

Boost Bull Fertility With Zinc

BY BECKY MILLS

Your yearling bulls are by far your best ever. They gained like gangbusters during your on-farm test, the market is up, and your phone is ringing off the hook with potential buyers. It looks like you're set for a record-breaking sale.

There is just one nagging unknown. They've still got to pass the semen test.

Thanks to work done at Kansas State University (K-State), the odds can be stacked in their favor. The secret is zinc.

"We've known for years that zinc played a role in male fertility," says John Arthington, a former graduate student at K-State and now an animal scientist at the University of Florida Range Cattle Research and Education Center in Ona. "We wanted to find out how important it might be in rapidly growing young bulls."

Arthington wanted to determine if the form of zinc had an effect on the fertility of yearling bulls. In the last few years, organic trace minerals have been all the rage. The inorganic forms of zinc are normal salts, such as zinc sulfate and zinc oxide. In the organic form, one or more of these are combined with an organic carrier.

"The current theory suggests that organic forms are more easily absorbed in the small intestine," Arthington explains.

Arthington, along with University of Nebraska graduate student Kammy Johnson, former K-State animal scientist and current Certified Angus Beef LLC (CAB) vice president Larry Corah, and animal nutritionist Dale Hill set out to answer the zinc-related questions.

To the test

The research group used a set of 325 Angus yearling bulls from the same ranch and of similar genetics. They divided them into six pens with two pens in each treatment. All six pens were fed a complete ration containing the mineral supplement. Two pens received zinc sulfate at 40 parts per million (ppm), two pens received two-thirds zinc sulfate and one-third zinc proteinate (an organic form of zinc) at 40 ppm, and two pens received zinc sulfate at 60 ppm.

All bulls were weighed, and their scrotal circumferences were measured. After 126 days, the bulls were weighed off test, and the same person who took the original scrotal-



Higher levels of zinc (60-90 ppm) can boost fertility in young, fast-growing bulls.

PHOTO BY ANGIE STUMP DENTON

circumference measurements took them again. The bulls selected for public sale, 167 head, were semen tested. Weights and scrotal-circumference measurements hardly varied across treatments, but when the semen went under the microscope, the effects of the zinc treatments were apparent.

In all the fertility measurements taken in the trial, the bulls that received the zinc proteinate/zinc sulfate combination rated the highest, followed by the bulls receiving the higher dose of zinc sulfate.

Bulls with normal sperm-cell counts of less than 70%, or with motility scores of less than fair, were labeled classification deferred (CD). That's where the difference among treatments showed dramatically. In the group of bulls receiving zinc sulfate at 40 ppm, 77.6% were CD. In the bulls receiving the zinc sulfate-zinc proteinate combination, 51.5% were CD, while 58.8% of the bulls receiving zinc sulfate at the 60-ppm level were CD.

"Clearly, in young bulls, these higher levels of zinc do make a difference in spermatogenesis," Arthington says. "In the case of young growing bulls, it appears the recommended level of 30 ppm [National Research Council (NRC), 1996] is too low.

We now recommend a dietary level of 60 ppm of zinc for young, growing bulls."

Recommendations

If you are developing young bulls, the Florida researcher says to pay close attention to both the level and form of zinc in the mineral mix. He also says to make sure the zinc-to-copper ratio is at least 3-to-1. "That shouldn't be a problem if you're feeding 60 ppm of zinc," he comments. However, he warns, "Zinc and copper antagonize each other, so if you are in a copper-deficient area and are supplementing copper at 15 ppm or higher, you'll want to watch the zinc level."

He adds, "The use of an organic form of zinc could make a difference, particularly in the South where young bulls can be grazed for longer periods of time and sold as 2-year-olds. In grazing environments, free-choice mineral intake may often be low. Additionally, Southeastern forages are notoriously low in zinc."

Whatever form of zinc you decide to feed, there is no need to get overzealous. Unlike selenium, zinc has

a wide range of tolerability. The maximum allowable level is 500 ppm (NRC, 1980). Still, Arthington cautions, "Many of the antagonisms between minerals are still beyond our understanding. There is probably no reason to feed over 90 ppm. It would probably offset or change the metabolism of the other minerals."

Older bulls

What about your mature bulls? Should they be getting more than the stated NRC requirements for zinc? It probably wouldn't hurt.

"I'm sure zinc is very important in older bulls, but we see the need more dramatically in younger bulls because they are under the stress of more-rapid growth," Arthington explains. "Whenever you have a stressed animal — through weaning, growth or sickness — nutritional deficiencies are accentuated."

Besides fertility, there is another bonus — particularly important for bulls destined for rough country. "The use of organic zinc increases hoof health," Arthington comments. "That has been shown quite conclusively."

