National Beef Quality Audit – 2016[1]

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Since 1991 the beef checkoff-funded National Beef Quality Audit (NBQA) has delivered a set of guideposts and measurements for cattle producers and others to help determine quality conformance of the U.S. beef supply. The first NBQA a quarter century ago focused on fed steers and heifers and the physical attributes of beef and beef by-products – marbling, external fat, carcass weight and carcass blemishes.

The beef industry conducted its first market cow and bull audit in 1994 to complement the National Beef Quality Audit for fed steers and heifers. As the foundation of cattle herds, cows and bulls are also sources of beef that are significant and worth understanding. In fact, it's estimated that sales of cull breeding animals contribute up to 20 percent of operational gross revenue for both beef and dairy operations.

Among the findings of that first cow and bull audit were that harvest cows and bulls were often not marketed in a timely manner; beef and dairy cows frequently had inadequate muscling at harvest; too many market cows were disabled prior to harvest; too many market cattle and carcasses were condemned; and that too many carcasses had excessive bruises.

Cattle industry concerns over the years have evolved to include food safety, sustainability, animal well-being and the growing disconnect between producers and consumers. As a result, over the past 25 years NBQA researchers have made significant changes to their research, leading to increasingly meaningful sets of results. In fact, data from both segments of the 2016 National Beef Quality Audit add tremendously to the core knowledge from the audits that precede it. Following is a summary of the research, as well as their implications for the industry.

There were several major elements to the 2016 Steer and Heifer and Market Cow and Bull National Beef Quality Audits:

Face-to-Face Interviews provided understanding of what quality means to the various industry sectors, and the value of the quality attributes. This research will help the industry make modifications necessary to increase the value of its products.

The interviews featured:

5) Definition of product attributes by each industry sector;
6) Relative importance of various product attributes;
7) Economic determination of what is important and how much beef buyers are willing to pay for attributes;
8) Image of the industry; and
9) Strengths and weaknesses of, and threats to, the steer and heifer and cow and bull markets.

Among the findings were:

- As it did in previous audits, Food Safety surfaced as a key quality factor for both segments of the industry. In fact, to many respondents, food safety was believed to be implied as part of doing business.

- The prevalence of branded beef items increased in the marketplace, which matched concerns about size inconsistencies in beef boxes. While size consistency was more important than the size increase, large carcasses are making it harder for many further processors to meet customer specifications for thickness and weights.

- Many companies were willing to pay a premium for guaranteed quality attributes. However, the average premiums companies were willing to pay were lower than in 2011. Tenderness and flavor continue to be the two beef quality factors that drive customer satisfaction.

- BQA is not currently a recognized leader in consumer-facing channels, which is consistent with 2011 findings in the NBQA Steer and Heifer Audit. Educating Packers, Retailers, Foodservice, and Further Processing entities about the BQA program could improve marketing weaknesses and negative public perceptions.

- Product quality was the most cited strength of the steer and heifer sector of the beef industry. Retailers and foodservice companies identified marketing, and lack of progression toward process transparency, as the largest industry weakness.

- In 2016 it also became apparent that fewer beef buyers in the cow and bull segment understand the types of cattle from which their products are being sourced. The beef industry needs to do a better job of helping beef buyers understand the products they're purchasing.

Steer and Heifer: Transportation, Mobility and Harvest Floor Assessment
The research evaluated various characteristics that determine quality and value, including quality and yield grade, weight and marbling. Research showed:

- Nearly 97 percent of cattle received a mobility score of 1, with the animal walking easily and normally, with no apparent lameness;

- Almost all hanging carcasses (99.5 percent) had no visible injection site lesions;

- There was a decrease in black-hided cattle and an increase in Holstein type cattle compared to the NBQA 2011, 57.8 percent vs. 61.1 percent and 20.4 percent vs. 5.5 percent respectively.

- There were more cattle without a brand, more cattle with no horns, fewer cattle with identification and fewer carcasses without bruises (though bruising was generally less severe);

Cows and Bulls: Transportation and Mobility
Sufficient space in trailers as outlined by the animal Handling Guidelines was generally provided. This helps to assure animal safety and welfare, while maintaining carcass value.

