

Focus on the Cow Herd

BIF focused on how novel traits affect the cow herd.

by *Kasey Brown*, associate editor, & *Troy Smith*, field editor

Novel traits: Are they needed or a novelty? That was the focus of this summer's Beef Improvement Federation (BIF) Annual Meeting & Research Symposium in Lincoln, Neb. The University of Nebraska–Lincoln, the U.S. Meat Animal Research Center and the Nebraska Cattlemen hosted the conference, where speakers covered topics spanning considerations of profitable cow herds, heifer intake and feed efficiency, heifer development strategies, selection for novel traits, genetics of disease susceptibility, genetically changing the nutrient profile of beef, nutritionally changing the fatty acid profile of beef, improving feed efficiency in the feedlot, and the relationship between selection for feed efficiency and methane production.

BIF was formed more than 45 years ago to standardize beef cattle performance programs and evaluation methodology and to create greater awareness, acceptance and usage of these concepts for the genetic improvement of beef cattle. It represents more than 40 state and national beef cattle associations.

Profitable cow herds

"Most people don't get into the cattle business because they have a passion for accounting, but it is still needed," observed Clay Mathis, director and endowed chair of the King Ranch Institute for Ranch Management.

All managers need a clear view of the operation's financial position, and excellent managers make strategic changes that have long-standing systematic benefit to the operation, he said.

He noted that revenue increases with heavier calves and improved reproduction performance. Expenses have increased across the board during the past 10 years, but he emphasized the "Big Three" expenses: labor, depreciation and feed.

"All decisions should be conscious of how it will affect these three costs. The most profitable operations work hard to minimize depreciation," he suggested.

Putting revenue and costs together



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To do so, managers must pay attention to financial information, even though it is not the "fun part." Mathis suggested implementing a managerial accounting system, which provides financial and statistical information required to make day-to-day decisions.

Drought has been a big issue for financial viability, he noted. When cows left the Southwest starting in 2011, the financial denominator changed, he explained. There were fewer cows, but the same fixed costs remained. Revenue was stretched tighter.

He reiterated that good managers make many small decisions to keep costs low relative to the value of the weaned calves they produce. Excellent managers take that a step further. They do the same, but they also understand and find leverage in the production system.

Mathis recommended taking a look at many options that could affect your production system. These include purchasing bred replacement females instead of raising your own, contracting hay production/farming tasks, or implementing a crossbreeding system. These are not blanket recommendations, he said; however, they can provide ideas of options to consider.

"Listen for information that may lead

to high-leverage improvement in your operation," he concluded.

— by *Kasey Brown*

Predicting cow efficiency

For the last several years, the beef industry has been abuzz about feed efficiency. According to University of Illinois animal scientist Dan Shike, the reason is fairly obvious. It's because the industry now operates in a new era of feed prices, with increased price volatility. Feed costs are a big deal, considering that expenditures for feed represent 50%-70% of a cow-calf operation's total production costs.

Shike admitted that little progress has been made in improving beef cow feed efficiency. That's because the industry has focused more



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on increasing output, with increased input requirements as a consequence. However, Shike said studies suggest that the feed intake of a developing heifer is a likely indicator of her intake requirement as a mature cow.

Shike said the feed-to-gain ratio used to measure efficiency in the feedlot has drawbacks when applied to the cow. Selection based on feed conversion is associated with increased growth and larger mature size, and may result in an increased feed requirement and greater total feed costs.

Other measures of feed efficiency include residual feed intake (RFI), which represents the difference between an animal's actual

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feed intake and its expected intake. RFI is independent of growth and mature weight. Residual body weight gain (RBWG) is similar to RFI except that gain is measured instead of intake.

Shike described a study that evaluated groups of heifers for RFI, RBWG and only dry-matter intake, respectively, from their development period, through breeding and delivery of their first calves, and up until heifers in each group were bred for a second time. Each group was evaluated for differences in dam and calf performance. The GrowSafe feeding system was used to measure feed intake.

“Heifers with a favorable RFI (ate less than expected) also ate less as cows, but there were no significant differences in mature size, reproductive performance or calf performance,” explained Shike. “By and large, there were no differences when heifers were evaluated for residual gain.”

When evaluated for intake, heifers exhibiting low intake during development weighed less at 2 years of age and their feed intake remained lower. The birth weights of their calves also were lower than for higher-intake heifers, but there were no significant differences in calf performance. There were no differences in rebreeding rates between low- and high-intake heifers as 2-year-olds.

“The results suggest that our goal should be to include feed intake in selection indices,” said Shike.

— by Troy Smith

Low-cost strategies for heifer development

There is cause for concern over low U.S. cattle numbers. Cattle feeders are really concerned about the diminished supply of feeder cattle. That, of course, is a result of having too few cows. Rick Funston told symposium-goers that the nation’s cow inventory needs to be rebuilt, but retention of more heifers for breeding can be expensive for cow-calf producers.

A reproductive physiologist at the University of Nebraska (NU), much of Funston’s research has focused on ways to lower costs associated with developing replacement heifers. Funston favors low-cost, forage-based development systems over growing breeding heifers in confinement.

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want to lock up our heifers and develop them on the kind of feed they will never see after they enter the breeding herd? It doesn’t make much sense,” stated Funston.

