PATHWAY
to a Successful Future

2022 National Beef Quality Audit

BEEF
Funded by the Beef Checkoff

"Lost Opportunities"

- "Lost opportunities in Beef Production" 1990
- $11.999 BILLION in lost economic opportunities
- Inefficiencies cost $458.00 per head

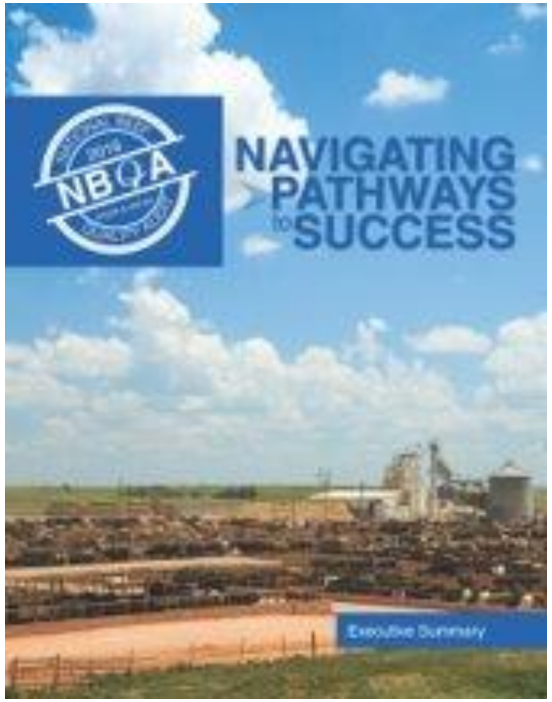
Rationale for Original Audit

"The U.S. cattle industry cannot expect improvements in prices for its products or by-products when '**quality**' doesn't warrant such increases."

1991 National Beef Quality Audit

National Beef Quality Audit

- Phase I: Interview Buyers of Beef
- Phase II: Conduct In-Plant Data Collection
- Strategy Session



NATIONAL BEEF 2022 NBQA QUALITY AUDIT

PATHWAY to a Successful Future

Phase 1: Interviews

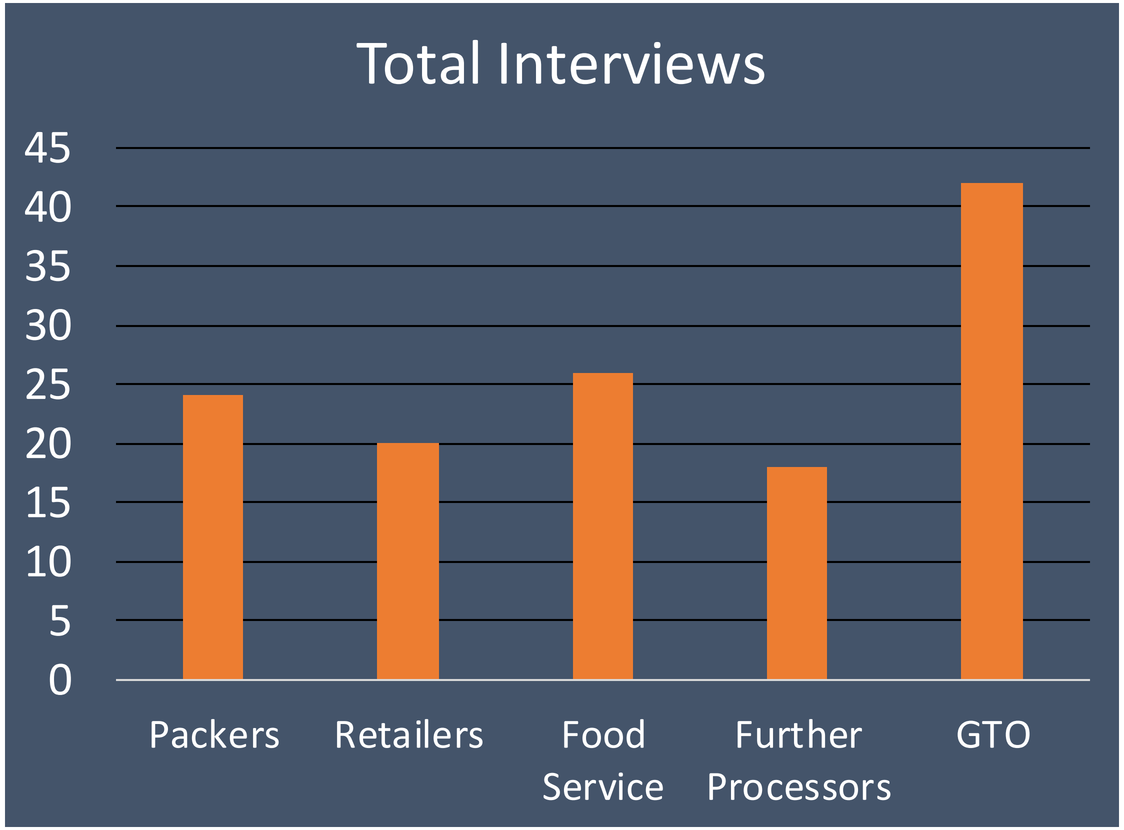
BEEF

Funded by the Beef Checkoff

Objective: Interview employees making cattle/beef purchasing decisions for companies across 4 market-sectors of the industry, as well as secondarily-related Government and Trade Organizations (GTO).

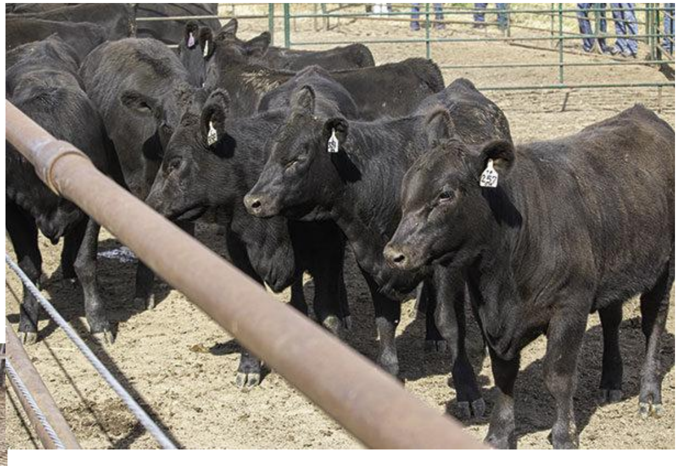
Total Interviews

- Packers= 24
- Retailers= 20
- Food Service= 26
- Further Processors= 18
- Government and Trade Organizations= 42



Cattle types reportedly purchased by sector

Type	Packers n=24	Retailer n=16	Food Service n=25	Further Processors n=19
Dairy	19	8	10	12
Beef	24	16	21	17
Beef x Dairy	9	4	10	3



What does the term "cattle genetics" mean to your company?

Packer n=26	Retailer n=18	Food Service n=26	Further Processors n=14	GTO n=42
54% Quality Genetics /Improving herd	55% Quality Genetics /Improving herd	50% Quality Genetics /Improving herd	28% Quality Genetics /Improving herd	64% Quality Genetics /Improving herd
35% Genetic Potential for Marbling	28% Beef Type	31% Angus	14% Beef Type	36% Genetic Potential for Marbling
23% Beef x Dairy	35% Genetic Potential for Marbling	15% Beef Type	14% Genetic Testing /Genetic Markers	33% Genetic Testing /Genetic Markers
			14% Marketing with Genetics to increase profits	

Packer – "Genetics directly dictates quality of product."

SWOT Analysis

(Strengths, Weaknesses, Opportunities, and Threats)

Funded by the Beef Checkoff

What changes has your company witnessed since the 2016 NBQA?

Packer n=17	Retail n=20	Food Service n=29	Further Processor n=19	GTO n=38
83.3% Knowledge of Program	66.7% Knowledge of Program	62.1% Knowledge of Program	84.2% Knowledge of Program	84.2% Knowledge of Program
25% Nothing Changed	26.7% Contracts Changed	16.7% More Efficient	25% Nothing Changed	40% More Efficient
20% More Efficient	21.4% Purchasing More Branded Beef	16.7% Contracts Change	12.5% Contracts Changed	10% Increase Food Safety
13.3% Purchasing Value Added	13.3% Increase Food Safety	16.7% Increase Food Safety	6.3% Purchasing More Branded Beef	10% Purchasing More Branded Beef
13.3% Increase Food Safety	13.3% More Efficient		6.3% Increase Food Safety	

Packer – "Efficient - Do more with less."

What are the strengths of the steer and heifer industry?

Packer n=17	Retail n=16	Food Service n=25	Further Processor n=18	GTO n=46
47.1% Product Quality	43.6% Marketing Programs	44% Food Safety	38.9% Consistency	60.7% Product Quality
41.2% Food Safety	31.3% Taste	44% Product Quality	33.3% Product Quality	23.9% Lifestyle
35.3% Diversity of Supply	18.8% Product Quality	32% Taste	22.2% Food Safety	19.6% Food Safety
29.4% Efficiency	18.8% Consistency	24% Availability	16.7% Efficiency	15.7% Consistency of Supply
23.5% Marketing Programs	18.8% Lifestyle		16.7% Lifestyle	

Packer – "Genetics have improved beef quality."

Retailer – "[The beef industry is] able to make informed decisions to increase quality."

NATIONAL BEEF 2022 NBQA QUALITY AUDIT
BEEF Funded by the Beef Checkoff

What are the opportunities for the steer and heifer industry?

Packer n=17	Retail n=16	Food Service n=25	Further Processor n=18	GTO n=42
29.4% Increase Product Quality	50% Changing Consumer	36% Changing Consumer	38% Supply Chain Equitability	37% Increased Education Initiatives
17.6% Increase Value Added	31% Increased Education Initiatives	16% Niche Markets	30.8% Increase Quality	34.8% Increase Quality
11.8% Export Markets	18% Niche Markets	16% Increased Education Efforts	23.1% Niche Markets	21.7% Export Markets
11.8% Changing Consumer	12.3% Animal Disease	16% Increase Product Quality	15.4% Changing Consumer	21.7% Changing Consumer
11.8% Better Education Initiatives			7.7% Increased Education Initiatives	15.2% Supply Chain Equitability

Retailer – “Educating the consumer, producing product with labor shortages, growing population, making sure we are efficient in feed conversion and production.”

What are the potential threats to the steer and heifer industry?

Packer n=17	Retail n=16	Food Service n=25	Further Processor n=18	GTO n=46
47.1% Labor Shortages	31.3% Cyber Security	36.0% Environmental Concerns	38.9% Environmental Concerns	33.3% Environmental Concerns
47.1% Environmental Concerns	25.0% Misleading Labels	36.0% Labor Shortages	22.2% Activist	28.3% Public Perceptions
35.3% Activists	18.8% Conglomeration	32.0% Lack of Consumer Education	16.7% Federal Regulations	28.9% Activists
29.4% Animal Disease	18.8% Federal Regulations	24.0% Activists		22.2% Animal Disease
17.6% Federal Regulations				20.0% Federal Regulations

Food Service – "Living in the past/unwilling to discuss hard topics."

Further Processor – "Drought is a real concern for supply of beef."

Impacts of COVID – 19 Pandemic on the Beef Industry

Funded by the Beef Checkoff

Positive Outcomes of COVID-19

Packer n=24	Retail n=17	Food Service n=25	Further Processor n=19	GTO n=42
60.9% Beef Performed	56.3% Beef Performed	55.0% Forced Needed Adaptations	62.5% Forced Needed Adaptations	55.0% Beef Performed
34.8% Forced Needed Adaptations	25% Showed Employer Empathy	45.0% Beef Performed	50.0% Beef Performed	40.0% Forced Needed Adaptations
26.1% Showed Employer Empathy	18.8% Forced Needed Adaptations	30.0% Beef Industries Resilience Highlighted	25.0% Revealed Unknown Weaknesses	22.5% Revealed Unknown Weaknesses
17.4% Beef Industries Resilience Highlighted	12.5% Revealed Unknown Weaknesses	20.0% United the Industry	12.3% Animal Disease	15.0% Showed Employer Empathy
17.4% United the Industry		15.0% Showed Employer Empathy	18.75% Beef Industries Resilience Highlighted	

Packer – "The pandemic showed people wanted beef."

