

Ultrasound technology could revolutionize the way Angus breeders improve carcass quality.

Measuring What You Manage

BY ERIC GRANT



The results of a study by the American Angus Association demonstrated that ultrasound detected the same traits in yearling bulls and developing heifers as those exhibited in 16- to 18-month-old steers in the packing plants.

Decatur County Feedyard has a long tradition of adopting new and improved ways of feeding and managing cattle. In fact, the Oberlin, Kan., operation was a leader in the strategic alliances movement in the early 1990s. By the middle of the decade, the company had become one of the few feedlots to explore the feasibility and application of electronic identification (EID) systems.

And, for almost a decade, the operation has employed the use of ultrasound, which it uses to sort, manage and market cattle at targeted and profitable end points.

Ultrasound technology is unique because it allows producers to see what they could not see before. It uses high-frequency sound waves to measure differences in tissue density in the live animal. The image it produces shows ribeye area (REA), marbling and fat thickness (FT) on live animals long before they're in the packing plant.

In effect, it removes much of the guesswork from feeding cattle and provides invaluable information to the operation's management.

So far, the technology has proven so beneficial that every animal in the feedlot is ultrasounded at least three times during the feeding period, says Chad Davis, who oversees Decatur's ultrasound and electronic-management programs.

"Every time our cattle come into the chute, usually during the initial processing, reimplanting and at the final sort, we scan these cattle," Davis says. "We use it to sort pens of cattle about a week before we think they're ready to be marketed and then about once a week after that."

The feedlot's certified technicians measure backfat between the 12th and 13th ribs. The goal is to market cattle when they have about 0.40 inch (in.) of backfat and to prevent them from becoming excessively fat. "We target our animals to hit the plant

The use of ultrasound shortens the generation interval by collecting data on yearling bulls instead of waiting two or three years to see their progeny hanging on the rail.

with a preliminary Yield Grade (YG) of 3, or four-tenths [inch] of backfat. Hopefully, many of them will end up being Yield Grade 1s or 2s, where the premiums are, once they're slaughtered," Davis says.

Almost all of the feedlot's cattle are sold on a value-based grid to the Excel plant in Dodge City, Kan. The carcass data, performance and ultrasound information

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are then sent back to producers who use them to make improvements in their cow herds. As a result of information sharing, Davis adds, "We've seen some dramatic improvements in the quality of the cattle since we adopted this ultrasound program."

Seedstock realm

Now the seedstock business — led by the American Angus Association — has tapped the power of ultrasound.

In November 1997, as part of its long-range plan, the Association approved a two-year American Angus Association Centralized Ultrasound Processing (AAACUP) pilot program with hopes of determining the feasibility of ultrasound, of defining genetic parameters from which to calculate expected progeny differences (EPDs) and of comparing ultrasound-based EPDs to EPDs based on carcass data collected at harvest. At the completion of the research, a report was to be made available to Angus breeders and other interested parties on request.

The results of the study demonstrated that ultrasound detected the same traits in yearling bulls and developing heifers as those exhibited in 16- to 18-month-old steers in the packing plants.

The road, therefore, was clear for the development of carcass EPDs based on ultrasound measurements. Since 1998 the participation of individual Angus breeders has astounded researchers and Association staff.

"We've received ultrasound records on more than 75,000 cattle since 1998," says John Crouch, director of performance programs at the Association. "To put that in perspective, in all the years we collected carcass records, we only had about 50,000 carcasses go through our program. In 2000, from January to June, we've already processed 43,000 animals, both heifers and bulls. It's really significant.

"The bottom line is that heretofore, by using the old carcass-data-collection system, we had at our disposal a total of 227 Angus sires with 35 or more progeny carcasses on record," he continues. "That's very limited numbers. Ultrasound gives us potential to evaluate almost every yearling bull and female, as well as sires and dams, in the breed for carcass traits. We never had that capability before."

Much like the work at Decatur County Feedyard, certified technicians do the ultrasound on registered Angus bulls and heifers. They measure Angus bulls when



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they are between 320 days and 440 days of age; heifers must be between 320 days of age and 460 days.

The images are then forwarded to Iowa State University (ISU) where they are interpreted, then they are sent to the Association, which adjusts the measurements for contemporary groups. Adjusted individual measurements and ratios for marbling, REA, backfat and rump-fat thickness are sent back to the breeder.

From all of this information, the Association will calculate carcass EPDs using a full-animal model for each of these four traits.

