

New Frontiers

Incorporating DNA technology into genetic evaluation and other technologies took center stage at the the 2008 BIF Annual Meeting and Research Symposium.

Beef industry leaders from around the world gathered in Calgary June 30-July 3 for the 2008 Beef Improvement Federation (BIF) Annual Meeting and Research Symposium. The Canadian Beef Breeds Council (CBBC) hosted nearly 400 cattle producers, industry representatives and academia for the event, themed "Beef Beyond Borders."

Incorporating DNA technology into genetic evaluation took center stage during general sessions, committee breakouts and meetings hosted by industry affiliates in conjunction with the BIF conference.

Angus Productions Inc. (API) is providing online coverage of the event at www.bifconference.com. What follows is a small glimpse of the information available online. From the site you can access summaries of the sessions, as well as proceedings papers, PowerPoint presentations, audios, news releases about award winners and photo galleries.

Coverage is made possible through sponsorship by Biozyme Inc. and its continuing support of the Angus Foundation and by the generous producers listed on the Seedstock Directory page.

For more information about BIF, visit www.beefimprovement.org. For more information about the CBBC, visit www.canadianbeefbreeds.com.

Keeping the Genetic Doors Open

DNA technology will someday become the most important tool for genetic selection, asserts John Pollak, Cornell University animal scientist and director of the National Beef Cattle Evaluation Consortium (NBCEC).

In remarks made during the opening session of the 2008 BIF Symposium, Pollak suggests cooperation in the convergence of two existing technologies — expected progeny differences (EPDs) and DNA testing — is the logical first step.

However, Pollak says he sees the inability to consolidate all DNA test information being generated as the primary obstacle to combining DNA marker information with EPDs. Reluctance to consolidate disparate databases is the same constraint that hindered implementation of multiple-breed EPDs, he suggests.

"We should consider a universal DNA information database so the infrastructure does not have to be duplicated, even across breeds," Pollak adds.

Pollak acknowledges that the Canadian and U.S. beef industries have historical ties through the exchange of beef genetics. Such ties led to collaboration among the two countries' respective breed associations and to a cooperative effort toward related education and research. Pollak hopes the same

collaboration can help deal with a troubling transition from EPDs based on performance and pedigree records, to DNA inferences of genetic merit.

"We're acting like we're paralyzed by the promise of 'someday.' We're just waiting for it to happen," Pollak states. "We really haven't tackled this problem appropriately. We should be thinking about how we are going to pursue the transition from today to 'someday.'"

Pollak encouraged symposium attendees to think about the steps needed to make the transition to "molecular breeding values" while listening to the remaining symposium presentations. He also suggested producers look for opportunities to collaborate, avoid duplication and share resources.

— by **Troy Smith**

Model for a Common Currency

Accurate DNA-based selection tools will present cattlemen the opportunity to identify animals with superior breeding value as soon as a tissue sample can be collected, says Mike Tess, professor of animal and range sciences at Montana State University. "However, the current state of national cattle evaluation (NCE) in the beef industry provides no clear direction to breeders regarding how best to use these new DNA tests in their selection programs."

During the opening session of

the 2008 BIF Symposium, Tess echoed John Pollak's comments calling for the need to marry DNA information with performance and pedigree information to provide a single estimate of breeding value for a particular trait.

A variety of DNA tests are currently available, including tests for parent verification, traceability, management and genetic selection, Tess explains, focusing the bulk of his comments on tests used in genetic evaluation. Accompanying those tests is a variety of confusing terminology — EPDs, GPDs, profiles, EBVs, MBVs, stars, MGVs, etc.

Also confusing is the variety of commercial tests available. Current DNA tests are based on a few to more than 100 genes, Tess says. And the number of genes measured is likely to increase rapidly during the next few years.

Though we know the tests are not independent of each other, Tess says it is not known how much they overlap. And not all tests are validated.

"We need a common currency for genetic evaluation," Tess says. That currency, he adds, is expected progeny differences (EPDs) and accuracies.

