



Proving Efficiency

Measuring residual feed intake allows producers to select for more efficient animals.

by Sara Gugelmeyer

It's a simple concept. If an animal eats less and gains more in a production setting, it's a superior animal. That, in essence, is what the RFI (residual feed intake) value measures. And, what more and more beef cattle producers are discovering is that an animal that is more efficient, or has a "good" RFI value, benefits everyone in the production chain.

For example, a more efficient cow helps the cow-calf guy by weaning a more efficient, bigger calf on less feed. The more efficient calf eats less and gains more all the way to the packinghouse, making more money for the stocker, backgrounder and feeder, which

in some cases is all the same person. Now, wouldn't it be smart to be that person?

That's what cattlemen like Alex Mih and Tom Krauss think, anyway.

Testing for efficiency

Alex Mih is the co-owner of MM Ranch, Chanute, Kan., and has been collecting RFI data on some of his calves since 2005. "The data itself allows us to select individual animals who are very efficient without necessarily selecting for excessive mature cow size," Mih explains.

The MM Ranch herd consists of about 1,200 cows and started testing bulls for RFI in 2005, then added heifers to the test in 2006.

Mih now has data on more than 700 females and 100 bulls and even bought a GrowSafe system so he could test calves himself.

Tom Krauss, Russell, Kan., runs about 150 cows, part of which are registered Herefords. He sells registered Hereford bulls and females as well as commercial females. He's tested about 50 head a year for the last three years for RFI data because efficiency is important to him and his customers. "The whole reason we started doing RFI is because feed efficiency and cost of gain is a prime driver on feeding cattle and cow maintenance costs," Krauss says.

Although Krauss tests most of his cattle at the University of Wyoming facility near Lingle, many other bull tests offer RFI testing as well.

The privately owned Green Springs Bull Test, Nevada, Mo., was the first bull test to use the GrowSafe technology back in 2005. According to Kent Abele, owner and manager, demand for RFI testing has increased, and the facility has doubled its capacity to accommodate. Green Springs can now test up to 260 head at a time and usually tests about 1,000 head a year.

"Breeders want this data because they realize that about 65% of the variable costs in their operation is feed cost," Abele says. "Efficiency is the one area that we can genetically make the biggest gains in regard to the bottom line."

Not a single trait selection tool

Although it's tempting to simply select for the most efficient

cattle or cull the least efficient, it's important to not use RFI as a single trait selection tool. "We need to find the cattle that do several things well," Abele says. "Not all efficient cattle grow well or have good carcass data. We need to find cattle that move several traits in the right direction."

Mih says, "RFI complements everything else we measure. If we have a bull that is good on birth weight, carcass and rate of gain, among others, and also has a highly negative residual feed intake, indicating a very efficient animal, that is highly desirable, so we want to multiply that animal. To us it's valuable because it allows us to add input in addition to all the other criteria we think are important in breeding stock."

Krauss also says not to get too focused on the actual RFI value but to consider the measurements that are used to calculate that number. "I don't get too hung up on the RFI number itself. I think what is important is the gain and intake and conversion data that ultimately means cost of gain."

Because the technology to test for RFI is relatively new, Mih and Krauss base their progress on somewhat limited data, but both agree selecting for efficient cattle has helped their operations. The heritability of efficiency is about the same as carcass traits, which is defined as moderate or about a .39 to .45.

Krauss says he culls anything that falls out of a desirable range for efficiency. "I cull anything that totally falls out of bed in terms of RFI data," he says. "Replacement



Testing for feed efficiency is the only way to determine an animal's efficiency, it can't be identified by physical traits.

heifers that don't gain but intake is through the roof have to go. Also anything that really gained but was abysmally inefficient about it gets culled."

With bull prospects, Krauss uses the data as more of a selection tool. "We look for a bull that is above average for that calf crop as far as gain and efficiency, carcass and birth weight and growth and their momma's cow record for production."

Making a difference

Mih and Krauss have only had one or two calf crops of progeny from measured high efficiency females and bulls. However, by simply eliminating very inefficient bulls and females, change can be seen.

"What I've seen is if we breed a bull that gains more on less to a heifer that's the same way, that calf is not necessarily always going to come to the top of the bunch, but he will likely be within an acceptable range. We are seeing a higher proportion of calves that are more efficient. We are eliminating the variance."

RFI value, at least in Krauss' operation, has proven to correlate to a more efficient cow. He prefers a cow with moderate milk for his environment and management style. If there are two cows in his herd, both with moderate milk and weaning ratios over 100, he says the cow with the better (more negative) RFI value will be in a better body condition at weaning.

"Within a given level of milk on a set of cows, the cows with better BCS at weaning with also have a better RFI," Krauss explains. "But if a heifer has a 30 milk, you can throw it all out the window. It doesn't matter how good her RFI number is; she will

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milk herself out of pregnancy in my program."

Where's the value?

But, these two cattlemen are seedstock producers, so are buyers also looking for a proven efficient animal? The problem is many people still don't understand RFI values, Mih and Krauss say.

"Right now the topic is new and some of our customers are interested in it," Mih says. "There is maybe some confusion about it and it's not known by everyone."

