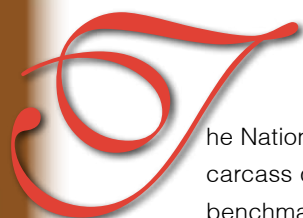


National Beef Quality Audit — 2011

Harvest-floor assessments, carcass characteristics, and instrument-grading information

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The National Beef Quality Audit (NBQA) initiated in 1991 periodically reports cattle and carcass defects and quality shortcomings in the beef industry. NBQA results provide key benchmarks for beef supply chain participants identifying gaps in value creation and lost economic opportunities.

Harvest-floor assessment

The objective of this portion of the NBQA-2011 (Phase II) was to assess targeted characteristics on the harvest floor that impact the quality and value of cattle, carcasses, and by-products.

Unique to the 2011 audit when compared to previous assessments is that beef processors are dedicating a higher percentage of their capacity, and thus their daily shifts, to value-based programs. These processors are also segregating days or shifts of production in order to meet country of origin labeling (COOL) requirements. Subsequently, when the audits were conducted at the different beef processing facilities, the potential existed for evaluating cattle included in these different value-based programs. Any biases resulting from the high percentage of value-based programs was effectively dealt with via the capture of a very large data set compiled from several processors who shared their camera-grading data.

Survey teams evaluated approximately 18,000 cattle/carcasses between May and November 2011 in eight beef processing facilities to assess the condition of traits known to impact value. Assessment of traits evaluated on live animals included animal identification, hide color, incidence of hide brands, presence of mud and/or manure, and presence of horns. Dentition was evaluated post-stunning and prior to hide removal. Following hide removal, carcass bruising and offal condemnation rates were recorded. Table 1 illustrates the findings from these cattle/carcass evaluations.





Table 1. Traits known to impact value

ID Method	Hide Colors	Brands/	Brand	Location of	Permanent	Bruise	Condemned		
Frequency	Breed Type	Brands/	location/	Mud or	Horns/	location/	item/		
%	Frequency/	Frequency	Frequency	Manure/	Frequency	Frequency	Frequency		
	%	%	%	Frequency	%	%	%		
lot visual tags/85.7%	black/61.1%	none/55.2%	butt/35.2%	none/49.2%	without horns/76.2%	none/87.3%	loin/50.1%	whole carcass/NR	
individual visual tags 50.6%	red/12.8%	one/40.4%	side/9.0%	legs/36.8%	length from 0-12.7 cm/17.8%	one/1.4%	one/18.7%	rib/21.3%	liver/20.9%
electronic tags/20.1%	yellow/8.7%	two 4.4%	shoulder/2.5%	belly/23.7%	other/6.0%	two/8.0%	two/3.4%	chuck/13.8%	lungs/17.3%
metal clip tags/15.7%	Holstein 5.5%	three or more/0.4%		side/14.9%		three/0.9%	three/0.6%	round 7.3%	tongue 10.0%
other/5.3%	brown 5.0%			tail region 13.7%		four/1.9%	four or more/0.3%	brisket flank or plate/7.5%	viscera/9.3%
none/2.5%	gray/5.0%			topline 11.0%		five/0.3%			head/7.2%
wattles 0.5%	white/1.4%					six/0.2%			
	brindle/1.0%					seven/0.1%			
						eight/0.02%			

Some of the trends observed in the 2011 NBQA include more black-hided cattle, more cattle identified individually, more cattle with no mud/manure present on their hides, and fewer carcasses with bruises. From these data, genetic and management decisions can be made by the rancher, stocker, and feedlot

personnel that could affect the type and value of cattle that are coming to the market.

In-plant carcass characteristics

In-plant cooler audits were conducted in 28 federally inspected beef processing facilities throughout the United States selected to represent the aggregate beef harvest. Beef carcasses (n = 9,802), representing approximately 10% of each production lot, were selected randomly for the survey. The mean USDA quality grade for the current study was Select⁹³, whereas the mean USDA yield grade was 2.9 (Table 2).

Table 2. Means, standard deviations, and minimum and maximum values for USDA carcass grade traits

Trait	Mean	SD	Minimum	Maximum
USDA yield grade	2.9	0.9	-0.2	7.1
USDA quality grade ¹	693	61	220	887
Adjusted fat thickness, cm/in	1.30/0.5	0.52/0.2	-1.02 ² /-0.4	3.96/1.6
Hot carcass weight, kg/lbs	374.0/823	46.5/102.3	140.4/308.9	545.7/1200.5
Ribeye area, cm ² /in ²	88.8/13.8	11.7/1.8	50.3/7.8	148.4/23.0
Kidney, pelvic and heart fat, %	2.3	0.8	0.0	5.0
Marbling score ²	440	98	100	960
Lean maturity ³	154	28	110	550
Skeletal maturity ³	162	34	100	600
Overall maturity ³	159	29	110	585

¹100 = Canner⁰⁰, 40 = Commercial⁰⁰, 600 = Select⁰⁰, and 800 = Prime⁰⁰.

²100 = Practically devoid⁰⁰, 300 = Slight⁰⁰, 500 = Modest⁰⁰, 700 = Slightly Abundant⁰⁰, and 900 = Abundant⁰⁰.

³100 = A⁰⁰ and 500 = E⁰⁰.

⁴Minimum value is less than 0 because of data conversion from a preliminary YG of less than 2.0.

Comparisons for USDA quality grades and yield grades from previous audits are reported in Table 3.

Some of the trends observed in the NBQA-2011 included an increase in USDA Prime and Choice carcasses, increased hot carcass weights, increased ribeye areas, and more dairy-type carcasses compared to previous audits. Also, the

percentage of nonconforming carcasses—quality grade of Standard and lower and (or) YG 4 and 5—has decreased when compared to the last NBQA. This indicates that the beef industry is improving at meeting commodity market targets.

