September 1, 2007

Carcass Ultrasound 101

By Patrick Wall, Director of Communications, The CUP Lab®

Volume 2

The Evolution of Carcass Ultrasound in Beef Cattle Operations

The term "evolution" must be used loosely, since the history of Centralized Ultrasound Processing only dates back about a decade. However, drastic changes have occurred in how cattle producers in all aspects of the beef cattle industry use carcass ultrasound data. This short history lesson will not only explain the trends, but also define why guidelines and rules were established for breeding programs.

In 1998, much of the initial research that garnered carcass ultrasound as we know it today was already completed. Diving into the research behind ultrasound could take another issue of *Carcass Ultrasound 101* in itself. Nevertheless, a set of guidelines were established between the American Angus Association and The Centralized Ultrasound Processing, CUP Lab®, at Iowa State University. In short, these rules required that scans be sent to one location for analysis. A highly trained group of technicians would then interpret the images and send the results to the respective association for genetic evaluation. The main goal was to deliver consistent, unbiased, and accurate interpretations, aiding in the formulation of Expected Progeny Differences (EPD). This protocol is still followed today, and deserves much of the credit for the growth of ultrasound in the seedstock business.

The pioneer breeders who utilized carcass ultrasound technology mainly scanned bulls. Since the power of carcass EPDs was not yet realized, many breeders simply passed the information out to sale attendees to help them make bull buying decisions. Nearly 84% of the animals submitted to CUP® in 1998 were bulls. Breeders quickly recognized potential problems with the "bulls-only" method. Ultrasound data collected on sale cattle left the farm as soon as the gavel hit the auction block, and feedback carcass information was hard to come by after a bull was sold. Along with this, actual ultrasound measurements often misled customers into selecting older animals rather than the carcass bull that really fit their needs. Since the poor carcass genetics were still marketed rather than being eliminated from the breeding population, progress at the commercial level was slowed. As a result, two changes occurred very rapidly among breeders using ultrasound: Carcass and/or Ultrasound EPDs found their way into sale catalogs and more heifers were scanned and submitted to genetic evaluations. From 2004-2007, just over 40% of the animals submitted to CUP® were heifers.

The emphasis of EPDs versus actual data and the influx of heifer scanning helped to intensify the selection for superior carcass genetics and allow breeders to make faster progress on carcass traits. Here's an example: Breeder A scans only bulls; Breeder B scans both bulls and heifers. Breeder A recognizes a handful of bulls that do not meet the goals of his/her operation. However, simple economics tell Breeder A to market those inferior bulls anyway. The dams of these bulls (which may be the source of the problem) are now bred back and due to calve in less

than 30 days. Most likely, Breeder A will keep those cows around at least one more year, as conventional wisdom tells him/her not to sell productive cows. Breeder B, on the other hand, scans his potential replacement heifers just after the bull sale. Using a combination of EPDs, ratios, and age-adjusted data, Breeder B culls poor carcass heifers from the breeding herd. Breeder A has poor carcass bulls and an inferior bred cow in the prime of her life. Breeder B has a consistent group of bred heifers that meet the goals of his/her operation.

Using the same selection scheme, commercial cattlemen are also using carcass ultrasound as a tool for herd improvement. In recent years, increasing numbers of commercial heifers are using the CUP® system or a chute-side interpretation of carcass traits in their replacement heifers. Since some commercial operations collect birthdates, age-adjusted values are often useful. Other producers rely on a tight calving window to compare animals from the same calf crop. Regardless of how the data is adjusted or analyzed, commercial operations are using ultrasound to establish benchmarks for carcass traits or set threshold levels that each animal in the breeding population must meet (i.e. >2.5%IMF or >10.5in^2 Ribeye Area). Agreeably, using actual scan data can be risky, but many producers believe the potential reward outweighs the risk.

It is more difficult to gauge the evolution of ultrasound in the feedlot sector of the industry with the ebb and flow of the fed cattle market. Dr. John Brethour dedicated a large portion of his career to ultrasound research in feedlot cattle. Numerous carcass contest champions and success stories can be attributed to his work. However, mainstream acceptance of ultrasound as a viable feedlot tool is much more market driven when compared to purebred breeders and cow/calf operators. Without a doubt, ultrasound has found a place among feedlots interested in niche markets and specific grid premiums. For example, some grids pay for a ribeye size that fits a consumer window of acceptability. Ultrasound can identify those cattle, but only if the premium warrants the price of scanning. If the incentives for Premium Choice and Prime carcasses increase as well as the discounts for overfed cattle, the use of ultrasound as a tool to find those individuals will soon follow.

Ultrasound technology is a brief history lesson at best, but its impact on all sectors of the beef industry is significant. The best summary of ultrasound comes from a simple analysis of the numbers. From the start of centralized processing, the number of field technicians has grown from roughly 20 to over 170 active scanners. CUP® processed just over 9,000 head in 1998. Over 200,000 head of purebred cattle will be submitted for genetic evaluation in 2007. The demand for the science has driven the growth and availability of the technology for producers of all sizes and scopes. For certain, live animal ultrasound will remain a useful carcass tool for any cattle producer who takes advantage of the technology.