Recipe for Success

Part 2

Conference looks at ingredients for profitably using advancements in technology to enhance reproductive success in the cow herd and garner premiums for a high-quality end point.

by ***Shauna Rose Hermel, Wes Ishmael, Troy Smith & Steve Suther***

Last month we shared highlights of the first day's sessions at the 2011 Applied Reproductive Strategies in Beef Cattle (ARSBC) symposium in Joplin, Mo. The symposium was hosted by University of Missouri (MU) Extension, Joplin Regional Stockyards and the Beef Reproductive Task Force.

That first day focused on "The Missouri Recipe" for reaching the high-quality target and the economic implications — for individual producers and for the industry — of seeking that goal. An evening event at Joplin Regional Stockyards featured management- and marketing-oriented tips (see September *Angus Journal,* pages 250-263).

During the second day of the symposium, speakers focused on nutritional influences on reproduction, bull management and bull-related factors affecting fertility. The closing session offered a diversity of subjects featuring current topics in reproductive management.

Following are outtakes of just four of the nearly 30 speaker presentations. Comprehensive coverage of the symposium is available at *www.appliedreprostrategies.com/2011/Joplin/.* Compiled by Angus Productions Inc. (API), the site is made possible through sponsorship by the Beef Reproductive Task Force, SEK Genetics and liveauctions.tv. Coverage includes summaries of the speaker presentations, PowerPoints, proceedings and audio.

Managing Reproduction on Toxic Fescue

There are no silver bullets when it comes to managing the challenges associated with cattle grazing endophyte-infected tall fescue. Challenges include reduced feed intake and performance, reduced fertility rates, increased respiration and body temperature and necrosis of the extremities due to constricted blood flow.

But there are ways to manage the challenges and reap the advantages provided by the widely used forage. That's what Neal Schrick, an animal science professor at the University of Tennessee (UT) told attendees of the ARSBC symposium in Joplin.

For instance, recent UT research suggests that breeding cows (spring-calving) in a narrower window of time can help mitigate the negative reproductive impacts. Though not conclusive, the research is helping explain why.

On the cow side, Schrick explained, the research indicates fescue toxicosis affects either the growing oocyte (egg) or early embryo while it's still in the oviduct. That's why late-pregnancy losses are no higher for cows grazing infected fescue compared to those on the noninfected variety. In the UT studies, Schrick said, "If cows were pregnant at 35 days, they stayed pregnant."

PHOTOS BY TROY SMITH

►Research indicates fescue toxicosis affects either the growing oocyte (egg) or early embryo while it's still in the oviduct, Neal Schrick said. Late-pregnancy losses are no higher for cows grazing infected fescue compared to those on the noninfected variety.

As for bulls, UT research indicates, "the fertilization ability or potential (ability to cleave) is reduced in semen from bulls grazing endophyte-infected fescue. Reduced cleavage rate is associated with the reduced penetration rate of spermatozoa into the oocyte."

As well, Schrick explained, semen collected from bulls grazing infected pastures have reduced post-thaw motility.

With the effect of fescue toxicosis on both bulls and females, Schrick said one recommendation is to remove cows from the toxic pastures for 30 days prior to breeding season and for 30 days afterward. He understands that may not be practical.

"More practical would be to have your cows calving early if spring calving and get them exposed to the bull before the hot summer months occur," Schrick said. He added that work at UT indicates June 10-12 is the latest breeding date in that state to avoid the most significant reproductive losses associated with tall fescue. Later into the summer, Schrick explained, cows get bred, but the calving season gets spread out.

"When I look at fescue, I have to think about it and heat stress as one and the same," Schrick said. "That's why fall breeding on tall fescue works better."

As well, Schrick emphasized adding clover to pastures and feeding supplemental grain as proven management techniques that help dilute the effect of fescue toxicosis.

"Remember, clover is your friend," Schrick said, stressing the recommendation that clover represent 25%-30% of the forage in an infected fescue pasture.

For anyone wanting to know how to gauge the proportion of clover in a pasture, Schrick related advice he heard someone give: "Take 10 steps across the pasture. If you step on clover three times, you're at 30%."

