Gone FLABBY

Beef cattle are losing muscle, and the efficiency opportunities that go with it.

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Being better than average doesn't help you nearly as much as being worse than average hurts you, says Duane Wulf, professor of meat sciences at South Dakota State University (SDSU).

Unfortunately, Wulf is referring to beef carcasses today, which are worse than average when it comes to cutability – the percentage of boneless, closely trimmed retail cuts within a carcass.

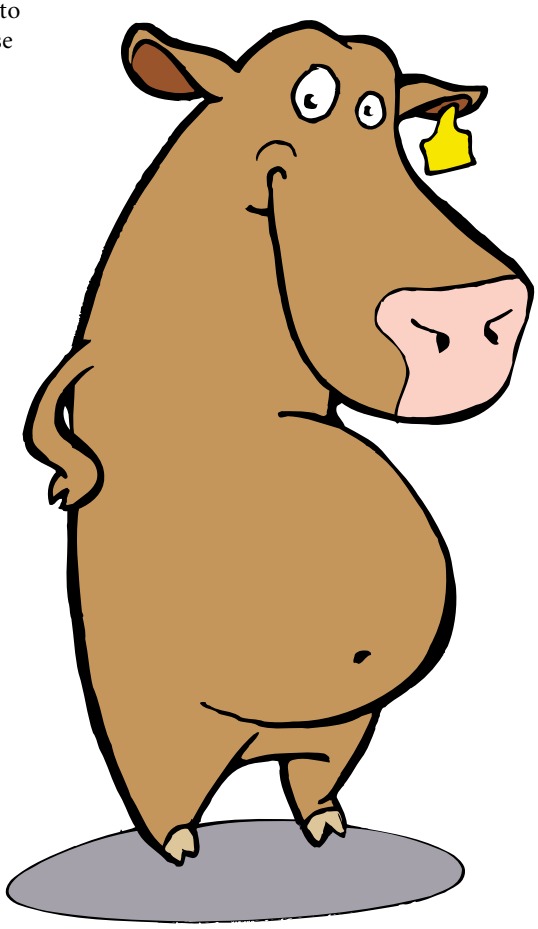
In fact, if the last National Beef Quality Audit (NBQA) is any indication, better than half the fed cattle are coming up light in the muscle department.

Wulf analyzed data from the audits conducted in 1991, 1995 and 2000 and found that cattle in the most recent audit are losing muscle compared to cattle in the previous ones.

The carcasses in the NBQA were randomly selected at 30 packing plants to represent the U.S. cattle population. When you remove the dairy carcasses, there were 8,749 beef carcasses represented in the 2000 NBQA. Of these carcasses, 39% were below typical ribeye size, whereas only 34% of the carcasses had ribeyes that were larger than typical.

"Typical" is the normal ribeye size at a given carcass weight within the USDA Yield Grade (YG) equation. Larger ribeyes than typical lower yield grade (make it better), while smaller ribeyes drive up yield grade (make it worse).

Annual USDA data points to declining muscularity as well. Yield grades of carcasses inspected by USDA graders have gotten worse, going from 57.5% YG 1-2 in 2000 to 52.7% last year. Since the last NBQA was performed, annual percentage of discount-heavy YG 4 carcasses increased from 2.0% to 5.1% last year. Keep in mind, most YG 4 carcasses go unreported because packers often choose not to yield grade them.



It's not like these cattle were losing muscle at the expense of increased marbling, either. During the same period of time, average USDA Choice quality grades have held even, despite so much chatter about it in the industry. Arguably, it takes at least five years for a selection decision in the seedstock pasture to get to the packing plant. It's possible that an increase in fed cattle marbling is on the horizon if seedstock producers have been selecting hard for the trait during the past few years, which seems to be the case.

Understand the basics

Keep in mind that dressing percent (carcass yield) is simply the ratio of hot-dressed carcass weight to live weight. Meanwhile, cutability is equivalent to the percentage of boneless, closely trimmed retail cuts within the carcass. So, at a given carcass weight, you can increase dressing percentage with fat, but cutability – what USDA Yield Grade

estimates – only increases with added muscle, relative to the fat.

Moreover, Wulf emphasizes, "Muscle determines cutability because it determines how fat the cattle will be at a given weight. Some people think fatness and YG 4s are solely marketing issues. They don't understand the huge impact muscle has in determining how fat they're going to be."


Duane Wulf

This reality speaks to a growing paradox. Growth potential is correlated to increased cutability because fat is deposited later in cattle with more growth. Thus, you have the rule of thumb that later maturing Continental breeds have more muscle than their earlier maturing English breed counterparts. With the improved genetics for pre-weaning and yearling growth seen in the most heavily used English breeds over the past decade, you would think that industry cutability should be increasing, but it's not.

"It's not that English breeds have more genetics for fat," Wulf explains, "It's that they have fewer genetics for muscle." He reckons the increased growth potential in these breeds is being expressed in increased frame size rather than increased muscle mass.

