

DNA Testing Useful Tool in Beef Industry

DNA (deoxyribonucleic acid) is found in the nucleus of every cell of the body of all animals. Each individual has the same DNA in blood, semen, tissue, bone or hair. It occurs in the classic double helix molecular structure and is the very basis of heredity.



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Like a fingerprint, it's unique to every individual which explains the term DNA fingerprinting. That DNA is different in every animal is due to the fact that half of the genetic code is inherited from each parent which creates a new and unique individual. Further, since half of the genetic code comes from each parent the parents of an animal can be identified by comparing DNAs.

DNA typing is the most accurate system of identification known to date. For example, establishing parentage by using only one parent in the analysis gives a probability of accuracy of about 99 percent. The use of both parents improves the accuracy to above 99.99 percent.

Obviously, the ability to establish parentage is a useful tool for beef cattle seedstock producers. Examples follow:

1. Multiple sire herds — It's possible to run two or more sires per herd allowing for larger pastures, better pasture rotation and more

accurate performance records through larger contemporary groups.

Also, the bull fathering the most calves in a multiple sire herd establishes himself as superior to the others in libido, fertility and aggressiveness. This suggests improved reproductive efficiency in both male and female offspring.

2. Embryo transfer programs — Should an ET recipient be suspected of producing a natural calf a true pedigree is easily established. Another possibility is the use of mixed semen from two or more bulls when inseminating a donor cow being super ovulated. Should several fertilized ova be recovered parentage is easily determined by comparing the DNA of each calf in the flush with that of the sires in the mix.

Multiple sired flush mates allow more accurate performance comparison by eliminating age differences; offer the breeder and customers a wider choice of pedigrees from a particular donor cow; and suggest which sire might work best for future matings of this same cow.

- 3. Carcass identification** — Should a set of cattle of known herd origin contain a group of carcasses uniformly superior in cutability or marbling, a sliver of muscle would identify the sire or sires.
- 4. Ownership** — DNA evidence recently used in a court case to convict a suspect of cattle theft. DNA from beef in the freezer of the accused was found to have been sired by a bull used only in the herd of his accuser.
- 5. Breed associations** — As DNA analyses become

cheaper and more credible, breed associations will probably incorporate these procedures into their requirements for registration.

DNA tying is relatively simple. First, a breeder must collect blood or semen from all bulls used in the herd either naturally or artificially and have these sires DNA typed. Then the DNA of any calf in question can be compared with that of the sires used and parentage established. Keep in mind that either blood, semen, tissue, bone or hair can be used satisfactorily.

Currently cost is considerable at \$30 to \$40 per DNA analysis. As more companies offer DNA typing, and they surely will, competition will reduce the price. Also, as more breeders use the service the economies of volume will further reduce the cost.

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