Negative Outcomes of COVID-19

Packer n=24	Retail n=17	Food Service n=25	Further Processor n=19	GTO n=42
61.9% Labor Struggles	58.8% Supply Chain Malfunctions	56.5% Labor Struggles	68.4% Supply Chain Malfunctions	47.5 % Supply Chain Malfunctions
47.6% Supply Chain Malfunctions	35.0% Labor Struggles	52.2% Supply Chain Malfunctions	47.4% Labor Struggles	45% Labor Struggles
19.0% Social Concerns	29.4% Market Volatility	30.4% Market Volatility	31.6% Market Volatility	32.5% Social Concerns
	12.3% Animal Disease	26.1% Workmanship		17.5% Market Volatility

Retailer – "Negative was and continues to be product availability and workmanship. We are willing to take just about anything at this point."

Food Service – "Negative is just lack of supply and workmanship."

Sustainability Goals

Funded by the Beef Checkoff

Does your company have sustainability goals?

Packer n=18	Retail n=14	Food Service n=11	Further Processor n=14
94.1% Yes	84.6% Yes	88.9% Yes	85.7% Yes
5.9% No	15.4% No	11.1% No	14.3% No

Retailer – "Yes, it is done through the people that we hire. They must also share that goal with people. They also develop strategy to achieve goals. And use purchasing decisions not a lot of beef options to supply a whole country while maintaining adequate supply of environmental beef. That is their beef goal. Must have the people too. But demand is very present. They produce it because people want it. Not buy as much beef because its damaging we produce based of demand."

What are your company's sustainability goals?

Packer n=18	Retail n=14	Food Service n=11	Further Processor n=14
64.7% Environmental	58.3% Environmental	67.7 % Environmental	61.5% Environmental
23.5% Unknown	33.3% Unknown	33.3% Unknown	30.8% Unknown
23.5% Social	25.0% Social	0.0% Social	23.1% Social
11.8% Economical	0.0% Economical	0.0% Economical	23.1% Economical

Packer – "Recycle more water than consumed in plant, reduce greenhouse gas emissions and reduce carbon footprint."

Market Cow and Bull

Funded by the Beef Checkoff

What is the image of the cow and bull industry?

Packer n=13	Retail n=5	Food Service n=7	Further Processing n=8	GTO n=35
30.8% Very Good	60.0% Very Good	14.3% Very Good	12.5% Very Good	14.3% Very Good
15.4% Good	20.0% Good	20.0% Good	37.5% Good	20.0% Good
15.4% Improving	20.0% Improving	0.0% Improving	25.0% Improving	0.0% Improving
15.4% Reputable	0.0% Reputable	14.3% Improving	0.0% Reputable	34.3% Reputable
15.4% Needs Improvement	0.0% Needs Improvement	0.0% Needs Improvement	0.0% Needs Improvement	0.0% Needs Improvement
0.0% Unknown	0.0% Unknown	42.8% Unknown	0.0% Unknown	0.0% Unknown

Packer – “Bad perception in the past, but with emphasis on humane handling our image has improved this greatly.”

What are the strengths of the cow and bull industry?

Packer n=13	Retail n=5	Food Service n=7	Further Processor n=8	GTO n=35
38.5% Consistency	40.0% Food Safety	60.0% Reduced Price	28.6% Secondary Value	34.5% Secondary Value
30.8% Availability	40.0% Reduced Price	20.0% Secondary Value	14.3% Product Quality	23.3% Availability
23.1% Reduced Price	20.0% Product Quality	20.0% Availability	14.3% Consistency	10.0% Marketing
	20.0% Secondary Value	20.0% Product Quality	14.3% Availability	10.0% Reduced Price
			14.3% Reduced Price	

GTO – "Look at horse industry as model for how important [the market cow bull industry] is. It is a profit center and allows for no loss when producers sell animals that are done instead of dying on the farm."

What are the weaknesses of the cow and bull industry?

Packer n=13	Retail n=5	Food Service n=7	Further Processor n=8	GTO n=35
38.5% Perception	50.0% Perception	20.0% Too Fragment	28.6% Foreign Objects	46.9% Product Quality
23.1% Supply	25.0% Supply	20.0% Supply	28.6% Supply	25.0% Supply
15.4% Too Fragmented	25.0% Poor Marketing	20.0% Product Quality	28.6% Product Quality	18.8% Animal Welfare
15.4% Foreign Objects	25.0% Too Fragmented	20.0% Perception	28.6% Perception	15.6% Food Safety
		10.0% Lack of Traceability	14.3% Too Fragmented	

Packer – "Bird shot in bulls and other foreign materials."

What are the opportunities to the cow and bull industry?

Packer n=13	Retail n=5	Food Service n=7	Further Processor n=8	GTO n=35
58.3% Producer Education	60.0% Consumer Education	40.0% Increased Profits	33.3% Increased Profits	26.7% Increased Profits
33.3% Consumer Education	40.0% Producer Education	40.0% Producer Education	33.3% Supply Regulation	36.7% Producer Education
25.0% Supply Regulation	20.0% Supply Regulation	14.3% Supply Regulation	16.7% Producer Education	17.2% Consumer Education
8.3% Foreign Objects			16.7% Foreign Objects	14.3% Traceability

GTO – "Improvements of welfare through training of workforces and evaluating when to cull and better procedures for that."

Packer – "Dairy side focusing on causes of condemnation rate and timeliness of marketing cull cows from dairy."

NATIONAL BEEF 2022 NBQA QUALITY AUDIT
BEEF
Funded by the Beef Checkoff

What changes has your company witnessed since the 2016 NBQA Market Cow and Bull?

Packer n=13	Retail n=5	Food Service n=8	Further Processor n=7	GTO n=35
10 Knowledge of the Program	0 Knowledge of the Program	0 Knowledge of the Program	4 Knowledge of the Program	19 Knowledge of the Program
40.0% Nothing			50.0% Nothing	35.7% Nothing
40.0% Increased Animal Welfare			25.0% Contracts Changed	21.4% Increased Animal Welfare
30.0% Increased Efficiency			25.0% Specifications Changed	14.3% Increased Efficiency
10.0% Contracts Changed				14.3% Increased Food Safety Initiatives

Packer – "There has been an increase in animal welfare programs."

GTO – "Increase in quantity exported from over 30-month cows."

Funded by the Beef Checkoff

Conclusions

Sustainability is primarily viewed as an environmental issue, while many are not familiar with their company’s goals or plans to become more sustainable.

Eating quality is a market expectation and is directly attributed to high quality genetics.

Branded beef programs continue to increase in popularity.

Conclusions Market Cow/Bull

The image of the Market Cow/Bull sector has improved over the past 5 years.

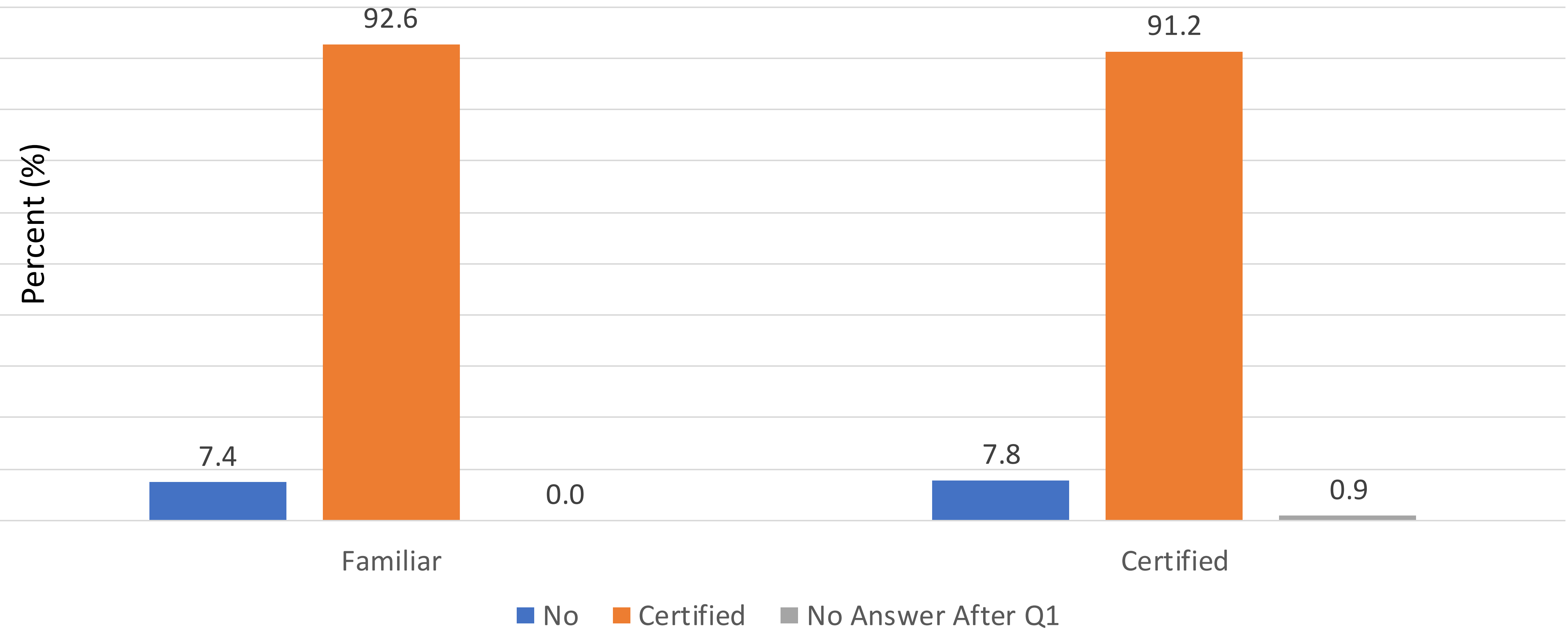
Secondary value of Market Cow/Bull sector was called out more.

The Market Cow/Bull industry has made strides in increasing animal well-being; however, increased producer education on animal well-being (e.g., timely culling, birdshot) is warranted.

