08

CARCASS TRACKING, COMPUTER-ASSISTED VISION GRADING AS TOOLS FOR VALUE-BASED MARKETING

By WILLIAM G. FIELDING,
President,
Excel Corporation
and Cargill Meat Sector

ABSTRACT: Excel Corporation views value-based marketing as a necessity for the beef industry to be competitive. Instruments for assessing carcass value are essential to true-value based marketing. Excel has developed carcass tracking and vision grading to objectively evaluate how individual carcasses will perform in the packing plant. Producers can use the data generated by these systems to enhance genetic selection in their herds, thus better meeting market demands.

Introduction

Based in Wichita, Kan., Excel Corporation is one of the larger red meat packers in North America. With its roots dating to the 1940s, Excel has six primary processing plants for beef and two for pork in the United States. A subsidiary of Minneapolis-based Cargill, Excel also operates four further-processing plants under the Cargill Processed Meat Products name. In Canada, the beef operations operate under the Cargill Foods name at two locations, one primary processing and the other further-processing.

The Value-Based Marketing Task Force was formed in 1989 under the combined auspices of the Beef Industry Council of the National Live Stock and Meat Board and the National Cattlemen's Association. Membership on the Task Force came from seed-stock and cow-calf producers, feeders, packers, purveyors and retailers.

In its 1990 report, the Value-Based Marketing Task Force listed eight consensus points to serve as specific research areas or priorities to accomplish the stated objective of reducing excess trimable fat and increasing lean production. This paper focuses on two of those objectives, and they are:

- Consensus Point No. 6: The beef industry should invest in research and development of an instrument for assessing carcass value.
- Consensus Point No. 7: Fed cattle should be valued on an individual carcass basis rather than an average live price.

Excel and Cargill have been long-time supporters of moving away from a system of cattle being sold for a pen average price and moving to a system where value is determined on individual carcass merits. The author of this manuscript was a member of the Value-Based Marketing Task Force. Additionally, Excel Corporation was the cooperating packer in a Strategic Alliance project, which was a follow-up exercise to the Value-Based Marketing Task Force. Excel also has explored other initiatives that have been in line with the consensus of the Task Force, most notably the development of case-ready beef and the move to close-trim beef.

Excel's interest in these and other projects was then and is today the same as other participants in the marketing chain -- improving industry cost efficiencies, thus keeping beef costs competitive with other protein products. This is a big challenge. In its 1990 report, the Task Force noted that marketing systems for cattle and wholesale beef had not "adapted sufficiently to the contemporary demands of consumers for beef cuts with little or no external fat trim." The 1986 National Consumer Retail Beef Study showed consumer preference for closely trimmed products. However, the marketing systems were tolerating and even encouraging the production of excess waste fat. There was no objective, reliable way to determine the value of individual carcasses. In turn, this prevented the packer from passing along the proper market signals to feeders by offering premiums for livestock with high quality and cutability and discounts for those that were below average. Producers had limited incentive from the packer in monetary terms to produce cattle that would yield products with the quality and composition desired by consumers.

A minor percentage of finished cattle are purchased on a grade and yield basis. This system moves the point of ownership transfer to the packing plant from the feedlot, and the pay weights are determined by dressed carcass weights and grades, rather than live animal weights. Historically, producers have had a lack of trust in this system of ownership transfer. Also, there is a lack of faith in the grading accuracy of USDA graders, who make visual, subjective determinations of carcass quality and yield grades. USDA graders do provide for some degree of trust -- not because they are infallible but because they are an impartial third party in the marketing chain.

Carcass Tracking

In 1989, Cargill opened a beef slaughter and fabrication plant in High River, Alberta, Canada. It was the first beef plant that Cargill and Excel had built from the ground up in North America since the construction of the Dodge City, Kan., facility in 1980. Starting from scratch gave Cargill and Excel the opportunity to incorporate the most advanced technology offered at the time in areas ranging from food safety to worker safety. It also was a chance to experiment with carcass tracking, which today forms a cornerstone of Cargill and Excel's efforts to evaluate carcasses individually.

The need for carcass tracking goes beyond its applications for value-based marketing. Keeping track of individual carcasses aids in record keeping, scheduling, production flows and inventory controls. It also augments the process of product trace back. Today, carcass tracking is in place at all Cargill and Excel beef facilities in North America, except for a cow slaughter and fabrication facility in Colorado.

