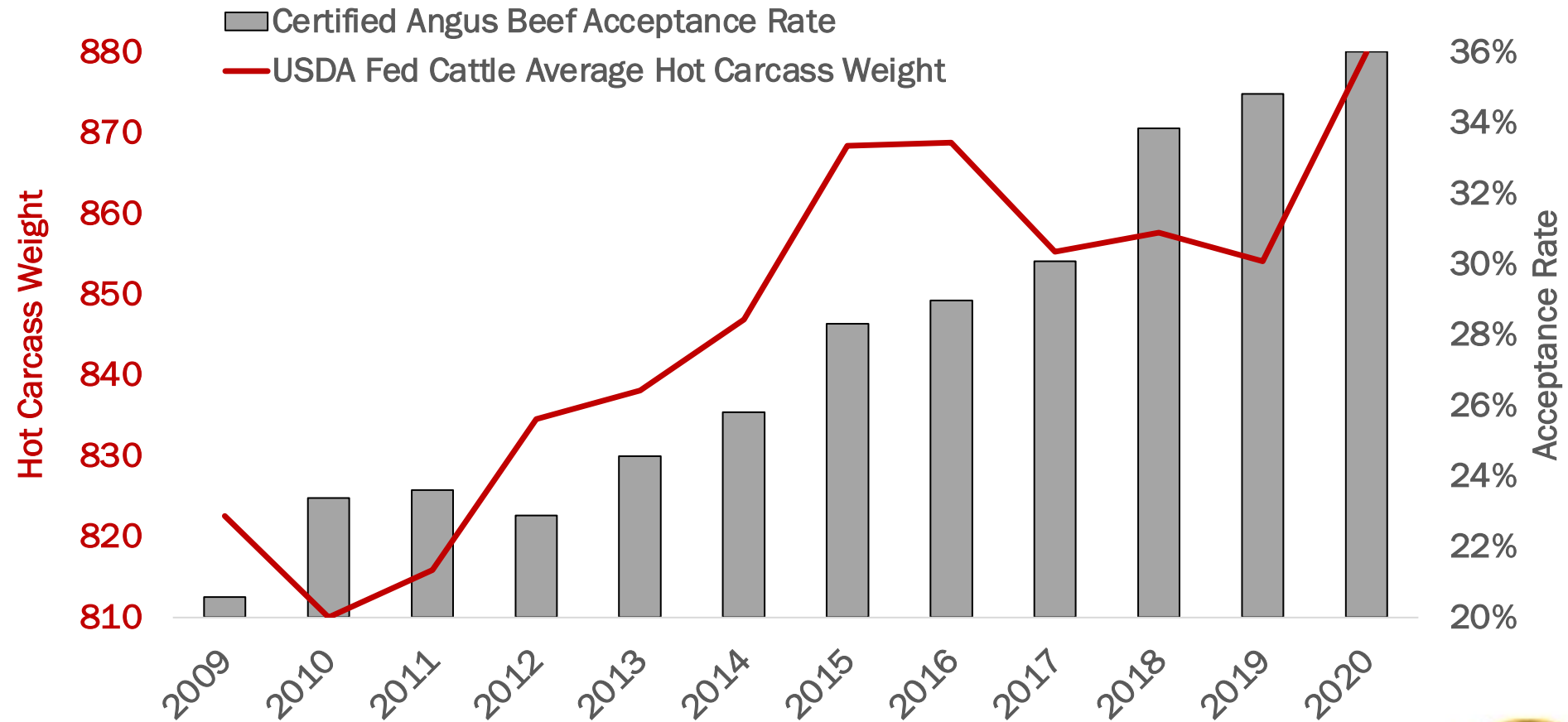
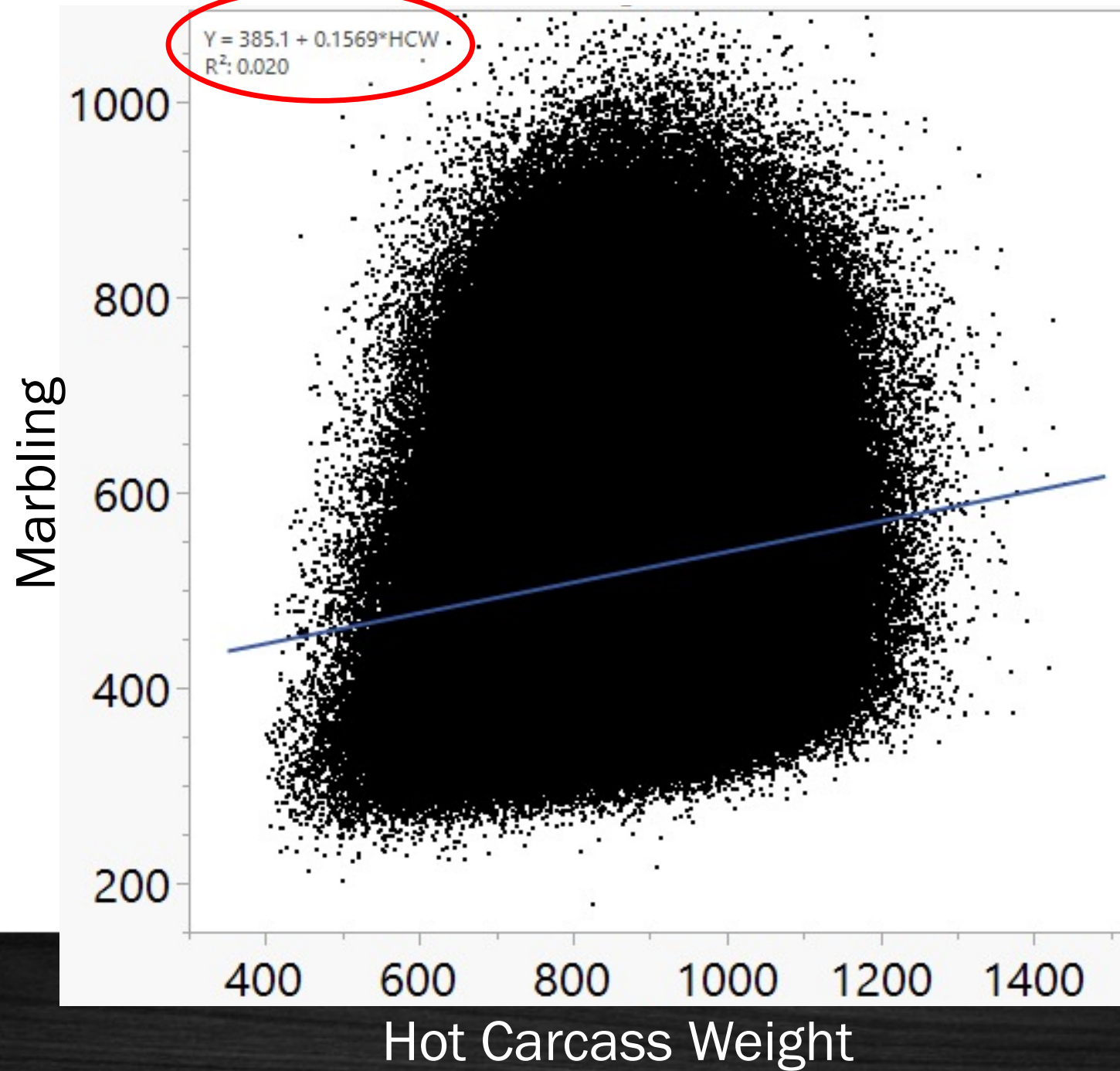




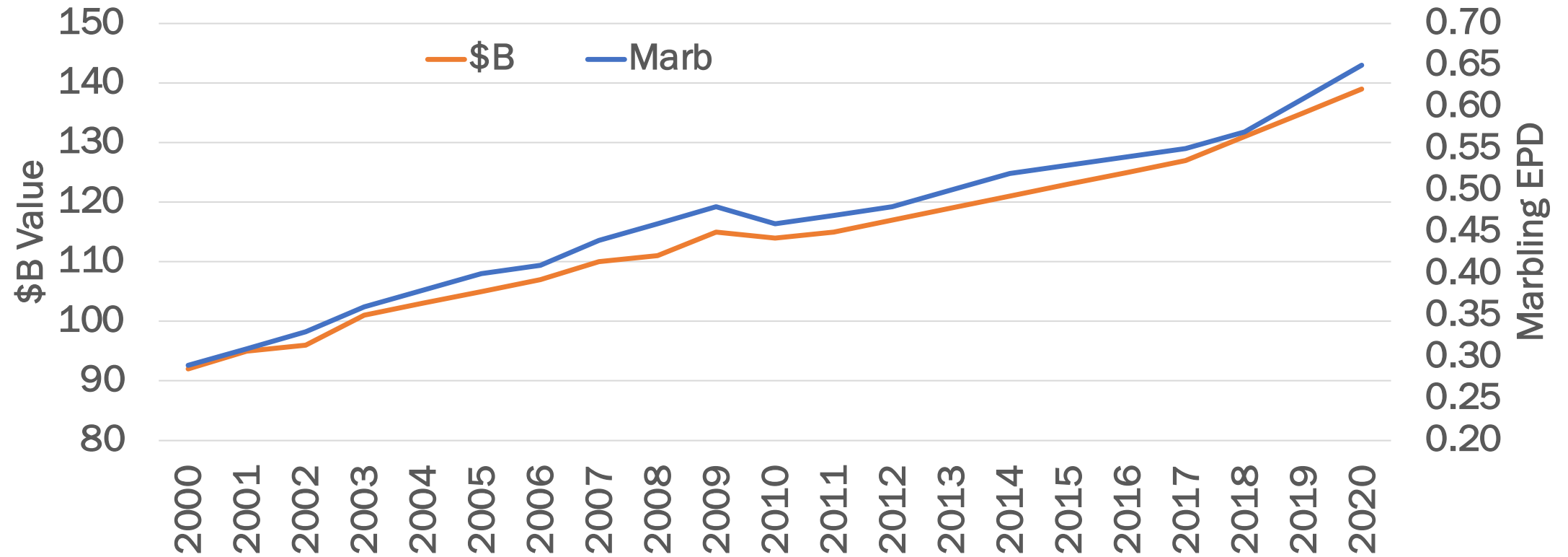
Clint Walenciak & Daniel Clark

Acceptance Rate vs. Hot Carcass Weight





Genetic Trend



Source: American Angus Association



10 SPECIFICATIONS

MARBLING & MATURITY

- ★ 1. Modest or higher marbling
- 2. Medium to fine marbling texture
- 3. Cattle must be less than 30 months of age by dentition and only A-maturity lean

