Updates on the benefits of monensin supplementation on beef cattle receiving warm-season perennial grasses

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Beef cattle production in Florida relies on warm-season perennial grasses and most of the cow-calf operations in the state have extensive grazing systems with limited levels of supplementation. Ionophores have been used to increase ruminant production and monensin has been the most used ionophore in the USA. Although the mechanisms are not completely elucidated, the main effects of monensin on ruminants are: 1) Shift in rumen fermentation, 2) Change feed intake and digestibility, 3) Alter gas production, and 4) Increase protein use efficiency. It is known that monensin selects microorganisms in the rumen and enhance fermentation efficiency by increasing propionic acid and decreasing methane production. However, in extensive grazing systems, the animals are usually consuming limited amount of propionic acid precursors, such as starch and sugars, and therefore, it is expected that monensin may not be an efficient feed additive to be used under those conditions. Conversely, beef cattle supplemented on pasture with significant levels of concentrate may consume considerable amount of starch and sugars, which may enhance the effects of monensin and result in increased animal performance.

Research projects conducted at the UF/IFAS Range Cattle Research and Education Center evaluated the effectiveness of monensin in different cow-calf production systems. An initial study tested the effects of monensin (200 mg/d) on 2-year old heifers grazing bahiagrass pastures. Heifers received 1 lb of concentrate supplement daily. The objective of the study was to verify the effectiveness of monensin in grazing animals with limited supplementation. There was no effect of monensin supplementation on heifer's average daily gain. At the end of the study, the heifers were moved to a drylot facility to quantify the effects of monensin (200 mg/d) on forage intake of heifers receiving stargrass hay. There was no difference in total dry matter intake (2.1% BW) or forage dry matter intake (2.0% BW) between treatments.

Molasses is one of the main sources of supplement for cow-calf production in Florida. A study was conducted at Ona to test the effects of adding monensin (200 mg/d) to molasses supplementation of beef heifers grazing bahiagrass pastures during the summer and autumn. Heifers were offered 7.8 lb of cottonseed mixed with 31 lb of sugarcane molasses per week. The weekly amount was divided in 3 feedings/week (Monday, Wednesday, and Friday). The addition

of monensin to the supplement did not impact heifer average daily gain or body condition score; however, supplement intake rate decreased and heifers receiving monensin consumed the supplement at a slower rate. Similar to the previous study, heifers were moved to a drylot facility and received the same treatments and bermudagrass hay. No difference in forage dry matter intake, total dry matter intake, or heifer average daily gain was observed.

Early weaning is an effective management practice to increase the likelihood of rebreeding first-calf beef heifers; however, the practice can be a challenge, partially because there are few management options for early weaned calves. Mild winters in Florida allow producers to raise early-weaned calves on warm-season grass pastures with at least 1% BW supplementation. With greater levels of concentrate, it is likely that monensin would be an effective additive to add to supplementation of early-weaned calves. Two experiments were conducted at Ona to evaluate the effects of concentrate amount and monensin inclusion on performance of early-weaned beef calves consuming warm-season grasses in drylot and pastures. In both experiments, treatments consisted of two concentrate amounts (1 or 2% calves body weight) with or without monensin. On pasture, early-weaned heifers grazed bahiagrass and in the drylot they received stargrass hay. The addition of monensin in the supplement on bahiagrass pasture increased average daily gain and decreased fecal coccidia egg counts, and calves receiving 2% body weight concentrate had greater average daily gain. In the drylot, there was no effect of monensin on forage and total dry matter intake and calves receiving 2% body weight concentrate had less forage intake than 1% body weight.

The decrease in coccidiosis caused by monensin was an attractive characteristic to potentially increase the performance of young calves on pasture. A few studies were conducted to test the effects of adding of monensin to the supplement of creep-fed and early-weaned calves. Early-weaned calves grazing bahiagrass in the winter and receiving 2% body weight supplementation had significant increase in average daily gain from 1.7 to 2.0 lb/d. They also had a 76% reduction in the incidence of coccidia. In addition, a study was conducted to test the effect of adding monensin to calves receiving 1 lb of supplement on creep-feeding. Monensin was effective to increase average daily gain on creep-feeding, primarily due to decrease in coccidia egg count.

In conclusion, the positive effects of monensin in rumen fermentation may be minimized in cattle receiving predominantly warm-season forages with limited concentrate supplementation. However, the addition of monensin may decrease supplement intake rate and be desirable in systems with infrequent supplementation on pasture. Monensin should be supplied to early-weaned and creep-fed calves to increase performance and decrease coccidia infestation. The addition of 200mg/head/d of monensin may result in an extra $ 0.10 cost in supplementation; therefore, a minimum of 0.1 lb/d of additional average daily gain would be necessary to offset the cost of monensin at the current cattle market (Cattle Market Mobile, $ 1.37 / lb for a 500 lb steer in Okeechobee, FL on 03/24/2020).

If you have questions about the use of monensin in supplements for cow-calf production in Florida, please contact Joe Vendramini at jv@ufl.edu.

Figure 1. Early weaned calves receiving concentrate supplementation

Figure 2. Calves receiving creep-feeding on pasture