Phase II: Fed Cattle

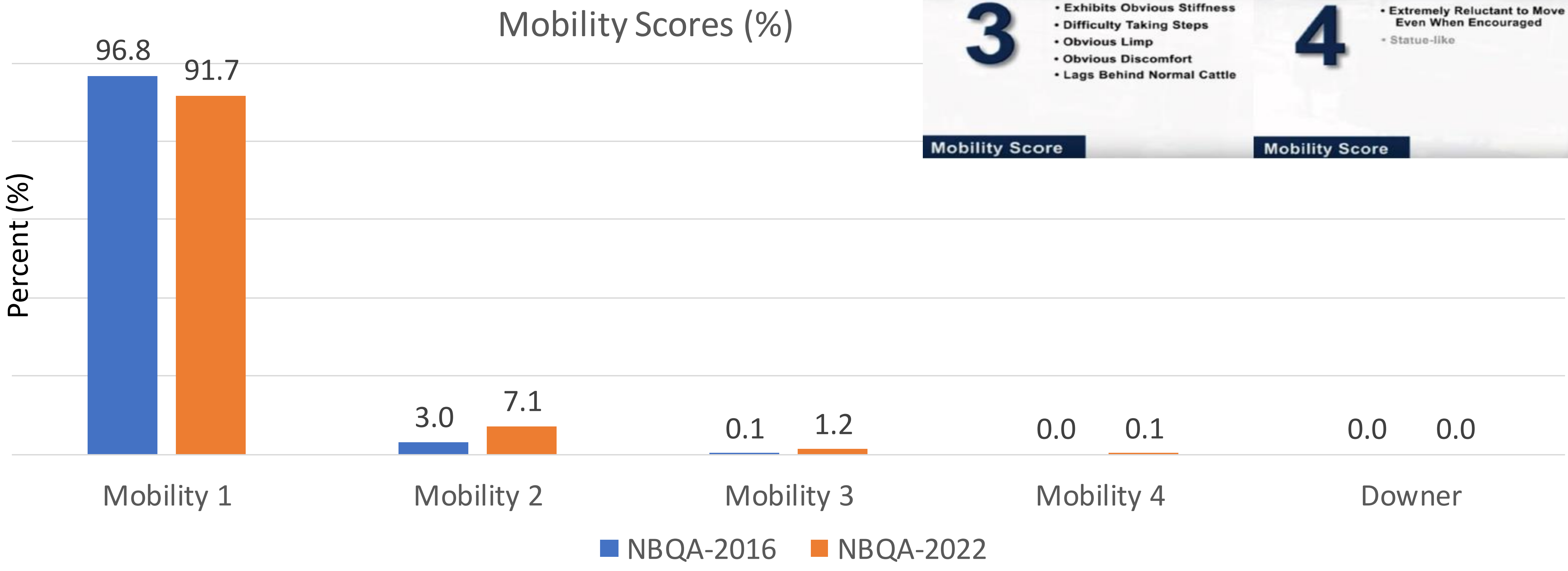
Funded by the Beef Checkoff

BQA Transportation



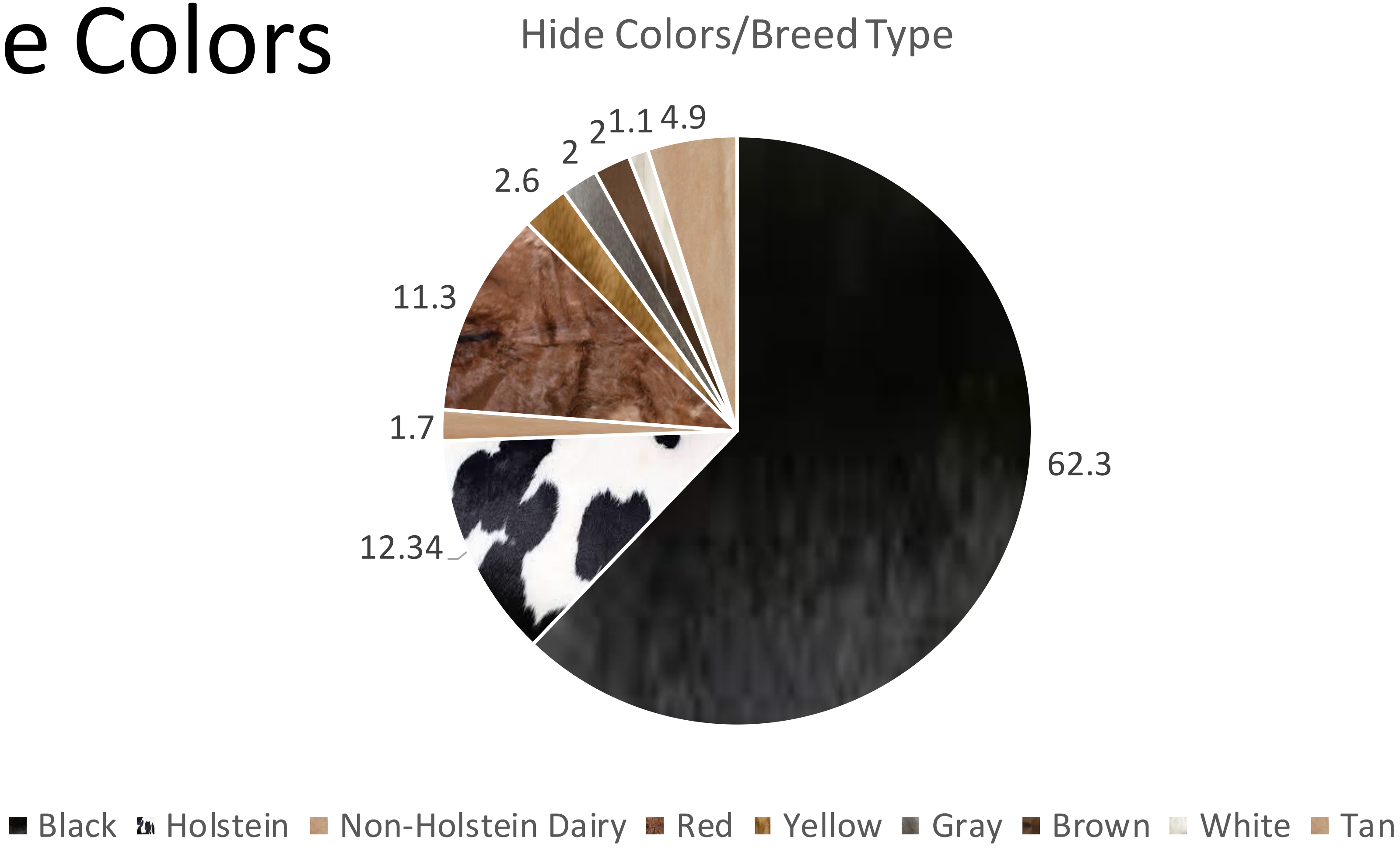
Funded by the Beef Checkoff

Cattle Mobility



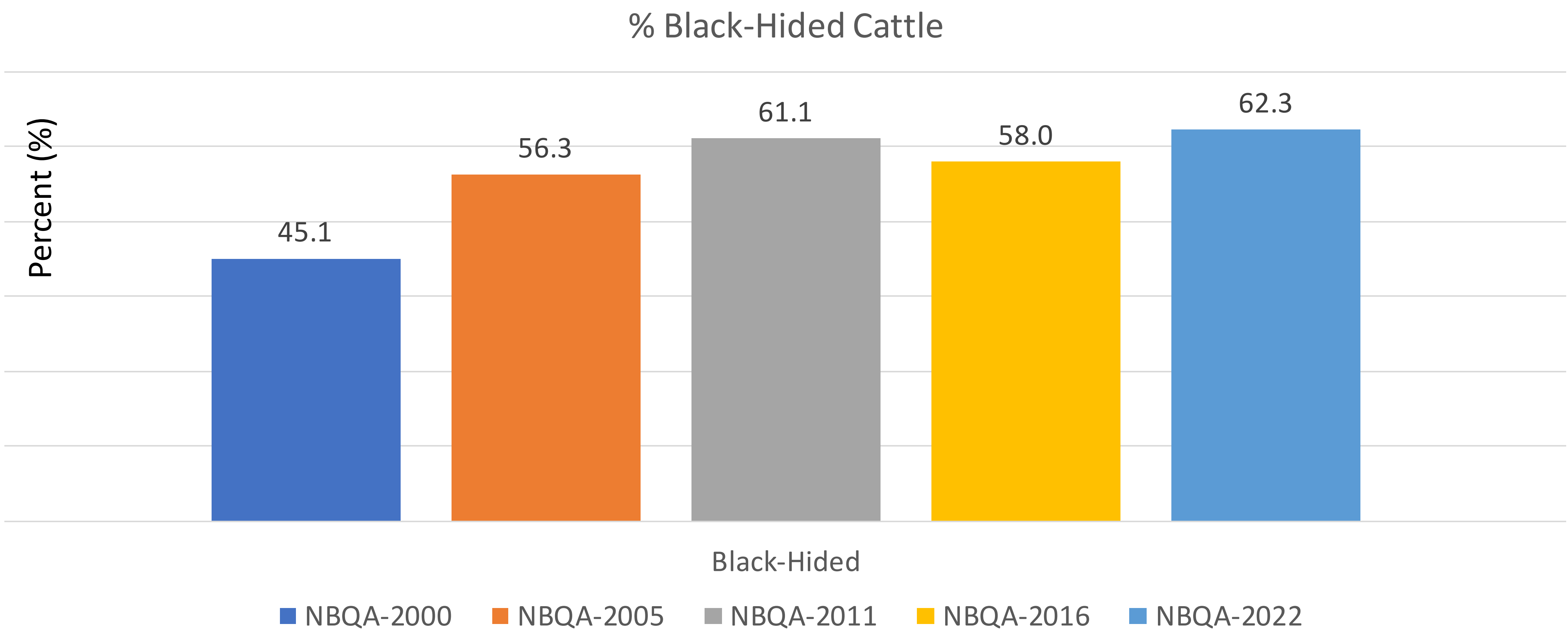
Funded by the Beef Checkoff

Hide Colors

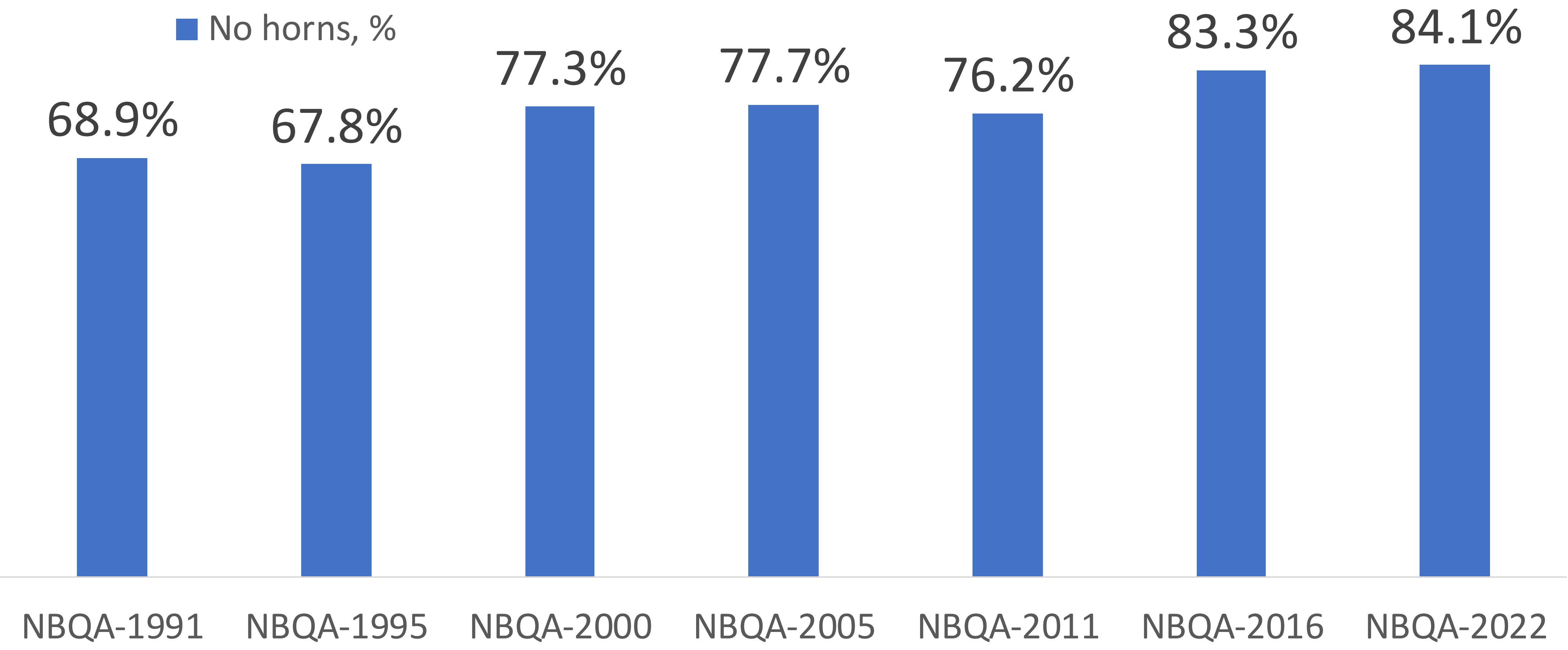


Funded by the Beef Checkoff

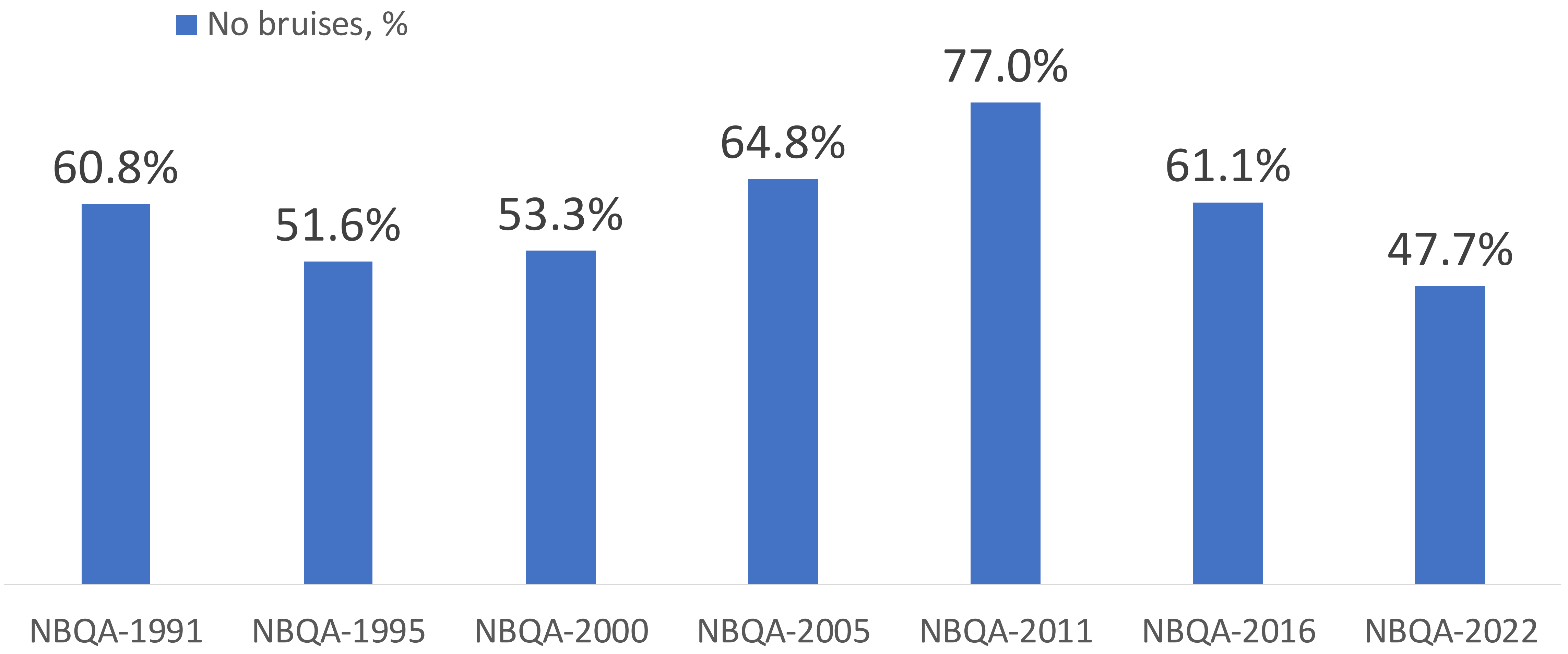
Predominantly Black-Hided Cattle



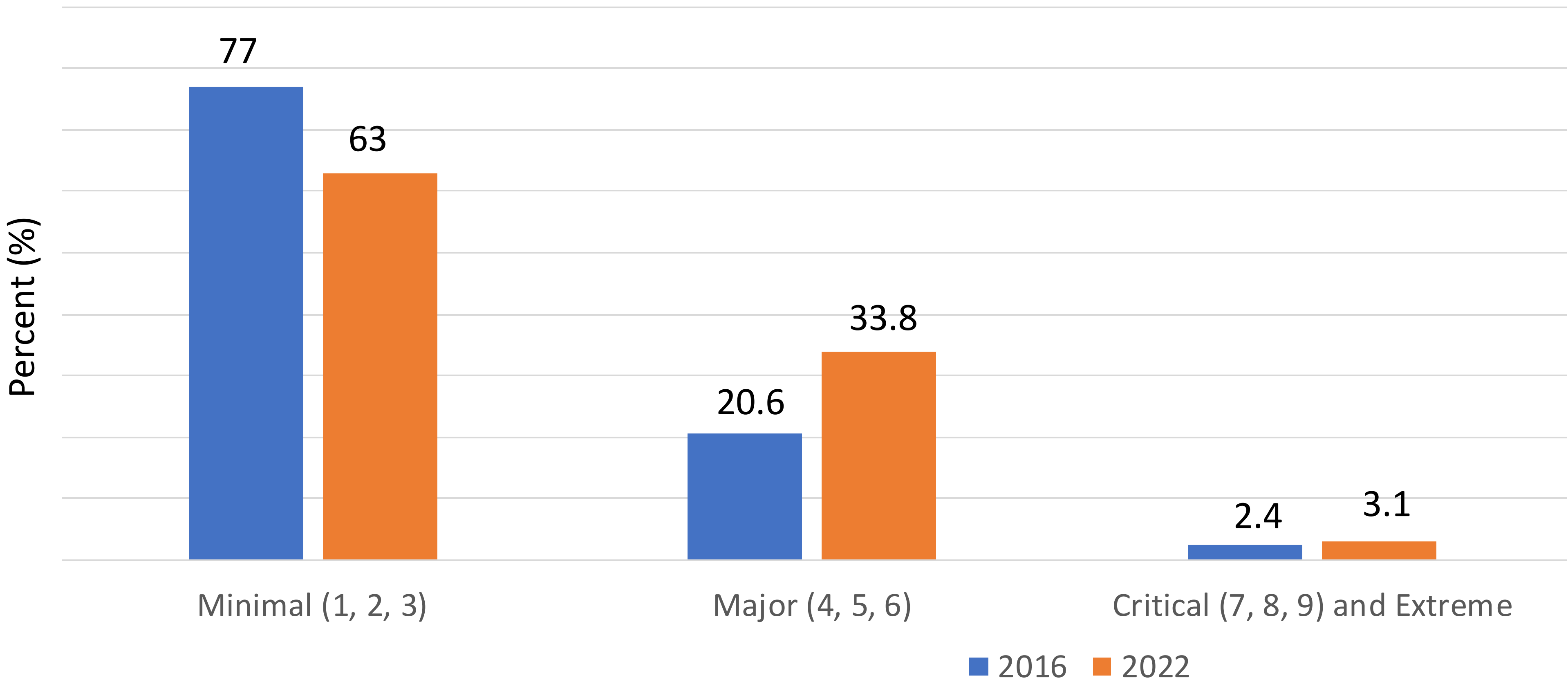
Presence of Horns



Bruising

