

Providing background on the manifestation of genetic defects, Rolf explained that lethal defects result from “broken genes.” To be affected, an animal must receive two copies of the allele associated with a specific defect, with one allele contributed by each carrier parent. Only when two carriers are mated can the resulting offspring inherit the defect, and only when both carrier parents contribute a lethal recessive allele. When carriers are mated, the inherited lethal combination occurs 25% of the time.



▶ Alison Van Eenennaam, University of California–Davis, demonstrated the MateSel decision-making software, which she described as a mating allocation program used to calculate which candidate bulls a producer might mate with each cow in his or her breeding herd.

“The impact of a lethal recessive gene depends on how common it is within the cattle population,” added Rolf.

Van Eenennaam then demonstrated the MateSel decision-making software, which she described as a mating allocation program used to calculate which candidate bulls a producer might mate with each cow in his or her breeding herd. Van Eenennaam said the program utilizes expected progeny difference (EPD) values for various traits, allowing the producer to plan matings to achieve certain goals for genetic progress. She demonstrated how the program could match bulls with females to pursue genetic merit based on selection indexes such as beef value (\$B) or weaned calf value (\$W).

The program can also be used to avoid or control the level of inbreeding, thus managing the chance of matings between carriers of specific genetic defects. Furthermore, MateSel can be used to plan matings to improve genetic merit and manage inbreeding at the same time.

“I think it is a very useful program, allowing you to play around with matings on paper to explore opportunities for genetic

progress, and also evaluate the consequences of different mating strategies,” stated Van Eenennaam.

Simply choosing to eliminate all genetic defect carriers from a breeding program may seriously hinder genetic improvement in economically important traits, she said. However, by managing the risk of carrier matings, profitable genetic progress might be achieved with minimal loss due to defects.

Van Eenennaam said the program is currently being used for research purposes, but she is discussing use with breed associations.

— Story & photos by Troy Smith

Editor's Note: Field editor Troy Smith is a freelance writer and cattleman from Sargent, Neb. This article was written as part of Angus Media's coverage of the 2017 Cattle Industry Convention.

DNA Profile Adds Accuracy to Prediction

With the availability of more dependable genetic information for a broader range of traits, cow-calf producers have the tools to make more informed selection decisions that influence cattle productivity and profit. That was the message Kent Andersen emphasized as he addressed Cattlemen's College attendees in Nashville, Tenn., during the 2017 Cattle Industry Convention & NCBA Trade Show.

To illustrate how genetic test data can enhance selection decision-making and profit margins, Andersen, who is genetics associate director of global technical services for Zoetis, talked attendees through a series of interactive selection scenarios. Through photo and video clips, participants were asked to view eight heifers and decide which four to keep and which four to cull. Initial selections were done with visual appraisal only — then Andersen shared genomics data to enhance the decision-making process.

Attendees also participated in a similar activity with fed cattle.

Via the scenarios, Andersen explained how the GeneMax[®] Advantage[™] report provides index scores producers can use to make selection decisions, including the Cow Advantage Score, the Feeder Advantage Score and the Total Advantage Score. He noted that producers can also choose to set outlier parameters that flag animals that may not fit their herd goals for cow cost, docility or tenderness.

**Cattlemen's College
spotlights genetic tools for
building more productive
cow herds and more valuable
feeder and fed cattle.**

Additionally, he noted, including the genomic component in the calculation of expected progeny differences (EPDs) can offer enhanced accuracy more quickly. He shared that for maternal traits, adding DNA profiling can increase EPD accuracy equivalent to adding the performance information of 16 daughters. For growth and efficiency, the DNA component's impact on accuracy can equal that of adding the performance of 18 progeny; and for carcass traits, submitting a DNA profile is equivalent to adding 10 progeny with carcass data.

During the fed-cattle activity, Andersen noted to the audience, “When we only base decisions on color, weigh up and tradition, there's a lot of information and opportunity left on the table.”

He shared that genetic differences in feedlot and carcass performance can be dependably predicted. He shared results that indicated genetic prediction data added value of \$12-\$17 per hundredweight (cwt.), amounting to well over \$100 per head.

In closing, Andersen encouraged cattle producers to embrace the genetic technology that exists, to work with marketing programs that help garner more margin for genetically proven cattle, and to ultimately integrate genetics into their management game plan.

He offered three take-home points for producers, advising:

- 1) Buy (and sell) bulls based on superior EPDs that include DNA profiling and indexes matched to your operation.
- 2) Examine your replacement heifer enterprise — evaluate more advanced selection, mating and marketing tools.
- 3) When marketing feeder and fed cattle, position yourself to be more of a price maker.

Learn more about the GeneMax Advantage program available through Zoetis at www.zoetis.com/animal-genetics/beef/genemax-advantage.aspx.

