

THE DIGESTIVE TRACT

What is ideal?

by Dan Shike, University of Illinois



What is an ideal cow? What metrics do we use to determine the ideal cow?

Typically, beef producers have focused on output traits that can be measured to determine which cows are the “best.” The easiest of these traits to “see” and to measure is size. We can weigh calves at birth and weaning, and we sell them by the pound.

Packer premiums and discounts for quality and yield have clearly driven beef producers to also focus selection pressure on carcass traits. Consequently, genetic progress in growth and carcass merit, especially in Angus cattle, has been quite impressive.

Some would argue that Angus cattle of today are nearly a different breed of cattle than they were just 25 years ago.

There is no question that modern genetics offer more revenue-generating potential today than ever before. These cattle are reaching heavier weights at slaughter and doing it at a younger age with more quality and marbling than ever before.

Have we selected for a more “ideal” cow?

In the October 1995 *Angus Journal*, the late Harlan Ritchie wrote a column, “The Search for the Elusive Optimum Cow.” In the opening paragraph Dr. Ritchie stated, “The optimum beef cow is indeed an elusive beast. I have searched for

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her for more than 20 years, and have come up empty-handed. But I believe I’m getting close.”

Fast-forward 25 years ... Have we found the optimum beef cow?

Consider inputs

As a nutritionist, it is impossible to have the discussion of an ideal cow without significant focus on efficiency. In an industry that has focused on outputs, consideration has to be given to the input side of the equation. What is the cost of

maintaining this high-output cow we have selected for?

The industry has wrestled with defining cow efficiency for decades. An often-accepted definition is pounds of calf weaned per cow exposed per unit of feed energy consumed. This accounts for inputs (cow feed intake), reproduction (cow has to be pregnant), milk production (influences calf growth prior to weaning), and growth (weaning weight).

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The only big thing this is missing is longevity. We don't just want a cow to wean off a big calf and breed back one time; we want her to do it until she is 10.

Honestly though, the biggest challenge with defining the efficient cow is the inability to measure cow intake, especially grazing intake, at the producer level. Consequently, many have selected for certain phenotypes that are believed to represent an "efficient" cow.

Breed types

I have discussed in previous columns the value of matching cows to their environment. Research from the U.S. Meat Animal Research Center (USMARC) was reported in 1984 identifying differences in maintenance requirements among breed types. Low-output breeds (Angus) were identified as requiring fewer inputs (low-maintenance). High-output breeds (Simmental) were identified as requiring greater inputs (high-maintenance).

There are a few key things to keep in mind about this. First, low-maintenance does not necessarily mean more efficient. How many times have you heard or said that a smaller-framed, easy-fleshing cow was efficient?

I struggle with the concept that small and fat is efficient when we are in an industry that is selling pounds. In fact, the same researchers who reported maintenance requirement differences between breeds in 1984 (Thomas Jenkins and Calvin Ferrell), later reported in 1994 that there were breed differences in cow efficiency that were resource-dependent. In a limited-resource environment, the low-maintenance breeds — Angus and Red Poll — were the most efficient. However, in an abundant resource environment, the high-maintenance breeds — Simmental and Charolais — were the most efficient. Essentially, when feed is limited, low-maintenance



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cattle have greater ability to breed back. When feed resources are abundant, high-maintenance cattle have greater genetic potential for milk and growth.

How about today?

I want to draw your attention back to earlier in my column where I said some would argue that Angus cattle of today are nearly a different breed of cattle than they were 25 years ago. How applicable are the findings of these breed differences of 25 years ago? There is no doubt in my mind that the concept still applies.

Low-output/low-maintenance cows will be more efficient in a limited-feed environment, and high-output/high-maintenance cows will be more efficient in an abundant resource environment. However, it would be hard to argue that Angus genetics of today are low-output.

With the selection pressure and genetic improvement for growth and carcass merit that has been observed, Angus genetics rival the Continental cattle in many

aspects. Thus, it is likely that the maintenance requirements have trended up as well.

Tools to assess efficiency

One thing hopefully we could all agree on is that, regardless of our environment and "ideal" cow size and type, we all want the most efficient cow. The challenge is with such minimal ability to measure intake on a broad scale, we are limited on tools available to improve efficiency.

I am a strong believer in the value of visual appraisal and phenotypic selection. I have spent the last 20 years teaching visual appraisal and have had the opportunity to evaluate several cattle shows. I have also spent the last 10 years measuring feed intake in replacement heifers and cows. However, you will have a hard time convincing me you can look at a cow and tell me if she is efficient.

Now, just because I don't think every moderate-framed, deep-bodied, easy-fleshing cow is efficient, I definitely am not saying that a big-frame, shallow, hard-doing cow is efficient. What

I am saying is that to truly define efficiency, you have to know intake.

Our data at the University of Illinois show that there is considerable variation in intake. Not all "small" cows eat less than the "big" cows. Within groups of cows that are very similar in size and have similar calf weaning weights, we have observed a 50% difference in intake. Unfortunately, I could not have predicted which ones were which by looking at them.

I firmly believe one of the greatest opportunities we have in the beef industry is identifying which cows truly are more efficient and can provide the growth and carcass merit we desire, but do it on fewer inputs and resources.

I must agree with Dr. Ritchie that the optimum or ideal cow is indeed an elusive beast. I believe we continue to get closer, but I am not convinced we have found her yet. |

Editor's note: "The Digestive Tract" is a regular column in the *Angus Beef Bulletin* focused on nutrition for the beef cattle life cycle. Dan Shike is associate professor in animal sciences at the University of Illinois.