

Progress Report: Centralized Ultrasound Processing

A.S. Leaflet R1626

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Summary

In January of 1998 Iowa State University began a two-year cooperative research pilot project with the American Angus Association (AAA). The purpose was to organize the collection and interpretation of ultrasound images and calculate Expected Progeny Differences (EPDs) for genetic improvement of carcass traits using the ultrasound data. The first Centralized Ultrasound Processing (CUP) center was established and located at Iowa State University. In 1998 a select group of ultrasound technicians was trained following a unique protocol for the collection of ultrasound images including rump fat thickness, rib fat thickness, ribeye area and % intramuscular fat (marbling). Images for over 9,000 head of bulls, steers, replacement heifers and feedlot heifers were received and processed through the CUP laboratory during 1998. Many of the results of these data can be found in ASL R1625.

Introduction

The use of real-time ultrasound to accurately measure body composition traits in live beef cattle has been demonstrated and is being integrated into the recording and selection programs of an increasing number of Angus seedstock producers. This technology has the potential to significantly improve the characterization of more Angus cattle for carcass traits in a more cost-effective and timely manner than do the existing progeny testing programs for carcass merit. However, for this to happen, a program must be developed to organize the collection and processing of the information which allows for the highest standards of integrity and accuracy. Even though considerable effort has been expended in developing a technician certification process, tremendous variation exists in technician proficiencies and in equipment and software technologies that are being used in the industry today.

The American Angus Association currently has the most comprehensive database for carcass traits ever assembled. This database continues to grow and support the genetic evaluation of more than 200 additional sires each year. This program must continue to be supported and expanded as the American Angus Association prepares to meet the ongoing challenges of producing high quality beef for consumers.

Within the near future, ultrasound data could be used to supplement the carcass database if organized to insure credibility, timeliness and accuracy of the ultrasound information. This program began as a cooperative research pilot program of the American Angus Association, Iowa

State University, and selected real-time ultrasound technicians. The CUP center, located at ISU, began accepting images in January 1998, and was fully operational with a seven working day turnaround by February 11, 1998. Over a two-year period, plans are for the research program to transition into an industry owned and operated program.

Why CUP?

Previous research has shown that real-time ultrasound can be an accurate means to evaluate carcass traits on live animals. Much effort has been made through the ultrasound certification processes to assess the ability of an ultrasound technician to accurately predict carcass traits. However, this by no means assures a breed association that the data being submitted are of the same quality as those collected and interpreted during the certification process. CUP is an unbiased third party that is able to monitor this process. CUP allows for standardization of the images interpreted by a small group of highly trained interpreting technicians within the CUP center. CUP also maintains high standards for images submitted to the lab. CUP has the right to reject images and data that do not meet or follow proper protocol when submitted to the center. These data would therefore not be submitted for further analysis of genetic improvement.

What is CUP?

CUP, located at Iowa State University, consists of the lab manager and a small group of trained interpreting technicians. CUP is a central location where trained and qualified field technicians can submit ultrasound images to be evaluated by the CUP staff. The CUP staff evaluates each individual image for quality assurance and interprets the images for rump fat thickness, 12th rib fat thickness, ribeye area and % intramuscular fat (marbling). Our goal is to provide ultrasound data collected on yearling seedstock that will allow for the calculation and utilization of EPDs for carcass traits from these ultrasound measurements.

How does CUP work?

An Angus breeder must first contact a CUP Field Technician to come to their ranch and ultrasound their cattle. Secondly, they will need to contact the Breed Improvement Department at AAA to request barnsheets for the cattle that will be ultrasounded. AAA will ask the breeder required pertinent information and will send their barnsheets along with a copy of the Breeder Guidelines.

CUP technicians (field and interpreting technicians) are under the highest standards for submitting and interpreting ultrasound images. There are guidelines that must be followed during each step of the process. It is these guidelines and the cross-checking process that brings the most accurate and standardized data possible to be used in genetic evaluation for Angus cattle.

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After the images have been interpreted the data are merged together with the barnsheet information from the AAA. The data are then submitted electronically to the AAA where they are adjusted to an age endpoint and contemporary group ratios are calculated. They are then returned to the breeder like all other Angus Herd Improvement Records. This process takes no more than seven working days.

1998 Update for CUP

As stated earlier, CUP has processed over 8,700 head of cattle during 1998 (yearling bulls, replacement heifers, steers and feedlot heifers) (Table 1). CUP worked with 14 field technicians this past season using Aloka 500 hardware. CUP has stated that in order to serve the beef cattle industry in the future, additional hardware should be examined while expanding the number of field technicians.

Table 1. Record of animals processed through CUP.

Bulls	6856
Steers	542
Replacement. Heifers	1312
Feedlot Heifers	42
Total	8752

CUP had its second annual training program in September of 1998 with hopes of adding new technicians and hardware. It was a great success and a great learning opportunity for the 39 attendees. Many of these technicians will be added to the CUP Field Technician list for 1999. The attendees consisted of Aloka 500 and Classic Scanner 200 technicians. The training program is designed to orient technicians to the process and guidelines involved with CUP and evaluate their ability to submit images to the lab.

At this time, 30 field technicians, utilizing both Aloka 500 and Classic Scanner 200 hardware, will be participating in CUP during 1999. In addition, the American Simmental Association and the North American Limousin Foundation, will be accepting data processed through CUP in 1999.

Implications

CUP procedures have proven to work well as shown by the support of the technicians in the program and the results reported to the Board of Directors of the AAA. Through the success of the 1998 research project with Iowa State University and the AAA, CUP is the model that the AAA has adopted to lead them into a more extensive evaluation of Angus carcass genetics. CUP will also be the model that other breed associations will participate in when using ultrasound data to evaluate carcass genetics for seedstock.