CONSISTENT SIZING

- ★ 4. 10- to 16-square-inch ribeye area
- ★ 5. 1,050-lb. hot carcass weight or less
- ★ 6. 1 inch or less fat thickness

QUALITY APPEARANCE & TENDERNESS

- 7. Superior muscling
- 8. Practically free of capillary ruptures
- 9. No dark cutters
- 10. No neck hump exceeding 2 inches



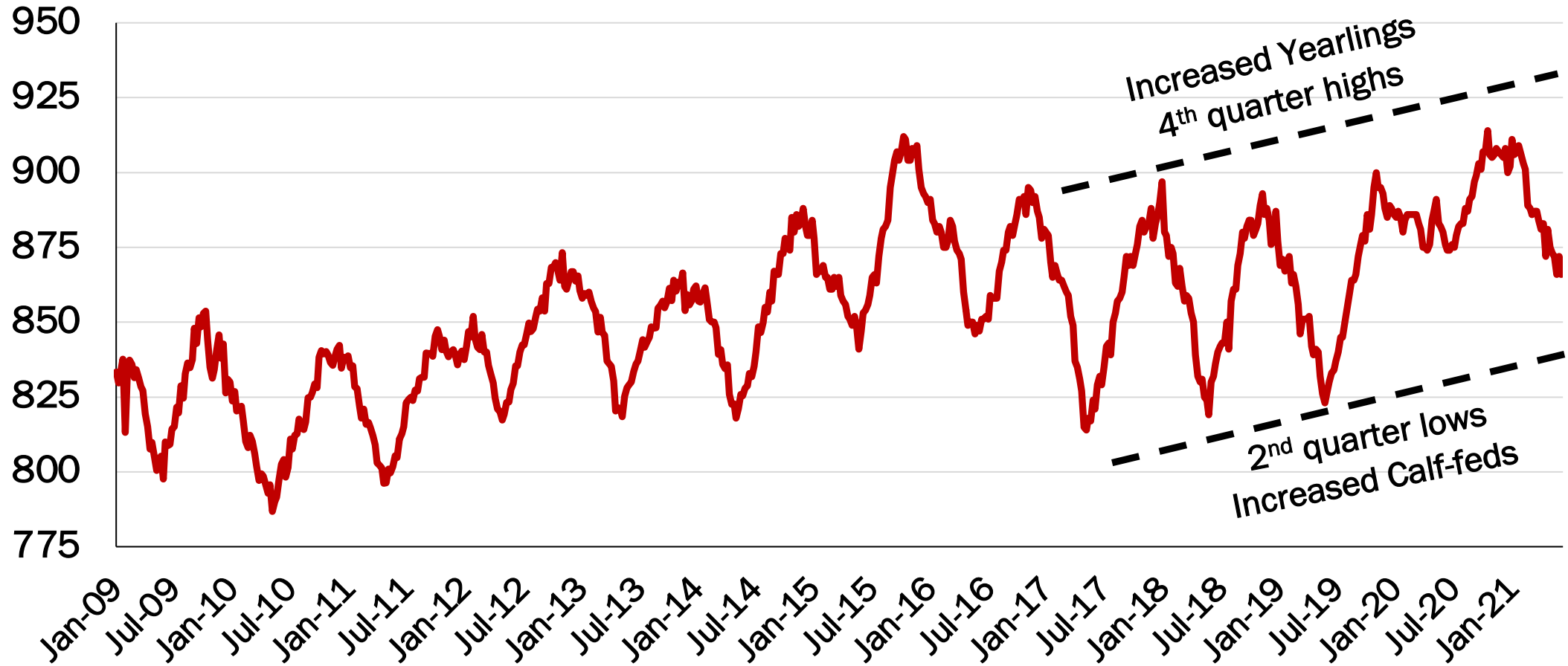
Reasons Carcasses Are Not Certified

Specification	Defect Rate (%)					
	2020	2019	2015	2013	2012	2008
Marbling <500	80.2%	89.9%	91.4%	94.8%	95.0%	94.0%
HCW >1,050	13.8%	6.8%	8.1%	NA	NA	NA
>1,000	NA	NA	NA	6.9%	6.5%	2.6%
Ribeye Area	17.9%	9.7%	15.6%	12.1%	16.6%	8.7%
>16.0"	17.6%	9.2%	14.8%	9.5%	15.2%	6.0%
<10.0"	0.3%	0.5%	0.8%	2.6%	1.4%	2.7%
Back Fat >1"	9.1%	4.9%	3.1%	2.0%	0.9%	2.5%

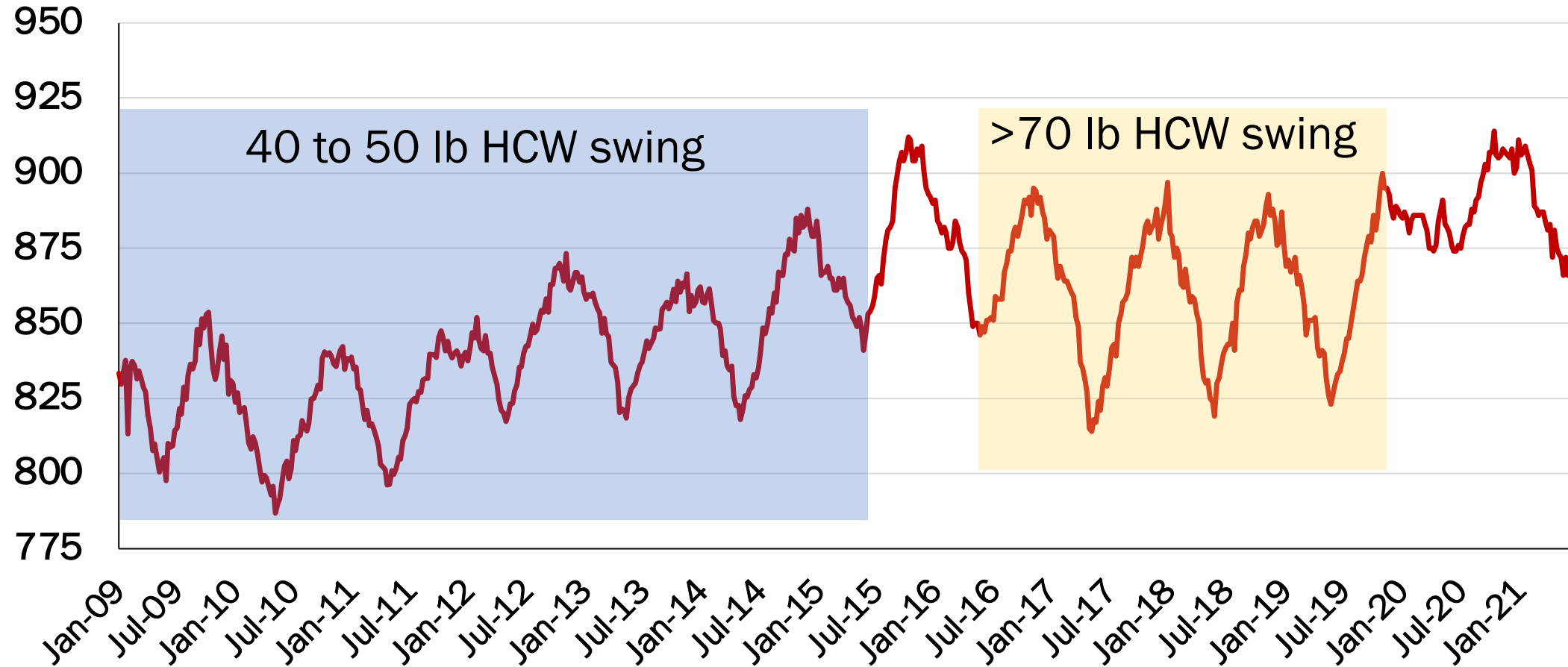
Source: Certified Angus Beef Consist Study