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Genetics, management are key

No one can lay the blame of declined cutability solely at the threshold of genetics. After all, even lighter-muscled cattle can achieve more lean mass at a given weight if they're fed slower and longer. That shouldn't be confused with feeding cattle to heavier weights and higher degrees of fat, which only impacts dressing percent, as mentioned earlier.

But Wulf points out, "The economics in the feedlot – the breakevens – drive you to push them all the way, and that's not the way to grow muscle." Incidentally, muscle is also correlated to feed efficiency, which translates into lower cost of gain.

Fact is, genetics rule muscle. Muscle is among the most heritable traits, and isn't influenced much by heterosis. Marbling is highly heritable, too, but not to the same degree as muscle.

"If you have a constant genetic source, the only thing that will deter-

mine cutabilty is when you send them to town," Wulf says. Market genetically diverse cattle at the same fat endpoint, though, and muscle will determine the cutability.

How much muscle is too much or too little?

In order to produce a low percentage of YG 4 steer carcasses, ribeyes need to average 14.1 sq. in. (basis 775-lb. carcass). In order to produce such a carcass using black baldy cows, as an example, considering that average genetics in this crossbred produces a ribeye size of 12.3 sq. in., [Meat Animal Research Center (MARC) data – Table 1], Wulf explains you need to use a bull on these cows that has a yearling ultrasound scan of at least 15.9 sq. in. He points out yearling bull ribeye size is comparable to that of market-ready steers.

Of course, this means seedstock suppliers would have to use sires even more muscular to build such bulls for their commercial customers. That means even the most muscled common breeds have some work to do. For instance, using MARC across-breed expected progeny difference (EPD) analysis, Wulf points out only 38% of Limousin sires in that breed's genetic evaluation have stout enough EPDs for ribeye to build these kinds of bulls; only 3% in the Angus breed (Table 2).

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>
> **– Duane Wulf**

Lost opportunities

"Even in this quality-driven market, with a small premium for YG 1s and 2s, cutability has a huge impact on carcass value. If the value of cutability increases in the future as many expect, muscle will become even more important, especially if the industry continues to lose muscle," Wulf explains.

Indeed, using USDA-reported average grid prices for the end of November with the 2000 NBQA data, Wulf found carcasses with above-average cutability had more value on average than even the highest marbling ones.

At the time, with a Choice-Select spread of $6/cwt., carcasses with a larger ribeye than what is considered typical for the weight in the USDA YG equation returned $126-$127/cwt. carcass value, compared to $118-$125/cwt. for carcasses with smaller than typical ribeye size.

That was true despite the fact that a substantially higher percentage of the lighter-muscled cattle graded Choice or higher (Table 3). Keep in mind, much of the economic advantage for the heavier-muscled carcasses came with the fact they produced substantially fewer YG 4 carcasses than their lighter-muscled counterparts.

Aside from the lost economic potential that individual producers incur with less than typical muscling, Wulf points out declining cutability makes it more difficult for beef to compete with other protein sources.

"We're giving up production efficiency," Wulf says. "Muscle is our product. If we're producing less muscle per pound of animal, we're not as efficient."

Table 1. Breed differences in ribeye (RE) area

Breed	Avg. RE at 776-lb. carcass (sq. in.)	Range in sires (sq. in.)
Angus/Hereford	12.3	9.3-15.3
Simmental	13.5	10.5-16.5
Gelbvieh	13.5	10.6-16.5
Charolais	14.2	11.2-17.2
Limousin	14.8	11.8-17.8

Source: Duane Wulf, South Dakota State Univerity; based on data from USDA Meat Animal Research Center

Table 2. Breed differences in ribeye (RE) EPD

Breed	RE EPD for 15.3-sq.-in. ribeye	Sires qualifying*
Hereford	+0.51	<1%
Angus	+0.53	3%
Simmental	+0.2	9%
Gelbvieh	+0.27	2%
Charolais	+0.23	28%
Limousin	+0.16	38%

**Based on MARC Across-breed EPD analysis*
Source: Duane Wulf, South Dakota State University

Table 3. Economic effect of ribeye size

Ribeye (+/- from USDA typical, sq. in.)	Ribeye area (sq. in.)	Cattle*	Yield Grade 4	Choice Grade	Standard Grade	Grid value ($/cwt.)
+3	16.5	5%	0%	25%	15%	$126
+2	15.0	9%	2%	34%	9%	$126
+1	13.9	20%	4%	45%	6%	$127
0-USDA-Typical	13.1	26%	7%	52%	5%	$126
-1	12.4	25%	17%	56%	5%	$125
-2	11.8	11%	32%	61%	3%	$122
-3	11.2	3%	54%	62%	4%	$118

**Percentage of 8,749 cattle in 2000 National Beef Quality Audit Analysis Source: Duane Wulf, South Dakota State University*