In Search of Efficiency

Research balances inputs, outputs with goal of developing genetic predictors of cow efficiency.

by KATIE ALLEN, Angus Foundation

Devastating storms and tornadoes, extreme flooding, record droughts. Across the United States, we saw it all in 2011. The unusual weather patterns have been cause for concern to many Angus breeders, who have faced significant hardships on their farms and ranches. Forage has been scarce this winter, reinforcing the desire — the need — for easy-keeping cows that can make the most of the feed resources available.

Researchers at North Carolina State University (NCSU) and the University of Illinois (U of I) are working on just that. Starting in 2011, the Angus Foundation provided these universities with a $350,000, multiyear investment to research Angus beef cow biological efficiency. This project is a continuation of research already funded by the Angus Foundation and American Angus Association to estimating feed efficiency in Angus cattle at both universities. Both NCSU and the U of I have purebred Angus herds and use similar sires, so it made sense to collaborate and share data.

“It doesn’t make sense not to work together,” says Joe Cassady, associate professor of animal science at NCSU. “Instead of small data sets from each university, we can get better answers based on a combination data set, which really helps the American Angus Association.”

Start with the basics

Feed efficiency is trying to get more profit out of the same set of resources while facing higher production cost. Prior research in feed efficiency has been heavily focused on terminal cattle rather than the lactating female. Efficiency of feedlot cattle is important, and it is much easier for researchers to collect data on these cattle, compared to collecting feed efficiency data on females in the herd. As Cassady explains, when feeders are buying corn, there is an immediate reaction to reduce the amount of corn to make more profit. Most cow-calf producers are not writing checks for semi-loads of corn.

“As soon as they have to start buying (continued on page 2)
In Search of Efficiency (from cover)

In search of efficiency, the three measures that determine nutrient residual gain predictors all take into account, in some form, the measures that determine nutrient utilization in cows: feed intake, average daily gain (ADG) and body weight or body composition. But, there is still not a clear-cut way to select females for efficiency.

Working through the challenges

Although researchers have attempted to determine efficiency and nutrient utilization in cows, there are many challenges to overcome.

“There is no genetic information [available] today,” Cassady says. “We need to not only understand the potential.”

Additionally, it is hard to determine efficiency when we don’t know what the cows are eating.

“When you put cows in a pasture, they don’t all eat the same thing. They select the clover or timothy, whatever is available,” Cassady says. “We need to not only understand their feed intake, we need to also understand the forages they are selecting.”

Look at potential relationships

The current collaborative study seeks to assess efficiency on two fronts: postweaning and as a brood cow. In the postweaning assessment, measures of growth, feed intake, feed efficiency, ultrasound backfat and ultrasound ribeye area are collected on developing heifers. Postweaning efficiency is important, Shike explains, because that is when most replacement selection is done.

For the brood cow performance assessment, data on cow milk production, based on the growth performance of their calves, and dry-matter intake are collected from first lactation up until cows are 5 years old.

“Our goal is to develop methods that will allow producers to identify the females who will become the most efficient cows and the sires whose daughters will become the most efficient cows,” Cassady says. “At this time, little is known about the relationship between heifer performance during the postweaning developmental period and her performance as a brood cow.”

Geneticists will also be involved in the evaluation of efficiency to hopefully find genomic indicators or tests to aid in selection.

“I hope, when we’re done, we will come up with information producers need to select for efficiency without having to impact the other traits,” Parrett says.

Finding that information will likely take some time based on the amount of data collection needed, and the Angus Foundation has funded the project for five years.

“On the feedlot side, researchers are able to generate a lot of data,” Shike says. “When you’re talking about retaining replacements and taking data on cows up to 5 years of age, it takes a lot of time.”

Despite the challenges, studying brood cow efficiency and the potential relationships between postweaning and lactating cow performance has merit that Cassady, Shike, Parrett and other researchers at the two universities have recognized. They know the need to have efficient cows will never go away.

While recent weather conditions and feed prices have heightened producers’ concerns regarding feed utilization, the challenges have not changed,” Cassady says. “Producers need to identify females that will utilize resources efficiently.”

