



# BIF Meets in Nebraska

## Highlights of the 2014 Beef Improvement Federation (BIF) Research Symposium and Meeting.

by Troy Smith

A Merriam-Webster dictionary describes “commingling” as the act of blending thoroughly into a harmonious whole. That’s the objective when commingling calves, and it’s the objective of the Beef Improvement Federation (BIF) Research Symposium and Meeting. The annual forum brings together members of the research community and industry to discuss issues related to the genetic improvement of beef cattle. Convention attendees learn about technologies and management practices that can enhance the profitability of beef cattle production.

This year’s BIF symposium was June 18-21 in Lincoln, Neb., and was hosted by the University of Nebraska–Lincoln (UNL) and the Roman L. Hruska U.S. Meat Animal Research Center (MARC). The collaboration also allowed for special recognition of MARC’s 50th anniversary and its scientists’ contributions to the beef industry and BIF.

During the opening session, geneticist and long-time MARC research leader Larry Cundiff recounted the facility’s development on the site of a World War II-era naval munitions depot. He also talked about MARC’s GermPlasm Evaluation (GPE) project, one of the largest and longest research projects for evaluating breed characteristics. The project examined 37 divergent beef breeds and yielded information for optimizing heterosis in cattle breeding. The GPE project also spawned across-breed expected progeny difference (EPD) values, which use adjustment factors to allow comparison of animals of different breeds.

### MARC genomics research

Current MARC geneticist Mark Thallman explained how the GPE project is now focusing on breeds most utilized by industry. Research goals include development of EPDs for novel traits including disease resistance,

meat quality and others. Thallman also emphasized MARC genomics research, which includes gene sequencing of sires considered significant to the industry. Thus far, 180 purebreds and 81 F1 bulls have been sequenced.

Praising MARC research contributions was Steve Kappes, deputy administrator for U.S. Department of Agriculture’s (USDA’s) Agricultural Research Service. Kappes talked about genomic research advancements,

from early gene mapping to the sequencing of the bovine genome, the discovery of gene markers associated with economically relevant traits and the development of genomic-enhanced EPDs for a growing number of traits. He said advancements in technology have allowed for genotyping of animals at significantly lower costs.

“The greatest gains are achieved,” said Kappes, “from applying the technology to selection for lowly heritable traits.”

Kappes said research has revealed just the tip of the genomics iceberg and predicted discovery of gene markers to aid selection for many hard-to-measure traits related to animal health, reproduction and cow longevity.

“Genomics will help us design a cow that better fits the resources available in her production environment,” Kappes added.

### Focus on the female

Matching brood cows to the environment is the goal of researchers who offered reports during subsequent BIF sessions.

University of Illinois animal scientist Dan Shike said too little progress in improving beef cow feed efficiency has resulted because of the industry’s focus on increasing output. The latter

has yielded increased mature cow size, increased feed requirement and the potential for increased maintenance costs.

Shike said studies do suggest that the feed intake of a developing heifer is a likely indicator of her intake requirement as a mature cow. He described research that evaluated groups of heifers for residual feed intake (RFI), residual body weight gain and dry-matter intake, respectively. Heifers were evaluated from the development stage through the time the females were bred for a second calf.

“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.”

Assessment of dry matter intake showed that 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.

However, there were no significant differences in calf performance, nor were there 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.

University of Nebraska reproductive physiologist Rick Funston explained his research, focusing on ways to lower costs associated with developing replacement heifers. He and his colleagues are working on development systems that incorporate grazing of crop residues. Calling corn stalks the cheapest feed available in Nebraska and many grain-producing states, Funston

emphasized that crop residues are representative of the low-quality forages that comprise mature cow diets on many cow-calf operations.

“If there is an alternative, why would we 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. “I think we do a heifer a huge disservice when we lock her up and feed her to gain 3 or 4 lb. per day.”

In Funston’s opinion, a heifer never has to gain more than 1.5 lb. per day during the winter development period. Targeting modest gains from grazed cornstalks and supplemental protein can help contain feed costs. He suggested that targeting heifer breeding weights that approximate 50-55% of mature weight is optimum. Modest rate of gain during the winter can be followed by compensatory gain after going to green grass in the spring and should put suitable replacement heifers in good shape to breed.

Funston cited advantages in managing replacement candidates more like stocker cattle and in making them lighter by design. A higher percentage of heifers may not breed during a defined breeding season, but Funston figures those heifers probably shouldn’t be cows anyway. Their lack of adaptability to the production environment has been determined early, and they should still be profitable when sold as yearling feeders. However, Funston said his research team has achieved artificial insemination (AI) pregnancy rates of up to 86% with heifers developed to lighter weights in low-input systems.



