These segments, known as microsatellite markers, are heritable.

The new machine will produce results which look like barcodes — these are the various markers. Scientists can then compare barcodes to identify the parents of the progeny tested.

Why go to such lengths to identify parentage? What's wrong with the traditional methods?

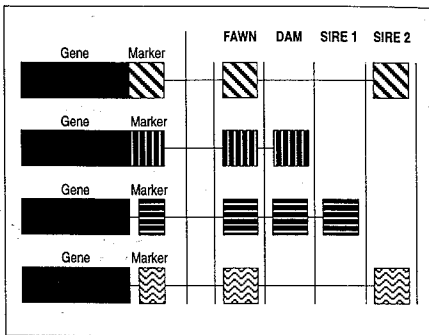
Woodhouse says research has found that up to 20 per cent of deer pedigrees are wrongly identified by traditional methods.

That's quite an alarming figure when you think that almost a fifth of recorded deer sold may not be what the buyer thought he was getting.

This difficulty in accurately identifying the parents of a calf or fawn comes from a number of factors peculiar to deer as well as human error in recording sires.

Deer are notorious for cross-suckling, fostering and mis-mothering, particularly with young hinds or in situations where synchronised mating has been used or in areas where there is little cover for deer to hide their young.

This means that unless the farmer is on the spot at the birth of the fawn there can never be 100 per cent certainty of its dam.



The diagram shows the markers inherited with the gene on the DNA molecule

The fawn has all four markers but its mother has only two. The other two have come from the sire, but which one? Sire 2 has the two markers not provided by the mother, so Sire 2 must be the father.

Likewise, multi-sire mating, human error and the large variability in gestation periods make it difficult to say with certainty who the sire is. However, parentage testing does give a definitive result.

Once the DNA test becomes available Woodhouse foresees that breeders will no longer have to waste time trying to match hinds with fawns in the paddock.

"They'll simply send us a bucket of blood samples from the weaners and we'll identify the parents more accurately than they could ever do."

Woodhouse says the popularity of the current service has increased rapidly. Buyers of elite breeding stock want to be sure the animal they are buying is the animal they thought they were buying. Some Elk breeders claim they can earn \$2000 more for an animal which is reg-

istered and has a certificate issued by GenomNZ stating the parentage.

The parentage test also provides breeders with a permanent identification system — particularly important for valuable animals in case of theft as well as an accurate way to identify tagless animals.

Although the new DNA parentage service is unlikely to be cheaper than the current service, Woodhouse expects costs will be reduced as the service becomes widely used by other animal groups.

"We're looking at expanding the service into the cattle and sheep market as well as other animals. It's a numbers game and high sample turn over should keep the service economical," he says.

In the meantime, prices for the new service are likely to be set at a similar price to the current protein blood typing service. □