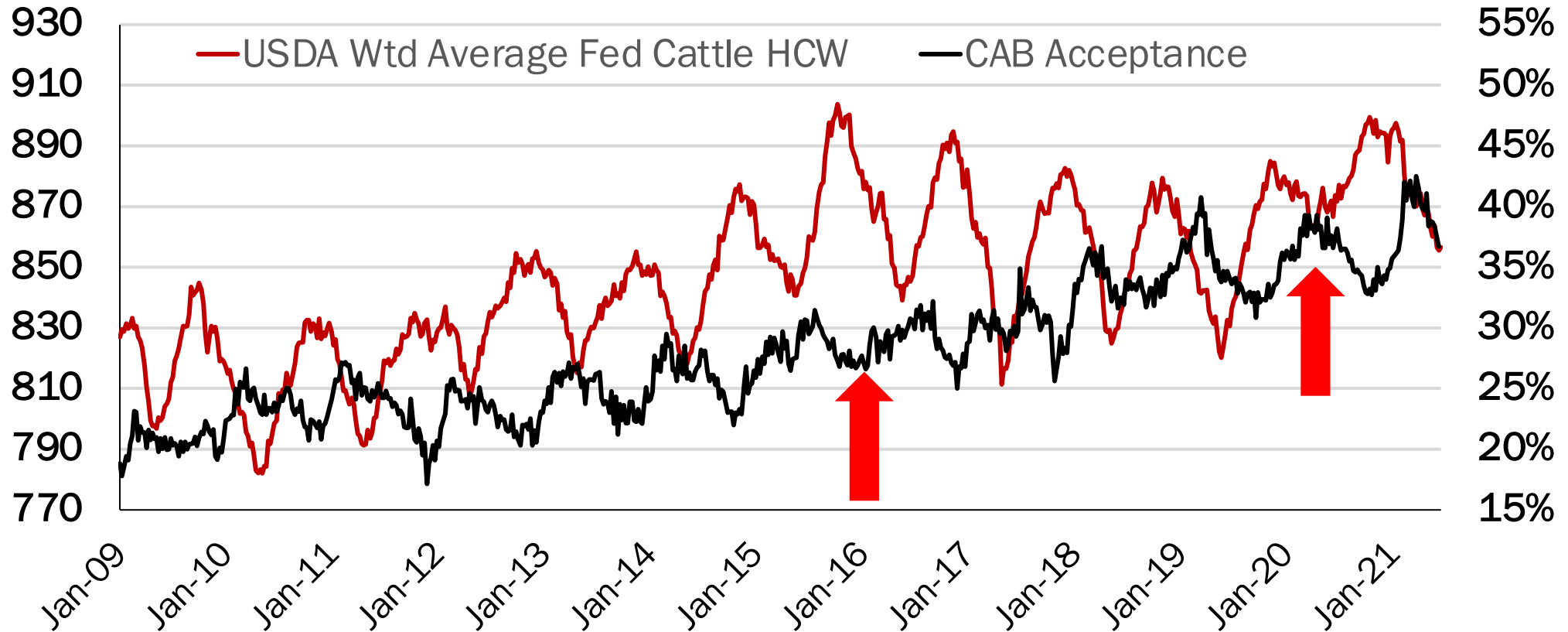
Hot Carcass Weight (Pounds)



Hot Carcass Weight (Pounds)



HCW and Acceptance Rate Trend



What we want to know

What we already know

What we can't account for



What We Want to Know

The Challenge:

How can we optimize Hot Carcass Weight to maximize carcass premium payouts?

Optimize Hot Carcass Weight

Increase Acceptance Rate

Maximize Premium Payout



What We Already Know

Days on Feed



Hot
Carcass
Weight

Fat

Ribeye
Area

Marbling

Early Maturing Cattle

Lighter Weight
Increased Marbling
Lower Yielding

Later Maturing Cattle

Heavier Weight
Less Marbling
Higher Yielding

What We Already Know



What We Can't Account For





FEEDING QUALITY
FORUM



Population Statistics (Big Data)

Vs.



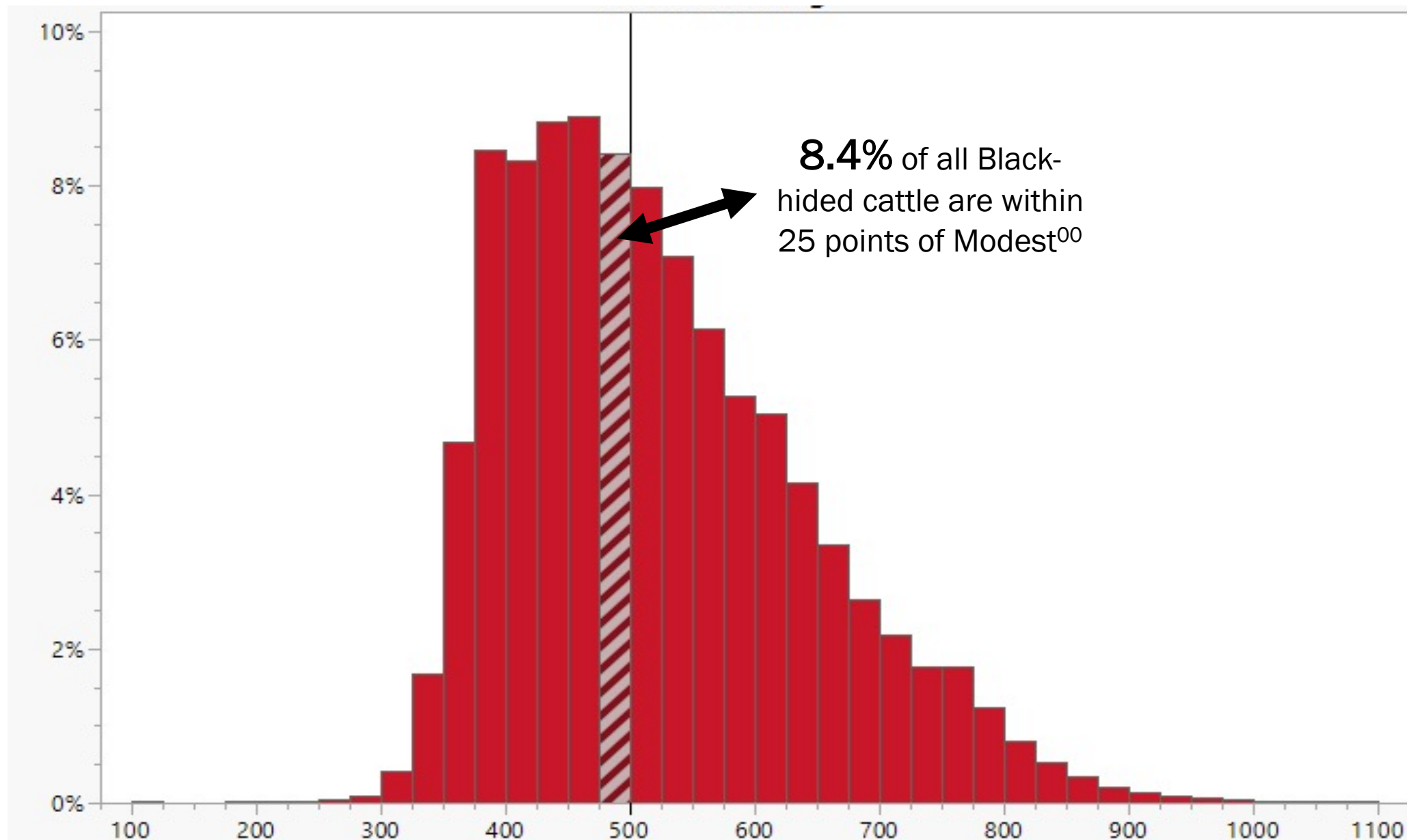
Individual Management

Consist Data

- A-Stamp Data
- Carcass Camera Data Only
 - No Tag Transfer
- Multiple Packers Represented
 - Representing 2/3 of the yearly harvest
 - 12 Major Plants
- 2019 Consist
 - 2.9M Data Points
- 2020 Consist
 - 5.0M Data Points