Steve Kappes



Rick Funston



Dan Shike

### BRD susceptibility

In her BIF presentation, Washington State University Animal Scientist Holly Neibergs said the apparent variation in susceptibility to bovine respiratory disease (BRD) between breeds or genetic lines of cattle suggests there is



Holly Neibergs

a genetic component involved.

Neibergs noted that multiple institutions are collecting phenotypic data related to BRD as part of a USDA grant-funded research program. Researchers are looking for gene markers associated with BRD susceptibility. Neibergs said heritability is estimated to be in the low to moderate range. This information suggests that selecting for BRD-resistant cattle could have a real effect on disease prevalence and could help curb annual U.S. beef industry losses attributed to BRD — about \$500 million annually.

### Genomics and selection

Other BIF speakers discussed opportunities to apply genomics to selection for improved nutrient content of beef and reduction of the beef industry's environmental footprint. Among them was Donagh Berry, geneticist for Teagasc, the agriculture and food development authority in Ireland.



Donagh Berry

Berry said the beef industry's use of genomic-enhanced selection has been challenged, as compared to dairy, because of the multiple breeds involved, the fewer numbers of producers keeping extensive records and the absence of international genetic evaluation. All of these things also contribute to added costs.

"The solution is collaboration between countries. We can keep costs down by swapping data, and everybody wins," Berry said, explaining how the dairy industries of many countries have shared genotypic and phenotypic information from their dairy populations. Berry said sharing phenotypes on a large collective population of animals increases the accuracy of genomic prediction, especially for novel traits for which there is limited phenotypic information.

"Sharing genotypes voids costly duplication," Berry added. "No competitive advantage is gained by genotyping the same animal twice."

Berry said the breeding goal of beef producers should be to improve the ability of animals to make a profit in an environmentally responsible and sustainable manner. Each breeder must establish his or her own breeding objective by identifying and selecting for traits that generate revenue, hold down costs of production and address social and environmental concerns.

Though much negative misinformation has been spread, Berry said the beef industry worldwide has become more environmentally friendly.

However, to improve profitability and to further reduce the environmental footprint, he recommended attention to reducing days on feed, to increasing growth rate and to maintaining fertility.

"Good fertility rates and good growth rates will optimize water use, and that will be a big concern in the future," explained Berry. "And I'd argue that days on feed is a better measure than feed intake. It gives a better indication over the lifetime of an animal. Less days on feed and less feed per day offer huge environmental benefits." **HW**

### Don't ignore accounting

In his presentation, Clay Mathis urged producers in the audience to give ample attention to accounting. While that aspect of ranching is not "the fun part" for most operators, the director of Texas A&M University's King Ranch Institute for Ranch Management said good accounting is a trait of practical and profit-minded producers. He advised focus on optimizing weaning rate, weaning weight, feed, labor and depreciation. He warned against ignoring that last factor.



Clay Mathis

"The most profitable operations work hard to minimize depreciation," Mathis emphasized, recommending implementation of a managerial accounting system which provides financial and statistical information required to make day-to-day decisions.

### Improving profitability



Donnell Brown

Efforts to merge genetics with management for improved profitability were discussed by a panel of producers including purebred and composite seedstock breeder Donnell Brown of RA Brown Ranch, Throckmorton, Texas. Brown said seedstock breeders should not overlook the consequences of increased production, citing the potential for accompanying production cost increases for their customers. He advised increased focus on controlling inputs. He

called selection indices "amazing tools" for making genetic change on multiple fronts.

Panelist Lorna Marshall, Burlington, Colo., a seedstock producer and marketing manager for Genex Cooperative, said seedstock breeders must realize that commercial operators have more to worry about than genetics. And some of those things may be more important to their profitability.



Lorna Marshall

"We need ways to simplify genetic selection for very busy people. One selection index won't meet every need in every environment," Marshall said.

Rounding out the panel was commercial producer JD Radakovich, Cody, Wyo. He agreed with Marshall, stating that improving the sustainability of the HooDoo Ranch has become a priority.



JD Radakovich

Radakovich said using genetics that decreased average calf weaning weight, by 50 lb. actually was a profitable move. This reduction fit with long-term goals for reducing mature cow size, increasing calving ease and reducing harvested feed and labor requirements.

During her presentation, Marshall said Hereford is the fastest growing breed of use by Genex customers using artificial insemination (AI) in commercial herds. **HW**



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