Editor’s Note: The research project is one of many supported by the Angus Foundation, a 501(c)(3) not-for-profit affiliate of the American Angus Association that secures and stewards charitable gifts to cultivate and foster the advancement of education, youth and research activities benefiting the Angus breed. For more information about the Angus Foundation visit www.angusfoundation.org.

What we can apply today

◆ Choosing the right sire is critical, because your sire(s) contributes half of the genetics of your future calf crop. But, breeders also need replacement females that will improve herd efficiency.

◆ Maintenance costs and body weight are related. The increase in cow size must be accompanied with an increase in calf performance to maintain efficiency.

◆ The Cow Energy Value (EN) can be used to help reduce herd inputs. The American Angus Association’s EN, expressed in dollars saved per cow per year, assesses differences in cow energy requirements in daughters of one sire compared to another. A larger value is more favorable when comparing two animals (more dollars saved on feed energy expenses). Components for computing the EN savings difference include lactation energy requirements and energy costs associated with differences in mature cow size.

◆ Research at North Carolina State University (NCSU) has found that calmer heifers have lower feed intake but similar average daily gain (ADG) compared to more excitable heifers. Therefore, calmer heifers have a better feed conversion ratio, so selecting for more docile cattle can help improve herd efficiency.

◆ Another finding at NCSU is that feed intake can be determined for total lactation (112 days) in a 42-day window. This finding has allowed NCSU to analyze feed intake data on more cows during calving season.

Follow us on

http://twitter.com/ABBeditor

Angus Productions Inc. Board of Directors
Chairman – Phil Trowbridge
Vice chairman – Bryce Schumann
President – Terry Cotton
Secretary/Treasurer – Richard Wilson
Directors – Charlie Boyd II, Vaughn Meyer, Jim Rentz, Chris Sankey, Darrell Silveira; and Gordon Stucky

Produced and published five times per year by Angus Productions Inc. in cooperation with the American Angus Association and Certified Angus Beef LLC.

3201 Frederick Ave. • Saint Joseph, MO 64506-2997
phone: 816-383-5200 • fax: 816-233-6575
office hours: (M-F) 8 a.m.-4:30 p.m. (Central time)
web site: www.angusbeefbulletin.com
Staff listed by name, phone extension and e-mail prefix. All direct phone numbers are “816-383-5…”; all e-mail addresses are “...@angusjournal.com”

General manager – Terry Cotton, 214, tcotton

Editorial Department
Editor – Shari Rose Hermel, 270, shermel;
Associate editor – Kasey Miller, 277, kaseymiller;
Assistant editor – Linda Robbins, 245, irobbins;
Artists – Craig Simmons & Mary Black

Field editors
Barb Baylor Anderson, 305 Valley View Dr.,
Edwardsville, IL 62025, 618-656-0870,
anderagcom@sbcglobal.net; Kindra Gordon, 11734 Weisman Rd., Whitewood, SD 57793, 605-722-7699, kindras@gordonresources.com; Becky Mills, Rt.1, Box 414, Cuthbert, GA 39840, 229-732-6748, beckymills81@yahoo.com; & Troy Smith, 44431 Sargent River Rd., Sargent, NE 68874, 308-527-3483; wordsmith@nctc.net

Publications and Production Department
Manager – LaVera Spire, 220, Ispire

Advertising Department
Advertising coordinators – Doneta Brown, 232, dbrown; Kari Mildenberger, 289, kmildenberger; & Sara Reardon, 212, sreardon; Production coordinator – Carol Beckett, 203, 226, cbeckett; Advertising artists – Mike Bush & Monica Ford; Advertising Proofreader coordinator – Jacque McGinness

Circulation & billing manager – LaVera Spire, 220, Ispire

Special Services Department
Coordinator – Sharon Mayes, 221, smayes; Assistants – Vickie Whitsell & Julie Tyliski; Artist – Susan Bomar; Proofreader – Melinda Cordell

Web Services Department
Coordinators – Doneta Brown, 232, dbrown; Sara Reardon, 212, sreardon; & Kari Mildenberger, 289, kmildenberger; Web developers – Tim Blumer, 227, & Thuy Copeland, 228

Photo Department
Coordinator – Kathrin Breytenbach;
Assistant – Colette Weipert

Network systems coordinator – Bruce Buntin