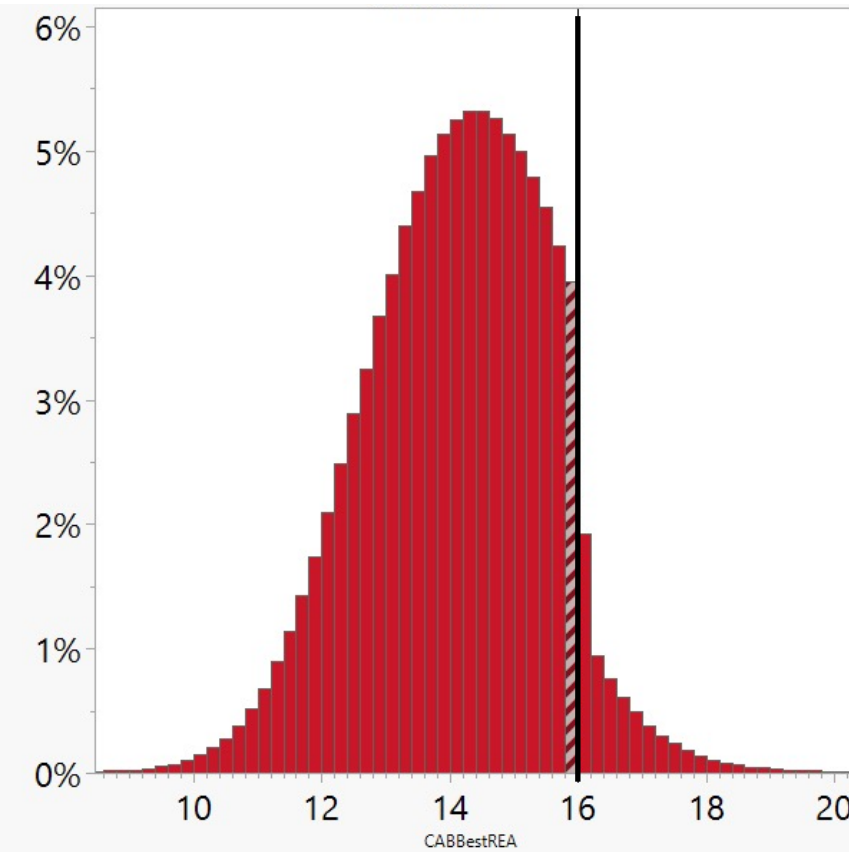


2019 Marbling Distribution



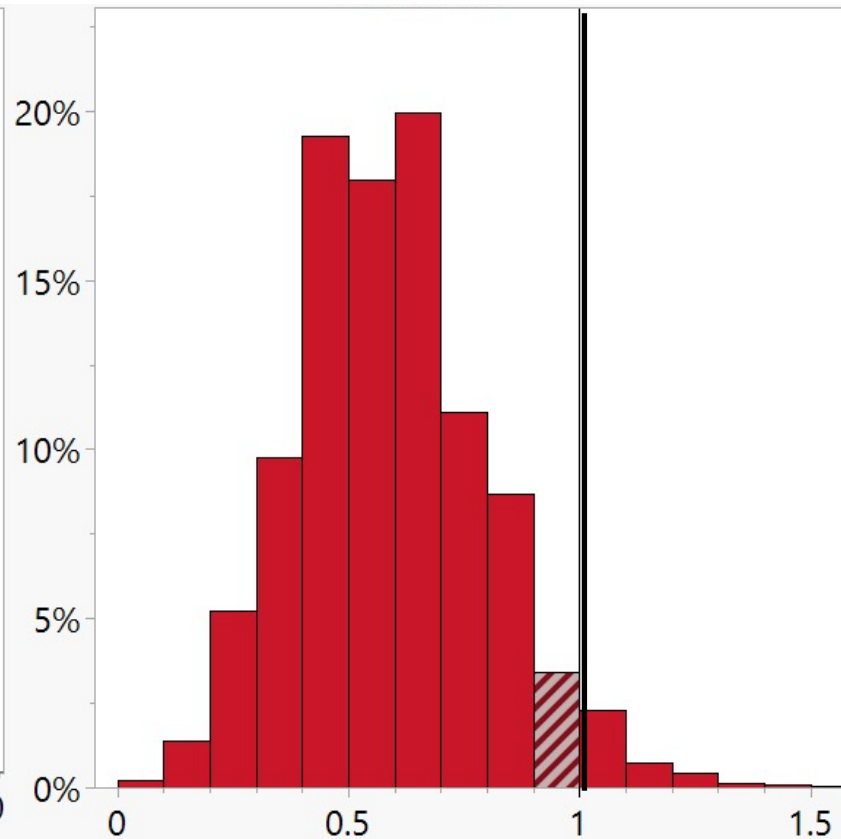
2019 Distribution

Ribeye Area



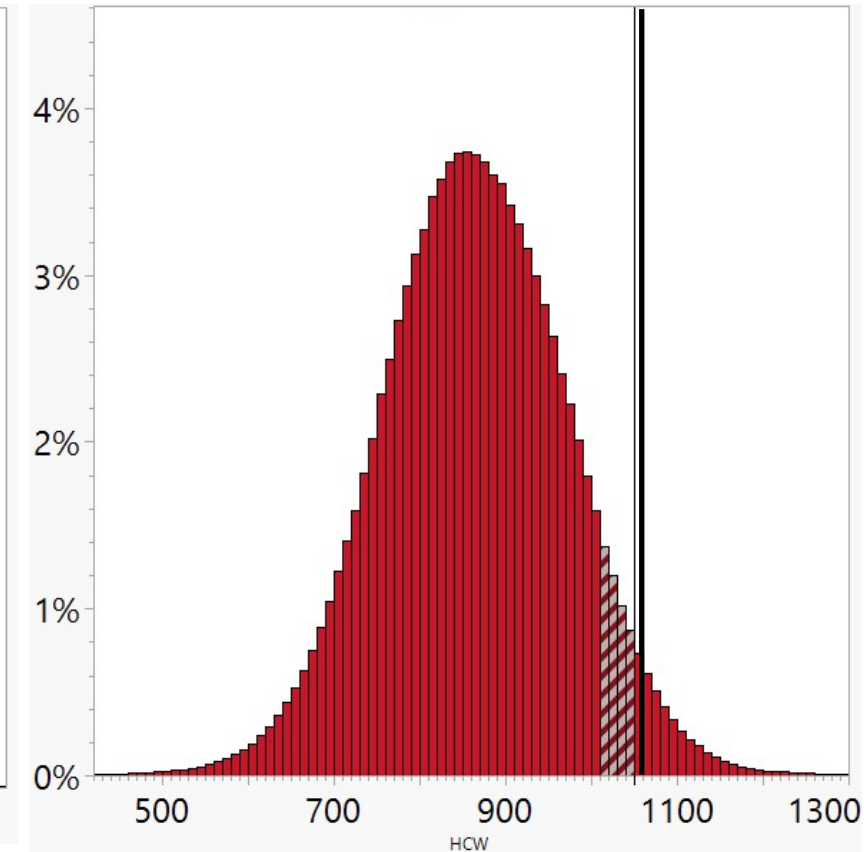
2% of all Black-hided cattle
have an REA between
15.75 – 16.00 in².

Fat Thickness



3.5% of all Black-hided
cattle have fat between
0.9 and 1.0 in.

Hot Carcass Weight



4.4% of all Black-hided
cattle have a HCW between
1010 and 1050 lb.



Acceptance Rate



≤ 1050 lb HCW



\geq Modest Marbling



10.0 – 16.0 in² REA



≤ 1 " Fat

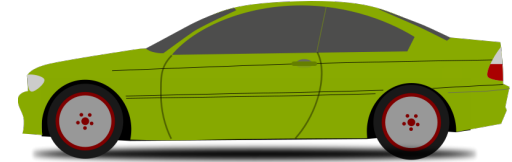




Acceptance Rate



≤ 1050 lb HCW

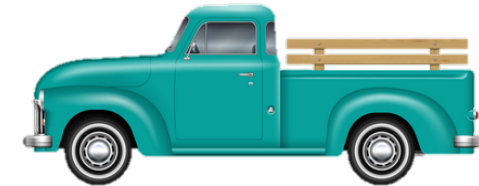


\geq Modest Marbling

10.0 – 16.0 in² REA



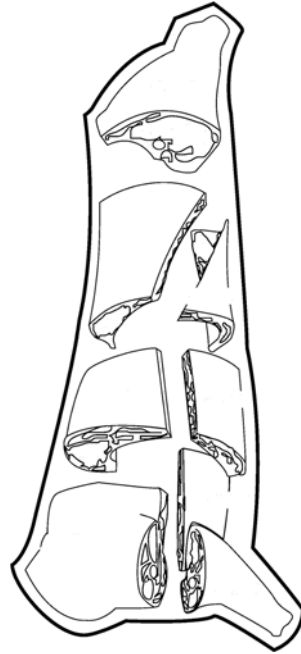
≤ 1 " Fat



2019
(Apr – Jun)



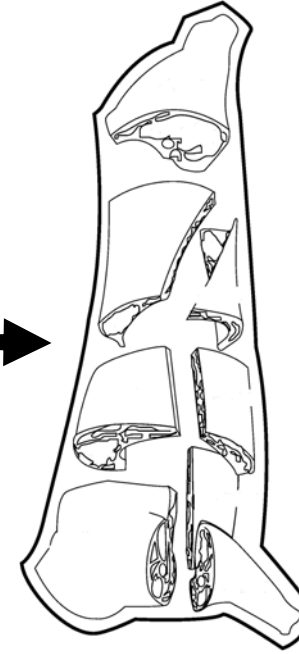
2020
(Apr – Jun)



2019

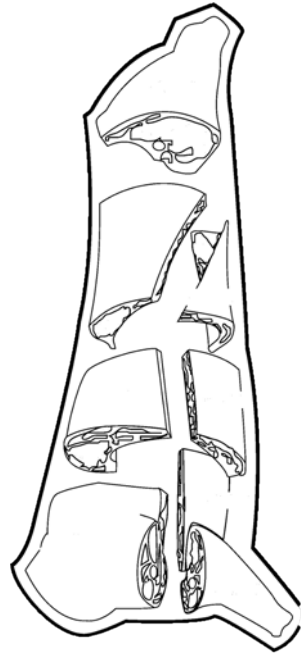
HCW: 800lb
REA: 13.6in
Marb: Mt²⁷
Fat: 0.50"

+DOF
~50 lb



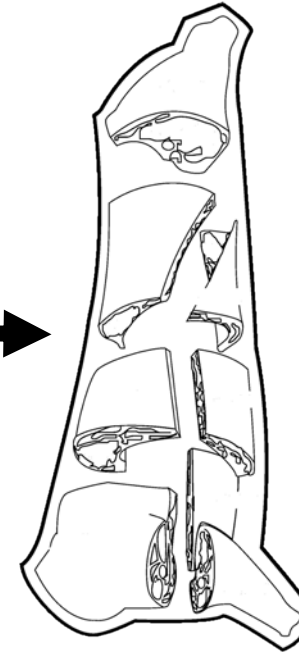
2020

HCW: 850lb
REA: 14.0in
Marb: Mt⁴⁸
Fat: 0.57"



HCW: 900lb
REA: 14.3in
Marb: Mt⁴²
Fat: 0.54"