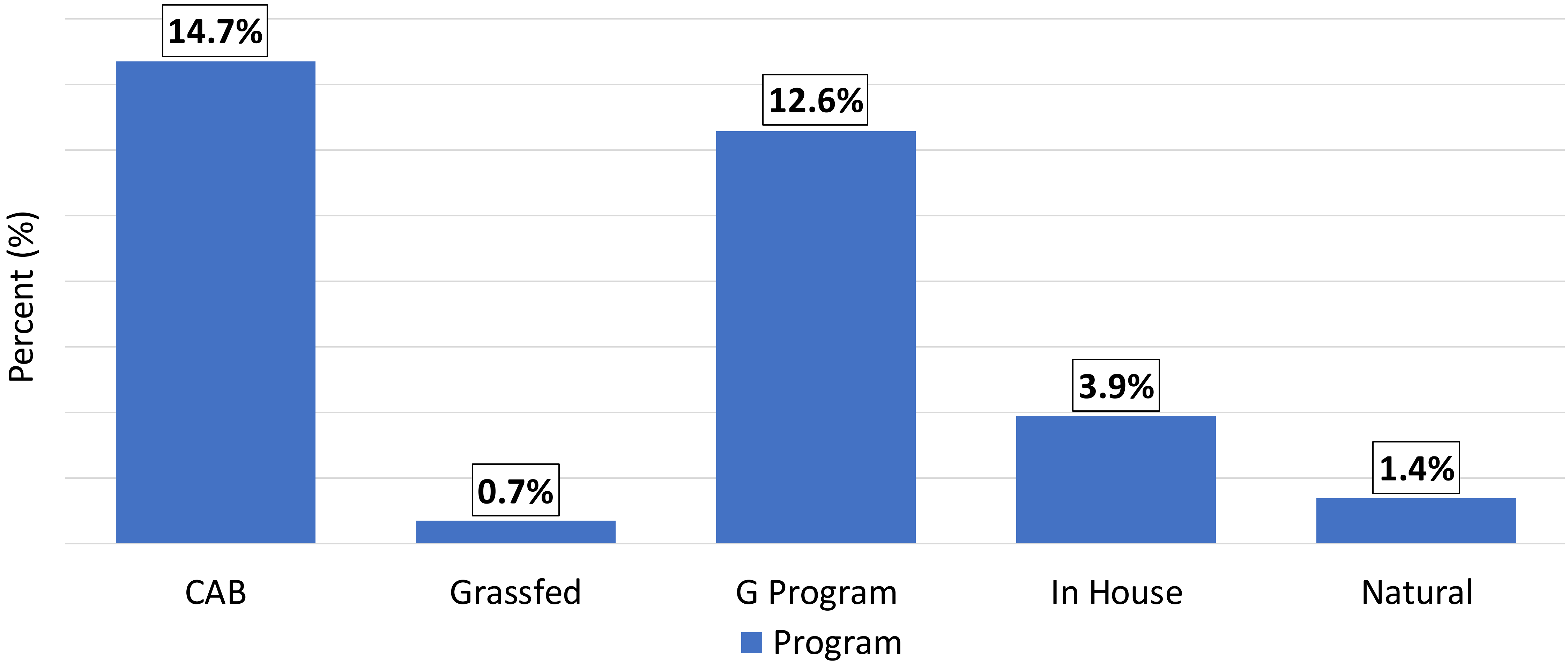

No bruises, %
60.8%
51.6%
53.3%
64.8%
77.0%
61.1%
47.7%
NBQA-1991
NBQA-1995
NBQA-2000
NBQA-2005
NBQA-2011
NBQA-2016
NBQA-2022

Bruise Severity (% of bruises observed)

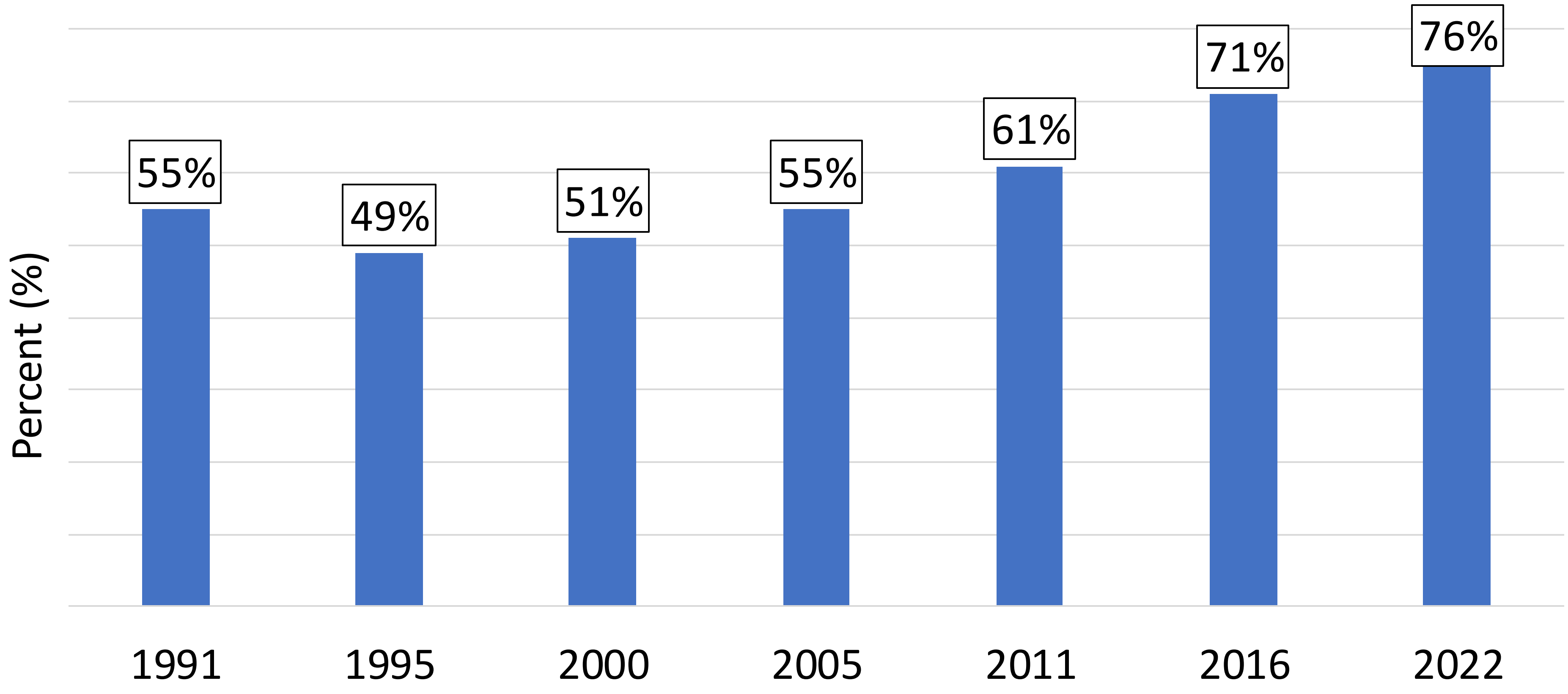


Bruise Size Key:			
Minimal (<1 lb-surface)	1= a quarter size	2= a silver dollar size	3= a deck of cards size
Major (1-10 lbs)	4= 1-3 lbs	5= 4-7 lbs	6= 8-10 lbs
Critical (>10 lbs)	7= 11-20 lbs	8= 21-30 lbs	9= 31-40 lbs
Extreme	10= Entire primal		

