Basics of Carcass Ultrasound in Beef Cattle

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Ultrasound is currently being used to indicate the carcass potential of an animal and is a very useful tool to determine genetic differences among potential breeding animals, both sires and dams. Ultrasound EPDs will lead to genetic progress for carcass traits. All ultrasound data included in the Beefmaster database must be collected by an Ultrasound Guidelines Council (UGC) certified technician and processed in a UGC certified laboratory. More about UGC can be found at www.ultrasoundbeef.com. If you are a producer who is interested in having cattle scanned or are already doing so, the following basics of ultrasound should be of interest to you.

Why do we measure carcass traits with ultrasound?
Ultrasound provides a non-invasive technique to collect carcass data without having to harvest the animal. The collected ultrasound data is used to calculate expected progeny differences (EPDs) for ribeye area and percent intramuscular fat (IMF or marbling). The calculated EPDs can then be used for selection of potential breeding animals. The ultrasound information can then be used to identify individual animals that possess inferior and/or superior carcass merit. Inferior animals should be culled based on this data if it was collected by a certified ultrasound technician and processed by a certified ultrasound processing (CUP) lab. Caution should be used in selecting animals solely on one superior ultrasound value. Use of a single trait outlier (for example, a high IMF – 7%) may lead to selection of many negative traits at the same time (for example, smaller ribeye and less efficient animal).

Who can collect the ultrasound images at your farm or ranch?
Only technicians that have a current UGC certified field technician status at the time of scanning. You can find a list of certified field technicians at www.ultrasoundbeef.com.

Who can interpret the ultrasound images collected by a UGC certified field technician?
Only UGC certified lab technicians that work for laboratories that have a current UGC certified lab status at the time of scanning. You can find a list of certified lab technicians and certified labs at www.ultrasoundbeef.com.

Is chute side ultrasound data collection and interpretation accepted by BBU?
It depends. Yes, if it collected by a UGC chute side certified technician (someone that has passed both the field certification and the lab certification on the BIA Pro System). No, if it is collected by anyone other than the eight (8) certified chute side technician acknowledged by UGC. You can see a list of chute side certified techs by going to www.ultrasoundbeef.com .

What should the breeder provide for the ultrasound tech on the day of ultrasounding?
It is the responsibility of the breeder to have a squeeze chute that has easy access to a grounded 110 electrical outlet. The chute must be covered so that is out of direct sunlight and/or rain. This may be as simple as placing a tarp over the chute. The breeder must also provide a complete ultrasound barn sheet that includes the ID, certificate number, birthdate, weight, etc. of all cattle being scanned that day. It is the responsibility of the breeder to correctly identify the proper contemporary group for each animal scanned.

What makes up a proper contemporary ultrasound grouping?
All animals must be of the same age (within 60 days), of the same sex (all bulls, all heifers, or all steers), fed the same feed and managed the same throughout (same vaccinations, etc.). For example, it is not appropriate to place a yearling heifer that has been fed for show in the same contemporary group with a heifer that is only being fed hay and little grass.

How does a breeder get an ultrasound barn sheet?
The ultrasound barn sheet can be requested from the BBU office in San Antonio. It can be emailed, ground mailed or faxed. It is also mailed out with the weaning worksheet for those in Whole Herd Reporting (WHR).

What does it cost?
Most technicians charge $15 to $25 per head. They may also charge a set-up fee, a mileage fee, and/or hotel costs. The fee is often based on the number of animals to be scanned.

What should the ultrasound tech provide on the day of ultrasounding?
The ultrasound technician will bring all of the ultrasound equipment (scanning console, transducer, computer, scanning software, etc.). Most technicians will bring their own scanning vegetable oil, paper towels, cleaning solutions, and multi-electrical outlet. Good technicians will also have a good livestock blower (air) and/or clippers in hand to remove all dirt and debris from the scanning sight for the best results possible.

What happens to the collected ultrasound images and how do I get the data?
The technician will send the collected images to a UGC certified lab for interpretation. However, some technicians leave the images and paperwork with the breeder for mailing to the UGC lab. The UGC lab interprets the images and sends the data to the BBU office.

