

Beef Carcass Grading Basics and 2023 Steer of Merit Program

Megan Van Emon, Beef Cattle Specialist

(406) 874-8286, megan.vanemon@montana.edu

Common Carcass Grading Terms and Definitions:

- **Live weight:** how much the steer weighed (in pounds) at the fair
- **Hot carcass weight (HCW):** how much the carcass weighed (in pounds) after harvest
- **Dressing percentage (DP):** hot carcass weight divided by live weight, expressed as a percent. $DP = (HCW \div LW) \times 100\%$
- **Backfat:** external fat thickness (in inches) measured at the 12th rib, $\frac{3}{4}$ of the length of the ribeye from the spine
- **Kidney, pelvic and heart (KPH) fat:** estimate of the amount of kidney, pelvic and heart fat as a percentage of carcass weight
- **Ribeye area (REA):** area of the ribeye muscle (in square inches) measured at the 12th rib
- **Ribeye area per hundred-weight (REA/CWT):** ribeye area divided by hot carcass weight expressed as hundred-weight. $REA/CWT = REA \div (HCW \div 100)$
- **Yield grade (YG):** equation based on balance between muscle and fat; ranges from 1 to 5
 - $YG = 2.5 + (2.5 \times \text{backfat}) + (0.2 \times \text{KPH fat}) + (0.0038 \times \text{HCW}) - (0.32 \times \text{REA})$
- **Maturity:** classification of the age of the carcass; ranges from “A” (youngest) to “E” (oldest). 4-H and FFA carcasses shouldn’t be older than “A”
- **Dark cutter:** beef exhibits a dark, purplish red to almost black lean color compared to a normal cherry red. This results from stress prior to slaughter and is a result of high muscle pH.
- **Marbling score:** numerical value representing the amount of intramuscular fat in the ribeye
- **Quality grade:** based on maturity and marbling; reflects flavor and tenderness of the beef. See Table 1.
- **Cutability:** equation similar to yield grade that estimates boneless, closely-trimmed retail cuts from a beef carcass
 - $\text{Cutability} = 51.34 - (5.78 \times \text{BF}) - (0.462 \times \text{KPH}) - (0.0093 \times \text{HCW}) + (0.74 \times \text{REA})$

Table 1. Quality grades, marbling calls, and marbling scores for “A” maturity carcasses.

Quality Grade	Marbling Calls	Marbling Score
Prime+	Abundant	900-999
Prime0	Moderately Abundant	800-899
Prime-	Slightly Abundant	700-799
Choice+	Moderate	600-699
Choice0	Modest	500-599
Choice-	Small	400-499
Select+	Slight	350-399
Select-	Slight	300-349
Standard+	Traces	200-299
Standard-	Practically Devoid	100-199

2023 MT Steer of Merit Standards

Item	Range/Standard
Hot Carcass Weight	700 – 1000 pounds
Dressing Percentage	55 – 68%
Back Fat	0.20 – 0.60 inches
Ribeye Area	11.5 - 17.5 square inches
Yield Grade	≤ 3.99
Dark Cutter	No
Quality Grade	Choice ⁺ or better
Cutability	≥ 51%

After evaluation, carcasses are ranked by sorting the data in three steps:

1. Steer of Merit (Yes or No)
2. Price per hundred-weight (highest to lowest)
3. Cutability (highest to lowest)

In the Ultrasound Division, we assume a 60% dressing percentage, 2.5% kidney, pelvic, and heart fat, and no dark cutters.

Carcasses are priced based on a grid formulated from USDA data the third week of June each year. Grid prices for 2023 are listed below.

2022 SOM Carcass Pricing

Base Price	\$295.98/cwt
YG 1	\$3.58
YG 2	\$1.58
YG 3	\$0.00
YG 4	(\$11.92)
YG 5	(\$17.25)
Prime	\$13.46
Ch ⁺ /Ch ⁰	\$4.43
Ch ⁻	\$0.00
Select	(\$20.00)
Standard	(\$32.64)
Dark Cutter	(\$34.58)

For example, a yield grade 3, Choice⁺ carcass would be priced at \$300.41/cwt (\$295.98 + \$0.00 + \$4.43). Whereas a yield grade 2, select carcass would be priced at \$277.56/cwt (\$295.98 + 1.58 - \$20.00).