Certified Marketing Programs



Changes in Prime and Choice Over Time

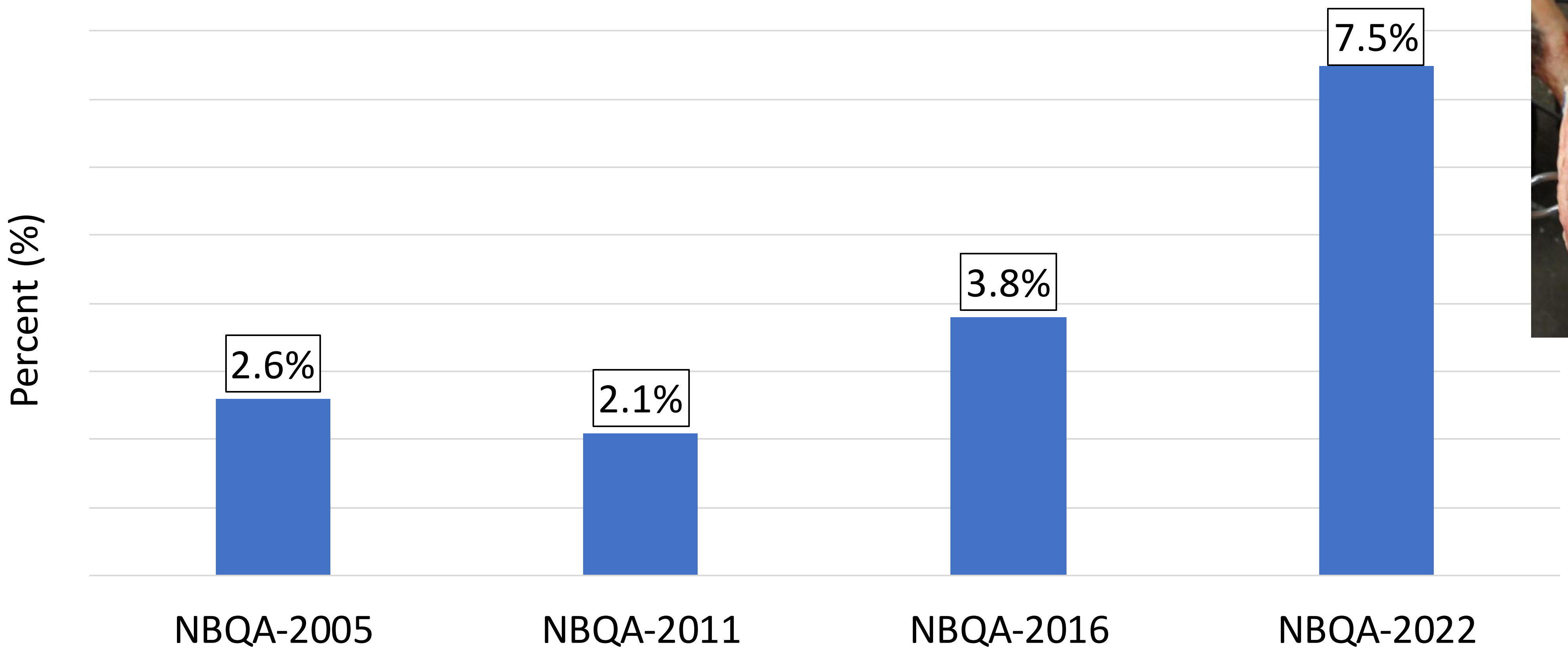


Prime: 7.5%

Choice: 68.3%

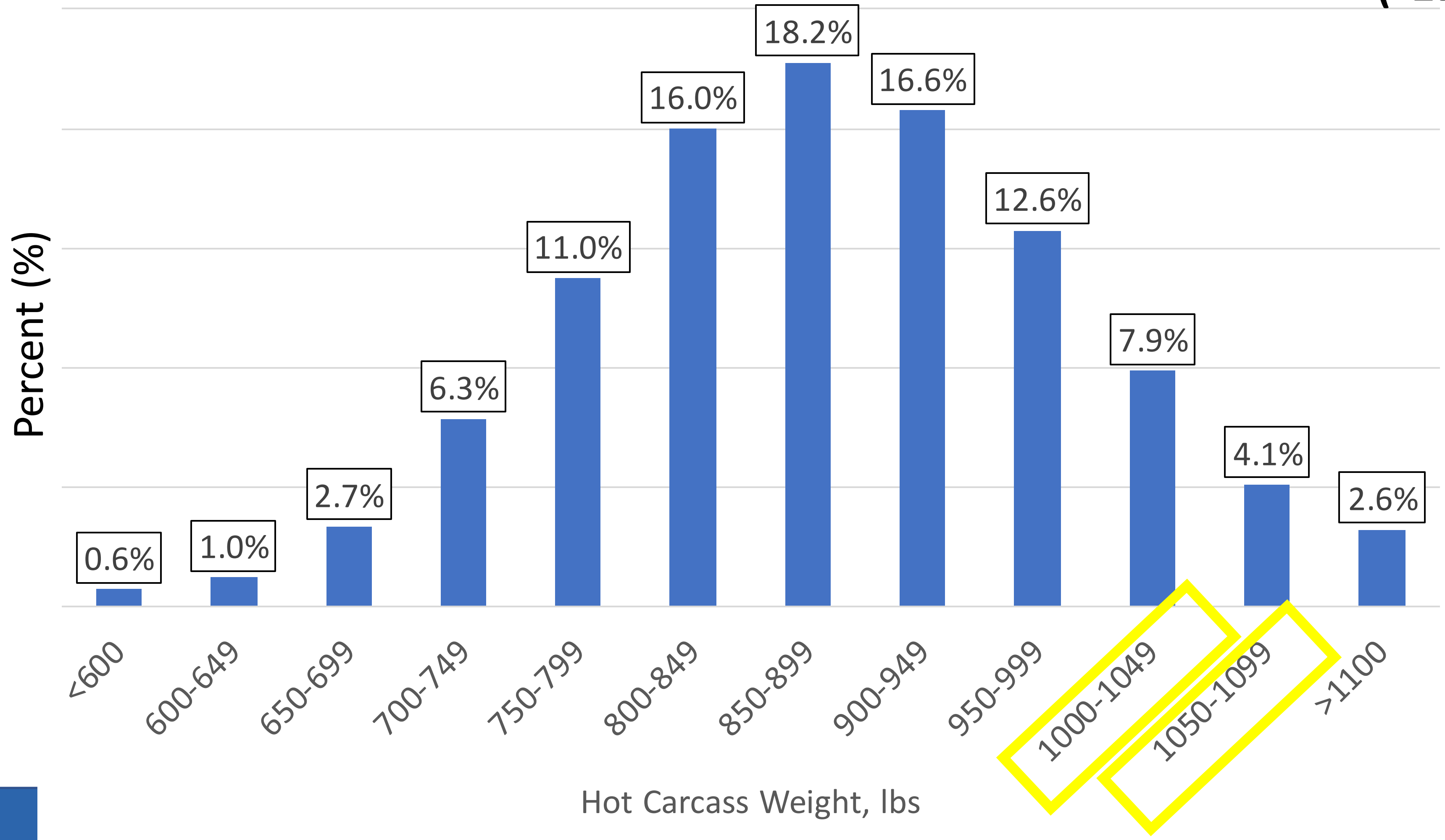
Funded by the Beef Checkoff

Carcasses Grading USDA Prime

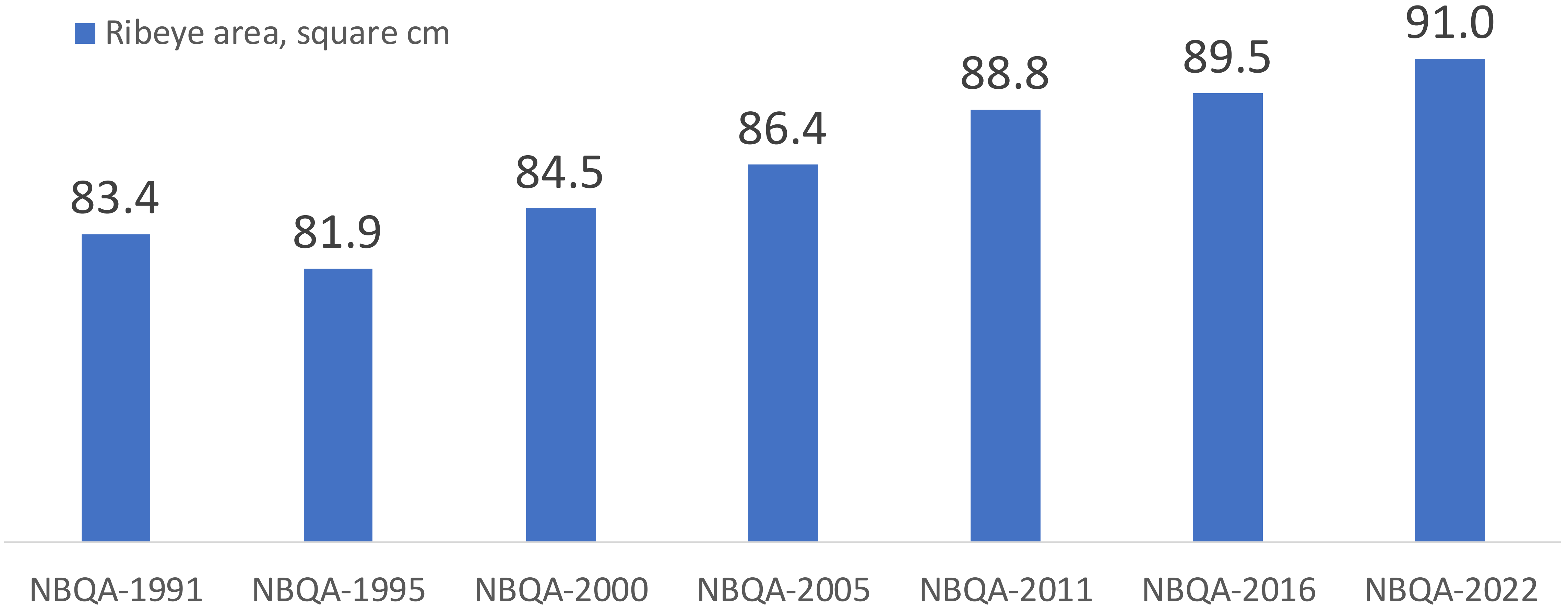


Carcass Weight Distribution, lbs

Average carcass weight: 886 lbs (+27 lbs from 2016)

