NATIONAL BEEF QUALITY AUDIT–2022: IN-PLANT SURVEY OF BEEF CARCASS CHARACTERISTICS FROM FED STEERS AND HEIFERS

Jeffrey W. Savell[1*], Trent E. Schwartz[1], Sydni E. Borders[1], Thachary R. Mayer[1], Kerri B. Gehring[1], Davey B. Griffin[1], Christopher R. Kerth[1], Keith E. Belk[2], Lilly Edwards-Callaway[2], J. Brad Morgan[2], Jarrett B. Douglas[2], Morgan M. Pfeiffer[3], Gretchen G. Mafi[3], Keayla M. Harr[3], Ty E. Lawrence[4], Travis C. Tennant[4], Loni W. Lucherk[4], Travis G. O'Quinn[5], Phil D. Bass[6], Lyda G. Garcia[7], Robert J. Maddock[8], Chad C. Carr[9], T. Dean Pringle[10], Keith R. Underwood[11], Bailey N. Harsh[12], and Crystal M. Waters[13]

[1]Department of Animal Science, Texas A&M AgriLife Research, Texas A&M University, College Station, Texas, [2]Department of Animal Sciences, Colorado State University, Fort Collins, Colorado, [3]Department of Animal Science, Oklahoma State University, Stillwater, Oklahoma, [4]Beef Carcass Research Center – Department of Agricultural Sciences, West Texas A&M University, Canyon, Texas , [5]Department of Animal Sciences and Industry, Kansas State University, Manhattan, Kansas, [6]Department of Animal, Veterinary, and Food Sciences, University of Idaho, Moscow Idaho, [7]Department of Animal Sciences, The Ohio State University, Columbus, Ohio, [8]Department of Animal Sciences, North Dakota State University, Fargo, North Dakota, [9]Department of Animal Sciences, University of Florida, Gainesville, Florida,[10]Department of Animal and Dairy Science, University of Georgia, Athens, Georgia, [11]Department of Animal Science. South Dakota State University, Brookings, South Dakota, [12]Department of Animal Sciences, University of Illinois Urbana-Champaign, Urbana, Illinois, [13]College of Agriculture, California State University Chico, Chico, California

*Corresponding author email: j-savell@tamu.edu

I. INTRODUCTION

The National Beef Quality Audit (NBQA) was first conducted in 1991 [1], and with additional surveys approximately every five years since that time with NBQA–2016 [2] being the most recent, the U.S. beef industry can monitor changes in several traits. Areas of interest include carcass characteristics, especially quality and yield factors related to value and consistency. These periodic evaluations provide valuable information for research and education programs. This phase of the NBQA–2022 reports the latest quality and yield characteristics from a broad sample of the U.S. beef supply.