Krauss has now offered RFI data on three bull crops for sale and admits most of his bull customers retain ownership of their calves and the majority considers RFI when purchasing. "They were somewhat hesitant, but customers that bought RFI-tested bulls and are now getting

progeny in the feedyard are looking at it harder because they are seeing some correlation there. It's definitely selling some bulls."

A proven efficient bull can also make a difference for a cattleman looking to improve the efficiency of his cow herd if he raises his own replacements. "A few of my customers are looking to go toward more of a grass and cake scenario and chop a bunch of winter feed out of their cows," Krauss explains. "They have really grabbed on to the RFI data because they know the newest genetics coming in and their progeny will be able to handle (less feed) better. Guys that are downsizing their cows (in terms of mature cow size) and making cows do more on less in the winter know that efficient genetics should prevail in that kind of environment."

RFI, like any new technology, has adversaries. It's been proven that there may be no physical difference between an animal with a highly negative "good" RFI value and an animal with a highly positive "bad" RFI value. For some more traditional buyers who like to make decisions based on appearance rather than paper, RFI is a tricky concept to trust.

Mih says some have come to him with a question about the poor doer — the animal that doesn't eat much but doesn't gain much either. They ask, "Could he have a 'good' RFI value?" Mih says he explains to them that poor doers are already easily identified by poor growth and carcass and physical characteristics. That's all the more reason to remember that seedstock producers and commercial cattlemen should not base decisions on a single trait. It's important to see the big picture. **HW**

Understanding RFI

Residual feed intake, or RFI as it is commonly called, is the difference between actual feed intake and predicted feed intake based on the requirements for production and maintenance of body weight. The predicted feed intake is calculated by considering the feed intake, average body weight and average daily gain of all the calves in the group.

University of Missouri animal scientist Monty Kerley has focused his research on cattle efficiency. He explains, "We'll take a group of animals (any size), and we feed them all together. And we measure individual feed intake; then we regress the intakes of the calves on their average body weight and average daily gain. This gives us a regression line; from that we have coefficients for body weight and average daily gain. Then we take each animal's body weight and average daily gain and plug that into the equation with those coefficients and then that solves for the expected intake of that calf. That intake is an estimate of what the average intake of that group of calves would have been for that particular body weight and average daily gain. Then you take actual intake of the calf and subtract from it that expected intake value to get an actual RFI value."

RFI is sometimes referred to as net feed intake because it is the difference of the two numbers. A highly efficient

animal will consume less than predicted, resulting in a negative value. The more negative the value the more efficient the animal. If the number is positive, it would indicate an inefficient animal, meaning the animal consumed more than predicted.

The problem with using the RFI value as a selection tool is that animals from two different test groups cannot be fairly compared based only on the final RFI value. It is more fair to simply identify the animals as being in the top, middle or bottom third of their test groups, Kerley explains. For example, if two bulls are being compared from two different test groups and if one bull is in the top third of his group and the other is in the bottom third, the first bull is more likely to be more efficient. However, this method is flawed as well, because, overall, one group may be more efficient than the other group, skewing the average when compared to the general population of cattle.

The bottom line is actual RFI values can only be fairly compared within test groups, and an index or EPD (expected progeny difference) is needed to fairly compare cattle from different tests. Most breeds are working toward such an index or EPD now. **HW**

The Association's perspective on RFI

American Hereford Association (AHA) staff members realize the importance of feed efficiency and finding a way to make it a more provable and, therefore, more easily marketable trait. AHA Chief Operating Officer and Director of Breed Improvement Jack Ward points out that the AHA already has a sizeable amount of feed intake data collected, as well as data compiled that breeders have collected and submitted.

In fact, about 200 head of Herefords came off feed efficiency test at Olsen's Ranch, Harrisburg, Neb., Oct. 1. The AHA has a partnership with Olsen's to collect data on cattle using the new GrowSafe system just installed there.

Although animal scientists are working hard on developing a measurement, like an EPD (expected progeny difference), to fairly and accurately compare cattle for feed efficiency, the science is still in progress. "It's up to the scientists to evaluate what way is the best to use feed efficiency," Ward says. "But we do realize that we need to collect data on feed intake and gain, and how the scientists will use that data we're not sure yet. But we will definitely be utilizing it for not only a measurable trait but possibly in the area of genomics as well."

Ward expects a DNA marker for efficiency will eventually be discovered, which will be of great use to cattlemen. "I think that's where DNA markers are going to have a lot of value, because obviously feed intake is an expensive and hard-to-measure trait. So if there's some way we can use DNA markers to make progress, that's where they are going to have their useful place in our industry."

At this point it's hard to speculate on when an EPD, index or DNA marker will be developed that incorporates feed efficiency, but Ward says it is something the AHA Board and staff are and will continue emphasizing.

For now, it's important for Hereford breeders to collect as much feed efficiency data with DNA data as possible and submit it to the AHA. "We aren't using it in the genetic evaluation today," Ward says, "but we are compiling it for future use. If breeders have a set of cattle that are on test in GrowSafe or feed efficiency testing bunks, they should not only collect the data but it's also very important to collect DNA on the cattle being tested, preferably blood. Also, just like every other trait, keeping contemporary groups accurate and making those groups as big as you can is important." **HW**