Carcass EPDs

An Investment in Time and Research

The potential is there. Developing accurate carcass trait measurements and eventually carcass expected progeny differences (EPDs) on a national scale will no doubt greatly benefit the entire beef industry — from breeder to packer.

Before this can happen, however, a serious commitment from the beef industry and universities must be made.

Research must become high priority. It also must be funded at a commensurate level. Most importantly, breeders must be convinced that an economic incentive exists before investing the time and expense required to collect the data.

Improving ultrasound equipment accuracy is first priority. The current equipment used in ultrasound research has been optimized for use in human medicine, not for tissue characterization of ribeyes in live beef animals where major variations exist in hide and fat cover.

To date, developers of ultrasound equipment have spent few corporate dollars in adapting equipment to the needs of the livestock industry. Such investment in research and equipment development is unlikely, unless the potential for a lucrative market exists.

Research at Iowa State and other universities shows that real-time ultrasound (RTU) can be used to accurately measure external backfat and ribeye area in the live animal. A computer software package called, "MedMorph," and an ultrasound A-scan backscatter, which will measure intramuscular fat levels in the ribeye, are also being developed at Iowa State.

Research results from Iowa State show a correlation to meat cooler measurements of .86 and .76 for backfat and ribeye area, respectively. Iowa State also has demonstrated RTU's ability to measure differences in ribeye marbling, but at a much lower correlation: .20 to .40

The challenge is to develop the engineering and/or image analysis enchancements that will improve this correlation to the .75 or higher level.

Carcass Evaluation with Angus

Iowa State has worked with the American Angus Association's sire evaluation for carcass merit since its inception in 1974. The carcass evaluation program has followed procedures of a structured reference sire testing program.

The American Angus Association assists a breeder in finding commercial cow herds to use in testing bulls. It also provides a list of bulls that can be used as reference sires -basically, any sire previously tested for carcass merit.

A large portion of carcass data has been collected by USDA graders through the Beef Carcass Evaluation Service and

the Beef Carcass Data Service (orange tag program).

The genetic evaluations were run on an annual basis through 1987. Since 1988, evaluations have been run semi-annually with growth and maternal traits. Although the program has existed for 16 years, only 524 Angus beef sires have been genetically evaluated for carcass merit. This number is a stark contrast to the more than 42,000 Angus sires evaluated for weaning weight (1990 Spring Angus Sire Evaluation Report).

On an encouraging note, 44 new sires were added to the Spring 1990 Carcass Evaluation. Credit for this goes to John Stowell, director of supply development for the Certified Angus Beef (CAB) program. He added a considerable amount of CAB carcass data to the existing data base. The carcass data base currently includes data collected on carcasses of 55 bulls, 1,119 heifers and 7,561 steers.

Through 1985, genetic evaluations were conducted using a single-trait sire mixed model. EPDs were calculated for carcass cutability expressed in percent, quality grade to one-third of a grade, and retail yield. Camasses were not adjusted to a common end point prior to running the evaluation.

In 1986, a new format for genetic evaluation was implemented. New procedures were used in an attempt to remove confusion associated with sire EPD for carcass traits and the subjectivity associated with the yield grading system.

The new format adjusted carcasses to common end points to account for the wide ranges in age at slaughter and carcass weight. Sires were evaluated for external fat thickness in inches, ribeye area in square inches and marbling score. These are major variables that go into yield grade and determine quality grade for young A-maturity carcasses. The new format uses multiple-trait mixed model procedures that account for genetic correlation between the three traits.

In the 1986 evaluation, all sires whose progeny carcass weights averaged less than 665 pounds were put into one evaluation category (A); sires whose progeny averaged more than 665 pounds were put into a second category (B). In category A, the three carcass traits were adjusted to an age at slaughter of 470 days and a carcass weight of 625 pounds. In category B, the three traits were adjusted to an age at slaughter of 496 days and a carcass weight of 750 pounds. EPDs weren't directly comparable between the two categories.

Plans for the summer 1990 genetic evaluation for carcass merit include adjusting all carcasses to a constant backfat end point of .4 inches and age at slaugh-

ter of 470 days. This will allow all sires to be evaluated in the same analysis, eliminating the weight designations.

Changes in Consumer Diet

Widely publicized changes in consumer eating habits and dietary concerns about fat in red meats have caused the beef industry to take a hard look at the end product. There appears to be a renewed interest in programs to change the end product through genetic improvement.

This interest is demonstrated through the willingness of major beef breed associations to fund research aimed at finding a better method of evaluating beef animals for carcass merit.

Iowa State RTU research is currently sponsored by the American Angus Association, the American Simmental Association and the Iowa Beef Industry Council. Iowa State cooperates with Patsy Houghton of Kansas State University for Angus data and several Iowa-based cooperator herds.

The main goal of the various research programs is the development of EPDs for body composition that will allow breeders to make directional change in both magnitude and uniformity. A second goal is to provide EPDs that will allow commercial producers to select bulls that will satisfy given end point specifications.