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There are still plenty of unanswered questions about how fescue toxicosis affects cattle performance and reproduction. For instance, Schrick explained, "A lot of producers plant MaxQ (an endophyte-free fescue variety) for their breeding pastures and then move them to endophyte-infected pastures. Will that be a problem? We don't know."

Visit the Newsroom at *www.appliedreprostrategies.com* to view the PowerPoint slides and proceedings paper submitted by Schrick to accompany his presentation.

— by Wes Ishmael

Calf Performance Starts in the Womb

"Genetics don't matter if you don't manage them to their ability," said Rick Funston, a researcher at the University of Nebraska (NU) Central Research and Extension Center at North Platte, Neb.

Funston wasn't talking about increasing inputs to maximize outputs. He was explaining the consequences on production from calves out of cows with restricted diets.

It has to do with something called fetal programming, how what the cow eats and what she endures during pregnancy impact subsequent lifetime performance of the calf she's carrying. Fetal programming is a growing area of study in both humans and livestock. Funston and his NU peers stumbled onto the effects of it with winter cow supplementation while researching year-round grazing in an effort to help ranchers reduce winter feeding costs.

"In a systems approach, we have to consider not only what we're doing to the cow, but also what we're doing to the calf," Funston explained.

In one study — calves early-weaned in August or conventionally weaned in November, with cows receiving or not receiving winter supplementation — steer progeny from cows that weren't supplemented ultimately gave up about 100 pounds (lb.) of live weight or about 60 lb. of carcass weight. Pregnancy rate of the cows was essentially the same between the study groups.

"In 11 years of studies we have seen no benefit of supplementing cows on winter range to her ability to breed or breed back," Funston said.

A similar study that included spring supplementation via meadow grazing yielded similar results. When researchers followed heifer progeny, though, those from cows that received no supplementation had a 13% lower pregnancy rate than heifers from cows that had been supplemented. What's more, 30% more of the heifers from supplemented dams conceived in the first 21-day breeding cycle. Keep in mind that heifer age at puberty and the percentage of heifers cycling at the start of the breeding season were similar between the two groups.

"So, we're not only impacting weaning weight and carcass weight of the steers, we're impacting the fertility of heifers before they're ever born," Funston said.

In another three-year study, Funston and his peers examined the effects on progeny of winter supplementation (last trimester) to cows grazing winter range or corn crop residue. The supplemented group received 1 lb. per day of a 30% protein supplement.

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Heifers from cows grazing winter range and supplementation had pregnancy rates 14% higher than those from non-supplemented dams. Heifers from cows grazing corn crop residue and supplemented had pregnancy rates 5% higher than those from non-supplemented dams.

Steers in the study from non-

supplemented dams were significantly lighter at harvest and Quality Grade was significantly less.

"By not supplementing the dam, we took marbling away from the calf before it was ever born," Funston said. He emphasized the supplementation was a pound of 30% protein supplement, not pouring feed into them in order to get the substantial gains.

Funston explained this fetal programming is associated with what's termed epigenetics — basically the heritable changes in gene expression caused by something other than the underlying genetics.

Visit the Newsroom at *www.appliedreprostrategies.com* to view the PowerPoint slides and proceedings paper submitted by Funston to accompany his presentation.

— by Wes Ishmael

Bull Management for Optimal Reproductive Performance

University of Missouri (MU) Veterinarian Dietrich Volkmann discussed commonsense practices for managing breeding bulls. To a fairly familiar list of recommendations he added a warning related to external parasite treatments involving a common class of insecticides. Volkmann cited evidence suggesting pyrethroid products may affect bull fertility.

Numerous commercially available treatments for flies and other external parasites, including sprays, pour-ons and insecticide-impregnated ear tags, utilize pyrethroid formulations. According to Volkmann, pyrethroid sprays and pour-on products have been implicated in the development of severe secondary sperm defects and poor sperm motility among breeding bulls exposed to the products.

