



Ultrasound's Roots are Still Strong and Growing

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When Dave Nichols and Dr. Doyle Wilson hatched the notion of using ultrasound in beef production on that infamous plane ride nearly two decades ago, the idea was to identify seedstock with a propensity for heavy marbling.

Dr. Harlan Ritchie, Michigan State University Professor of Animal Science says, "Marbling is the essence of quality grade." And noted ultrasound pioneer John Brethour, in a 2007 article for the North American Limousin Foundations' *Bottom Line*, says "The heritability of marbling is about 0.4 so, where producers have focused genetic selection on that trait, it has been improved substantially."

So, identifying breeding stock with heavy marbling, and being able to identify them in half the time it takes to collect harvest carcass data, made perfect sense – and it still does. Add to that the ability to measure rib eye size and back fat accumulation, and incorporate that data into breed-specific Expected Progeny Differences (EPDs), and you have a technology that in the course of one human generation has become indispensable.

Paul Bennett, of Knoll Crest Farms in Red House, Virginia, a prominent breeder of purebred Hereford, Angus, and Gelbvieh cattle; can't imagine doing business sans ultrasound. "We wouldn't think of trying to market bulls without it," says Bennett. "That information is essential for marketing and merchandising."

Dr. Kent Andersen, Ph.D., Associate Director of Pfizer Animal Genetics, has seen the evolution of the industry's dependence on ultrasound-obtained carcass merit data: "Not that many years ago, maybe one-half to three-fourths of the bulls sold were scanned. Things are different today. In the heart of bull sale country, scanning is almost required standard practice."

In short, the customer has become dependent on ultrasound carcass data and EPDs. Bennett recently conducted an informal poll of his customers and found 50-60 percent consider ultrasound data in their selection process. "From a marketing perspective, this is something we need to do," says Bennett.

Dr. Wade Shafer, Ph.D., Director of Performance Programs for the American Simmental Association, sees it. "Our producers use it heavily, especially with bulls, and the bull customers are demanding it," he says.

And so does Jack Ward, Chief Operating Officer and Director of Breed Improvement for the American Hereford Association: "In the Hereford breed, as more breeders have used ultrasound, we've seen an increased demand in our cattle. That may not be the only reason, but it's certainly one of the reasons. Commercial breeders rely on Hereford seedstock breeders to provide data, and there is a definite benefit to those who do."

But do the dollars and cents add up?

"Short-term, the benefit is seen in the bull market," says Ward. "It's hard to pin down a dollar figure, but as we've seen an increase in the use of ultrasound, bull sales have seen a higher average than ever before."

A 2006 *Bottom Line* article outlines a Colorado State University study that did try to pin down a dollar figure. The North American Limousin Foundation (NALF) and Colorado State University (CSU) partnered on a project to analyze factors affecting the sale prices of Limousin breeding cattle at more than 40 auction and private-treaty sales from 2004 and 2005.

The conclusion: Bulls' EPDs affect sale prices. Researchers observed a \$634 price differential between the base and those bulls with an REA EPD greater than +0.31, and a \$177 premium for greater levels of the marbling EPD.

So ultrasound data can mean more money on the bull market. But, the study says, "Attention to the quantitative traits (growth, maternal, reproductive and carcass), however, has more potential effect on cow-calf profitability." According to the 2006 figures, a bull with complete data, including ultrasound scan data, garnered an additional \$349 at sale, while a female with complete data brought in an extra \$443.

Ward sees even more reason to put an emphasis on including herd females in ultrasound data collection. "Long-term, the real genetic improvement is in scanning females," he says. "That's what really makes a difference in herd improvement." And that higher calling for herd improvement is what ultimately leads to real dollars in the purebred business.



"The seedstock producer is taking on more challenge than the commercial guy," says Ward. "He's producing a quality of seedstock that can be used by the commercial guy, who ultimately produces for the consumer. It's his duty to collect the data that will make his stock genetically superior. Ultrasound identifies the animals good for the traits the customer needs - whether that be decreasing fat, or increasing marbling or rib eye size. And the seedstock producer has an obligation to take it forward."

Patrick Wall, Director of Genetic Improvement and Field Representative for the American Shorthorn Association, presents a scenario that outlines the cost of neglecting the females.

"The real value every breeder should get is in heifer selection," says Wall. "If a producer scans heifers as yearlings, he can cull those who do not measure up prior to breeding. If he does not scan, and keeps a heifer that doesn't meet his standards, not only could that heifer's first calf be a bull that scans and sells poorly, but she's likely had the second and is pregnant with the third calf before the producer realizes he's made a mistake in using her."

"Plus," Wall continues, "the producer's put a year's worth of feed and time into that first bull calf when he decides he doesn't like him, yet he still has to sell him to recover his costs."

Ultimately, the cost can be more than monetary. "The producer's not happy. The customer's not happy," adds Wall. "That potential loss is a lot more than a \$15-20 scan."

What about DNA?

Technology continues to advance, and genomically enhanced EPDs are all the rage. The American Angus Association released theirs several months ago. The American Hereford Association's will be ready soon. So, why ultrasound when products like Pfizer's HD 50K genetic marker panel can identify an animal's potential to pass on a dozen or more traits?

"Our business is DNA, but we very much encourage the use of both companion technologies," says Dr. Andersen. "We need scan data and carcass data to "train" our high-density marker panels. That's necessary to calibrate them and keep them accurate. All of that data needs to feed into the system. They are technologies that complement and feed on each other."

Andersen realizes cost is a factor. "Officially, we encourage producers to do all of it, though we realize that's a bit spendy," he says. Pfizer's high-density 50K marker panel costs \$139, and gives the producer genetic predictions on 14-20 traits, plus parentage verification. An ultrasound scan costs around \$20 per animal. "It can be a hard decision for a producer to make."

It's not a hard decision for Bennett, who uses both technologies. "Seedstock producers need to collect ultrasound data," he says, "for herd improvement, for marketing, and as part of the documentation and validation for genomics. Like carcass ultrasound was 10-15 years ago, DNA markers are still in the development stage. DNA still needs ultrasound. The two go hand in hand."

Bennett embraces constantly changing and advancing technology, but the economic reality rests with the tried and true.

"As seedstock producers, we try to be progressive and forward thinking, in both breeding and marketing," he says. "But we don't want to give our customers information that says there could be value where there isn't. Our information has to be reliable. And ultrasound is reliable. It *does* have value, and it *will* have value for some time to come. Our customers are comfortable using it and it enables them to buy with increased confidence."