However, chute side scanned data is sent to the BBU office. The scanning technician must also submit the images collected to the ILIA CUP lab for long term storage. This allows for validation and clarification of outlier data points if necessary.

What traits must be measured for EPD calculations?
Three different images are collected by the ultrasound technician. The first one is a cross-sectional image of the ribeye muscle between the 12th and 13th ribs (the last two ribs) of the animal. Fat thickness and ribeye area are measured from this particular image. The second image taken is a longitudinal image of the 11th-12th-13th rib region for estimation of percent intramuscular fat (IMF or marbling). The technician must take at least four images in this location to send to the CUP lab. The last image is collected between the hook and pin bones parallel to the backbone. This image is used to measure the amount of rumpfat on the animal.

What animals do we measure and when?
All bulls, heifers and steers that have a registration number (Cert #) or performance only number (P#) should be scanned. All animals must be between 320 and 550 days of age when scanned. Animals ultrasounded less than 320 days and more than 550 days of age will not be included in the BBU database for EPD calculations.

Should the cattle be weighed on the day of ultrasounding?
Yes. However, the breeder has seven days (before or after the scanning date) to get the weight. The breeder must provide a weight (called scan weight) that was taken within seven days of the ultrasound data being collected. Additionally, all cattle in the same contemporary group must be weighed on the same day.

What ultrasound data will I receive from the BBU office?
Breeders will receive an ultrasound summary (whether done conventionally or chute side) that includes all of the raw data, the 365 day adjusted data and the contemporary group ratio for each trait for each animal. You should use the adjusted measures and ratios for in herd comparisons.

What adjusted values should we strive for in each trait measured?
Fat thickness measures should range from 0.20 inches to 0.50 inches. Any values less than these may not be measuring true genetic differences between animals. Anything greater than 0.50 inches is merely costing you extra money in over feeding. Overfeeding females at this stage of their life may permanently impair reproductive performance and/or milking ability.

Ribeye area measurements should range from 10.0 to 17.0 square inches in yearling Beefmaster cattle. Ribeye area per 100 pounds of scan weight (REA/CWT) is a good indicator of optimum ribeye area measurements. Elite females should have 1.1 in^2 per hundred pounds and herd sire prospects should have 1.3 in^2 per hundred weight. For example, a bull with an adjusted scan weight of 1200 pounds and an adjusted ribeye area of 15.6 in^2 would have a 1.3 REA/CWT (15.6 divided by 12.0). It is more important to use this scan value to cull inferior animals (e.g. animals with less than 1.0 in^2) than it is to select animals for excessive values (e.g. an animal with a 19.0 in^2 ribeye).

Adjusted IMF values should be 2.5% or higher for bulls and 3.0 or higher for females. Steers should scan equivalent to heifers (3.0 or higher). Cattle fed to a 0.50 inch fat thickness level will be fed adequately to express their full genetic potential for marbling. Thus, animals fed to 0.90 inches of fat will not statistically express more IMF if they don't have the genetics to produce more marbling.

Rump fat is a bit more interesting to me. In general, rumpfat should be equal to or greater than the 12th rib fat measurement. I believe that rumpfat should be approximately twice the level of the 12th rib fat measurement. For example, an animal with 0.20 inches of rib fat thickness should have between 0.20 and 0.40 inches of rumpfat. There is not any research that gives us a better guideline for this trait at this time.

Can ultrasound be used in the feedlot?
Yes. Ultrasound is used to sort and market fat cattle into optimum harvest groups. This is done to prevent overfeeding of the cattle and will reduce or prevent Yield Grade 4 and 5 carcasses. Feedlot scanning uses the ultrasound scan weight, ribeye area and fat thickness to determine the optimum harvest endpoint in order to provide more profit for the producer. Feedlot cattle are generally scanned at re-implant time or no less than 30 to 90 days before harvest.

Can ultrasound measures be taken on either side of the animal for data collection?
Yes. Research as shown that there are no statistical differences in the ultrasound measures on an animal right or left side. Therefore, the ultrasound technician can scan from either side of the animal. Scanning side is generally determined by the chute set up and the outside elements (sun, rain, etc.