

More with Less

Do feed intake EPDs work for cows?

by *David Lalman, Ph.D., and Sam Talley*

Substantial progress has been made in understanding the sources of variation and genetic components of feed efficiency in growing animals consuming energy-dense mixed diets during the post-weaning phase. Much less is known about the within-animal variation of feed efficiency of beef cows consuming moderate- to low-quality forage diets common in cow-calf production systems. The cow herd uses about 74% of the feed energy required to produce one pound of carcass weight. Therefore, improving forage use efficiency could substantially reduce the cost of production and the carbon footprint.

At the same time, aggressive selection for growth and carcass weight in nearly every breed has resulted in a) increased mature cow size and b) increased feed intake over time. For perspective, federally inspected steer carcass weights are increasing by about 6 pounds per year while cull cow live weights are increasing at around 7 pounds per year. More beef produced per cow and improved post-weaning feed

efficiency represent progress in our industry. But, larger cows requiring more high-quality feed will be more susceptible to reproductive failure, drought and falling out in extensive or “tough” environments.

“DMI EPD directly may be a more direct path to producing females with exceptional fertility and production traits while reducing or holding feed intake in check.”

— David Lalman,
Oklahoma State University

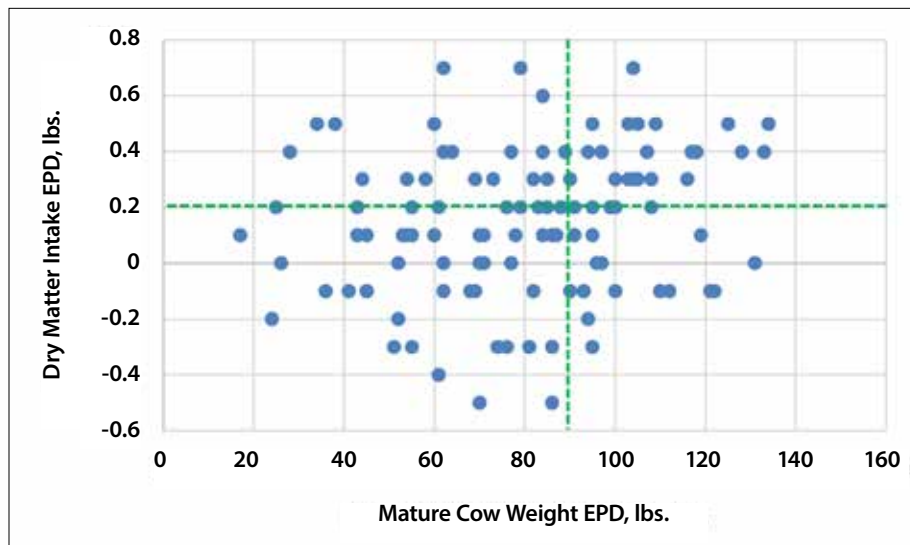
Using the tools at hand

Currently, we do not have a selection tool designed specifically to rank sires or cows for moderate- to low-quality forage intake. Can the American Hereford Association’s (AHA) Dry Matter Intake expected progeny difference (DMI EPD) be used to control the genetic capacity for feed intake in a mature cow?

According to a recent USDA Meat Animal Research Center (MARC) study, the answer is “yes.” In this study (Freetly et al., 2020) the scientists set out to determine the genetic correlation for feed intake during the heifer development stage, and then tested the same animals for feed intake at 5 years old. A similar diet was fed at both stages of production — corn silage, chopped alfalfa hay and supplement. Over the multi-

year experiment, 622 animals were phenotyped at both stages of production. The genetic correlation for feed intake was 0.84, suggesting that minimal reranking should occur between heifers and cows when provided a similar diet at both stages. Granted, it would be nice to know if the same results could be achieved by feeding moderate-quality, unprocessed forage at both stages of production. We have an ongoing project at Oklahoma State University with that objective in mind. Nevertheless, the MARC results are encouraging and suggest that DMI EPDs, already available, could be used to identify cows that are more efficient.

Figure 1: The relationship of DMI EPD to MCW EPD in 116 Hereford sires with > 0.5 accuracy for DMI EPD. The dashed green lines represent breed average for each of the traits.



With those results in mind, we screened AHA's database for sires proven for DMI EPD and Mature Cow Weight (MCW) EPD (accuracy > 0.5). The search returned 116 sires (Figure 1). There was a weak positive relationship between the two traits. In other words, as one would expect, increased genetic capacity for mature cow weight was associated with increased genetic capacity for feed intake.

Importantly, notice there are numerous proven sires that produce females with below breed average mature cow weight, but above breed average feed intake. At the opposite end of the spectrum there are a few sires that produce larger females with average to below breed-average feed intake genetics. The take-home message is that MCW EPD alone is likely not as effective as using the DMI EPD directly to control or manipulate herd average feed intake and efficiency over time.

In summary, we submit that using DMI EPD directly may be a more direct path to producing females with exceptional fertility and production traits while reducing or holding feed intake in check. Conceptually, this approach should allow increased, or at least stable, stocking rate over time without increasing grazing pressure on a given land base. Moderate



"The cow herd uses about 74% of the feed energy required to produce one pound of carcass weight," explains David Lalman, Oklahoma State University.

forage requirements should also better equip cow herds to deal with extensive production systems and (or) increasing frequency and intensity of drought conditions. **BA**

Editor's note: David Lalman, Ph.D. is a professor and Harrington Endowed Chair at Oklahoma State University (OSU). Sam Talley is an OSU graduate research assistant studying beef cattle feed efficiency.