— by Kindra Gordon

Editor's Note: Field editor Kindra Gordon is a freelance writer and cattlegirl from Whitewood, S.D. This article was written as part of Angus Media's coverage of the 2017 Cattle Industry Convention.

PRODUCTION EFFICIENCY

Priming Calf Performance

At an early morning Cattlemen's College session in Nashville, Victor Cortese took attendance by asking cow-calf producers to raise their hands. He then joked that the stocker and feedlot operators in the room had better take a good look at those cow-calf folks because, he said, "Your problems start there."

Getting calves off to a healthy start during the first 60 days primes calves for life.

Cortese, a veterinarian and director of cattle and equine immunology for Zoetis, explained that he made that point to underscore that more and more research indicates calf health in the first 60 days is paramount to the long-term performance of the animals.

He added, "A calf's highest genomic potential is the day they are born, and then we start to screw it up."

That said, Cortese emphasized

that research in the area of "perinatal programming" is looking at what is important to the calf after it's born to help it reach its full genetic potential. (The term "prenatal" refers to the time before the calf is born.) Thus, cow-calf producers have a crucial role to help put calves on their best path for performance.

As one example, research during the past decade suggests colostrum is not only important to the immediate health and immunity of the calf — but colostrum's biggest impact may actually be in influencing a calf's long-term performance. Cortese reports that researchers are finding that the presence of hormones, insulin, leptin and relaxin — all found in colostrum — are responsible for influencing long-term feed efficiency, gain, appetite and management of stress.

Of this emerging research, he says, "Colostrum transfer is one of the best predictors of how calves will do."

Cortese also shared that research findings suggest that the more growth a calf has in the first 60 days of life, the more efficient that calf will be throughout its life. Cortese suggested a good rule of thumb is to double a calf's birth weight by about 60 days.

A second area of emerging research that Cortese shared with attendees was the concept of "prime boost," which he described as utilizing — and properly administering — vaccinations to cattle at different life stages. He suggested thinking about the stages as "a baby, maintaining them through being a teenager and then through to adulthood."

Essentially, prime boost research indicates that more vaccine efficacy and disease control can be achieved by combining use of intranasals with injectables. Of the emerging research, Cortese anticipates improved management protocols to come, and says, "It's changing what we do when vaccinating young calves."

— by Kindra Gordon

Select Healthier Genetics

"Genomics allow us to look 'under the hood' of an animal so to speak," said Alison Van Eenennaam with University of California–Davis as she addressed Cattlemen's College attendees in Nashville.

Van Eenennaam provided an overview of the history in DNA sequencing that has

brought the industry to where it is today. She commended breed associations for the incorporation of genomic information into national cattle evaluation (NCE).

That said, Van Eenennaam said a hindrance for the future is collection of new data to develop new trait selection tools for fertility, feed efficiency or disease traits not currently represented in the NCE.

A five-year USDA-funded project is helping address that lack of data, at least with regard to bovine respiratory disease (BRD). Titled the Bovine Respiratory Disease Complex (BRDC) Coordinated Agricultural Project (CAP), the effort is a collaboration among researchers at Texas A&M University (TAMU); Washington State University (WSU); the University of California–Davis (UC Davis); New Mexico State University (NMSU); Colorado State University (CSU); the University of Missouri (MU); USDA's Agricultural Research Service; and Neogen GeneSeek Operations of Lincoln, Neb.

Van Eenennaam explained that the focus on BRD is important as it is the No. 1 disease challenge for the U.S. cattle industry, with

CONTINUED ON PAGE 176

HERD HEALTH



PHOTO BY KYRA MEYER FROM NJAA/ANGUS JOURNAL PHOTO CONTEST

► More and more research indicates calf health in the first 60 days is paramount to the long-term performance of the animals, said Victor Cortese, Zoetis Animal Health.

a 16.2% national prevalence of BRD in the feedlot. An economic cost of \$253.97 per BRD feedlot steer is estimated as a result of loss of carcass quality, death and treatment costs. She shared that there are as many cattle dying from respiratory disease today as there were 30 years ago, despite advances in vaccines and technology.

Genetic prediction for resistance to bovine respiratory disease is on the horizon.

The ultimate goal of the BRDC CAP is to identify genetic markers that can be used to select for healthier cattle, specifically those that are less susceptible to BRD, said Van Eenennaam. "Our premise is that using genetic selection is a better solution to BRD than antibiotic therapy. A BRD EPD is our goal at the end of the day."



► The ultimate goal of the BRDC CAP is to identify genetic markers that can be used to select for healthier cattle, specifically those that are less susceptible to BRD, Alison Van Eenennaam chaired with Cattlemen's College participants.