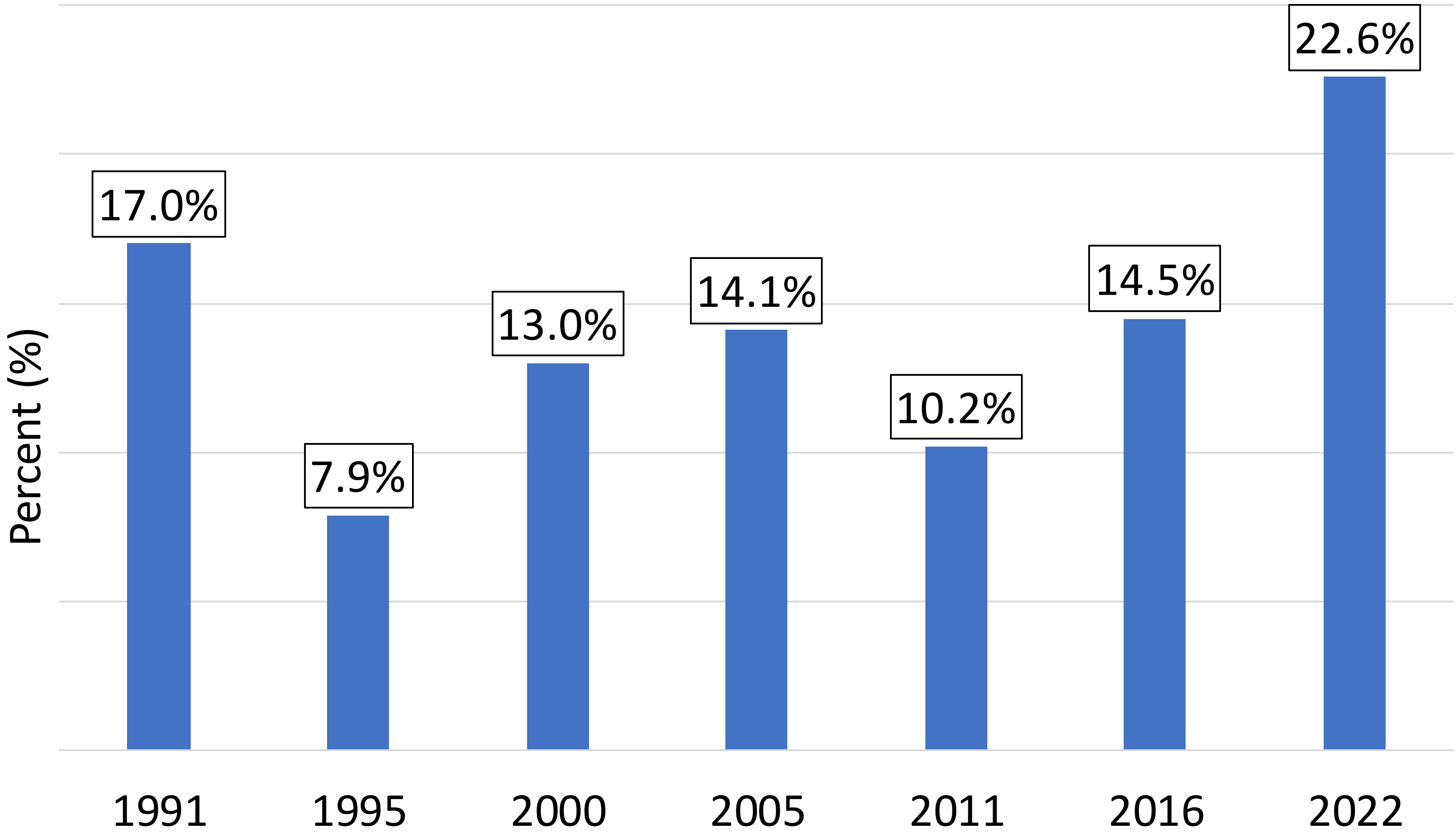


Ribeye area



Funded by the Beef Checkoff

USDA Yield Grades 4 and 5



Yield Grade 4: 17% (+5% from 2016)
Yield Grade 5: 5.6% (+3.1% from 2016)

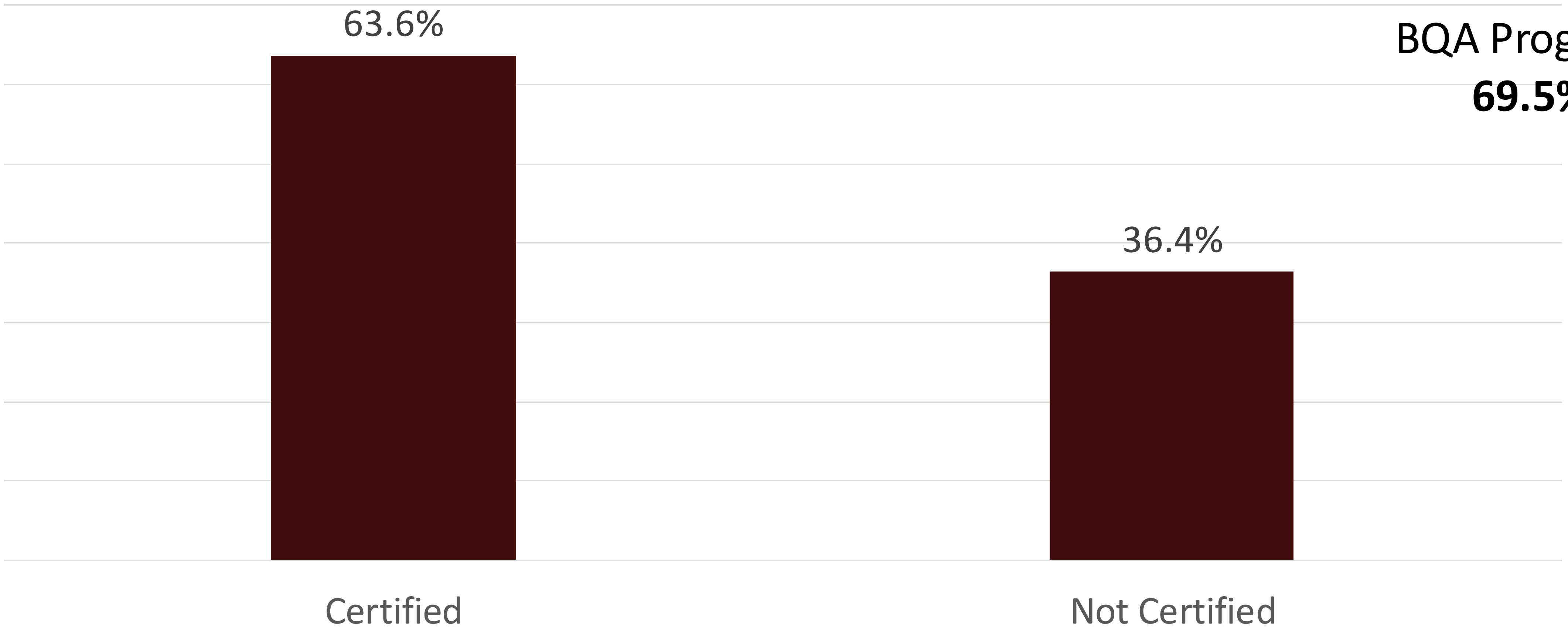
2022 National Beef Quality Audit NBQA
Funded by the Beef Checkoff