Funston said he and his colleagues are working on heifer-development systems that incorporate grazing of crop residues — cornstalks in particular. Abundant in Nebraska and other grain-producing states, Funston called cornstalks “the cheapest feed we’ve got.” Corn residues also are representative of the type of low-quality forages that comprise winter diets for mature cows.

“I think we do a heifer a huge disservice when we lock her up and feed her to gain 3 or 4 pounds (lb.) per day,” Funston stated.

According to Funston, a heifer never has to gain more than 1½ lb. per day during the winter development period. Targeting modest gains from grazed cornstalks and supplemental protein can help contain feed costs. An increased rate of gain after going to green grass in the spring should put heifers in good shape to breed.

“You know that compensatory gain thing that feeders of yearling cattle have known about for years? Well, it works in (replacement) heifers, too,” said Funston.

In Funston’s opinion, targeting heifer breeding weights that approximate 50%-55% of mature weight is optimum. He sees advantages in having heifers that are managed more like stocker cattle and are lighter by design. For one thing, the percentage of heifers that do not breed during a defined breeding season may be higher. However, Funston’s research team has achieved artificial insemination pregnancy rates of up to 86% with heifers developed to lighter weights in low-input systems.

Funston said heifers found open probably shouldn’t be cows anyway. Adaptability to the

production environment is determined early, and open heifers should still be profitable when sold as yearling feeder cattle.

— by Troy Smith

Nutrition’s effects on developmental programming

What the cow eats while she’s pregnant can affect the performance of her calf, a phenomenon often called developmental programming, explained Kim Vonnahme, associate professor of animal science at North Dakota State University.

She explained that developmental programming is the effect of a stimulus or insult that establishes a permanent response to the phenotype. The phenotype equals the genotype plus the environment.



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The hypothesis behind developmental programming is that exposure during a critical period in development may influence later metabolic or physiological functions in adult life. Simply put, management changes during certain stages in pregnancy can affect the calf.

She illustrated examples that steers with dams supplemented with protein late in the pregnancy had heavier live weights and heavier hot carcass weights. Additionally, a higher percentage of those steers graded Choice.

On the female side, Vonnahme noted that a higher percentage of heifers born to dams who received protein supplementation calved in the first 21 days and had an increased overall pregnancy rate.

The placenta plays a huge role in fetal growth. Nutrition of the dam affects the blood flow to the fetus, she explained. In a



study looking at how nutrient restriction affects blood flow to the uterus, there was no alteration in blood flow until day 140, and then compensatory blood flow was observed. In tests with nutrient restriction early in the pregnancy, not much restriction of blood flow was observed. However, when the nutrients were restricted later in the pregnancy, blood flow was also restricted.

“The timing of the restriction affects placenta function,” Vonnahme said.

The placenta is adaptable and has a great ability to compensate. Future work will look at maternal intake and efficiencies, timing of supplementation and specific components of the diet.

Developmental programming isn’t just on the dam side, Vonnahme noted. Sires can impact fetal development, though research is lacking in livestock.

— by Kasey Brown

Genetics + management = profitability

The beef industry is not an industry known for simplicity. However, producers want simplicity wherever possible, says a panel addressing profitability and consisting of Donnell Brown, R.A. Brown Ranch, Throckmorton, Texas; Lorna Marshall, Marshall Cattle Co., Burlington, Colo.; and J.D. Radakovich, Hoodoo Ranch, Cody, Wyo. The panel was moderated by Tom Field, director of the Engler Agribusiness Entrepreneurship Program and the Paul Engler Chair of Agribusiness Entrepreneurship at the



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Brown said management changes are easier to quantify than genetic changes. His family has been using selection indexes for 20 years on their operation.

“It is easier to sell what people want to buy than it is to try selling what you want to raise,” he said. “It is our duty to help customers get what they need more efficiently, effectively and profitably produce beef using their available resources.”

Marshall emphasized that large commercial ranches expect her family’s seedstock operation to take care of logistics and to provide low-risk, no-surprise genetics. Simplicity, risk management and avoiding mistakes are key for large herds, she said, while genetics is relatively low on the list of priorities for large commercial producers.

The industry has done a mediocre job of helping producers objectively select for type traits that affect longevity, Marshall said. However, artificial insemination (AI) is an under-used technology that adds value to the industry.

Radakovich added, “I’m not that interested in sexy technology — just give me a simple, disciplined approach.”

Land managers have an inherent obligation to maintain or enhance choices for future generations, he said. Optimization of production systems provides flexibility to respond to changing markets and environments, and he emphasized simplicity.

To improve profitability, the panel emphasized reproductive traits, longevity and soundness, and easy-to-use selection indexes that work for their environment. Brown did grant that many simple tools are already available, like the American Angus Association’s Optimal Milk Module, but breeders don’t always use them.

To that point, Radakovich emphasized that he worries about genetic maintenance instead of large improvement, “Do I justify making the cows a little more right when they aren’t wrong to begin with?”

Marshall added that seedstock producers must be conscious of what commercial customers want — functional bulls with solid genetics.

Brown challenged seedstock breeders to change emphasis from being genetic providers to solution suppliers instead.

— by Kasey Brown



Editor’s Note: The Angus Journal and LiveAuctions.tv provided comprehensive online coverage of the event at www.BIFconference.com. Visit the Newsroom for summaries, proceedings, PowerPoints and audio of the sessions; the Awards page for announcements of award winners; and the Photos page for galleries of photos from the meeting and the tours.



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