Table 3. Means for USDA carcass grade traits from NBQA-1991, NBQA-1995, NBQA-2000, NBQA-2005, and NBQA-2011

Trait	NBQA-1991	NBQA-1995	NBQA-2000	NBQA-2005	NBQA-2011
USDA yield grade	3.2	2.8	3.0	2.9	2.9
USDA quality grade ¹	686	679	685	690	693
Adjusted fat thickness, cm/in	1.5/0.6	1.2/0.5	1.2/0.5	1.3/0.5	1.3/0.5
Hot carcass weight, kg/lbs	345.0/759	339.2/746	356.9/785	359.9/792	374.0/823
Ribeye area, cm ² /in ²	83.4/12.9	82.6/12.8	84.5/13.1	86.4/13.4	88.8/13.8
Kidney, pelvic and heart fat, %	2.2	2.1	2.4	2.3	2.3
Marbling score ²	424	406	423	432	440
Lean maturity ³	163	154	165	157	154
Skeletal maturity ³	175	163	167	168	162
Overall maturity ³	169	160	166	164	159

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Carcass instrument grading information

For the first time in the history of the National Beef Quality Audits, instrument-grading information was obtained. Instrument-grading data on approximately 2.4 million carcasses were collected over the course of 13 months and used, in addition to the traditionally collected information from the cooler and slaughter floor, to create a compilation of carcass information from multiple companies and facilities to acquire a more accurate assessment of the beef industry. Because of the immense volume of data included in this dataset, it was possible to view the seasonal changes that occur in beef carcass characteristics over the course of the year.

Shifts in the magnitude of the mean of certain quality grade (QG) and yield grade (YG) traits did occur on a month-to-month basis. The seasonal variation is likely because of the various production systems utilized to continually supply the United States with a safe, high quality product. Carcass weight declined from the heaviest point in November 2010 to the lightest point, which was observed in May 2011 (Figure 1).

Fat thickness followed a similar trend line as carcass weight, again having the smallest fat thickness measurements observed in May 2011 (data not shown). Conversely, marbling score increased from November 2010 to the peak in March 2011, and then declined each month for the remainder of the study (Figure 2).

Figure 1. Seasonal changes in carcass weight by month (2010-2011)

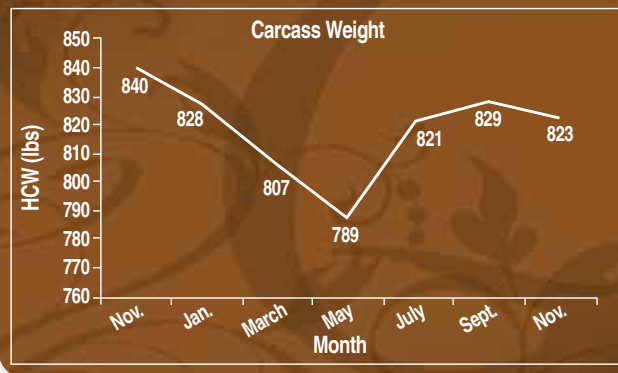
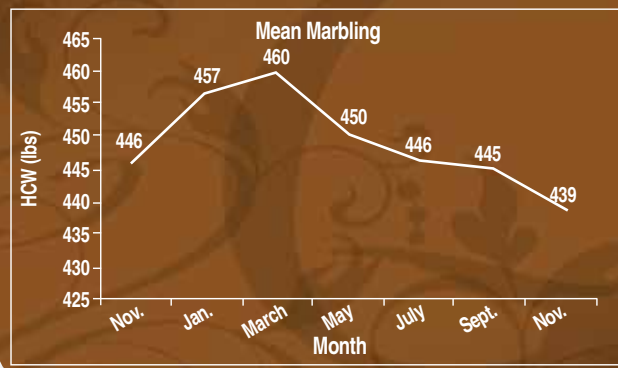


Figure 2. Seasonal changes in marbling scores by month (2010-2011)



QG and YG frequency distributions and QG and YG trait means within the instrument-grading dataset were found to be very similar to the frequency distributions and means from the NBQA in-plant chilled carcass assessment dataset (Table 4).

The surprisingly similar results of the ribeye area, fat thickness, YG, and marbling scores between the traditional in-plant carcass assessment and the instrument-grading dataset adds credibility to the current, as well as the previously conducted surveys, that the sample sizes have been adequate to obtain a representative snapshot of the industry.

This dataset presented the opportunity to further investigate the array of value-determining factors that influence the viability and profitability of the beef industry, and with the opportunity to utilize this method of online, electronic collection of data, these datasets are larger than those used in previous audits. These data demonstrate the month-to-month change in the consist of cattle type and carcass quality, and as future NBQA are performed, it will be interesting to determine if seasonal trends for these quality attributes are repeated.

Table 4. Comparison of carcass characteristics between traditional cooler data and instrument grading data.

Trait	Traditional cooler data (n = 9,802)	Instrument grading data (n = 2,427,074)
Yield grade	2.95	2.86
Fat thickness, cm/in	1.30/0.51	1.20/0.47
Hot carcass weight, kg/lbs	374.0/823	371.3/817
Ribeye area, cm ² /in ²	88.77/13.76	88.45/13.71
Marbling score ²	440	450

²100 = Practically devoid⁰⁰, 300 = Slight⁰⁰, 500 = Modest⁰⁰, 700 = Slightly Abundant⁰⁰, and 900 = Abundant⁰⁰.



For more information, contact:

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