For all cattle types (beef cows, beef bulls, dairy cows and dairy bulls) the majority of cattle walked normally with no apparent lameness. This compared favorably with results from the previous market cow and bull audits (Figure 1).

Since 2007 there has been a 3.3 percentage point increase in sound beef cows, a 24.6 percentage point increase in sound dairy cows, and a 14.2 percentage point increase in sound beef bulls. Despite the positive soundness findings for cows, it's important for producers whenever possible to be mindful of the advantage to culling cows before lameness is observed.

Steer and Heifer: In-Plant Research
The research compared data from 2016 with that of the previous five surveys to assess progress in improving quality. It also provides a benchmark for future beef industry educational and research efforts. The 2016 research showed:

- While the industry is improving the quality of beef being produced, that quality is being accompanied by an increase in size and fatness;

- Since 1995 there has been a continued increase in hot carcass weight (HCW). Key reasons for increasing weights at the packing segment are labor, infrastructure and energy costs, as harvesting large carcasses costs the same as harvesting small ones;

- Consumers generally prefer thicker steaks with a smaller surface area. Larger carcasses could result in a steak with an undesirable surface area for many consumers;

- There was a dramatic increase in the frequency of Prime and Choice, and a decrease in the frequency of Select. One of the reasons for this is the increase in dairy-type carcasses. While the greatest proportion of carcasses were within the lowest third of the grade for Choice and Prime, the majority of carcasses qualifying for Select were in the top half of the grade;

- The number of blemishes, condemnations and other attributes that can have an impact on animal value remain small, and industry efforts to address these issues since 1995 have been generally encouraging.

Cow and Bull: Live Animal Evaluations
For cows and bulls there has been a trend toward increased body condition scores in beef and dairy cows since 2007, while condition has stayed relatively constant for bulls. In fact, body condition scores for dairy cows improved from 36 percent with body condition score of 3 or above in 2007 to 45 percent in 2016.

In the 2016 cow and bull audit, the majority of cattle surveyed had no defects present when evaluated, indicating animals were culled for less visible reasons, possibly including behavior, reproductive inability or replacement of the genetic pool. Data suggested producers may have been more likely to cull cattle after observing a single defect rather than holding an animal until other conditions occurred.

Of cattle surveyed, 97.9 percent had no visible knots – swellings resulting from an injection of animal health products. Of the visible knots, 44.9 percent were observed in the neck, the region in which injections should be administered in accordance with Beef Quality Assurance (BQA) guidelines.

Additional research was conducted in 2017 at seven 2016 NBQA cow and bull audit plants to determine the presence of injection site lesions based on the slide audit procedure used in a 1998-2000 audit. This research demonstrated a reduction of 13 percentage points in beef-type carcasses and 20 percentage point reduction in dairy-type carcasses since the 2000 injection-site audit.

Cow and Bull Harvest Floor Assessments: Hide-On

The percentage of cows and bulls without mud in 2016 (56 percent) was noticeably higher than cattle with no mud in 2007 (42.7 percent), suggesting industry improvements in removing mud from hides prior to dressing. Use of branding also saw a slight improvement: the majority of cattle (77.3 percent) had unbranded hides. Producers can minimize the value loss due to branding by placing brands on the butt or shoulder rather than the side.

Cow and Bull Harvest Floor Assessments: Hide-Off

Although more than half of the cow carcasses surveyed in the audit were bruised, the largest majority possessed a bruise of minimal severity (less than 1 pound of surface trim to remove bruise damage). Identification of bruising in the 1999 National Market Cow and Bull Beef Quality Audit might have contributed to the significant industry improvement in bruise reduction from 1999 to 2007 (Table 1). Based on 2016 cow and bull audit results, there is still opportunity for improvement in decreasing the prevalence of carcass bruising.

The 2016 liver condemnation rate was comparable to the 2007 audit, with both frequencies higher than the 1994 and 1999 studies. Leading cause for condemnation was abscesses.

Cow and Bull Cooler Assessments

There was an increase in the average fat thickness in beef cow, beef bull and dairy bull carcasses, but a decrease in the average fat thickness in dairy cow carcasses since 2007. Meanwhile, carcasses were more often light muscled than heavily muscled, even though muscle distributions have shifted upwards toward average muscling (score 3) since 2007. The percentage of carcasses free of arthritic joints also increased since 2007.