Research indicates pyrethroids may inhibit production of an enzyme responsible for the conversion of testosterone to dihydrotestosterone, a hormone necessary to the proper function of multiple accessory sex glands. As a result, said Volkmann, bulls may produce lower volumes of semen, sperm cells may be abnormal and the 'freezeability' of

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sperm collected from artificial insemination (AI) sires may be compromised.

It appears to be a temporary effect, he says, and semen quality will improve in four to six weeks. Volkmann said he would not expect a similar effect in cows since the underlying problem was in the conversion of testosterone to dihydrotestosterone.

"All evidence is case-based, meaning there is no controlled research," Volkmann stated, "but I advise producers to stay away from pyrethroids for six to eight weeks before the onset of breeding season."

Beyond that warning, Volkmann advised producers to apply the usual litany of good management guidelines, starting with selecting bulls that are appropriate for desired goals. For example, when selecting a bull to breed heifers, calving ease may be the most important trait. Volkmann also advised against selecting bulls fresh from a confined feeding situation for immediate use for pasture breeding. Such bulls may need time to adapt to a diet of grazed forage. Furthermore, Volkmann said bulls that are obese and have not experienced sufficient exercise in recent months are more subject to musculoskeletal injuries during breeding.

Volkmann advised producers to consider a bull's age and experience when determining a bull-to-cow breeding ratio. He also recommended that bulls used in multiple-sire pastures be of similar age. Young and smaller bulls may not compete successfully against older and heavier bulls.

Recommending annual vaccination against clostridial and respiratory diseases, bovine viral diarrhea (BVD), and campylobacter (vibrio), Volkmann said vaccinations should be administered at least eight weeks prior to breeding season. Every bull, he advised, should receive a full breeding soundness examination four to eight weeks prior to breeding. After turnout in breeding pastures, bulls should be monitored for health and physical well-being, and to determine whether each bull is actively pursuing and servicing females.

For herds in which trichomoniasis has been diagnosed and carrier bulls eliminated, Volkmann advised producers to think about buying inexpensive bulls as replacements, at least for the short term.

"You might want to consider 'cheap,' and by that I mean expendable bulls, until you are sure the herd is clean," said Volkmann. "In that situation achieving a high pregnancy rate may be more important than pursuing the specific genetics you want."

— by Troy Smith

What are Herd Bulls Accomplishing in Multiple-Sire Breeding Pastures?

Outside of paternity testing, there is no way to know which calves were sired by individuals in a multi-sire pasture. Using DNA testing to accomplish that, a recent study of progeny from 2,400 cows bred to 100 bulls on three California ranches showed a range of 0 to 54 calves per bull used.

Alison Van Eenennaam, University of California-Davis animal scientist, shared results and implications in Joplin.

"We saw huge variations in production and dollar returns," she said. "This bull produced 20,000 pounds of weaning weight, this one 1,000 pounds; 7.3% of them failed completely and did not sire any calves."

While that was interesting, Van Eenennaam noted follow-up studies looked at repeatability in those production patterns. "We found it is moderately repeatable, at 0.33," she reported. Similarly, by sampling

►Using DNA testing to know which calves were sired by individuals in a multi-sire pasture showed a range of 0 to 54 calves per bull used, said Alison Van Eenennaam, University of California-Davis animal scientist.

DNA of dead calves, those problems were found to be moderately repeatable by sire.

However, cost of testing was a major barrier to culling bulls by DNA results. "You could justify finding and culling the 7% nonbreeding bulls if DNA testing only cost $1 per head," she said, but even at $5 per head, it would not pay unless 25% of the bulls were to be culled and replaced with better ones.

The studies underscored common knowledge that senior bulls prevent younger bulls from breeding, even if the young bulls are much more capable. Although many producers introduce yearling bulls into a battery of older ones, Van Eenennaam said that practice should end: "Keep the yearlings together in a pasture."

In the California pastures, she said ranchers were buying "single-trait-selected calving-ease bulls" and then using them on older cows when they grew to mature weight. "A better plan would be to use high-accuracy calving-ease sires on heifers using artificial insemination (AI)," she added.

— by Steve Suther