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When someone buys beef that is tough, they go off it for a while so if all beef can be reasonably tender, sales of beef should increase.

New Zealand and Australia are racing to find meat tenderness genes, that could make tough chewy beef a thing of the past, and give beef exports a boost.

Dr Neil Clarke, Meat New Zealand's General Manager of Research and Development worked for two years to find New Zealand cattle carrying the gene Calpain 1, which accounts for around 30 percent of the differences in beef tenderness.

Clarke said: "New Zealand and Australia are searching for different genes, both of which affect tenderness. The prize will be a leap ahead in local and chilled export beef trade if either of us can guarantee that consumers can buy melt-in-the mouth grass-fed beef as a matter of routine." "The stakes are high," Clarke said. "New Zealand's export beef market is worth \$1.7 billion, and Australia is one of our main competitors in global beef exports."

This is from a New Zealand total population of 4 million people and about 5,000 beef farmers owning 4.4 million head of pure beef and 3 million dairy beef animals.

Meat New Zealand contracted AgResearch to scan twelve New Zealand cattle breeds to determine the frequency of the Calpain 1 gene, Clarke said. "Once farmers know which animals are carrying the gene, they can breed from those cattle to ensure that their entire herds guarantee tender meat."

"The other approach is to test a herd for the gene, and Channel Island animals (Jersey and Guernsey) carrying the gene into prime beef production, and others into manufacturing beef production for hamburgers where tenderness is not such an issue," Clarke said.

Clarke emphasised that while genetics has a strong influence, so do environmental and management practices. "Good herd management and transport practices are still required, particularly around the time of slaughter."

"Other factors like nutrition, stress, and processing can have just as big an impact on tenderness as the genes," he said.

AgResearch scientist Dr Chris Morris said that the Calpain 1 gene is present in all cattle, but has two versions, one tough and one tender. He said that a DNA test developed in collaboration with the US Department of Agriculture identifies the difference between the tender and tough versions of the gene.

"There is tremendous interest in the research from New Zealand breed societies such as the Hereford, Simmental and Angus groups, and I have already had enquiries from individual breeders," Morris said.

The research follows on from an original discovery two years ago by AgResearch of a variant of the Calpain 1 gene in Jersey/Limousin cross cattle. This gene turned out to be the same tender form of the tenderness gene, which US scientists had already discovered in different breeds and crosses of cattle.

Odd spot: Humans also carry the Calpain 1 gene for toughness or tenderness. Don't tell the cannibals!

In a prepared statement, CSIRO said selectively breeding beef herds from "cool-headed" cattle not only increase producers' profits but also produce better-tasting beef and that slower-moving cattle produced more tender beef, and increased profitability through a smoother production process.

"Poor temperament reduces cattle profitability through increased production costs." said project leader Heather Burrow. "Poor temperament also leads to decreased productivity due to the relationship (with) growth rates, fertility, carcass and meat quality."

Burrow told Reuters that over the past year her team had 12,000 carcasses evaluated using "sheer force" measuring. This involved collecting muscle samples at slaughter and mechanically measuring the amount of force necessary to break through the tissue.

About half the samples were also taste-tested in Sydney using groups of untrained beef-eating consumers in sporting clubs, parent and citizen associations and similar organizations.

Quiet cows outperformed their faster cousins not only in paddocks but also in feedlots, where CSIRO, Australia tests show flighty cattle tend to stand back at feeding time, failing to put on as much weight as quieter breeds, Burrow said.

The study found flighty cattle also produce less glycogen, a sugar that helps break down the muscle after slaughter.

For years some people believed (and some still do believe) that marbling was essential for tenderness, but it is only a small factor in tenderness. The fat taste, which most people like, could give tasters the impression of tenderness if they confuse it with palatability.

Mendell's Laws of Inheritance

Mendell did genetic and breeding trials and discovered many principles nearly 200 years ago. See www.visionlearning.com/library/module_viewer.php?mid=129

Man apparently started developing dogs 20,000 years ago and ones like Border Collies that have been bred for herding ability are very similar to look at (showing purity), but still quite different in herding ability. See Dogs logo.

See www.eatwild.com for information on conjugated linoleic acid (CLA).