Strategy Session

In a December 2016 Strategy Session, more than 70 individuals representing every sector of the beef industry met to review results of the research and discuss industry implications for both the steer and heifer and cow and bull NBQAs. Outcomes from that meeting provide quality guidance to the industry for the next five years.

One essential need identified was for greater education and communication of BQA to the supply chain and consumers, and how increased certification of BQA followers could enhance respect for the program.

Participants for the steer and heifer NBQA broke suggestions into three categories:

Safety and Animal Food Health
- Implement information sharing systems, based on modern animal identification and record-keeping technologies, to improve global market access;
- Improve uptake of preventive health strategies and good cattle husbandry techniques to ensure future effectiveness of antimicrobials;
- Continue efforts to improve supply chain safety interventions.

Eating Quality and Reduction of Variety
- More measurable information systems and supply chain coordination;
- Research and genetic strategies to improve eating satisfaction;
- Utilize advancements in genetic selection technologies to breed for carcasses with increased eating satisfaction, uniformity, and desirable end product specifications;
- Implement or refine sorting strategies to maximize uniformity of cattle, carcasses and end product. Systems to enable rewarding of increased uniformity should be developed.

Optimizing Value and Eliminating Waste
- Implement information sharing systems, based on modern animal identification and record-keeping technologies, to assist in sending informed market signals to producers for greater (or lesser) valued carcasses and improve system efficiency;
- Increase industry-wide uptake of proven genomic technologies and invest in the development, testing and acceptance of techniques to improve traits more quickly.

During the Strategy Session factors affecting the cow and bull beef market were discussed, including the need for:
- More timeliness in the marketing of animals at both ranch and dairy;
- Appropriate changes to placement and size of brands on the ranch;
- Addressing the appropriate site for injections with the veterinarian community;
- Greater coordination to ensure promotion of BQA principles and consideration of meat quality;
- More effective communication about animals that are not fit for transport; and
- Remaining diligent in educating on the principles of Beef Quality Assurance.

Lost Opportunities
Lost opportunities are calculated for each audit to give perspective to the value of the quality defects identified during in-plant assessments. For steers and heifers, Strategy Session participants set a target consensus for Quality Grade, Yield Grace and carcass weight. These goals, with the actual prevalence of each from the audit and summary prices for 2016 as reported by USDA, are used to calculate these values.

Challenges arise each audit in this exercise as prices sometimes are not reported, or changes in data collection occur. New issues for 2016 include lack of yearly prices for lungs and tongues as well as no collection of trip condemnations. The total lost opportunities for previous audits are adjusted to 2016 prices to give an accurate comparison between years.

For the cow and bull industry there has been a large increase in lost opportunities from 1999 to 2016 – the biggest driver of which is the increase in value for virtually all products, including by-products.

Conclusions

The beef industry has spent the last quarter century significantly improving the quality of its product, but there's no denying there is always room for improvement. In fact, the audits acknowledge room for improvement in every area.

The audit for steers and heifers recognized the decrease in cattle with hide brands, the decreased presence of horns, and an increase in the frequency of Prime carcasses. It is evident, however, that further improvement is needed with liver condemnations and carcasses with bruising.

For the market cow and bull beef sector specifically, progress can continue by focusing on:

- Food safety, an important factor for those who purchase beef;
- Appropriate management of cull cows and bulls to increase muscle condition before harvest;
- Culling animals before physical defects are severe;
- Seeking to better understand causes of liver abscesses;
- Implementing measures to eliminate carcass bruising;
- Reducing defects to allow the cow and bull industry to capture additional value; and
- Emphasizing education in the Dairy FARM and Beef Quality Assurance programs to propel the momentum of the cow and bull industry.

While the data from both audits show that those in the industry have a valuable story to tell, it doesn't help that many in the industry don't fully know the best way to tell it.

An important strategy for improved industry health and success was evident in the research: utilizing BQA and its principles to increase consumer confidence and enhance industry commitment would encourage greater beef demand, and improve industry harmonization. Carrying this BQA message throughout the industry all the way to consumers would benefit every audience.

The full executive summaries and more information about both the 2016 NBQA for Steers and Heifers and the 2016 NBQA for Market Cows and Bulls can be found on the Beef Quality Assurance website at www.bqa.org.

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