By the Numbers

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Angus *Curvebenders plus Carcass* sires

They're back, still bending the growth curve and doing much more.

Not a new philosophy

The term "curvebender" was coined more than two decades ago. Cattle that were light at birth, grew rapidly to a year of age, then matured at a below-average size were called curvebenders. They bent the biological growth curve at both ends.

Producers liked these cattle, for obvious reasons:

1. Lighter birth weights meant fewer calving problems;
2. Faster growth provided more saleable pounds at weaning and yearling; and
3. Moderate mature sizes helped keep feed expenses in check.

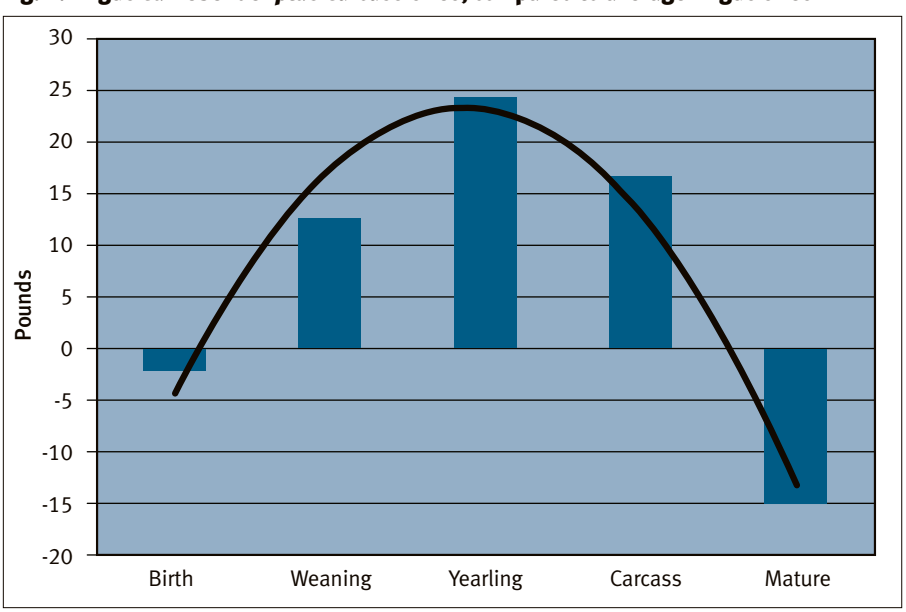
Curvebender was a favored label when applied to a young breeding bull or artificial insemination (AI) sire, conveying a genetic package that created less hassle and the potential for improved financial returns.

Today, the curvebender name has all but disappeared from beef industry vocabulary. It became a victim of its own success. There are a relative abundance of Angus bulls that provide favorable calving ease, strong growth and reasonable mature sizes. Curvebenders are so common that they are much less unique than a couple decades ago, so the word is seldom even mentioned.

Note the sizable advantage these sires have in weaned calf value ($W). Calving ease, growth and maternal traits all contribute to $W, and the *Curvebender plus Carcass* sires stand strong when the full package of such traits are considered together.

The value of curvebender principles, however, remains unchanged. We still like calving ease. We still favor rapid growth. We like our cows to have reasonable mature sizes. Furthermore, there is another "like" that has been added to the list. With the advent of grid marketing, we like — and need — superior carcass genetics.

Fig. 1: Angus *Curvebender plus Carcass* sires, compared to average Angus sires



Combining traditional curvebender traits with carcass superiority makes for a highly desirable package. Such genetics can positively impact every segment of the beef business — from ranch to consumer, and no breed offers this combination of traits more frequently than Angus.

Coming to a semen tank near you?

To illustrate that the curvebender concept is alive and well, we identified and evaluated the expected progeny differences (EPDs) and dollar value indexes ($Values) of 50 Angus *Curvebender plus Carcass* sires currently available from U.S. semen providers. To make our list, sires were required to have:

- a calving ease direct (CED) EPD of 8 or higher (top 35% of Current Angus Sires);
- average to above weaning weight (WW) and/or yearling weight (YW) EPDs;
- average to below-average mature height (MH) and/or mature weight (MW) EPDs; and
- top 25% beef value ($B) index.

