

# NBQA-2000: A Survey of the Beef Industry

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## SUMMARY

The first phase of the National Beef Quality Audit – 2000 was conducted to determine what producers, packers and end-users considered the biggest quality challenges facing the fed cattle industry. The surveys conducted also determined what management changes producers have made over the past ten years. Seedstock generators and cow-calf producers (n = 2,308) most frequently cited (P<0.05) improved genetics using EPDs and changed injection-site location as management adjustments made since 1991. Stockers/backgrounders and feedlot operators most frequently (P<0.05) made adjustments to injection-site location and handling practices. A majority of beef producers indicated that previous audits had a “strong” or “moderate” impact on management changes made since 1991. End-users revealed insufficient marbling, lack of cut uniformity, and inadequate tenderness to be the greatest (P<0.05) quality challenges. Results will assist in development and implementation of beef quality assurance principles, and encourage beef producers to improve beef quality and consumer satisfaction.

**Key Words:** Beef Quality, Industry Survey

## INTRODUCTION

National Beef Quality Audits (NBQAs) in 1991 and 1995 identified goals and objectives that producers could use to justify implementation of changes in their genetic and/or

management programs to help improve the quality, consistency, and value of beef (Smith et al., 1992; Smith et al., 1995). Face-to-face interviews in the NBQAs of 1991 and 1995 identified hide defects and lack of uniformity in live cattle, respectively, as the leading quality concerns for packers, and excessive external fat and low overall uniformity and consistency, respectively, as the leading quality concerns for purveyors, retailers, and restaurateurs (Smith et al., 1992; Smith et al., 1995). For the 2000 National Beef Quality Audit (NBQA-2000) it was decided to conduct a survey, using questionnaires, rather than interviews to: (1) determine changes that seedstock generators, cow-calf producers, stockers/backgrounders, and cattle feeders made in management practices since completion of NBQA – 1991, and (2) identify the top ten current beef quality “concerns” (termed “challenges” in NBQA – 2000) facing the beef industry as expressed by producers, packers, purveyors, restaurateurs, and retailers.

## MATERIALS AND METHODS

### *Producer Surveys*

Different questionnaires were developed for seedstock generators, cow-calf producers, stockers/backgrounders, and feedlot operators, and were sent to state beef quality assurance coordinators for dissemination to their groups within each state. Information provided by respondents included their sector of the industry, the current size of their operation, the genetic and/or management changes (from a given list, with an optional user-defined change) made over the past 10 years, the overall impact of the 1991 and 1995 National Beef Quality Audits, and the five greatest quality challenges currently facing the beef industry.

### *Packer and Merchandiser Surveys*

Separate questionnaires were developed for packers and for

merchandisers (retailers, purveyors, and restaurateurs). Questionnaires were sent to the packers who had agreed to allow in-plant audits and to corporate representatives of those packing companies with more than one plant in the audit (n = 36; 32 plants, 4 corporate offices). Questionnaires were also sent to purveyors identified by the North American Meat Processors Association (n = 227), to the top retailers as identified by *Progressive Grocer* (n = 315), and to the American cuisine restaurants and steakhouses that were listed on state restaurant association web pages (n = 367). Respondents identified the sector of the industry in which they operated, answered demographic questions, and identified, in their opinion, the five greatest quality challenges (from a given list, with an optional user-defined challenge) for which the beef industry has made the greatest and least improvement during the past ten years, the overall impact of the 1991 and 1995 National Beef Quality Audits on improvements in overall quality and consistency of beef carcasses and products, and the five greatest quality challenges (from a given list, with the option of adding challenges) currently facing the beef industry.

### *Statistical Analysis*

Analyses were performed to generate weighted LS means and frequency distributions using the analysis of variance procedure of SAS (SAS Inst., Cary, NC). The chi-square option of the frequency procedure of SAS (SAS Inst., Cary, NC) was used to compare frequencies. If the overall chi-square value was significant (P<0.05), Fisher’s Exact Test (SAS Inst., Cary, NC) was used to separate the frequencies.

## RESULTS

### *Respondent Demographics*

Two-thirds (67%) of seedstock generators and more than half (53%) of cow-calf producer respondents managed small herds (less than 100 head), nearly three-fourths (73%) of

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stocker/backgrounders managed small operations (one-time capacity of less than 1,000 head), and almost half (47%) of feedlot operators managed operations characterized as small (one-time capacities of less than 1,000 head). There were producer respondents in at least one or more sectors from many of the major beef production states (n = 21; including 8 of the top 11 cow-calf states and 9 of the top 11 cattle feeding states).

Over 90% of carcasses were reported by the responding packers to have hot carcass weights between 600 and 1,000 lb.; to have Select, low Choice, or average Choice quality grades; and to have a yield grade of 1, 2, or 3. A very small percentage of carcasses, less than 2% each, were reported by packers as being B-maturity, hard-boned, dark cutters, or as having calloused or blood splashed (ecchymosis) ribeyes.