Phase II: Market Cow and Bull

Funded by the Beef Checkoff

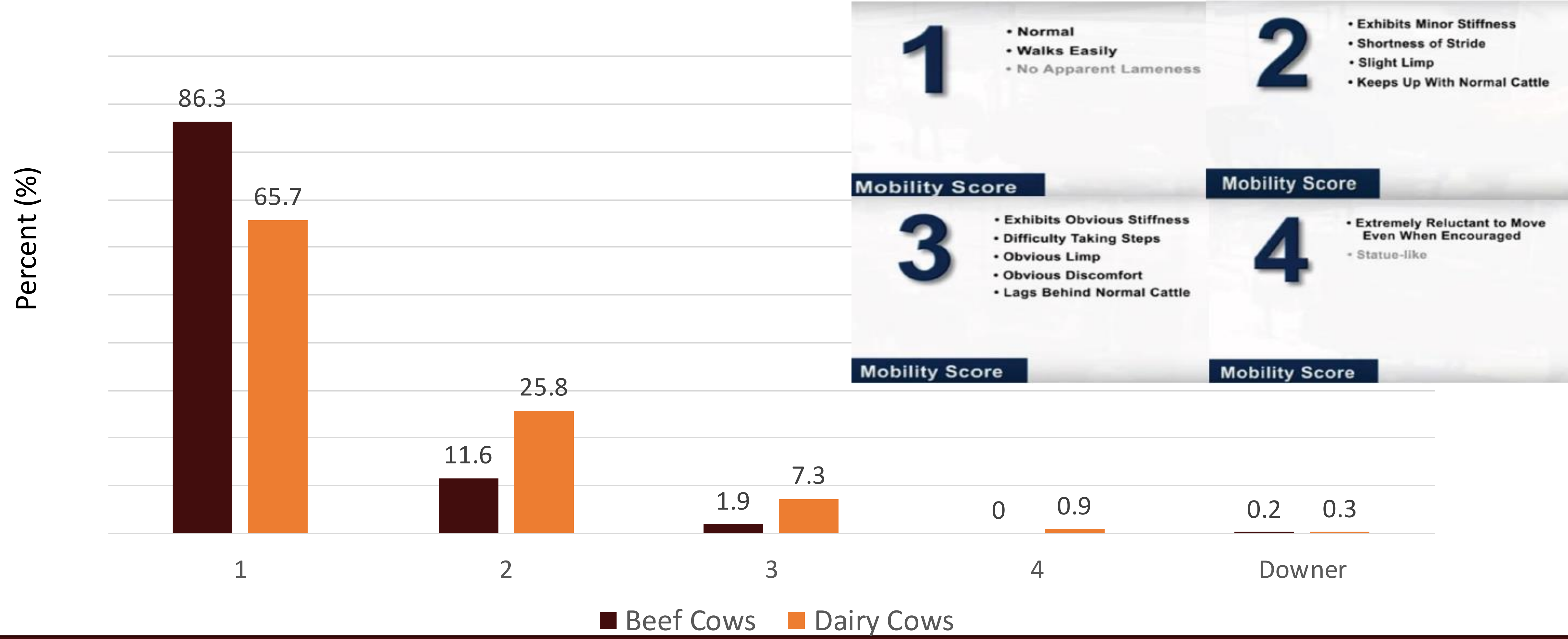
Beef Quality Assurance

Familiar with the BQA Program:
69.5%



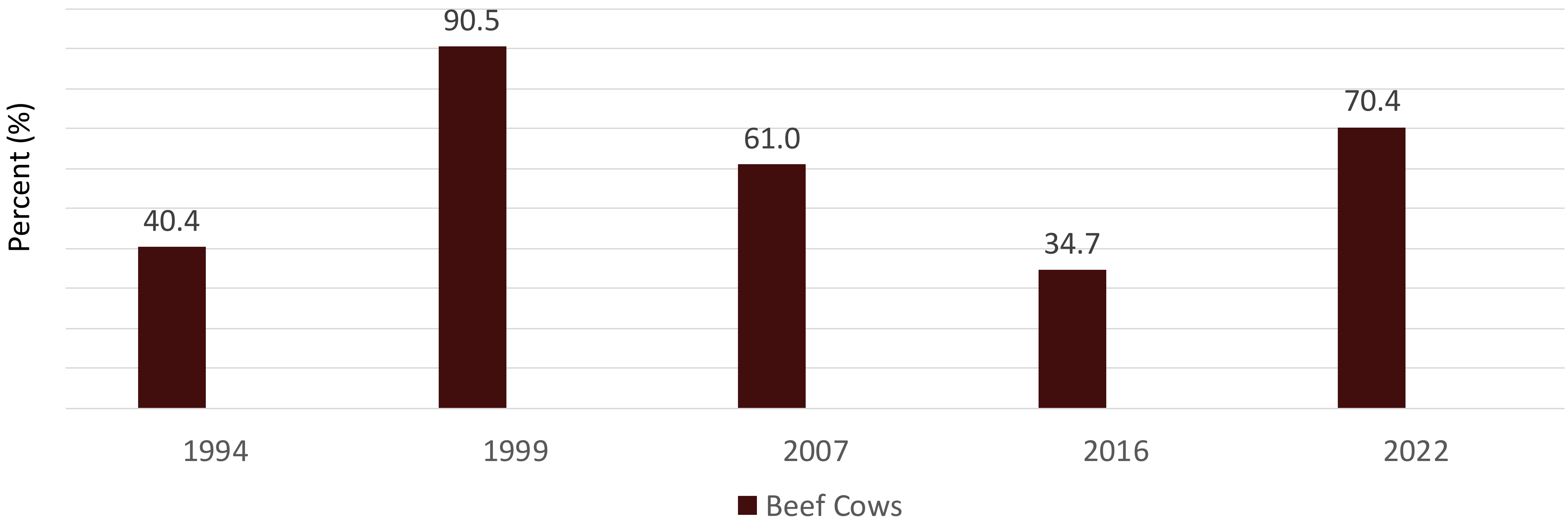
n = 118

Mobility



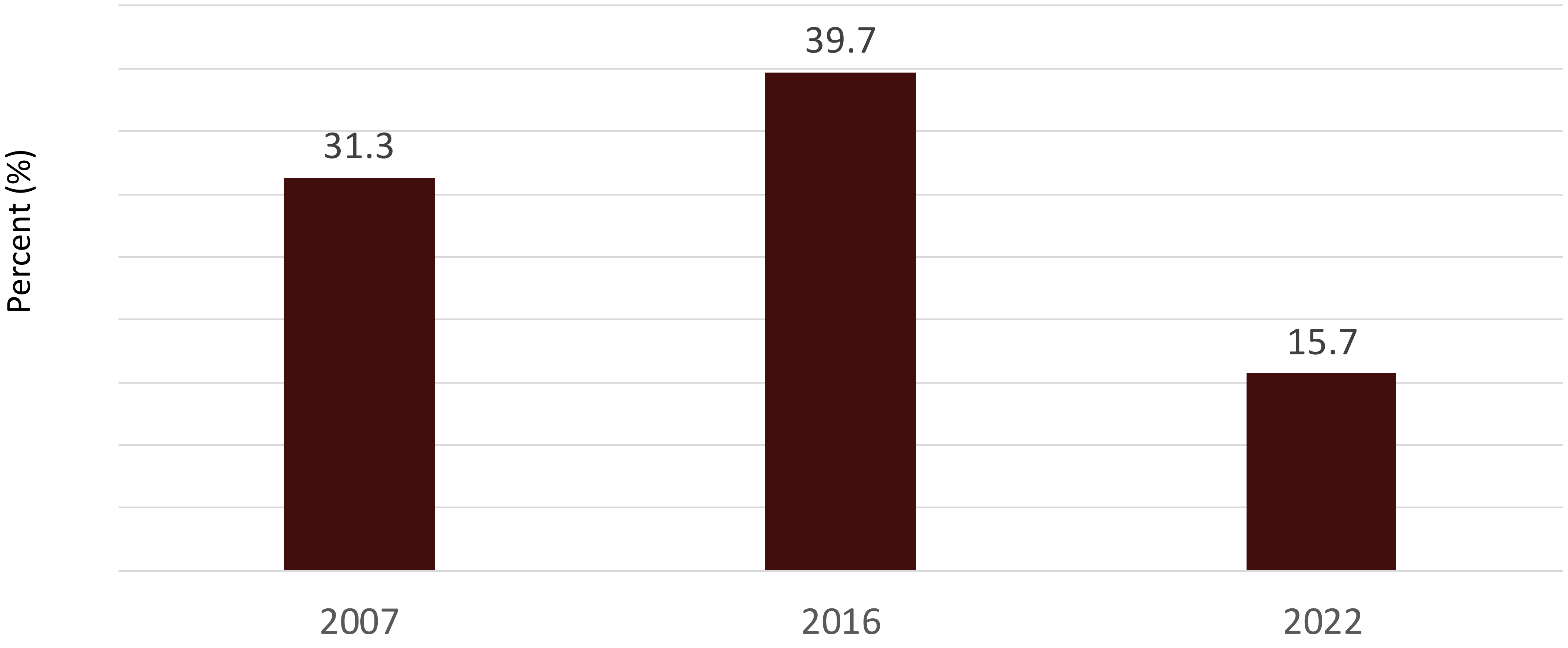
Percent (%)
86.3
65.7
25.8
11.6
7.3
1.9
0
0.9
0.2
0.3
1
2
3
4
Downer
Beef Cows
Dairy Cows
1
• Normal
• Walks Easily
• No Apparent Lameness
Mobility Score
2
• Exhibits Minor Stiffness
• Shortness of Stride
• Slight Limp
• Keeps Up With Normal Cattle
Mobility Score
3
• Exhibits Obvious Stiffness
• Difficulty Taking Steps
• Obvious Limp
• Obvious Discomfort
• Lags Behind Normal Cattle
Mobility Score
4
• Extremely Reluctant to Move Even When Encouraged
• Statue-like
Mobility Score

Audit Comparison:
Percentages of Beef Cows Classified as Inadequately Muscled

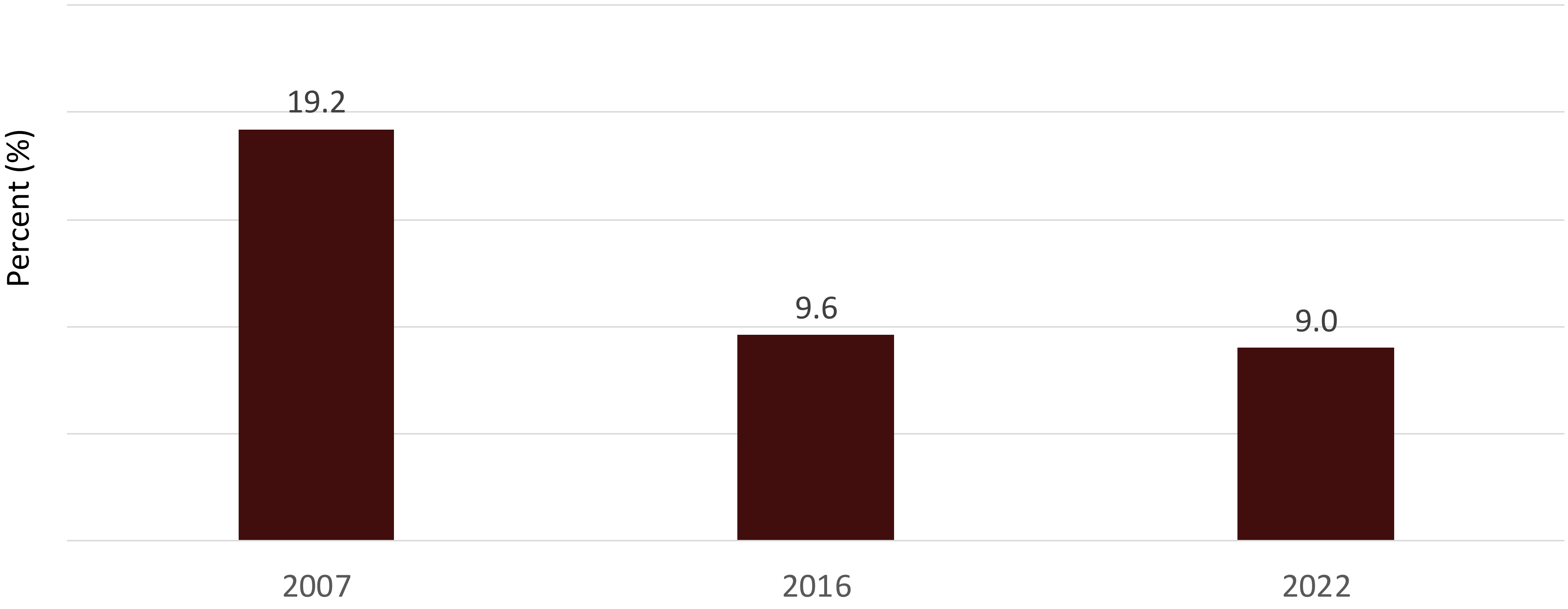


Inadequately muscled = muscle scores of 1 or 2

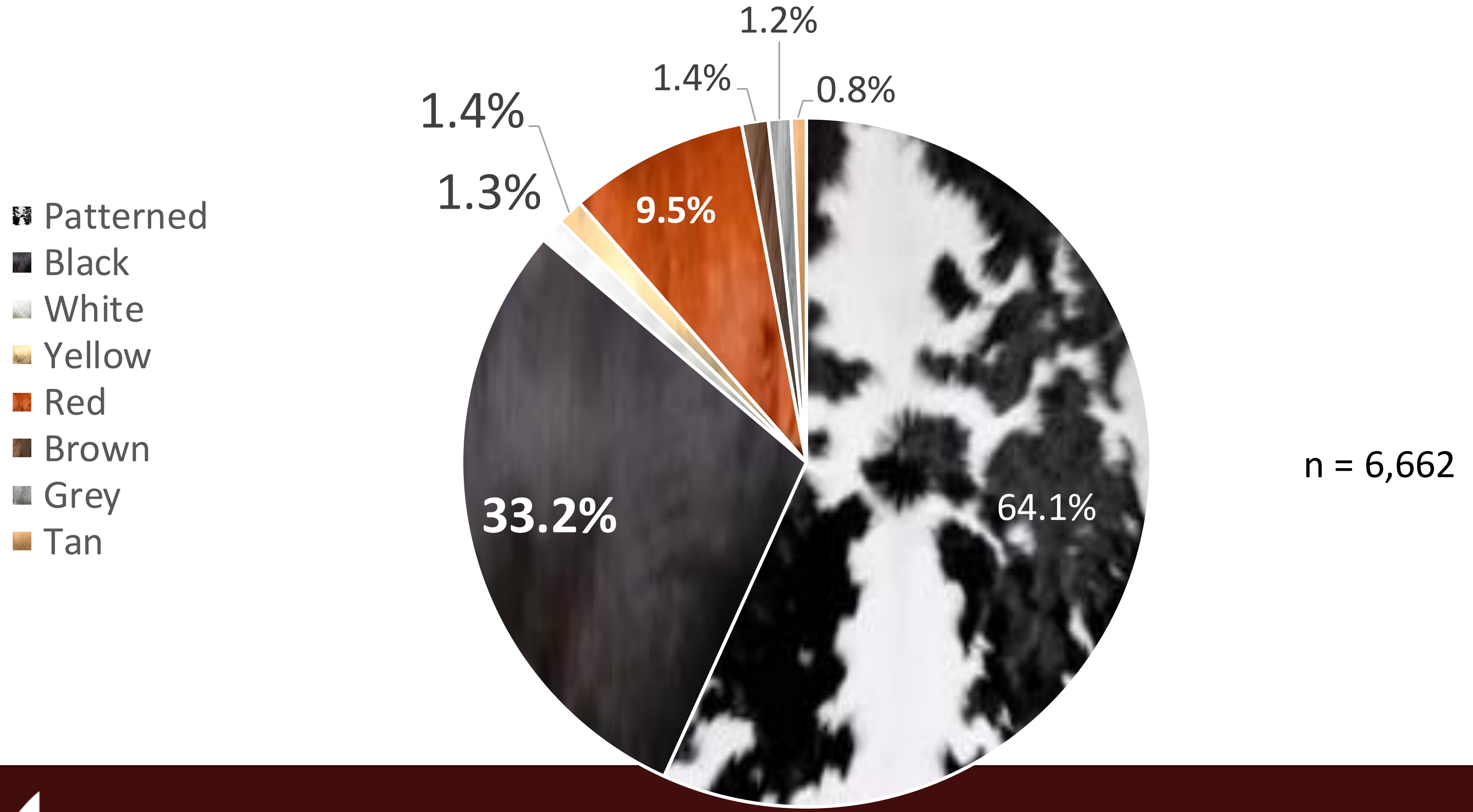
Audit Comparison:
Prevalence of Brands in Beef Cows Surveyed