Getting to that point is no small undertaking. Van Eenennaam explains that thousands of BRD observations are needed, and thus collaboration with several universities is also necessary. Additionally, because diagnosis of the disease is not, in her words, "black and white," an objective scoring system to consistently identify BRD had to be developed. (Learn more about the resulting scoring system at www.vetmed.wisc.edu/dms/fapm/fapmtools/8calf/calf_respiratory_scoring_chart.pdf)

Trials with both dairy and beef cattle are included in the effort. Beef animals included 1,000 case animals in Washington and 1,000 in Colorado — and 1,000 controls in each of those projects, as well.

While a BRD EPD is still several years away, initial results are indicating BRD incidence is about 20% heritable, according to Van Eenennaam. While she acknowledged this is a low heritability, she says it is "better than nothing" and can still begin making a difference. She noted, "We won't have bullet-proof cattle, but can select cattle that are less likely to get sick if you treat them properly."

Additionally, as the genetic selection ability for BRD resistance becomes available in the future, Van Eenennaam said she believes there may be premiums for cow-calf producers that add this trait to their selection pressure.

Learn more about the project at <http://brdcomplex.org>. Additional information about research efforts focused on developing genetic tests for other economically important traits, including feed efficiency and reproduction, can be viewed at <http://ebeef.org>.

— Story & photo by Kindra Gordon



The Future of Cattle Feeding

What does the future hold for the cattle-feeding segment of the beef industry? Where and how will cattle be fed? How will they be marketed? What challenges lie ahead for cattle feeders?

These were the questions posed to University of Nebraska Beef Feedlot Extension Specialist Galen Erickson, during a Cattlemen's College® session in Nashville. Lacking a crystal ball and claiming to be armed only with training in ruminant nutrition plus his power of observation, Erickson shied away from long-term predictions. However, he said the current state of cattle feeding and certain trends may offer a glimpse of what lies ahead, at least in the near future.

Reviewing the feedlot sector's basic needs — things like feeder-cattle supplies, feedstuffs, water, energy, labor and markets — Erickson said climate is likely to become more important in the future because of its relationship to temperature extremes, precipitation, and feed and water supplies. While there has been some increase in housed feeding operations in areas of less favorable weather conditions, Erickson

Geography, size and timing will affect cattle feeders significantly in the future.

believes the vast majority of cattle will be fed in open-lot facilities. Thus, geography matters.



► "Economics favor feeding cattle longer, rather than marketing them sooner and replacing them with expensive feeder cattle. There is no price slide on fed cattle, so cattle fed to heavy weights make more money," said Galen Erickson, University of Nebraska ruminant nutritionist.

Size matters, too. While some people have questioned whether the trend toward ever heavier finished weights can continue, Erickson sees no reason yet for that to change.

"Economics favor feeding cattle longer, rather than marketing them sooner and replacing them with expensive feeder cattle. There is no price slide on fed cattle, so cattle fed to heavy weights make more money," said Erickson, who expects that trend to continue until cost of gain decreases or fed-cattle prices increase significantly.

According to Erickson, there has been some increase in numbers of cattle sold on the basis of hot carcass weight, rather than on a live-weight basis, and long feeding periods have been positive for quality grade.

"At least for the near future, I think the focus will continue to be on bigger, fatter cattle," affirmed Erickson.

This is also likely to continue having an effect on numbers of cattle placed as yearlings vs. calf-feds. Bigger in means bigger out, so Erickson expects a preference for yearlings to continue.

Industry-wide, rates for morbidity and mortality have been creeping upward, despite modern treatment protocols. Erickson called health management a big problem for feeders. However, some small feedlots whose lower numbers make marketing more challenging have been converted to backgrounding operations. He believes more small feeders may find opportunity in handling calves, straightening out health issues and readying the animals for a finishing yard.

With regard to environmental regulations, Erickson expects the primary concerns for feedlots to be related to management of

Industry-wide, rates for morbidity and mortality have been creeping upward, despite modern treatment protocols.

manure nutrients, feedlot runoff, air quality and antibiotic resistance.

It is sometimes argued that more but smaller feedlots would be more environmentally friendly than fewer large feedlots. He believes large feedlots make more

sense for the future. He offered a hypothetical comparison scenario to illustrate his view.

“If you have one 10,000-head feedlot, it is going to be required to control runoff. The same number of cattle could be fed in a hundred 100-head feedlots, but feeding operations that small are not required to control runoff,” said Erickson. “Which is better for the environment?”

Lastly, Erickson predicted that U.S. cattle feeders will continue to focus on producing the highest-quality beef.

“That’s been our niche,” he stated, “and I see no reason that would change.”

— *Story & photo by Troy Smith*

CONTINUED ON PAGE 178