"These EPDs are better than carcass EPDs," says Gene Rouse of the animal science department at ISU. "It's so much faster and so much cheaper than harvesting cattle and measuring carcass traits in the packing plant. Ultrasound allows us to get EPDs on so many more bulls so much quicker. The program shortens up the generation interval because you're able to collect data on bulls that are 1 year old, not on their progeny two or three years down the road."

Roy Wallace, who manages the beef cattle division for Select Sires, Plain City,

Ohio, is excited about the potential of ultrasound. He sees it not only as a means to test progeny of sires but also to identify breed-leading cattle of the future.

"I think ultrasound provides us with a more accurate depiction of the actual traits that we're trying to look at," Wallace says. "With ultrasound, you can collect information on cattle at an earlier age, at a fat-constant basis, and you can get a more accurate look at the effects of different sires on their progeny."

Plus, Wallace adds, the trouble with collecting conventional carcass data in the packing plant is that so many factors — above and beyond genetics — can affect carcass quality. Implants, for instance, can affect marbling negatively while positively affecting percent retail product.

"So how does a producer really determine whether it was genetics or management that caused his cattle to grade so low?" Wallace asks. "Plus, when we slaughter, the cattle are overly fat. That's an environmental situation, not a true indicator of genetics."

There are two other big advantages to ultrasound, Wallace adds.

"First, the Angus Association is going to



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Second, "with ultrasound, we're looking at the total biology of an animal, not just a carcass," Wallace explains. "It allows us to identify and eliminate cattle with heavier fat deposition. It enables us to identify very quickly which cattle are truly superior and eliminate those that are not long before they become breeding animals. This will equate to very quick progress for Angus breeders."

Mark Gardiner of Gardiner Angus Ranch, Ashland, Kan., agrees with Wallace's assessment. For him, ultrasound is the most exciting technology that's come into the beef business in years.

"This spring we had a bull that was our third-high-gaining bull in our performance test," Gardiner says. "In the past, we probably would have sold him. But ultrasound enabled us to see that he was the highest calf we had for intramuscular

fat, and he did this against a very good contemporary group. Instead of selling him, we're in the process of getting his calves on the ground. Now we think he's going to have a great impact on our breeding program, when in the past we probably would have sold him as a commercial bull."

Plus, ultrasound removes the subjectivity from carcass evaluation, Gardiner says. "Everybody assumes kill data is perfect, when marbling is really a subjective measurement. Ultrasound is less likely to have those mistakes because it's interpreted by unbiased technicians."

Getting started

So how do producers begin the work of ultrasounding their cattle?

It's simple.

To participate, producers must have their herds enrolled in the Angus Herd Improvement Records (AHIR) program. In addition, producers must have submitted weaning weights on the calves they wish to ultrasound. The necessary forms normally

are included in the envelope containing producers' weaning summaries.

Next, visit the Association's Web site at www.angus.org. It contains a complete listing of certified and participating ultrasound technicians. The list also can be found in the *Angus Journal* or can be obtained by contacting the Association headquarters.

Bulls to be ultrasounded must be 320-440 days of age. They need to be in good flesh, having been fed to gain approximately 3.0 pounds (lb.)/day. Heifers should be measured at 320-460 days of age and should be in normal pasture condition. It appears developing heifers, due to their physiological makeup, will have enough condition at this age to express variation, Crouch adds. "Yearling cattle will be sorted back into the groups in which they were weaned."

The costs of ultrasound vary, but they tend to range between \$12 and \$18/head, says Gardiner, who ultrasounded 1,000 head of his own cattle this year. "Producers should see ultrasound as an investment, not a cost," he says. "This is cool stuff, and I can make more money with it. Cattle that make the most money on the grids are the high-quality cattle. If I can identify and produce more of them, I can make more money. It's simple dollars and sense."

Wallace adds: "The really great thing about this program is that anybody who's breeding Angus cattle can take part in this evaluation. Before, it was difficult for breeders with less than 100 head to get bulls' progeny tested . . . This program opens those doors. I think the power of this program will really become noticeable when individual breeders begin to look at their cow herds and their heifer replacements and have information on those females that we've never had before. It will help them move quickly and to make sound decisions about which cattle will parent the next generation."

For Davis, the proof of ultrasound is there already. "I know we're making better decisions as a result of its use," he says. "I know we're marketing cattle when they should be marketed. And when individual producers can couple what we do with ultrasound information on their own seedstock, I think we could see vast improvements in the quality of cattle in the coming years. After all, you can't manage what you don't measure."

