The Use of Live Animal Carcass Ultrasound and Relevance to Veterinary Practice

Mel Pence, *DVM*
Department of Veterinary Diagnostic and Production Animal Medicine
College of Veterinary Medicine
Iowa State University
Ames, Iowa 50011

Currently, the beef industry is attempting to improve the quality and consistency of the beef product for consumers.[1] Part of the methodology employed to make changes is the use of live animal carcass ultrasound.[2] This procedure has been used to determine economic and physiologic growth endpoints in feedlot situations.[3] It was used as a measure of genetic merit of breeding stock.[2] Heritabilities of carcass traits are moderately high, 0.30 to 0.40, so they should respond well to genetic selection pressure.[4] Currently two breed associations are using live animal carcass ultrasound results to help determine carcass EPDs for genetic change. In the course of clinical practice veterinarians may be asked to help make genetic selections of breeding stock and may be asked about the appropriate use of ultrasound scanning results. This presentation will explain the use of live animal beef carcass ultrasound and to demonstrate alternative uses of ultrasound in a clinical veterinary practice.

The USDA grading system uses quality and yield grades. Measurements of fat cover, ribeye size and intramuscular fat (marbling) are taken between the 12th and 13th ribs because that is the area exposed when the carcass is quartered. The quality grades of Prime, Choice, Select and Standard are determined by the age of the cattle and the degree of intramuscular fat (marbling). The yield grades of 1 to 5 estimate the red meat yield for the beef carcass. Fat cover, carcass weight, kidney heart and pelvic fat, and ribeye area are considered in the determination of the yield grade.[5] Currently producers have the option of selling cattle on a grid system to take advantage of higher quality cattle.

The NCBA Beef Quality Audit in 1991 and 1995 demonstrated that the beef industry produces too much external fat (average .47 inches compared to ideal of .25) and not enough Choice carcasses (only 50% of the Choice carcasses desired). The Angus Association database predicted a negative correlation of external fat to marbling (-.13).[6] This would indicate that selection for cattle that have reduced backfat and increased marbling is possible. The identification of the genetic lines that produce these types of carcasses can be aided with ultrasound.

Live animal beef carcass ultrasound is used to sort feedlot cattle to a more uniform and profitable finish end point.[6] This is typically done at reimplant time, and cattle are sorted to degree of finish into three sorts. Data from Dr. Brethour at Hays, Kansas, indicates that the percent Choice can be increased and the yield grade four or greater cattle can be decreased with this technology.[3]

The other main use of live animal beef carcass ultrasound is for genetic improvement. A contemporary group of yearling bulls or heifers are scanned to determine ribeye area, fat cover and intramuscular fat.[2] These measurements are adjusted to a 365 day end-point and indexed within this contemporary group, and genetic selections are made based on these data. These measurements may also be sent to the breed association for use in determining EPDs.

As practitioners, you may be asked to help make genetic selections based on real time live animal carcass ultrasound data. Ideally you would have EPDs to use, but not many yearling bulls will have these data available. The next best comparison is the rank within a contemporary group. It may not be appropriate to compare single animal data to another animal in a different contemporary group.

This use of ultrasound technology may enhance your client's ability to sell bulls that will produce the type of finished cattle the industry is seeking. Ultrasound technology can be used to increase feedlot owners' profits by reducing feed costs and increasing market price. It can add to your ability to service the type of client that will be able to compete in today 's market.

References

1. National Beef Quality Audit Executive Summary. 1995. Cattlemen's Beef Promotion and Research Board. National Cattlemen's Beef Association. Englewood, CO 80155   2. Beef Research Report. 1995. Iowa State University. Ames, IA 50011   3. KAES Report of Progress 597. 1990. Kansas Agricultural Experiment Station. Hays, KS 67601   4. Proceedings for the Fifth Genetic Prediction Workshop. 1995. Beef Improvement Federation. Genetic Aspects of Beef Carcass Growth and Development. Kock, R., Gregory, K., and Cundiff, L Roman L. Hruska U.S. Meat Animal Research Center, USDA-ARS. Clay Center, NE 68933.   5. How USDA Beef Grades Are Determined. 1990. Iowa State University Extension Paper. AS-337   6. Genetic Parameters for Carcass Traits Estimated from Angus Field Records. 1993. Wilson, D., Willham, R., Northcutt, S., Rouse, G. Journal of Animal Science 1993, 71:9.   7. Personal communication with Tom Noffsinger DVM. Benkelman, NE 69021