Iowa State's RTU research currently has four objectives:

1. Characterizing changes in body composition (fat and lean) in both steers and bulls.
2. Determining genetic parameters, heritabilities and genetic correlations associated with measured traits of body composition.
3. Developing procedures for collecting RTU measurements as a part of national genetic improvement programs.
4. Helping to push adoption and engineering of RTU equipment for genetic improvement needs of the beef industry.

Proposed Research with NCA

In March of this year, the National Cattlemen's Foundation requested proposals from university experiment station directors and animal science departments in the areas of: 1. Instrument assessment of carcass characteristics; and 2. genetic evaluation for beef carcass merit.

Funds for this research are provided through the national $1 beef checkoff. All proposals are to undergo a technical review and screening process. Successful proposals will be announced this fall.

Iowa State has teamed up with the University of Georgia and Cornell University in submitting a cooperative research proposal to the National Cattlemen's

Foundation for objective 2 of the request. Dr. Larry Benyshek of the University of Georgia is leading the development.

The goal of the research proposal is to provide the beef industry procedures for a national genetic evaluation program specific for carcass traits similar to those in place for growth and maternal ability

If funded, the main objectives of the cooperative research proposal will be to:

1. Determine effectiveness of the live animal measurements in predicting carcass genetic merit.
2. Describe the genetic and environmental variances for several breeds.
3. Develop mathematical models and computer applications necessary for implementation of a national program.
4. Evaluate correlated responses in non-carcass traits to selection for carcass traits.

—Doyle Wilson, Gene Rouse & Dave Duello, Iowa State University.

FIGURE 1. ANGUS CARCASS DATA BASE

DISTRIBUTION BY BACKFAT THICKNESS

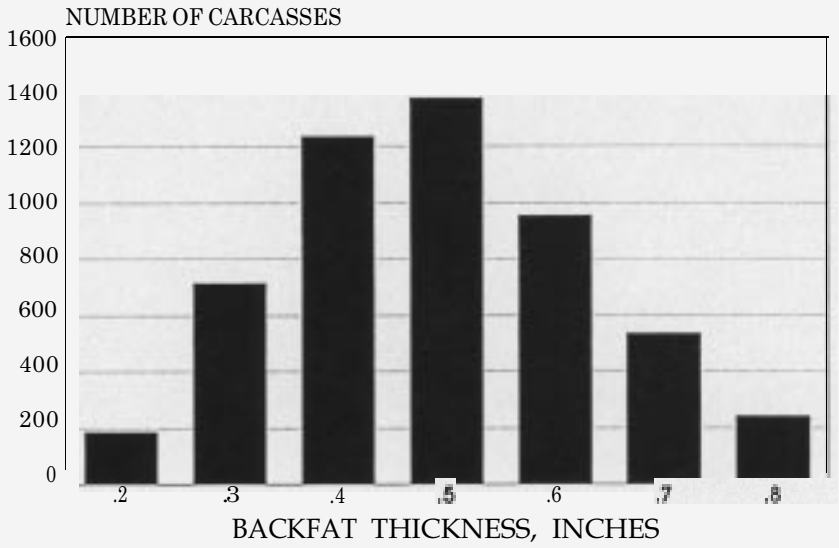
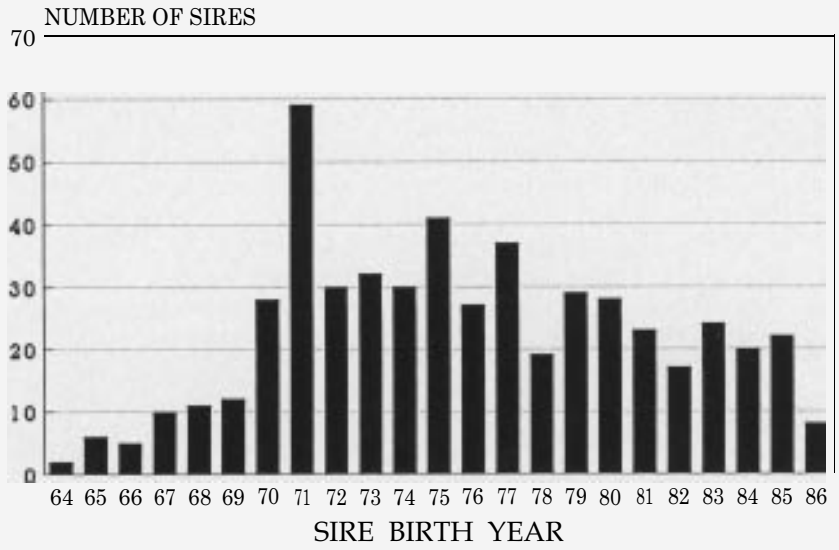


FIGURE 2. ANGUS CARCASS DATA BASE

NUMBER OF SIRES BY BIRTH YEAR



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