More than 64% of purveyors, 55% of retailers, and 97% of restaurateurs reported using at least some product that is low Choice or higher. More than half (54.1%) of purveyors reported that they age product 14 to 21 d after they received the product, 53.5% of retailers reported that they age product for 14 d or less after they receive the product, and 55.2% of restaurateurs reported that they age product for 7 to 21 d after they receive the product. Retailers, purveyors, and restaurateurs reported that, on average, they use product from 4.0, 2.5, and 2.3 branded beef programs, respectively.

### ***Changes Made Since 1991***

Across all production sectors of the industry (seedstock generators, cow-calf producers, stockers, and feedlot operators), adjustments in injection-site location, increased record keeping, improved handling practices, and maintenance of health and management data were included among the top ten most frequent changes in management made by all four groups of producers during the past ten years (Table 1). The most recent injection-site lesion audit data (Roeber et al., 2001) revealed that the incidence of injection-site lesions in

top sirloin butts from fed steers/heifers had declined 19.1 percentage points from 1990 to 2000, indicating that producers have made adjustments in injection-site location. Seedstock generators and cow-calf producers identified among their top ten changes, improved genetics and changed vaccination programs. Stockers/backgrounders and feedlot operators, in addition to making the four changes common to among all production sectors, collected carcass data, increased employee awareness, changed genetic type of cattle purchased, and provided incentives for pre-conditioned cattle and calves of superior genetics (Table 1). Data provided by Cattle-Fax (2001) verified that feedlot operators do pay premiums for preconditioned calves. Cattle-Fax reported that, on average, producers received a \$13 per head premium, above the cost of preconditioning, on preconditioned calves (Cattle-Fax, 2001).

Changes in genetic selection and management practices made by producers during the past ten years generally paralleled those quality characteristics that packers and merchandisers believed improved the most during the same period of time (Tables 1 and 2). Quality characteristics for which the industry has made the greatest improvements since 1991 that were included in the top ten list by three or more of the packer, purveyor, retailer and restaurant sectors were presence of injection-site lesions, carcass weights too light, excess external fat, presence of bruises, inadequate palatability, lack of uniformity in live cattle, carcasses, and cuts, and inadequate tenderness (Table 2).

### ***Impact of Past NBQAs***

Over 70% of respondents from each producer sector and more than 62% of respondents from packer and merchandiser sectors believed that past NBQAs (1991 and 1995) have had a “strong” to “moderate” impact on either the changes made in production systems or the

improvements observed in product quality since 1991.

### ***Current Quality Challenges***

Seedstock generators, cow-calf producers, stockers, and feedlot operators all identified lack of uniformity in live cattle, carcasses, and cuts, presence of injection-site lesions, insufficient marbling, inadequate tenderness, excess external fat, low cutability, and inadequate flavor among their top ten quality challenges (Table 3).

Five quality challenges appeared in the lists of all four of the packer, purveyor, retailer and restaurant sectors. Packers, purveyors, retailers, and restaurateurs all identified lack of uniformity in live cattle, carcasses, and cuts, carcass weights too heavy, insufficient marbling, inadequate tenderness, and excess external fat among their top ten quality challenges (Table 4).

Among quality challenges for which the industry has made the least improvement since 1991, four quality challenges appeared in the top ten lists of all four of the packer, purveyor, retailer, and restaurant sectors. Those challenges included lack of uniformity in live cattle, carcasses, and cuts, carcass weights too heavy, insufficient marbling, and inadequate tenderness (Table 5).

## **IMPLICATIONS**

Results of the surveys conducted as a part of the NBQA – 2000 suggest that many producers have followed the recommendations of the past NBQAs and have changed some of their genetic selection and management practices. Changes made by producers have resulted in improvements in some product characteristics that are apparent to packers and merchandisers. Opportunities remain for further improvements in cattle, carcass, cut, and offal characteristics; specific opportunities are identified in the list of top ten quality challenges. Data from the NBQA – 2000 should be useful to producers who wish to improve the quality, consistency, and

competitiveness of beef in the market place.

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Table 1. Top ten changes made by producers since 1991 presented as percentage\* of respondents identifying it as one of the five changes made in their genetic and/or management programs.