+DOF
~50 lb



HCW: 950lb
REA: 14.6in
Marb: Mt⁶⁴
Fat: 0.61"

Marbling Score Increase per 25 lb Increase in HCW

Key Takeaways:

- 1.) As HCW increases, the gains in marbling start to diminish
- 2.) HCW increases impacts marbling in a seasonal dependent manner

H C W I n c r e a s e s	HCW Bin	Q2	Q3	Q4
	700 — 725	11.0	24.7	11.5
	725 — 750	10.4	24.6	9.7
	750 — 775	10.2	25.4	7.1
	775 — 800	10.7	24.0	8.8
	800 — 825	10.6	23.2	10.2
	825 — 850	11.2	23.5	7.0
	850 — 875	11.5	23.1	6.9
	875 — 900	10.6	21.7	5.3
	900 — 925	11.0	21.7	6.4
	925 — 950	9.2	20.1	4.4
	950 — 975	9.6	18.6	7.3
	975 — 1000	9.2	21.1	6.1
	1000 — 1025	5.6	19.1	10.9
	1025 — 1050	7.5	25.1	12.4

**Mean HCW for
simulated 50
head lots**

HCW Bin	HCW KO	REA KO	Fat KO	Marb KO
600 — 625	0.0%	0.0%	0.0%	33.3%
625 — 650	0.0%	2.0%	0.0%	58.8%
650 — 675	0.1%	3.1%	0.3%	55.3%
675 — 700	0.0%	3.0%	0.4%	57.3%
700 — 725	0.1%	2.8%	0.8%	55.2%
725 — 750	0.1%	2.8%	1.1%	52.6%
750 — 775	0.2%	3.2%	1.8%	51.1%
775 — 800	0.3%	3.8%	2.4%	50.1%
800 — 825	0.6%	4.7%	3.4%	48.9%
825 — 850	1.1%	5.8%	4.4%	47.0%
850 — 875	2.1%	6.4%	5.3%	45.7%
875 — 900	3.7%	7.2%	5.8%	45.3%
900 — 925	6.1%	8.1%	6.1%	45.8%
925 — 950	9.7%	9.8%	6.6%	45.7%
950 — 975	14.6%	12.2%	6.8%	45.6%
975 — 1000	22.0%	14.7%	7.7%	43.5%
1000 — 1025	32.6%	17.9%	8.9%	40.2%
1025 — 1050	44.3%	21.3%	10.6%	36.7%
1050 — 1075	56.1%	19.9%	13.8%	32.4%
1075 — 1100	68.4%	25.6%	15.4%	30.4%
1100 — 1125	79.5%	35.7%	11.8%	33.8%
1125 — 1150	86.7%	49.8%	15.1%	28.2%
1150 — 1175	89.5%	39.2%	13.1%	20.9%

**Individual
specification
knockout rate
for 2019
by carcass weight
group**

**Mean HCW for
simulated 50
head lots**

HCW Bin	HCW KO	REA KO	Fat KO	Marb KO	
600 — 625	0.0%	0.0%	0.0%	33.3%	+25 lb
625 — 650	0.0%	2.0%	0.0%	58.8%	+25 lb
650 — 675	0.1%	3.1%	0.3%	55.3%	+25 lb
675 — 700	0.0%	3.0%	0.4%	57.3%	+25 lb
700 — 725	0.1%	2.8%	0.8%	55.2%	+25 lb
725 — 750	0.1%	2.8%	1.1%	52.6%	+25 lb
750 — 775	0.2%	3.2%	1.8%	51.1%	+25 lb
775 — 800	0.3%	3.8%	2.4%	50.1%	+25 lb
800 — 825	0.6%	4.7%	3.4%	48.9%	+25 lb
825 — 850	1.1%	5.8%	4.4%	47.0%	+25 lb
850 — 875	2.1%	6.4%	5.3%	45.7%	+25 lb
875 — 900	3.7%	7.2%	5.8%	45.3%	+25 lb
900 — 925	6.1%	8.1%	6.1%	45.8%	+25 lb
925 — 950	9.7%	9.8%	6.6%	45.7%	+25 lb
950 — 975	14.6%	12.2%	6.8%	45.6%	+25 lb
975 — 1000	22.0%	14.7%	7.7%	43.5%	+25 lb
1000 — 1025	32.6%	17.9%	8.9%	40.2%	+25 lb
1025 — 1050	44.3%	21.3%	10.6%	36.7%	+25 lb
1050 — 1075	56.1%	19.9%	13.8%	32.4%	+25 lb
1075 — 1100	68.4%	25.6%	15.4%	30.4%	+25 lb
1100 — 1125	79.5%	35.7%	11.8%	33.8%	+25 lb
1125 — 1150	86.7%	49.8%	15.1%	28.2%	+25 lb
1150 — 1175	89.5%	39.2%	13.1%	20.9%	+25 lb

**Simulate response
for a 25 lb increase
in HCW.**

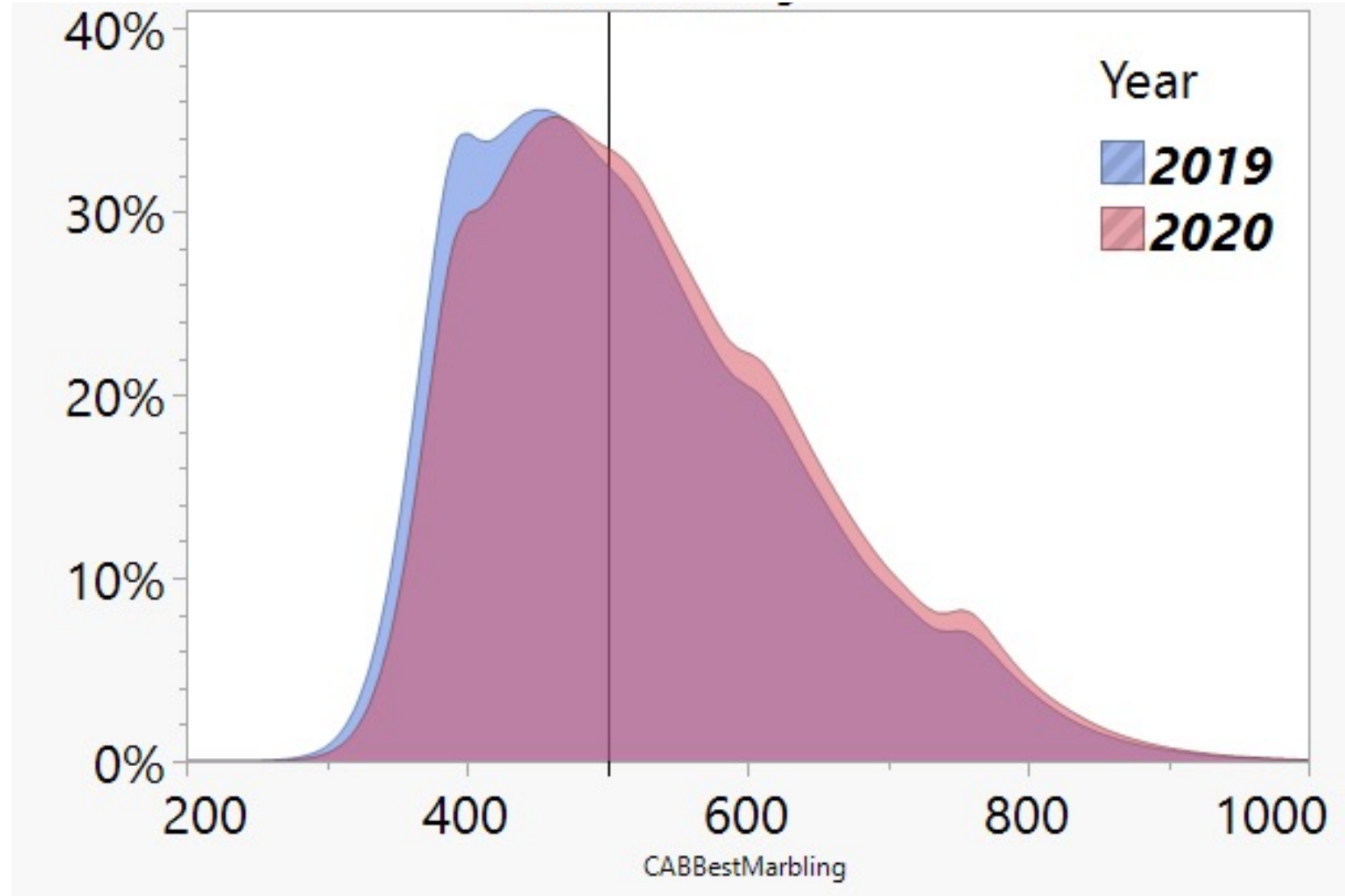
*(Response factors calculated
from 2019 to 2020 changes)*