Finding sires that met these criteria was not especially difficult. We could have kept going, but 50 sires is a large enough group for our purposes here. It is clear that the major AI companies have continued to seek out such sires, likely due to their favorable marketability to both seedstock and commercial producers (more on that later).

The resulting profile of traits offered by these sires is impressive. They beat breed-average sires in a host of categories, both production-wise and financially. As shown in Table 1, better calving ease and lighter birth weights are evident. Most of the 50 *Curvebender plus Carcass* sires are suitable for heifers. Along with providing improved calving ease, progeny of these sires will push the scale further down as calves and yearlings, with WW and YW EPDs beating breed average by 13 pounds (lb.) and 25 lb., respectively.

Progeny of these sires are expected to eat slightly more feed on a daily basis. However, the net feed-to-gain ratio (feed efficiency) is advantageous because the extra weight gain offsets modestly higher feed consumption. Other potential benefits include modest stature at a year of age, improved docility

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and larger scrotal circumferences on male offspring.

We could stop there and have a good list of benefits, but there is much more. Desirable maternal traits are certainly worth highlighting (see Table 1). The *Curvebender plus Carcass* sires will make daughters with higher heifer pregnancy rates, better maternal calving ease, and milking ability at pretty much any desired level from high to low. They range from 13 to 37 for Milk EPD, with an average 3 lb. above Current Angus Sires.

In true curvebender style, daughters of our 50 selected sires will mature below breed average for weight and height. MW EPDs average 18 lb. below the average of the Current Sire group. MH EPDs are 0.2 inches (in.) shorter. With fast early growth and more moderate mature sizes, many of the heifer calves from these sires are well-suited for the replacement pen. Note the sizable advantage these sires have in weaned calf value ($W). Calving ease, growth and maternal traits all contribute to $W, and the *Curvebender plus Carcass* sires stand strong when the full package of such traits are considered together.

Table 1: Comparing *Curvebender plus Carcass* sires to average Angus sires

EPDs and $Values	*Curvebender plus Carcass*	Current Sires Avg.	Difference	Comments
CED	12	6	6	More calving ease
BW	-0.6	1.5	-2.1	Lighter birth weights
WW	64	51	13	More growth to weaning
YW	114	90	24	More postweaning growth
RADG	0.22	0.19	0.03	Slightly better feed efficiency
DMI	0.45	0.25	0.20	Higher daily feed consumption
YH	0.3	0.5	-0.2	Less height as yearlings
SC	1.02	0.78	0.24	Larger scrotal circumferences
Doc	21	12	9	Better docility
HP	11.1	9.4	1.7	Higher heifer pregnancy rates
CEM	12	9	3	Better maternal calving ease
Milk*	27	24	3	More daughters' milk
MW	13	28	-15	Less weight at maturity
MH	.1	0.3	-0.2	Less height at maturity
$EN	-15.61	-8.99	-6.62	Higher daughters' feed energy use
CW	45	29	16	Heavier carcass weights
Marb	0.82	0.44	0.38	More marbling
RE	0.77	0.41	0.36	Larger ribeyes
Fat	0.03	0.01	0.01	More fat (fleshing ability)
$W	76.30	46.58	29.72	Higher $W
$F	76.51	44.33	32.18	Higher $F
$G	40.19	28.45	11.74	Higher $G
$QG	36.42	25.47	10.95	Higher $QG
$YG	3.78	4.16	-0.38	Lower $YG
$B	149.11	102.52	46.59	Higher $B

*Milk EPDs range from 13 lb. to 37 lb. among the *Curvebender plus Carcass* sires.

Carcass excellence too

We complete our evaluation of these sires by focusing on the "plus Carcass" portion of their genetic profile. More carcass weight — yes, they bring more weight at harvest. More marbling and more muscle — yes and yes. Their marbling and ribeye area EPDs are superior, with the *Curvebender plus Carcass* bulls passing on marbling genetics more than one-third of a marbling score better (enough to tip USDA quality grade from low-Choice to *Certified Angus Beef*® qualifiers) and more premium dollars.

