Instrument Augmentation of USDA Beef Carcass Grading System

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Issue

Instrument assessment of the factors that influence the official grades of beef carcasses has developed to the point of being able to provide highly reliable, accurate assistance in the evaluation process. A large segment of the U.S. beef supply chain depends on the application of the *United States Standards for Grades of Carcass Beef* by Department of Agriculture (USDA) grading personnel to determine carcass value and to establish a basis to negotiate pricing for product. Therefore, it is essential that USDA deploy all reasonable measures to maximize the accuracy of grade application nationwide. This must include implementation of technology that will augment a USDA grader s ability to make accurate grade decisions.

Discussion

Instrument grading systems present a number of opportunities for USDA to enhance the accuracy and consistency of grade application. One of the most obvious benefits of instrument systems is to minimize the variation between graders and between locations. In addition, instruments will virtually eliminate perceived grader bias, which has far more potential for adversely impacting confidence in the current grading system than the actual variation. Environmental factors of each establishment also influence the evaluation for grade application. Thus, instrument grading systems have the potential to provide a more accurate and consistent application of the standards, regardless of which plant the evaluation is being conducted in. This technology is extremely important to producers who market their cattle on value-based carcass grids as well as to cattle buyers, in order to have confidence in the system that is ultimately used to assign value.

Uniform assessment of all carcasses in all the establishments utilizing this technology will provide a higher level of confidence in the already very reliable grading system. While we recognize the challenges ahead, the incorporation of augmented grading systems will undoubtedly enable USDA to provide more accurate, consistent, and timely service to our customers at current chain speeds. Ultimately, instrument grading systems will provide more opportunities for differentiating value in the domestic and global marketplace.

Background

Official grading of beef carcasses has been a vital marketing service provided by USDA since the 1920s. Consumers, both domestically and internationally, have become accustomed to the grade shield of USDA Choice and USDA Prime, as symbols of high-quality American beef. The grading activity is often scrutinized closely for the accuracy and consistency of evaluations because of the impact carcass grades have on cattle and carcass value.

Of the approximately 28 million fed steers and heifers slaughtered annually in the United States, 96% are graded by the Agricultural Marketing Service, Meat Grading and Certification (MGC) Branch graders. Currently, the largest four packing firms account for over 85 percent of the total annual slaughter; and accomplish this through about 30 processing plants nationwide, with some facilities harvesting over 5,000 cattle per day. The USDA s grading service provides the tools to segregate this large and diverse population into smaller more homogeneous groups (grades) that are utilized in the price/value discovery process by both the buyer and seller of beef.

The history of instrument grading technology has spanned more than 30 years, as the initial development began in the 1970s. Researchers at Kansas State University and the USDA Meat Animal Research Center collaborated on the technology that demonstrated the potential to effectively segment differences in USDA Quality and Yield grades. However, the Industry opted to explore other technologies in predicting value of beef carcasses, and the instrumentation work was abandoned.

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In 1994, a subcommittee of the National Live Stock and Meat Board (now National Cattlemen s Beef Association (NCBA) convened a National Beef Instrument Assessment Planning Symposium (NBIAP) to assess the status of instrument technology. The committee concluded that reliable, accurate tools for instrument assessment hold the promise of more accurately measuring factors that contribute to consumer satisfaction with beef. The NBIAP meetings led to research strategies aimed at utilizing instruments to evaluate carcasses based on expected eating quality. These initiatives then led researchers to refine the older technology which showed substantive improvements in its ability to predict USDA Quality and Yield grades.

Following the refinement of the technology, standards were established for predicting ribeye size (a component of the yield grade standard) and USDA Yield Grade in 2003 and 2005, respectively. The performance requirements of these standards were established after consultation with an Industry Working Group that was convened by the Livestock and Seed (LS) Program and the NCBA. The Industry Working Group was comprised of representatives of USDA, NCBA, packing companies, producers, instrument manufacturers, and academia.

Current Status

Performance standards are currently in place for the instrument augmentation of yield grades, one of two components to the *United States Standards for Grades of Carcass Beef*. Trials were conducted in January and February 2006 at different locations to assist in the refinement of criteria for an instrument performance standard (i.e., quality grade) in marbling prediction for beef carcasses, which is the other component of the *United States Standards for Grades of Carcass Beef*. In January 2006, a draft performance standard for instrument marbling prediction was published and distributed to the industry for comment. It became apparent after statistical analysis of the two trials that the statistical approach, performance requirements, and the protocol design in which to conduct the evaluation of instruments were going to change from the proposed draft standard. After data analysis and review of comments, the LS Program published an approved performance standard for marbling prediction. The performance standard was published as two separate approval procedures for the *Performance Requirements for Instrument Marbling Evaluation (PRIME)*

1. *Demonstration of Repeatability, Accuracy, and Precision and*
2. *Implementation and Verification of Operational Procedures.*

The LS Program is currently testing two technology providers against the performance standard for marbling prediction and is working on the implementation procedures for yield grade with another company.