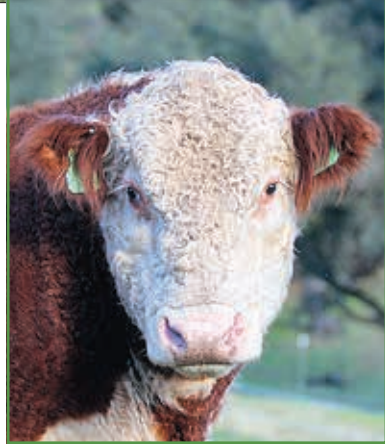# Repro Roundup

Bull Management

Industry specialists offer breeding advice.

by **Kindra Gordon**

"**D**on't make sire selection more cumbersome than it needs to be." That's the advice of University of Nebraska Beef Genetics Extension Specialist Matt Spangler. Spangler acknowledges sire selection "would be simpler if only one trait affected a cow herd's profitability," but he added, "In truth there's a multitude of traits."

That said, how should a producer approach the sire selection process? At the 2015 Range Beef Cow Symposium held that fall in Loveland, Colo., Spangler shared this list of three questions producers should ask themselves:

1) **What are my breeding and marketing goals?**

2) **What traits directly impact the profitability of my enterprise?**

3) **Are there environmental constraints?**

Regarding the traits that impact profitability, Spangler emphasizes it is important to recognize the difference between economically relevant traits, (ERTs), and indicators of those traits. He defines ERTs as traits that are directly associated with a revenue stream or cost.

For example, calving ease is an economically relevant trait, whereas birth weight is an indicator of that trait. Spangler points out, "Producers don't get paid for birthweight or have a direct cost for that, but they do have a cost if they have to provide labor when a calf is born or if there is calf mortality due to calving ease." As a second example, he notes ribeye area is an indicator of the economically relevant trait yield grade.

Additionally, Spangler notes as producers wade through the abundance of traits, selection indexes are a powerfu, too. He adds, "You have to use the one appropriate for your breeding objectives." As an example, if you sell at weaning and retain heifers, a carcass index may not be the one to focus on for your marketing goals.

Looking to the future, Spangler emphasizes that improvements in current indexes still need to be made by increasing the number of economically relevant traits that have EPDs (expected progeny differences). Additionally, Spangler is concerned that many ERTs are not currently evaluated nor collected routinely in the seedstock sector, even though they drive value downstream.

He points out for the future enterprise-level profitability needs to move closer to industry-level profitability. For instance, he gives the example that presently no direct economic benefit for a producer exists to improve tenderness, even though it is valued by the industry.

Spangler advises producers, "Know your costs, select on profit, not just revenue." He adds, "Multiple trait selection is critical and could become more cumbersome but economic indexes help alleviate this. Find and use index values that meet your breeding objective."

Synchronization and AI

Once sire selection is considered, getting cows bred is the next step in the breeding equation.

"Pregnancy has a four times greater economic impact than any other production trait in a cow herd, yet how many producers select for pregnancy first?" That's a question Cliff Lamb asks producers to consider. Lamb, who is with the North Florida Research & Education Center (NFREC), has been conducting research with the center's cow herd to determine the outcome when an emphasis was placed on selecting for pregnancy.

Lamb and NFREC staff initiated a study in 2008 to keep only the females in the herd that were bred within the first 25 days of the breeding season. Additional criteria for cows to remain in the herd included calving by 24 months of age, calving every 365 days with no assistance, providing enough resources for their calves to reach their genetic potential, maintaining body condition score and not having disposition issues.

As a result of using estrus synchronization, artificial insemination (AI) and the strict culling rule eliminating heifers that did not become pregnant after the first 25 days of the breeding season, over a six-year period, the Center's staff moved the herd from a 120-day breeding season to a 70-day breeding season. Longevity of the herd's females also increased, and females in the herd tended

to wean heavier calves. In addition, the herd at NFREC experienced an increase in herd value of $50,000 annually.

Lamb emphasized producers often tend to get hung up on pregnancy rates with AI. Instead, he says, "To me, the most important thing is what percent of the herd is bred within the first 21 to 30 days, so you can calve more calves in the first 30 days of the calving season."

Lamb also underscores the value of estrus synchronization and AI by sharing data from a study done in South Dakota looking at pregnancy rates of eight different herds. Three operations had pregnancy rates in the 56 to 65% range. Five operations had pregnancy rates in the 44 to 50% range. What was the difference? Lamb reports the three operations with the higher rates did AI for several years, whereas the five operations with the lower percentage did not.

"That tells me producers must stick with it [estrus synch and AI]. It's not just something to try one time [to test the results] and be done." He adds, "If you get poor pregnancy rates, don't give up, stick with it over a period of time and it will improve."

To help producers evaluate cost of AI compared with cost of purchasing bulls, Lamb suggests using the AI Cowculator, which is available as a free app download. Learn more at *facebook.com/AICowculator/.*

Can repro efficiency be improved?

Looking to the future of reproduction, South Dakota State University Animal Science Professor and Beef Reproduction Extension Specialist George Perry is conducting research focusing on improving the reproduction efficiency of beef cattle. Perry notes having more cows bred means having the opportunity for more calves and more beef produced.

"All ag sectors are looking at production efficiency — dairy is looking at producing more milk, poultry is looking at more eggs, swine is aiming to add more piglets in a litter," Perry says. "We in the beef industry are taking the approach that asks 'How can we get more cows bred early?'"

Research data have shown that beef cows bred earliest in a breeding season are more productive during their entire life cycle. However, Perry notes beef producers do face challenges with conception rates. He reports that when a cow shows estrus, ovulates and semen is present from artificial insemination or natural service, fertilization occurs 90% of the time. However, conception rates usually only average 50 to 60%.

"This equates to a 30-40% embryonic loss," Perry says.

"If we can get more of these embryos to survive — even if conception rates were 75% — that many more cows bred and producing that much more beef over their lifetime would benefit the world's food supply."

Perry's reproductive work with heifers and cows focuses on the hormone estradiol. "Estradiol is the signal to the brain for onset of estrus," Perry explains. Different levels of estradiol appear to result in differences in estrus expression.

From data collected on 10,000 cows synchronized with recommended fixed time AI protocols, Perry and his team of researchers identified a 27% improvement in animal conception rates among those cows and heifers with high levels of estradiol. Those results mean estradiol prompted the opportunity for an extra 27 calves out of 100 cows.

Presently, estradiol cannot legally be administered to cattle. Thus, Perry says, "We need to figure out how to get the body to produce estradiol."

His current research is focused on studying what regulates production of estradiol by the follicle and evaluating what might prompt increased production of the hormone in some animals and not others.

From this research, a third area to evaluate was identified — sperm transport. Perry points out that sperm in the epididymis can live for a few weeks, but in the lab cultures only a few days and in the reproductive tract a few hours. As well, the cryo-packaging process for semen to be used for AI can negatively impact sperm survivability.

"We need to learn more about the proteins that surround sperm and the environments we ask sperm to live in," Perry says. For instance, he points to the fact among poultry, hens can store sperm and fertilize an egg each day for a week. He believes this longer storage period may be related to the protein surrounding the sperm.

Perry believes with more information, the beef industry can eventually better identify which sperm will do better at fertilization. He notes currently a Breeding Soundness Exam looks at motility and morphology of a bull's sperm. However, the bull may still have poor conception rates. The research he is conducting aims to learn more about the fluid the semen is in. "Some sperm may have higher survivability based on the protein that surrounds it," Perry says.

As new information is gleaned from this research, Perry says better technologies to store semen and increase conception rates through AI may be developed. **HW**

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