Tess presented a model for NCE that incorporates pedigree relationships, phenotypes (performance measures) and DNA test information to compute EPDs with accompanying accuracies based on the amount and type of information available.

For more information and a schematic of the model, see the proceedings accompanying this summary online at www.bifconference.com.

— by **Shauna Rose Hermel**

Creating the Circumstance

People laughed in 1987 when leaders in the hog industry predicted they could use indexing systems made possible with advancements in computer technology to achieve production goals such as raising 25 pigs per sow per year or marketing hogs by 160 days of age. They aren't laughing now, says Brad Wildeman, Poundmaker Feedlot, whose background in genetics originated in

the hog industry. Every parameter has been exceeded.

Wildeman spoke to 2008 BIF Symposium attendees about "Information Channels: Access to and Benefits from Enhanced Data Protocols."

The cattle industry has lagged behind other industries in developing advanced information channels for several reasons, Wildeman says. For one, the industry is segmented — ownership changes often. Selection throughout the value chain has always been more art than science. And because of the varied environments in which cattle are raised, no one breed or type can fit every operation.

Lack of measurement criteria has made it difficult to see rapid improvement, Wildeman continues. Little feedback from sectors other than at the genetic level has occurred. "Without improvements in information flow," he says, "it takes a very long time to yield results."

Opportunities are presenting themselves, he asserts, and many of the tools are in place to take advantage of those opportunities. DNA genotyping offers huge potential, and the ability to transfer data electronically makes large amounts of data available to a wide number of stakeholders.

Wildeman shared how the Canadian Beef Advantage Pilot Project, sponsored by a host of beef industry participants, is positioning itself to take advantage of such opportunities. Participants of the project have identified objectives based on key attributes of the Canadian beef industry, and will depend on information sharing for continual improvement.

Potential results, he says, include:

- Movement of information up and down the value chain.
- More defined breeding, feeding and marketing strategies.
- Improving overall herd, which could result in eliminating poor performers and creating more superior performers.
- More coordinated and informed industry.

Wildeman concluded his presentation with a quote from George Bernard Shaw: "Those people that succeed in this world are those who look for the circumstances

they want ... and if they cannot find them, they create them.”

— **by Shauna Rose Hermel**

New Trait Development

Producers must be willing to adopt economically viable technologies that improve profitability. From a genetic perspective, such technologies must improve the accuracy of economically relevant traits (ERTs) in a cost-effective manner. That was the message Mark Enns, Colorado State University, delivered during Thursday's general session of the 2008 BIF Symposium.

“As an industry, we must identify the deficiencies in our current national cattle evaluations (NCE) and focus efforts on additional ERTs. We need to open up a whole new set of traits to evaluate and choose those traits that will be most profitable,” Enns says. “As we move forward, we must develop tools that don't increase the confusion [any more than expected progeny differences (EPDs) do]. We must make it as easy as possible to help commercial customers become more profitable.”

Enns says the guiding principle for new trait development is to identify the right ERTs. The process requires breeders to outline current production levels, consider marketing methods and identify performance characteristics that determine animal value at marketing. Seedstock producers should center on meeting the needs of customers, while commercial producers should focus on their own operation's characteristics, he adds.

Traits that are economically relevant in specific production systems are traits for which a unit of genetic change directly influences either production costs or revenues. Once ERTs are identified, each breeder can focus selection decisions on EPDs for those traits.

“In the process of new trait development, we must address not only traits for which the current NCEs are deficient, but also look forward 20 years, identifying ERTs for the future,” he says. “Development of EPDs for many new traits will require detailed collection of performance information from research populations. It is often expensive and/or difficult to collect. Genomic/marker information could be collected more widely from the industry, especially for traits such as tenderness or feed intake.”

Enns identifies feed intake from the cow-calf, background and feedlot sectors as a key area within the new realm of traits. He also singles out health and survival traits, regionalized adaptability traits, consumer acceptance traits and male fertility traits.

