

Refining Tenderness



Feeding vitamin D shows promise as a means of providing a more tender beef product to consumers.

BY CHRISTY COUCH

A guarantee is not something usually associated with beef; but current research indicates it may be possible to ensure that each thick, juicy steak placed before a consumer is tender.

For more than six years, Oklahoma State University (OSU) animal science faculty members have attempted to find ways to improve beef tenderness and speed the aging process in beef carcasses. (Carcasses become more tender if allowed to age.)

“What can you do to speed up tenderness? One thing we can do is elevate calcium,” says Brad Morgan, OSU assistant professor of animal science. Increasing calcium activates calpains, which are enzymes that feed on muscle fiber during the aging process.

Injecting calcium chloride into carcasses can provide calcium, but there has been limited acceptance of the practice within the industry. So researchers turned their attention to finding ways to

enhance tenderness by elevating calcium through feeding.

“That’s when we started looking at vitamin D applications,” Morgan says. The idea stemmed from the 1950s, when dairy cattle were fed high levels of vitamin D to increase calcium levels and reduce milk fever.

OSU is currently researching seven projects involving 400 head of cattle. Working closely with the Food and Drug Administration (FDA), OSU works with three U.S. feedyards

and others in Australia and South Africa.

Initial results from the studies indicate feeding vitamin D at high levels for six to seven days prior to slaughter may be an effective tool in increasing calcium levels in the muscle. In several studies the calcium levels of cattle fed vitamin D

increased 20%-40% over nonsupplemented cattle. In return, supplemented carcasses also exhibited improved tenderness.

“You’re giving very ... high doses of vitamin D to the animal, and that’s why we have the FDA’s involvement,” says

Morgan. “We’re checking a lot besides meat tenderness and cattle performance. We’re also looking at residue level of vitamin D in tissues, muscle, fat, liver and kidney samples.”

In addition to residue testing, studies are evaluating what level of vitamin D will provide the best balance between improved carcass tenderness and cattle performance.

“If you feed these levels that we’re talking about feeding, and you feed them wrong, if you don’t package the product right to be delivered to the animal — you’ll have cattle that go off feed; so you can have some performance problems,” says Morgan.

Jayden Montgomery, Texas Tech University animal science research assistant, has been working with OSU to verify the vitamin D research results. He says results of further testing were surprising.

Montgomery says researchers at first assumed feeding vitamin D would result in a linear effect — tenderness would increase as the level of vitamin D fed increased. Research has shown, however, that the tenderization effect of feeding vitamin D varied. It appeared to have less of an effect on cattle that were inherently tender. It will not make tender cuts more tender, but it could increase tenderness in tough cuts.

“I don’t see us feeding

Above: Initial results from studies at Oklahoma State University indicate feeding vitamin D at high levels for six to seven days prior to slaughter may be an effective tool in increasing calcium levels in the muscle and thereby improving the tenderness of the carcasses of vitamin-D-supplemented animals.

vitamin D to all feedlot cattle,” says Montgomery. “I see us feeding it to cattle with tenderness problems.”

■ **The marketing advantage**

Feeding vitamin D would provide a unique marketing tool for beef producers, says Morgan. “People don’t really care whether it’s Choice or Select.” What they are interested in, he adds, is tenderness, flavor, residue amounts and the humane treatment of the animal.

“If you can actually put a sticker on your package of product that says it is guaranteed to be tender, then it will sell product,” he says.

“[Labeling beef as tender] would at least differentiate it as being better than the norm — better than the mix,” he says. “As long as people say it’s better than the norm, that’s fine. It’s when they start saying, ‘Ours is good and theirs is bad,’ that we don’t get anywhere as an industry.”

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Although producers may not initially see direct results, researchers say the benefits of feeding vitamin D will be evident.

“People will be able to sell more of your product because it is more consistent and people



JAMI STUMP PHOTO

Carcasses become more tender through the aging process, but the expense involved in the logistics of allowing carcasses to age 7-21 days is incentive for finding ways to speed the tenderization process. Several studies are looking at feeding vitamin D to cattle preharvest as a way of doing just that.

will have more confidence in it,” he says. “In the long run, hopefully, you’ll be able to move more product through the system at a higher level of confidence.”

Morgan says Angus producers have experienced the benefits of a marketing advantage through the Certified Angus Beef (CAB) Program. “With *Certified Angus Beef*[™] [product], packers identify the product as being better than the norm ... and [producers] receive a premium for it because people are willing to pay for it because they feel like it’s more of a consistent product.”

Vitamin D may provide an alternative for cattle not meeting *Certified Angus Beef* standards.

“It appears that this works pretty nicely across all marbling levels,” Morgan says, adding that currently less than 19% of the black cattle actually meet *Certified Angus Beef* specifications. What about the

others? Morgan says vitamin D may be a way to add value to those that don’t meet *Certified Angus Beef* standards.

■ **Only a matter of time**

Feeding vitamin D could be an industry practice within a year, assuming the FDA issues a clean bill of health, believes Morgan. “We want to get some bugs worked out and ... right now we’re doing some residue testing to make sure that’s clear. [We’re] looking at worst-case scenarios — cattle fed at very high levels for long periods of time,” Morgan says.

The cost of feeding vitamin D is about 20¢/day, totaling about \$1/head. Morgan says returns are being determined.

■ **A feeder’s perspective**

“We were really enthusiastic about the initial results of feeding vitamin D,” says Rod Schemm, vice president of feedyard operations for Hitch Enterprises, Guymon, Okla. He

has been working closely with Morgan and OSU on the vitamin D research.

The inconsistency in the tenderization response to feeding vitamin D is a concern to Schemm. “We’re not skeptical but are convinced we don’t know enough about feeding vitamin D.”

Schemm believes vitamin D is a potential solution to the question of beef tenderness.

“We have high hopes this is one tool we can utilize,” he says. “We’ve probably outrun the knowledge curve. They need to do the homework and basic research. We’re not giving up by any means; we’re at the point we need more knowledge.”

Feeding vitamin D requires extra work in the feedyard, including increased supervision of the cattle. “We can manage a challenge if we know we can get a consistent, positive response,” observes Schemm.