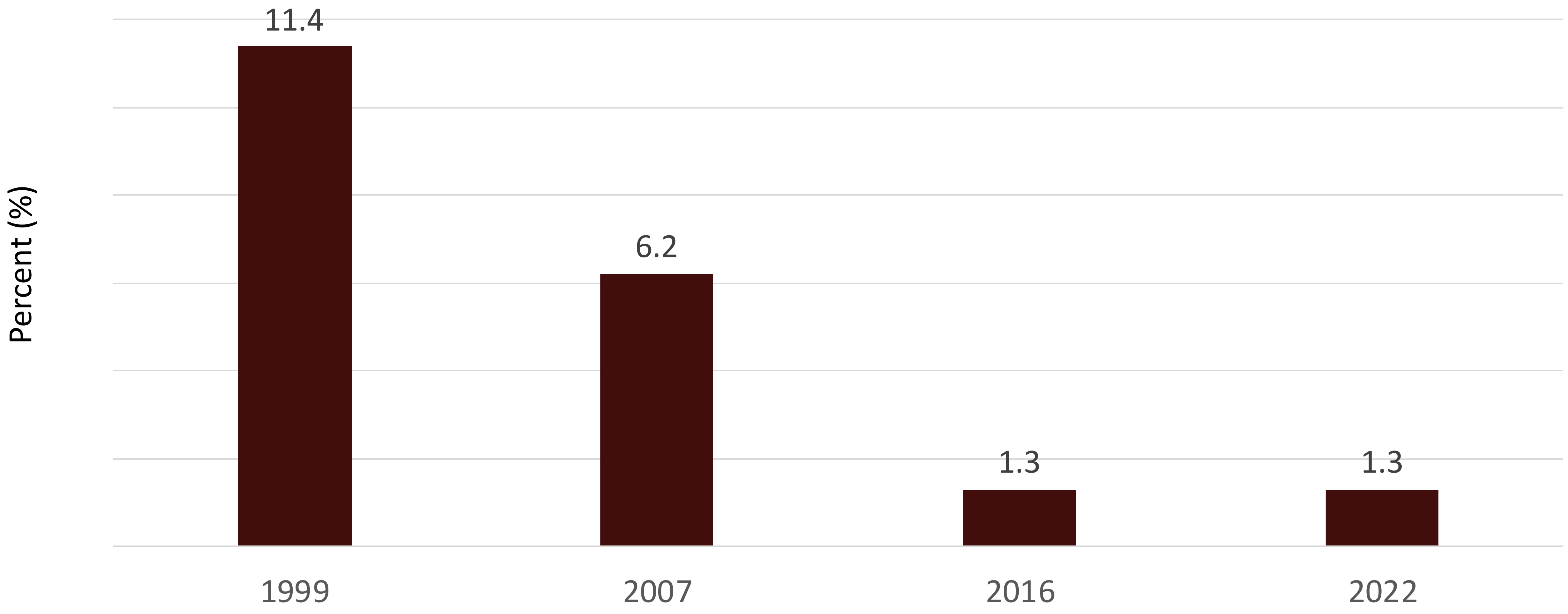
Audit Comparison:
Percentage of Beef Cows with Horns



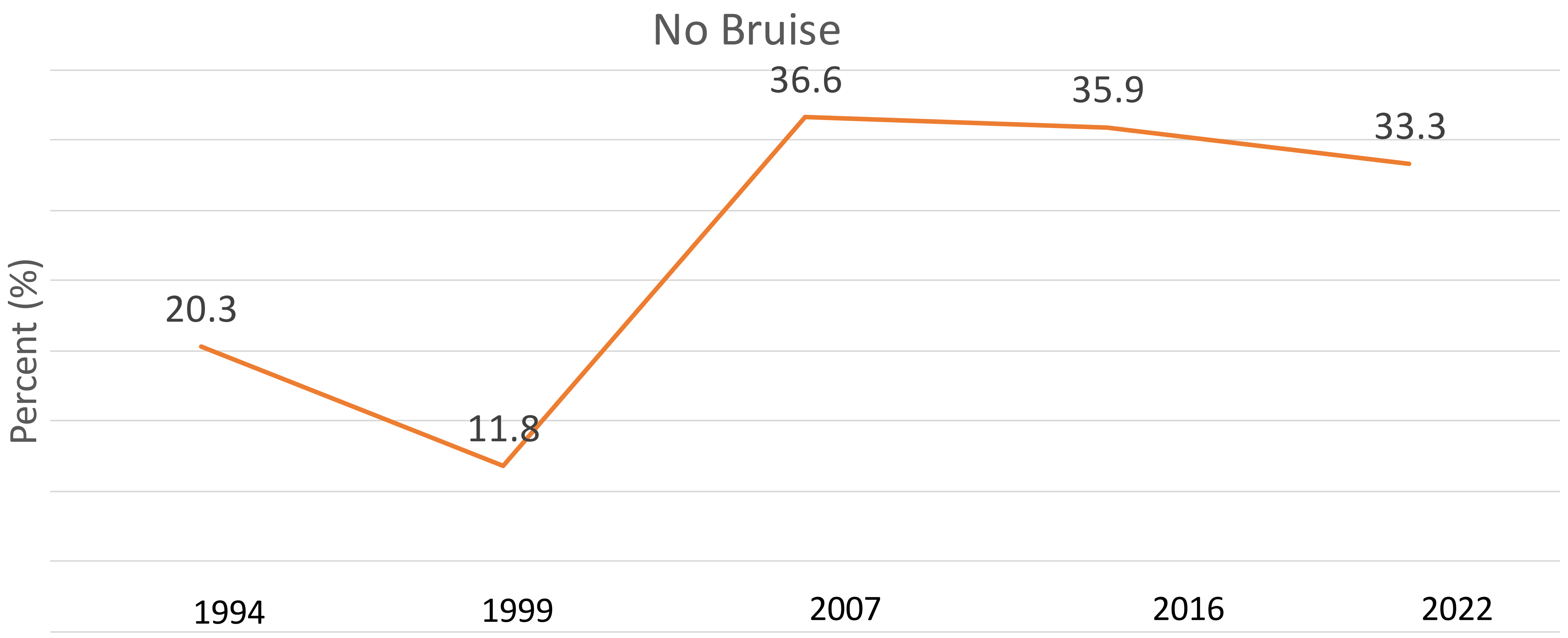
Percentage of Primary Hide Color Observed in All Cattle



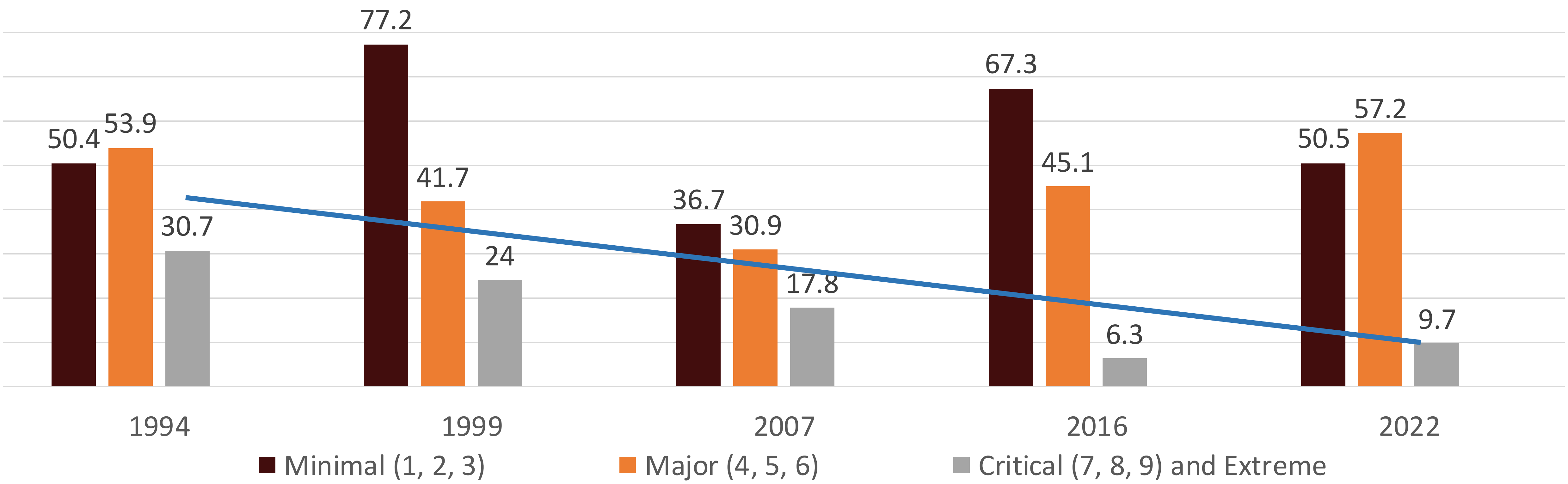
Percent of All Cattle Surveyed with Arthritic Joints



Audit Comparison: Percentage of Cattle With **No** Bruises



Audit Comparison: Bruise Severity (% of bruises observed)



Bruise Size Key:			
Minimal (<1 lb-surface)	1= a quarter size	2= a silver dollar size	3= a deck of cards size
Major (1-10 lbs)	4= 1-3 lbs	5= 4-7 lbs	6= 8-10 lbs
Critical (>10 lbs)	7= 11-20 lbs	8= 21-30 lbs	9= 31-40 lbs
Extreme	10= Entire primal		

Funded by the Beef Checkoff

NATIONAL BEEF 2022 NBQA QUALITY AUDIT

PATHWAY to a Successful Future

Product Fabrication

BEEF

Funded by the Beef Checkoff

Frequency of Primal/Subprimal and Lean Trim Production in Plants that Provided Fabrication Information

Primal/Subprimal	Percentage (%)
Brisket	88.9
Chuck Roll	66.7
Ribeye Roll	88.9
Striploin	88.9
Tenderloin	88.9
Top Sirloin Butt	77.8
Whole Muscle Round Pieces	100.0
Lean Trim	100.0

n = 9

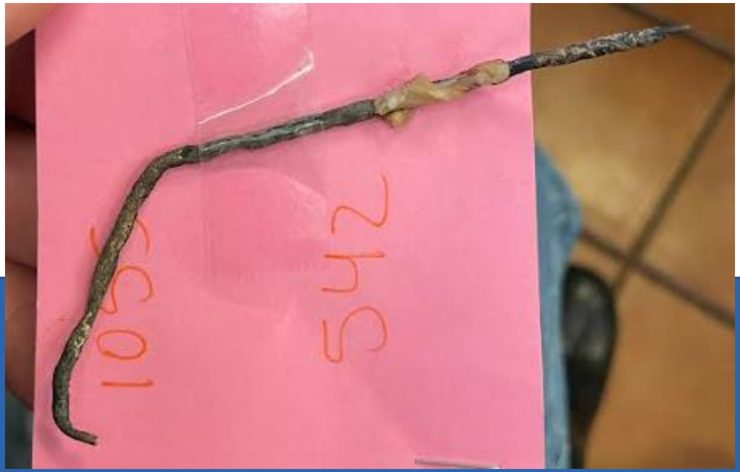
Food Safety

Funded by the Beef Checkoff

Food Safety

Foreign Materials Reported in Plants Surveyed (24)	
Material Reported	% of Response
Buckshot	45.83%
Needles	29.17%
Wire	12.50%
Other	8.33%
None	41.67%

Foreign Material Detection Methods Reported in Plants Surveyed (22)	
Equipment Used	% of Response
Metal Detection	90.91%
X-Ray	59.03%
Magnet	9.09%



Percentage of Plants that Reported Foreign Objects Found in Beef From Market Cows and Bulls

n = 16

Objects found	Percentage (%)
Buckshot/Birdshot	100.0
Bullets	18.8
Needles	18.8
Wire	18.8
Darts	18.8
Other	12.5

50% of plants reported customer complaints

Detection Systems:
X-Ray (87.5%)
Metal Detectors (75.0%)

Acknowledgements

Texas A&M University
Jeffrey W. Savell
Davey B. Griffin
Kerri B. Gehring
Christopher R. Kerth

Colorado State University
Keith E. Belk
J. Brad Morgan
Lily Edwards-Callaway

West Texas A&M University
Ty E. Lawrence
Travis C. Tennant
Loni W. Lucherk

Oklahoma State University
Morgan M. Pfeiffer
Gretchen G. Mafi

California State-Chico
Crystal M. Waters

Kansas State University
Travis G. O'Quinn

North Dakota State University
Robert J. Maddock

South Dakota State University
Keith R. Underwood

The Ohio State University
Lyda G. Garcia

University of Florida
Chad C. Carr

University of Georgia
T. Dean Pringle

University of Idaho
Phil D. Bass

University of Illinois
Baily N. Harsh

USDA-AMS
Chad Nelson

Lead Graduate Students
Trent E. Schwartz, Texas A&M University
Sydni E. Borders, Texas A&M University
Thachary R. Mayer, Texas A&M University
Jarrett Douglas, Colorado State University
Keayla Harr, Oklahoma State University

NCBA Staff Coordinators
Michaela Clowser
Josh White
Wendy White
Dancinee Jennings

Thank you

Funded by the Beef Checkoff