

Genes To Fight the Fat Battle

People who eat beef prefer meat with less fat. If the beef industry is going to match those preferences, they're going to have to change.

The industry has two ways to get rid of fat, said Sue DeNise, an associate professor in the University of Arizona department of animal sciences.

"They can either trim the fat off the carcasses or they can change the genetic makeup of the animal to produce a leaner product," she said. "The long-term answer is clearly to change the genetic makeup of our feeder cattle."

Forty-five percent of the differences in carcass fat is a result of genetics. Finding, marking and identifying those differences — and finally selecting — animals with the desired composition can directly influence future cattle herds.

"By knowing the structure and development of muscle and fat deposits, we can use genes we already know about to look for subtle changes that directly influence composition and quality," DeNise said.

"If we find genes with major effects, we could select directly just like we might for coat color or horned vs polled animals," she added.

Perhaps the selection could be done somewhat less directly, but just as powerfully by choosing animals whose descendants would carry a "marker gene" that is linked to a gene of importance.

"We have identified very few genes in beef cattle, but we can use known genes to tell us something about unknown genes," DeNise explained.

So, the known gene can "mark" a specific chromosome segment. Checking for the marker gene in the



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progeny of a specific bull would allow scientists to quickly determine genetic worth without waiting to see the performance of the bull's progeny during many years.

Scientists could more simply see which animals have inherited the set of desirable genes from their sire by checking in the laboratory.

"It's been proposed that such markers should be incorporated someday into EPDs to more accurately predict genetic worth," DeNise said. The EPDs, or Expected Progeny Differences, is a method of measuring the value of herd sires by the performance of their offspring.

DeNise and her associates have already done similar work with dairy cattle to look for the genetic component that influences producing higher levels of milk — generation after generation.

The beef industry need to make changes — now. So, DeNise is using a genetic marker technology that should yield much speedier results than more traditional genetic work.

Many research scientists are trying to map the entire DNA structure of cattle, an enormous task that could take years. This kind



Restriction fragment length polymorphism in bovine growth hormone.

of analysis will be useful in future genetic analyses.

"We are identifying genes that may make direct contributions to carcass traits that can be used immediately in beef selection programs and may be incorporated into the DNA map later," DeNise said. ♦

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