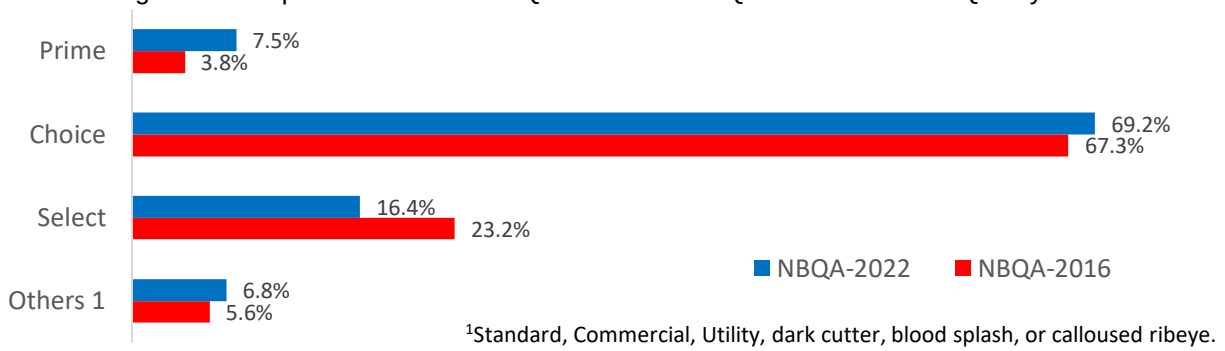
II. MATERIALS AND METHODS

Collection of in-plant cooler data occurred between July 2021 and November 2022 at 35 different beef packing plants through a collaboration of 13 different universities. Universities collected data from 10% of all carcasses processed during one full day of operation for a total of 9,746 carcasses. Hot carcass weight (HCW), ribeye (*M. longissimus thoracis*) area (REA), sex class, and breed classification (native, *Bos indicus*, and dairy) were evaluated. *Bos indicus* carcasses possessed a dorsal thoracic hump measuring greater than 10.2 cm, and dairy cattle had muscling and conformation that was angular and thin overall. All remaining cattle were classified as native. REA was measured using a dot grid, blotting paper, or the plant's beef grading camera. Lean and skeletal maturity was determined by the United States Department of Agriculture Meat Grader. Preliminary yield grade (PYG); kidney, pelvic, and heart (KPH) fat; marbling score; degree of dark cutting; and presence of blood splash or callouses were recorded. Data were sent to Texas A&M University for analysis. Microsoft Excel and JMP Pro 16.0.0 software were used to analyze data.

III. RESULTS AND DISCUSSION

Distributions of sex class among sampled carcasses were steer (65.0%) and heifer (35.0%), whereas distributions of breed type were native (87.7%), dairy (11.3%), and *Bos indicus* (0.9%). Mean marbling score was Small[98]. With the increase in mean marbling score, the mean quality grade (QG) increased numerically to Choice[16] compared to Select[96] in NBQA-2016 [2]. The overall maturity of carcass was A[66], the highest maturity mean since the NBQA–2000 [3].

Figure 1. Comparison between NBQA-2016 and NBQA-2022 for USDA Quality Grades



[1]Standard, Commercial, Utility, dark cutter, blood splash, or calloused ribeye.

Figure 1 compares current data to that from NBQA-2016 [2]. Prime (+3.7%), Choice (+1.9%), and other (+1.2%) all increased numerically, whereas Select carcasses decreased drastically (-6.8%). Dark cutting (1.7%) and blood splash (0.5%) revealed a decrease in dark cutting carcasses from the NBQA – 2016 [2], but an increase in blood splash. Distributions of USDA YG were YG 1 (7.7%), YG 2 (29.5%), YG 3 (40.1%), YG 4 (17.0%), and YG 5 (5.6%). Both Mean YG (3.3 from 3.1) and HCW (401.9 kg from 390.3 kg) increased numerically compared to NBQA – 2016 [2].

IV. CONCLUSION

In the 30 years of the NBQA, this audit was the first to report the highest frequency of carcasses grading Prime and Choice. Much like previous years, there was an increase in the YG of carcasses as characteristics such as HCW, adjusted fat thickness and REA all increased. This Information will be useful to the beef industry as it measures progress in quality and yield of beef carcasses over time.

ACKNOWLEDGEMENTS

This study was funded, in part, by the Beef Checkoff

REFERENCES

1. Lorenzen, C. L., Hale, D. S., Griffin, D. B., Savell, J. W., Belk, K. E., Frederick, T. L., Miller, M. F., Montgomery, T. H., & Smith, G. C. (1993). National Beef Quality Audit: Survey of producer-related defects and carcass quality and quantity attributes. Journal of Animal Science 71:1495-1502.
2. Boykin, C. A., Eastwood, L. C., Harris, M. K., Hale, D. S., Kerth, C. R., Griffin, D. B., Arnold, A. N., Hasty, J. D., Belk, K. E., Woerner, D. R., Delmore, R. J., Jr., Martin, J. N., VanOverbeke, D. L., Mafi, G. G., Pfeiffer, M. M., Lawrence, T. E., McEvers, T. J., Schmidt, T. B., Maddock, R. J., Johnson, D. D., Carr, C. C., Scheffler, J. M., Pringle, T. D., Stelzleni, A. M., Gottlieb, J., & Savell, J. W. (2017). National Beef Quality Audit-2016: In-plant survey of carcass characteristics related to quality, quantity, and value of fed steers and heifers. Journal of Animal Science 95:2993-3002.
3. McKenna, D. R., Roeber, D. L., Bates, P. K., Schmidt, T. B., Hale, D. S., Griffin, D. B., Savell, J. W., Brooks, J. C., Morgan, J. B., Montgomery, T. H., Belk, K. E., & Smith, G. C. (2002). National Beef Quality Audit-2000: Survey of targeted cattle and carcass characteristics related to quality, quantity, and value of fed steers and heifers. Journal of Animal Science 80:1212-1222.