When we add up all of the growth and carcass advantages, as expected, these bulls have significantly higher $B values vs. breed average. Their combination of pounds and quality is difficult to beat, both inside and certainly outside the breed. They will produce progeny with significant advantages in the feedlot and packing plant. The only potential negative carcass-wise is that these sires are higher than breed average for fat EPD. That may be beneficial on the range (easier-fleshing daughters), but it will need to be managed a bit more carefully among their progeny fed for harvest.

Overall, what we see with these *Curvebender plus Carcass* sires are an abundance of positives and very few negatives. They won't all fit phenotypically with what an individual breeder is looking for, but with 50 sires on the list, there is a good chance most producers find what they are looking for appearance- and functionality-wise, too. Pedigrees are important, as well, and though there is some commonality with some of the sires, numerous bloodlines are represented across the entire list.

Progeny of these sires are expected to eat slightly more feed on a daily basis. However, the net feed-to-gain ratio (feed efficiency) is advantageous because the extra weight gain offsets modestly higher feed consumption.

Final observations

Evaluating these 50 sires is enlightening in several respects. We need to recognize and thank U.S. beef AI companies for offering genetics of this caliber to Angus breeders and the cow-calf industry as a whole (and to progressive Angus breeders for raising them). Their work and investment is invaluable to the advancement of the Angus breed, and also to the many commercial producers who put Angus semen in their heifers and cows, and then clean up with a registered-Angus bull.

It is interesting that a significant portion of the sires identified for this analysis originated on small and mid-size Angus farms and

ranches across a wide range of geographies. This suggests the AI companies are scouring the country to bring the best to the industry, regardless of breeder size or location.

Now some key points

1. We've seen that the *Curvebender plus Carcass* sires excel breed average in a broad range of traits and economic values. This is especially impressive when you consider that the average Angus bull is by no means a weak benchmark for comparison. Thanks to the willingness of Angus breeders to remain focused on genetic needs of the beef industry and to adopt genetic improvement technologies, the "average" Angus keeps getting better and better virtually every year. An average bull today stands well above the package of traits offered by the average bull 10-15 years ago.

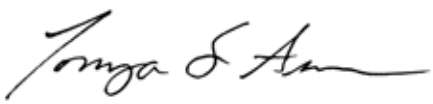
2. There is no need for maternal vs. terminal; the *Curvebender plus Carcass* sires offer both. Calving ease, strong growth, moderate mature sizes and beneficial maternal traits in a single genetic package make it unnecessary to choose between maternal traits and terminal/beef traits. It is possible to put both together in a win-win manner.

Marbling and ribeye area EPDs are superior, with the Curvebender plus Carcass bulls passing on marbling genetics more than one-third of a marbling score better (enough to tip USDA quality grade from low-Choice to *Certified Angus Beef*® qualifiers) and more premium dollars.

3. These genetics are available to almost everyone. Seedstock breeders and commercial operations using AI have direct access to any and all of these bulls. Other producers can purchase sons (which are plentiful) to use as walking bulls in their herds.

4. Loosen the sort criteria we used to select these 50 sires, and the list gets bigger rapidly, with many more bulls that also offer great packages of traits. For example, maybe top 50% calving ease is acceptable in a certain herd. Boom! The list of qualifying bulls would expand significantly. Or maybe breed-average mature size and weight is considered okay in a particular environment, but the rest of the criteria should remain fixed. Again, many more sires could be found that fit the bill.

In the end, this evaluation is not just about the 50 sires that made our list, even as genetically powerful as they may be. The real message is how well the Angus breed is collectively answering the needs of its breeders and simultaneously making improvements that benefit all segments of the beef industry. The seedstock industry exists as a business to meet the needs of commercial cattlemen, and it's clear that performance-minded Angus breeders have learned this lesson well. The *Curvebender plus Carcass* sires do a great job making that fact readily observable. There are many, many more bulls only inches behind them.



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