HCW Bin	HCW KO	REA KO	Fat KO	Marb KO			HCW KO	REA KO	Fat KO	Marb KO
600 — 625	0.0%	0.0%	0.0%	33.3%	+25 lb		0.0%	0.0%	0.0%	33.3%
625 — 650	0.0%	2.0%	0.0%	58.8%	+25 lb		0.0%	1.0%	0.0%	51.0%
650 — 675	0.1%	3.1%	0.3%	55.3%	+25 lb		0.1%	2.6%	0.3%	49.3%
675 — 700	0.0%	3.0%	0.4%	57.3%	+25 lb		0.0%	3.9%	0.6%	52.8%
700 — 725	0.1%	2.8%	0.8%	55.2%	+25 lb		0.1%	4.0%	0.9%	50.5%
725 — 750	0.1%	2.8%	1.1%	52.6%	+25 lb		0.2%	4.1%	1.3%	47.9%
750 — 775	0.2%	3.2%	1.8%	51.1%	+25 lb		0.3%	5.0%	2.0%	46.5%
775 — 800	0.3%	3.8%	2.4%	50.1%	+25 lb		0.6%	6.1%	2.7%	45.6%
800 — 825	0.6%	4.7%	3.4%	48.9%	+25 lb		1.1%	7.6%	3.7%	44.5%
825 — 850	1.1%	5.8%	4.4%	47.0%	+25 lb		2.0%	9.0%	4.8%	42.7%
850 — 875	2.1%	6.4%	5.3%	45.7%	+25 lb		3.7%	9.9%	5.7%	41.5%
875 — 900	3.7%	7.2%	5.8%	45.3%	+25 lb		6.3%	10.9%	6.4%	41.3%
900 — 925	6.1%	8.1%	6.1%	45.8%	+25 lb		10.1%	12.0%	6.9%	41.7%
925 — 950	9.7%	9.8%	6.6%	45.7%	+25 lb		15.5%	13.8%	7.6%	41.6%
950 — 975	14.6%	12.2%	6.8%	45.6%	+25 lb		22.7%	16.3%	8.1%	41.5%
975 — 1000	22.0%	14.7%	7.7%	43.5%	+25 lb		32.4%	18.6%	9.5%	39.3%
1000 — 1025	32.6%	17.9%	8.9%	40.2%	+25 lb		44.3%	21.3%	11.3%	35.9%
1025 — 1050	44.3%	21.3%	10.6%	36.7%	+25 lb		56.7%	24.3%	13.7%	32.5%
1050 — 1075	56.1%	19.9%	13.8%	32.4%	+25 lb		67.6%	22.5%	17.6%	28.5%
1075 — 1100	68.4%	25.6%	15.4%	30.4%	+25 lb		77.5%	27.6%	20.7%	27.0%
1100 — 1125	79.5%	35.7%	11.8%	33.8%	+25 lb		85.6%	37.7%	17.2%	29.5%
1125 — 1150	86.7%	49.8%	15.1%	28.2%	+25 lb		91.6%	50.5%	21.9%	23.3%
1150 — 1175	89.5%	39.2%	13.1%	20.9%	+25 lb		93.5%	41.2%	17.6%	20.9%

HCW Bin	HCW KO	REA KO	Fat KO	Marb KO			HCW KO	REA KO	Fat KO	Marb KO
600 — 625	0.0%	0.0%	0.0%	33.3%		+25 lb	0.00%	0.00%	0.00%	33.33%
625 — 650	0.0%	2.0%	0.0%	58.8%		+25 lb	0.00%	0.98%	0.00%	50.98%
650 — 675	0.1%	3.1%	0.3%	55.3%		+25 lb	0.09%	2.62%	0.29%	49.26%
675 — 700	0.0%	3.0%	0.4%	57.3%		+25 lb	0.05%	3.90%	0.55%	52.82%
700 — 725	0.1%	2.8%	0.8%	55.2%		+25 lb	0.13%	4.02%	0.88%	50.51%
725 — 750	0.1%	2.8%	1.1%	52.6%		+25 lb	0.19%	4.11%	1.32%	47.94%
750 — 775	0.2%	3.2%	1.8%	51.1%		+25 lb	0.34%	5.02%	2.01%	46.49%
775 — 800	0.3%	3.8%	2.4%	50.1%		+25 lb	0.60%	6.14%	2.68%	45.57%
800 — 825	0.6%	4.7%	3.4%	48.9%		+25 lb	1.10%	7.57%	3.70%	44.45%
825 — 850	1.1%	5.8%	4.4%	47.0%		+25 lb	2.03%	8.97%	4.81%	42.71%
850 — 875	2.1%	6.4%	5.3%	45.7%		+25 lb	3.68%	9.91%	5.73%	41.54%
875 — 900	3.7%	7.2%	5.8%	45.3%		+25 lb	6.29%	10.86%	6.43%	41.28%
900 — 925	6.1%	8.1%	6.1%	45.8%		+25 lb	10.09%	11.99%	6.86%	41.71%
925 — 950	9.7%	9.8%	6.6%	45.7%		+25 lb	15.49%	13.82%	7.62%	41.62%
950 — 975	14.6%	12.2%	6.8%	45.6%		+25 lb	22.67%	16.34%	8.14%	41.45%
975 — 1000	22.0%	14.7%	7.7%	43.5%		+25 lb	32.45%	18.56%	9.55%	39.30%
1000 — 1025	32.6%	17.9%	8.9%	40.2%		+25 lb	44.26%	21.29%	11.30%	35.94%
1025 — 1050	44.3%	21.3%	10.6%	36.7%		+25 lb	56.71%	24.29%	13.72%	32.51%
1050 — 1075	56.1%	19.9%	13.8%	32.4%		+25 lb	67.64%	22.48%	17.60%	28.51%
1075 — 1100	68.4%	25.6%	15.4%	30.4%		+25 lb	77.54%	27.63%	20.71%	26.97%
1100 — 1125	79.5%	35.7%	11.8%	33.8%		+25 lb	85.57%	37.68%	17.17%	29.48%
1125 — 1150	86.7%	49.8%	15.1%	28.2%		+25 lb	91.58%	50.55%	21.91%	23.31%
1150 — 1175	89.5%	39.2%	13.1%	20.9%		+25 lb	93.46%	41.18%	17.65%	20.92%

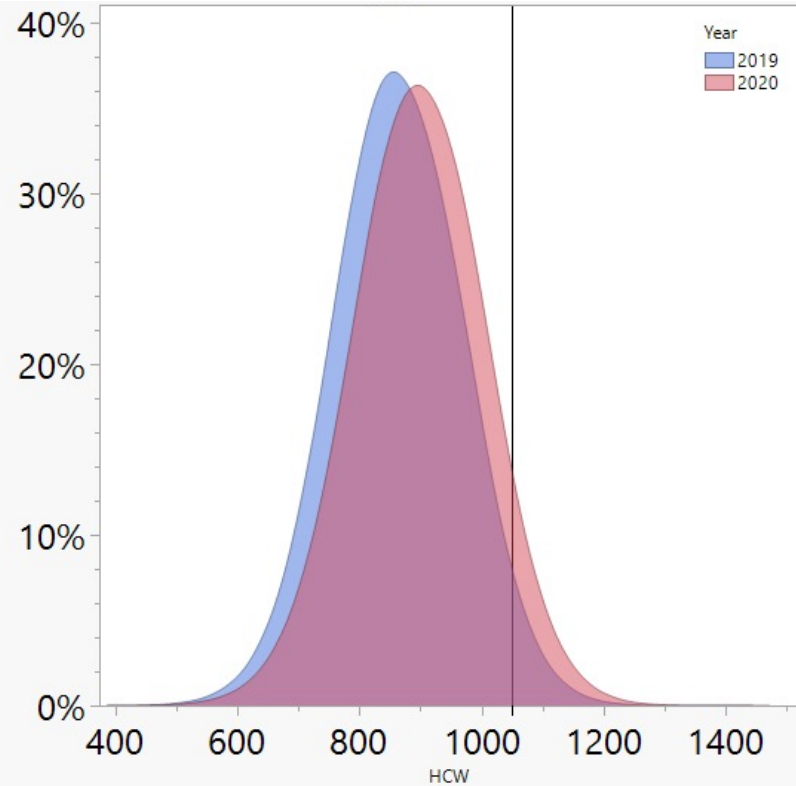
											Head count change for a 50 head lot
HCW Bin	HCW KO	REA KO	Fat KO	Marb KO			HCW KO	REA KO	Fat KO	Marb KO	
600 — 625	0.0%	0.0%	0.0%	33.3%		+25 lb	0.00%	0.00%	0.00%	33.33%	0.0
625 — 650	0.0%	2.0%	0.0%	58.8%		+25 lb	0.00%	0.98%	0.00%	50.98%	+4.4
650 — 675	0.1%	3.1%	0.3%	55.3%		+25 lb	0.09%	2.62%	0.29%	49.26%	+3.1
675 — 700	0.0%	3.0%	0.4%	57.3%		+25 lb	0.05%	3.90%	0.55%	52.82%	+2.1
700 — 725	0.1%	2.8%	0.8%	55.2%		+25 lb	0.13%	4.02%	0.88%	50.51%	+2.1
725 — 750	0.1%	2.8%	1.1%	52.6%		+25 lb	0.19%	4.11%	1.32%	47.94%	+2.0
750 — 775	0.2%	3.2%	1.8%	51.1%		+25 lb	0.34%	5.02%	2.01%	46.49%	+1.8
775 — 800	0.3%	3.8%	2.4%	50.1%		+25 lb	0.60%	6.14%	2.68%	45.57%	+1.5
800 — 825	0.6%	4.7%	3.4%	48.9%		+25 lb	1.10%	7.57%	3.70%	44.45%	+1.2
825 — 850	1.1%	5.8%	4.4%	47.0%		+25 lb	2.03%	8.97%	4.81%	42.71%	+0.9
850 — 875	2.1%	6.4%	5.3%	45.7%		+25 lb	3.68%	9.91%	5.73%	41.54%	+0.6
875 — 900	3.7%	7.2%	5.8%	45.3%		+25 lb	6.29%	10.86%	6.43%	41.28%	+0.2
900 — 925	6.1%	8.1%	6.1%	45.8%		+25 lb	10.09%	11.99%	6.86%	41.71%	-0.2
925 — 950	9.7%	9.8%	6.6%	45.7%		+25 lb	15.49%	13.82%	7.62%	41.62%	-0.8
950 — 975	14.6%	12.2%	6.8%	45.6%		+25 lb	22.67%	16.34%	8.14%	41.45%	-1.4
975 — 1000	22.0%	14.7%	7.7%	43.5%		+25 lb	32.45%	18.56%	9.55%	39.30%	-2.1
1000 — 1025	32.6%	17.9%	8.9%	40.2%		+25 lb	44.26%	21.29%	11.30%	35.94%	-2.5
1025 — 1050	44.3%	21.3%	10.6%	36.7%		+25 lb	56.71%	24.29%	13.72%	32.51%	-2.7
1050 — 1075	56.1%	19.9%	13.8%	32.4%		+25 lb	67.64%	22.48%	17.60%	28.51%	-2.7
1075 — 1100	68.4%	25.6%	15.4%	30.4%		+25 lb	77.54%	27.63%	20.71%	26.97%	-2.2
1100 — 1125	79.5%	35.7%	11.8%	33.8%		+25 lb	85.57%	37.68%	17.17%	29.48%	-1.5
1125 — 1150	86.7%	49.8%	15.1%	28.2%		+25 lb	91.58%	50.55%	21.91%	23.31%	-0.8
1150 — 1175	89.5%	39.2%	13.1%	20.9%		+25 lb	93.46%	41.18%	17.65%	20.92%	-1.0