“Currently, many cow-calf producers sell weaned calves and cull cows and retain female replacements,” Enns says, noting ERTs for those producers include calving ease, sale weights, milk production, cow maintenance feed requirements, stayability, heifer pregnancy

rate, bull fertility, and cow and calf health. “EPDs are available for all but bull fertility and health, yet both clearly influence costs and revenues and are ERTs. They should be a focus of genetic improvement research and yield selection tools.”

Enns cautions that the ERT list introduces the issue of accuracy. Even though EPDs are available for several traits, the time required to achieve

acceptable levels of accuracy for cow maintenance feed requirements, length of productive life and heifer pregnancy, for example, are much longer than for calving ease, sale weight and milk production. Selection accuracy influences how quickly genetic progress can be made, so genomic information could be especially useful in improving young animal selection accuracy.

“There is considerable need throughout the beef production system for the development of new ERTs and associated selection tools. Development and delivery of these tools will likely require better data tracking systems, facilities for intense phenotype collections and/or increased use of genomic tools in NCE systems,” he says. “All of these technologies will

(Continued on page 51)

New Frontiers (from page 49)

likely be needed to deliver selection tools for these new traits, but the genetic improvement trends are long-term and the results can be sustainable.”

— by **Barb Baylor Anderson**

Kniebels Top Field of Commercial Producers

The Beef Improvement Federation (BIF) honored Kniebel Farms & Cattle Co. of White City, Kan., with its Commercial Producer of the Year Award. The Kniebels accepted the award July 2 during the organization's 40th annual meeting in Calgary, Alta., Canada.

This year marks the 130th anniversary of the diversified family operation owned and managed by Kevin and Mary Ann, Chuck and Kim, and Charles and Mona Kniebel and families. The farm has grown from a single homestead to encompass 7,000 acres of Flint Hills grass and farmland.

When the Kniebels started raising cattle in 1878, like many operations at the time, the base herd was Hereford. But, unlike most operations, no calves were sold only market-ready cattle.

Finished cattle were originally driven to the railhead. As years passed, the cattle were trucked to Kansas City, Mo., sold to packinghouses through local sale barns and, eventually, sold directly to packers.

The current operation consists of 500 spring-calving cows and 60 fall-calving cows. The family utilizes a three-breed rotation of Red Angus, Angus and horned Hereford in their crossbreeding program. All calves are finished in a family-owned feedyard. The Kniebels raise their own food, and consider the operation truly a “conception to consumption” operation.

In 1996, the family joined U.S. Premium Beef (USPB), a progressive group of ranchers and feeders that purchased part of the National Beef packing plant. USPB pays for harvested cattle on a grid, which rewards the quality the Kniebels strive to produce.

Kniebel Farms & Cattle Co. produces thick, moderate, easy-keeping, pound-producing cattle that also happen to be higher grading. Through USPB, the Kniebels collect carcass data and add that to their culling criteria. The family believes in trying to have a well-rounded program and not chasing any one single trait or fad. They continue to find ways to increase efficiencies and are incorporating different grazing varieties and techniques to hold down costs.

The Kniebels tag and tattoo cattle and keep performance records. By maintaining genetic lines on their commercial cows, they are able to utilize artificial insemination (AI) on the heifers to optimize even more genetic progress. The top one-third of the heifers are kept as replacements.

Cow records on calving and weaning performance are kept on file as well for both USDA traceback and to support production and business decisions.

Monitoring and recording carcass performance, like pounds produced, helps in culling decisions.

Kniebel Farms & Cattle Co. was nominated for the award by the Kansas Livestock Association (KLA). For more information, visit their web site at www.kcattle.com.

— **Release provided by BIF**



BIF President Lora Rose (left) presents Mary Ann and Kevin Kniebel, White City, Kan., with the 2008 BIF Commercial Producer of the Year Award.

[PHOTO BY CRYSTAL YOUNG, API CREATIVE MEDIA]