

The smoking gun



GENE TALK

Mark Young

Sometimes you can find good examples of important ideas in strange places. Take accuracy as an example, an idea important in the characterisation of genetic merit.

A place where accuracy was very important, often a life or death situation, was the Old West. Frontiersmen opening up the western United States depended on several things – chief among them was their gun.

When the Winchester Repeating Arms Company produced the 1873 Winchester, the first really successful repeating rifle, they produced a gun that went on to change the Old West. In the early years they had several marketing strategies to promote their product. Most notable was the production of the One in a Thousand model 1873. In actual fact there were only 136 One in a Thousand 1873 model Winchesters made out of the 720,000 of

the 1873 model manufactured, which is less than 1-in-5000.

The relevance of the One in a Thousand rifle in this instance is that of being the best in a group. In animal breeding we estimate genetic merit by comparing animals in mobs raised under similar conditions. We place more emphasis on animals that are the best from a large mob than those that are the best from a small mob. We are intuitively saying the statistics are better – that an animal is superior if it comes from a large rather than small mob. It's better to be the best out of 500 than the best out of 50.

Our term in animal breeding for such mobs is contemporary groups. Animals are contemporaries because they are run under the same conditions. Two different mobs may be grazed on similar blocks but they aren't the same. So differences in soil fertility, age of the pasture, or aspect may mean one paddock grows better grass and so one mob does better than the other, for non-genetic reasons. For this reason we try to have fewer, but larger, mobs when conducting genetic evaluations. This gives us more power in our search for superior genetics.

When comparing across flocks or herds we can make adjustments between different contemporary groups if we have animals of common ancestry in each group. Our gold standard for this is progeny of a common sire in the different groups. Such progeny allow us to remove non-genetic effects and cast our net wider in the genetic comparisons we can make.

The power of this strategy is such that sheep and beef breeders in New Zealand can extend their comparisons from among those animals they have onfarm to across their breed or even further. Therefore, a breeder can go from finding the best one sire from the ten they have used, to the best one in the hundreds used by other breeders of his breed to the "One in a Thousand" across breeds. No one animal will be the best for all criteria – it would be one in a million, possibly more. But if you are looking for the best animal for the specific criteria you have, we need good comparisons to be made of animals in larger groups and to have those groups genetically connected.

You can give B + LNZ Genetics or SIL your thoughts on this topic by email to silhelp@sil.co.nz or by leaving a message on 0800 silhelp (0800 745 435).

- *Dr Mark Young is the senior geneticist with B+LNZ Genetics and SIL.*

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Straight shooter

The Winchester Repeating Arms Company tested rifle barrels before they assembled the guns. Those that produced the tightest pattern of shots – the most accurate – were fitted to rifles with precision trigger mechanisms and given a higher quality finish.

These were much sought-after and those of you old enough to remember will know this was the theme of the 1950 film starring Jimmy Stewart, pictured above, Winchester '73.

To find out more about the Winchester '73, go to http://en.wikipedia.org/wiki/Winchester_rifle.