2019 vs. 2020 Distribution

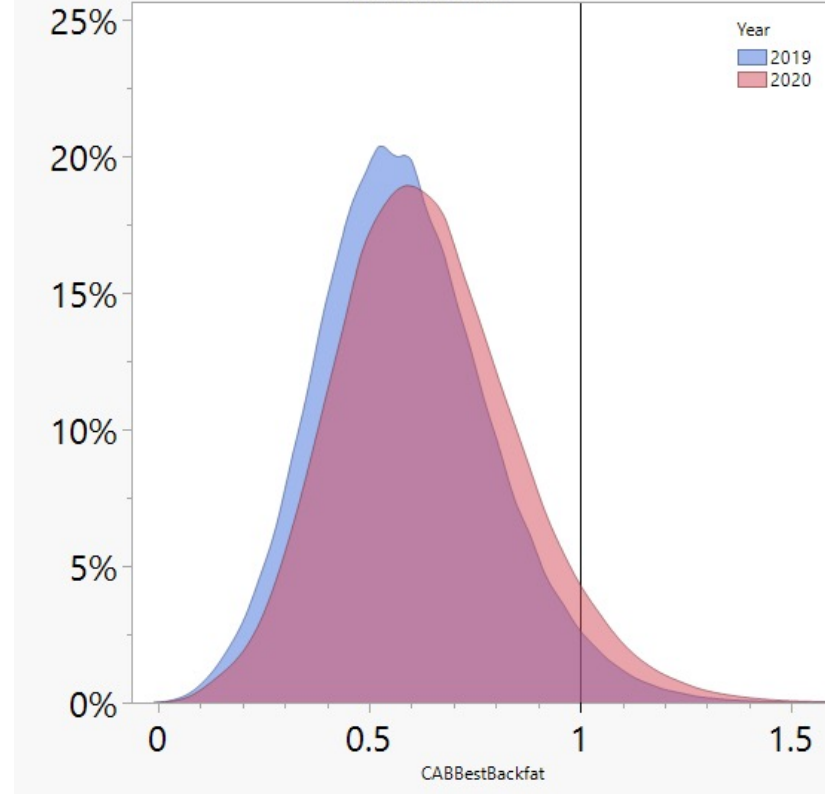


2019 vs. 2020 Distribution

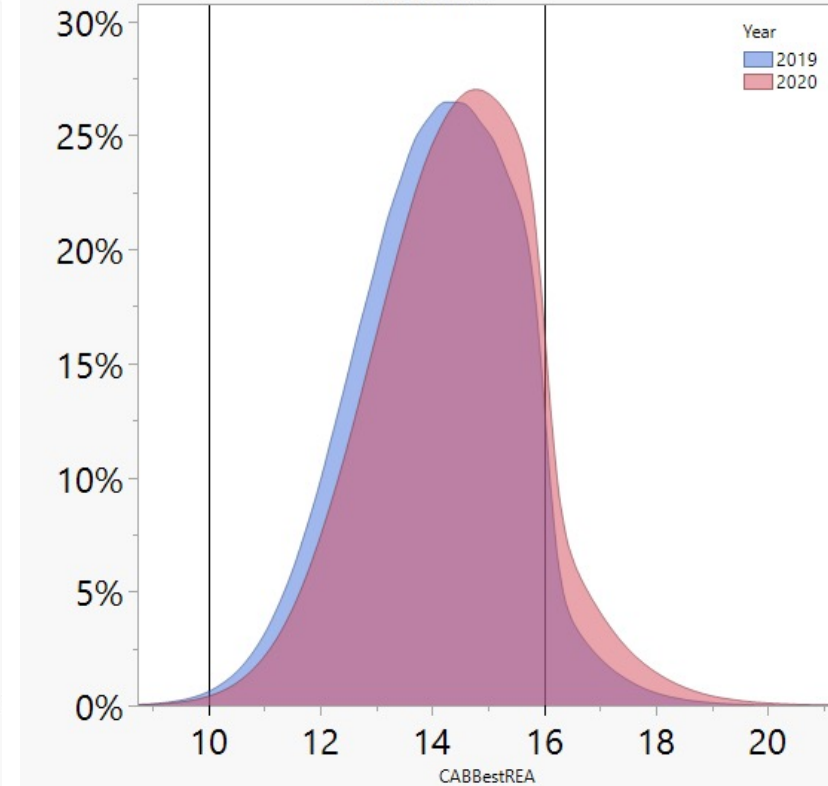
Hot Carcass Weight



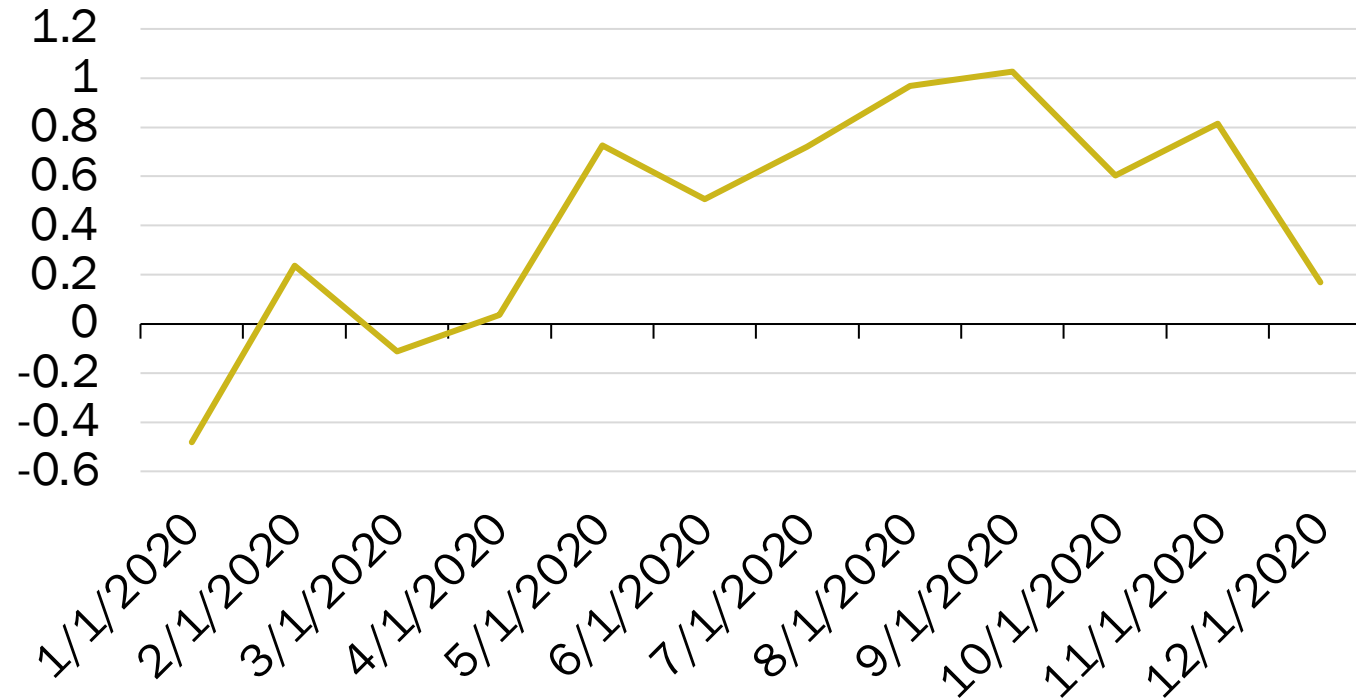
Fat



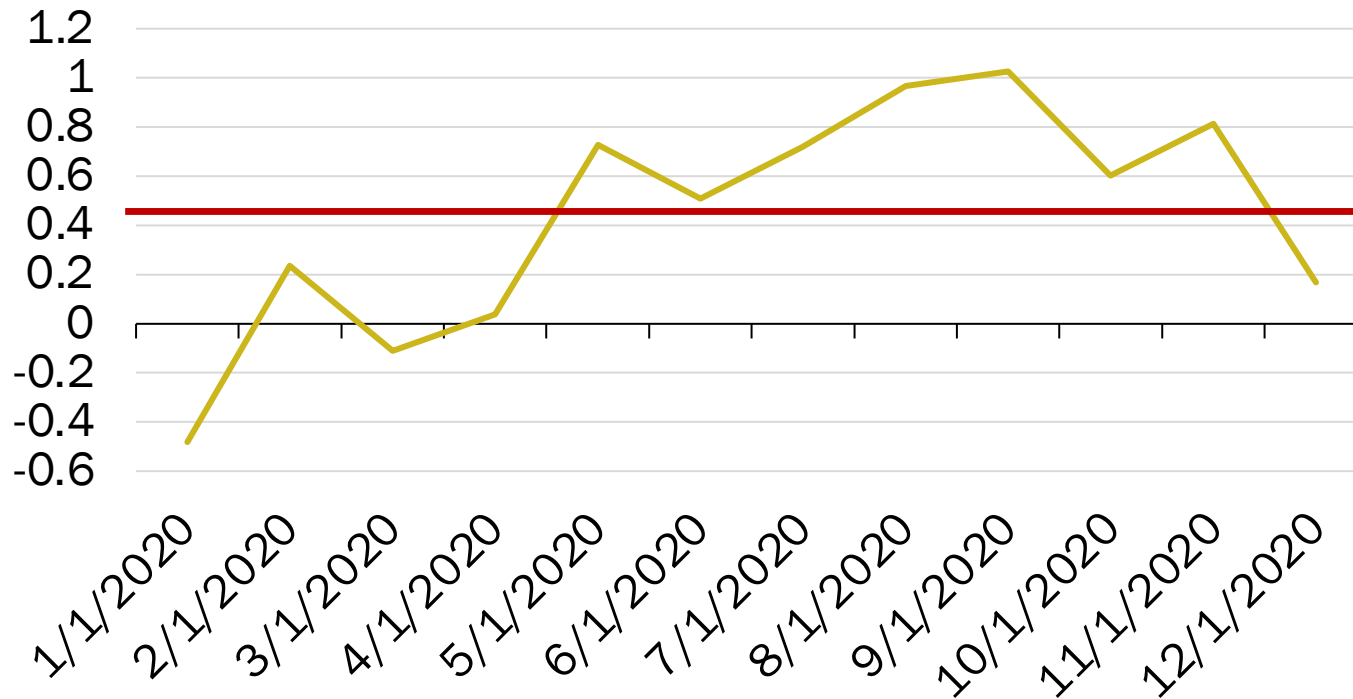
Ribeye Area



Marbling Shift per Change in 50 lb of Hot Carcass Weight



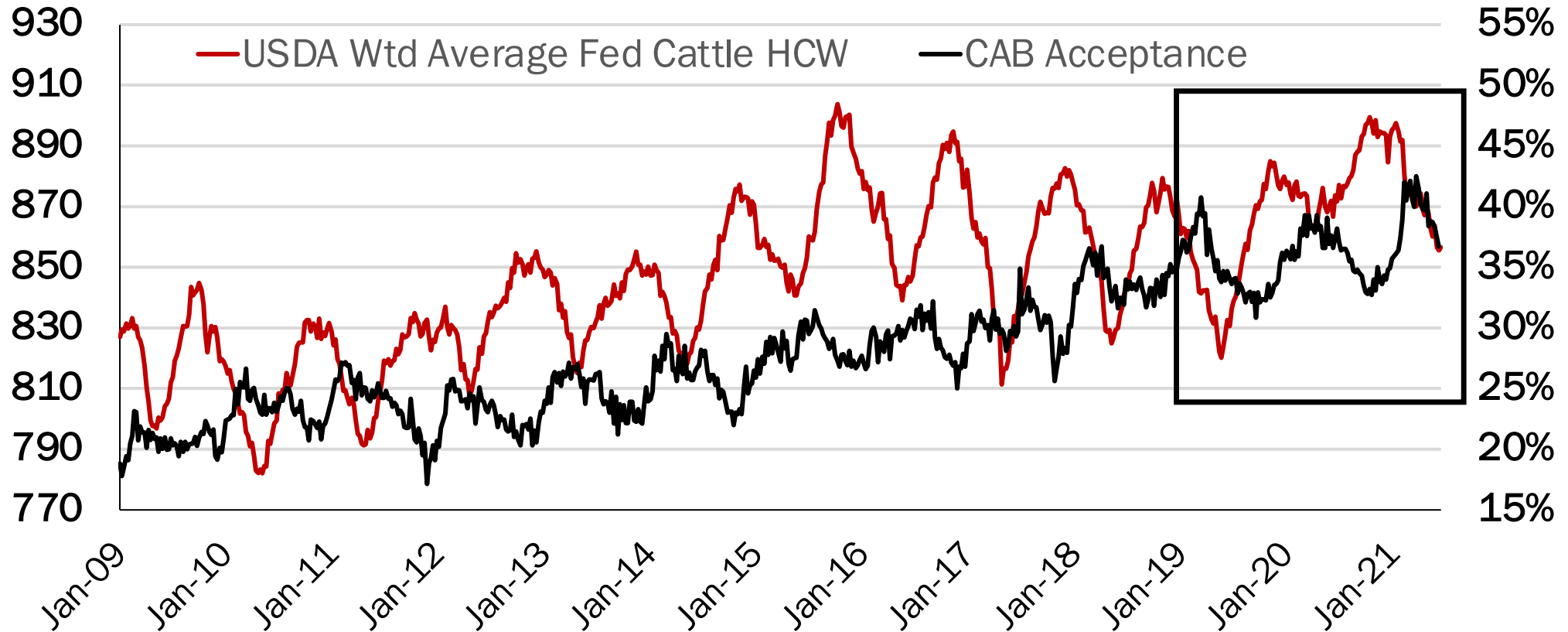
Avg. Lot Marbling Shift per Change in pound of Hot Carcass Weight



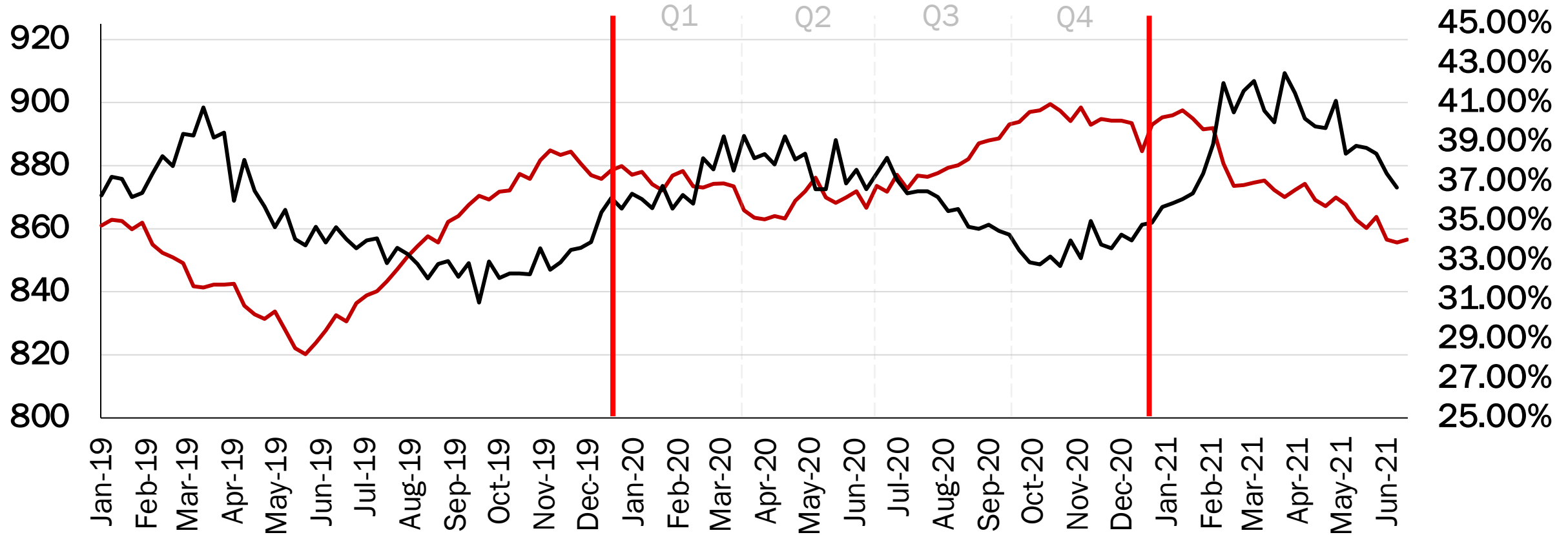
0.45/lb

Approximate threshold to increase HCW without negatively impacting acceptance rate
(ie. Small25 → Small47 for a 50 lb increase in weight)

HCW and Acceptance Rate Trend



HCW and Acceptance Rate Trend



— USDA Wtd Average Fed Cattle HCW

— CAB Acceptance

Key Takeaways

- Sweet Spot: 850 – 900 lb Industry Average
 - < 850lb - Cattle are likely not being fed to meet their genetic potential
 - > 900lb – Ribeye, HCW, and Fat are too large
- Cattle must have high genetic propensity for marbling to market at higher weights
- Benefits in Choice and Prime
- The ever changing market, feed costs, and other logistical constraints will impact marketing decisions.