Change Made	SS <sup>1</sup> (n = 622)	CC <sup>1</sup> (n = 1,686)	STK <sup>1</sup> (n = 467)	FDLT <sup>1</sup> (n = 273)
Improved genetics using performance traits (measured traits) <sup>a</sup>	16.99 <sup>c</sup>	14.57 <sup>c</sup>		
Improved genetics using physical traits (visual appraisal traits) <sup>a</sup>	11.36 <sup>d</sup>	10.56 <sup>d</sup>		
Improved genetics using carcass traits <sup>a</sup>	8.01 <sup>e</sup>	4.93 <sup>fg</sup>		
Improved genetics using ultrasound <sup>a</sup>	6.39 <sup>ef</sup>			
Changed injection-site location	11.69 <sup>d</sup>	15.36 <sup>c</sup>	15.41 <sup>c</sup>	13.72 <sup>c</sup>
Increased record keeping	9.39 <sup>de</sup>	10.22 <sup>d</sup>	8.73 <sup>ef</sup>	8.46 <sup>cd</sup>
Improved handling	5.09 <sup>f</sup>	6.99 <sup>e</sup>	10.26 <sup>de</sup>	9.15 <sup>cd</sup>
Collected carcass data	5.06 <sup>f</sup>		5.41 <sup>g</sup>	11.91 <sup>cd</sup>
Changed vaccination program	4.35 <sup>f</sup>	5.82 <sup>ef</sup>	8.38 <sup>efg</sup>	
Maintained health and management data	4.31 <sup>f</sup>	4.09 <sup>g</sup>	6.94 <sup>efg</sup>	5.91 <sup>d</sup>
Changed preconditioning program <sup>a</sup>		4.93 <sup>fg</sup>		
Increased animal identification		6.09 <sup>ef</sup>		4.70 <sup>d</sup>
Increased employee awareness			6.72 <sup>fg</sup>	8.37 <sup>d</sup>
Changed genetic type of cattle purchased <sup>b</sup>			13.53 <sup>cd</sup>	7.94 <sup>d</sup>
Provided an incentive for preconditioning <sup>b</sup>			6.37 <sup>fg</sup>	12.00 <sup>cd</sup>
Provided an incentive for “superior” genetics <sup>b</sup>			5.72 <sup>fg</sup>	6.65 <sup>d</sup>

\* Percentages are weighted based on the size of the production unit.

<sup>1</sup> SS=Seedstock generators, CC=Cow-calf producers, STK=Stockers/backgrounders, and FDLT=Feedlot operators.

<sup>a</sup> Changes that were listed only for seedstock generators and cow-calf producers.

<sup>b</sup> Changes that were listed only for stockers/backgrounders and feedlot operators.

<sup>c,d,e,f,g</sup> Percentages, within the same column, with a common superscript letter do not differ (P > 0.05).

Table 2. Top ten quality characteristics, identified by packers, purveyors, retailers, and restaurateurs, for which the industry has made the greatest improvements since 1991 presented as percentages<sup>a</sup> of respondents identifying it as one of the top five improvements.

Quality Characteristic	Packers (n = 29)	Purveyors (n = 37)	Retailers (n = 44)	Restaurateurs (n = 32)
Presence of injection-site lesions	18.71	10.95	12.50	12.15
Carcass weights too light	15.83		4.17	4.67
Reduced quality grade and tenderness due to implants	8.63		7.81	
Inadequate muscling	7.91			5.61
Too small ribeyes	7.91			
Hide damage due to parasites	6.47			
Carcass condemnations	5.76			
Excess external fat	5.76	10.95	15.10	9.35
Presence of bruises	5.76	12.40	13.54	12.15
Hide damage due to brands	4.32			
Inadequate palatability		8.76	4.69	8.41
Low cutability		8.03	10.95	
Inadequate flavor		7.30		8.41
Lack of uniformity in live cattle/carcasses/cuts		6.57	9.90	7.48
Inadequate tenderness		6.57	4.17	8.41
Inadequate marbling		5.84		4.67
Inadequate juiciness		5.84		6.54
Excess seam fat			6.77	

Table 3. Top ten quality challenges, identified by producers, on which the industry needs to focus efforts toward improvement, as percentages of respondents identifying it as one of the top five challenges.