Carcass tracking does what its name implies: it allows the tracking of individual carcasses as they move throughout the plant. Along the way, key data can be collected and identified by individual carcass.

Each carcass is attached to a trolley. Holes of different shapes (squares, triangles, circles, etc.) in different sequences represent alpha-numeric code numbers. By using combinations of no more than eight holes per trolley, as many as 30,000 code numbers are available, which is more than enough for a modern meat plant.

As the trolley passes each data-collection point, a strobe on one side of the trolley shoots light through the holes and to an electronic reader, which identifies the trolley and the carcass it carries. Carcass weight is automatically recorded into the plan information system at various points within the plant. There are three data-collection points: 1) on the kill floor for hot carcass weight; 2) at the grading stand; and, 3) just prior to going onto the fabrication floor. At the grading stand, additional data are manually entered into the system for each carcass. This information includes quality grade, yield grade, house grade and whether there are any defects, such as dark cutters, bloodshot muscle and/or miss-split carcasses.

Vision Grading

Vision grading goes beyond the subjective evaluation done at the grading stand by using a digitizing camera coupled with a computer to evaluate carcasses. Excel began testing vision grading at its plants in 1991. Currently, two plants have the system on line with three others scheduled to follow.

Also known as Video Image Analysis (VIA), the system takes a picture of the loin-eye surface at the 12th rib, where the carcass is routinely quartered for traditional USDA grading.

Factors Measured with VIA

- Rib Eye Area
- Fat Thickness (External)
- Marbling
- Fat Area
- Lean Area
- % Fat Area
- % Lean Area
- % Rib Eye Area

This picture is digitized by the camera, based on the difference between fat and muscle reflectance. The computer then interprets the picture and determines total lean and total fat content. From this information and the carcass weight, the total red meat cut-out of each carcass is predicted.

The accuracy of this system outperforms any other current system, with standard deviation of plus or minus seven pounds per side. The system "reads" the information on each carcass in a few seconds, making its application in high-speed, high-volume packing plants practical.

There still is the one- to two-day wait while the carcass is chilling between the time of slaughter and grading. In combination, this delay and the reliance on subjective grading had made some producers reluctant to trade "on-the-rail." One next step may be the development of an instrument to grade the beef before chilling. If this could be done, it would facilitate the adoption of practices such as hot boning. In isolation, however, concerns about the one- to two-day wait appear minimal, especially when producers are comfortable with the objective data generated by visual grading and carcass tracking.

This data can be very useful to producers to help them understand which cattle perform best. Just as important, they will be paid based on the true value of each carcass -- something that must take place for value-based marketing to become a reality. As the data base grows, Excel will be able to evaluate producers and target cattle purchases that fit the needs and specification of a particular customer and/or product line (i.e., Certified Angus Beef, Excel's Sterling Silver). Because we will be able to price product more competitively on the sales end, we should be able to pay producers more for true value on the buying end.

Instruments in the Feedlot

The packing plant isn't the only place where data is being collected. Excel is working with Integrated Beef Technologies (IBT) to link the data from the packing plant with information being generated in the feedlot. During 1995, IBT will collect data on about 5,000 head of cattle with known genetics (mainly Angus) to learn more about sorting cattle to determine the optimum time for sending certain ones to market.

As each animal passes through a chute, it is weighed on a scale and the frame size is measured by camera. The animal is identified -- and the data matched to it -- by a computer chip tagged to the ear. Data is collected at key points in the process, such as when the animal first enters the feedlot, at regular intervals during feeding, and when it leaves the feedlot for market.

When the livestock reach the packing plant, additional data will be generated through carcass tracking and vision grading. This information will help lend validity to conclusions and assumptions made from what is gathered at the feedlot.

Conclusion

The work IBT is doing can help feeders make more accurate decisions about when to send cattle to market and how to bunch them together. Once at the packing plant, the cattle can be assessed on individual carcass merits through the combined use of carcass tracking and vision grading. The information from this system will send better signals back from the packer to the producer and also will help the packer to respond more efficiently to signals coming from that part of the marketing chain that eventually stops at the consumer.

Cargill, Inc.
15615 McGinty Road West
Wayzata, MN 55391-2398