Quality Challenge	SS <sup>1</sup> (n = 622)	CC <sup>1</sup> (n = 1,686)	STK <sup>1</sup> (n = 467)	FDLT <sup>1</sup> (n = 273)
Lack of uniformity in live cattle/carcasses/cuts	15.54 <sup>a</sup>	15.46 <sup>a</sup>	11.71 <sup>ab</sup>	14.87 <sup>a</sup>
Carcass weights too heavy	4.76 <sup>c</sup>		5.13 <sup>d</sup>	8.13 <sup>bc</sup>
Yield grades too high	4.29 <sup>c</sup>		3.79 <sup>d</sup>	
Presence of injection-site lesions	8.10 <sup>b</sup>	12.10 <sup>b</sup>	10.72 <sup>ab</sup>	6.83 <sup>bcd</sup>
Insufficient marbling	12.23 <sup>a</sup>	11.40 <sup>b</sup>	11.91 <sup>ab</sup>	10.58 <sup>ab</sup>
Inadequate tenderness	14.50 <sup>a</sup>	14.56 <sup>a</sup>	14.71 <sup>a</sup>	14.15 <sup>a</sup>
Inappropriate muscling	6.22 <sup>bc</sup>	4.36 <sup>de</sup>		4.38 <sup>cd</sup>
Carcass condemnations		3.26 <sup>e</sup>		
Reduced quality grade/tenderness due to implants				5.36 <sup>cd</sup>
Excess external fat	5.19 <sup>c</sup>	4.43 <sup>de</sup>	5.38 <sup>cd</sup>	3.57 <sup>d</sup>
Low cutability	5.66 <sup>bc</sup>	4.56 <sup>de</sup>	5.83 <sup>cd</sup>	5.09 <sup>cd</sup>
Inadequate flavor	8.03 <sup>b</sup>	8.57 <sup>c</sup>	8.52 <sup>bc</sup>	7.01 <sup>bcd</sup>
Presence of bruises		5.29 <sup>d</sup>	4.84 <sup>d</sup>	3.57 <sup>d</sup>

<sup>1</sup>SS=Seedstock generators, CC=Cow-calf producers, STK=Stocker/backgrounder, and FDLT=Feedlot operators.  
<sup>a,b,c,d,e</sup> Percentages, within the same column, with a common superscript letter do not differ (P > 0.05).

Table 4. Top ten quality challenges, identified by packers, purveyors, retailers and restaurateurs, on which the industry needs to focus efforts toward improvement, presented as percentages of respondents identifying it as one of the top five challenges.

Quality Challenge	Packers (n = 29)	Purveyors <sup>a</sup> (n = 37)	Retailers (n = 44)	Restaurateurs <sup>a</sup> (n = 32)
Lack of uniformity in live cattle/carcasses/cuts	17.73 <sup>b</sup>	13.19	13.02 <sup>b</sup>	9.56
Carcass weights too heavy	17.02 <sup>bc</sup>	10.42	8.34 <sup>bc</sup>	4.41
Yield grades too high	2.13 <sup>c</sup>			
Presence of injection-site lesions	2.13 <sup>c</sup>			
Insufficient marbling	7.80 <sup>bc</sup>	13.89	1.30 <sup>c</sup>	11.03
Inadequate tenderness	7.80 <sup>bc</sup>	9.03	14.59 <sup>b</sup>	13.23
Food safety	7.09 <sup>bc</sup>			
Reduced quality grade and tenderness due to implants	7.80 <sup>bc</sup>			
Excess external fat	12.14 <sup>bc</sup>	11.11	7.81 <sup>bc</sup>	10.29
Low cutability	4.96 <sup>bc</sup>	9.72		7.35
Inadequate flavor		4.17	13.02 <sup>b</sup>	10.29
Too large ribeye		10.42	3.65 <sup>bc</sup>	6.62
Inadequate palatability			7.81 <sup>bc</sup>	
Excess seam fat		4.86		5.15
Inadequate juiciness			6.25 <sup>bc</sup>	9.56
Presence of bruises	2.84 <sup>bc</sup>	4.17	3.13 <sup>bc</sup>	

<sup>a</sup> Percentages, within the purveyor and restaurateur columns, do not differ ( $P > 0.05$ ).

<sup>b,c</sup> Percentages, within the same column, with a common superscript letter do not differ ( $P > 0.05$ ).

Table 5. Top ten quality challenges, identified by packers, purveyors, retailers and restaurateurs, for which the industry has made the least improvement since 1991 presented as percentages<sup>a</sup> of respondents identifying it as one of the top five challenges.

Quality Challenge	Packers (n = 29)	Purveyors (n = 37)	Retailers (n = 44)	Restaurateurs (n = 32)
Lack of uniformity in live cattle/carcasses/cuts	14.18	12.00	11.80	6.59
Carcass weights too heavy	13.48	11.20	7.45	5.49
Yield grades too high	12.06			
Hide damage due to parasites	10.64			
Insufficient marbling	9.22	12.00	9.94	12.09
Inadequate tenderness	8.51	7.20	14.30	8.79
Liver condemnations	8.51			
Hide damage due to brands	4.26			
Hide damage due to mud/manure	4.26			
Reduced quality grade and tenderness due to implants	2.84			
Excess external fat		10.40	5.59	12.09
Low cutability		9.60		8.79
Inadequate flavor		9.60	10.56	7.69
Too large ribeye		6.40	3.73	9.89
Inadequate palatability		6.40	11.18	
Excess seam fat		4.80	7.45	7.69
Inadequate juiciness			7.45	5.49
Presence of bruises			3.73	

<sup>a</sup> Percentages, within a column, do not differ ( $P > 0.05$ ).