



Probiotic Supplementation for Beef Heifers

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Probiotics, sometimes called direct-fed microbials, are live bacteria or yeast that provide health benefits when consumed. When added to the diet, probiotics help develop a healthy population of good bacteria in the gut, prevent harmful bacteria from taking over, improve the gut lining, and strengthen the immune system. While probiotics have been widely studied in human health, they haven't been researched as much in beef cattle.

One type of bacteria, called *Bacillus*, has anti-inflammatory properties that can improve animal performance. *Bacillus*-based probiotics are also cost-effective, costing around 3.5 cents per animal per day, and they help cattle digest forage better. In a study with pregnant Brangus heifers, we found that those given *Bacillus*-based probiotics had better body condition score at calving. Additionally, their calves responded better to vaccinations against respiratory diseases and showed improved growth and feed efficiency compared to calves whose mothers didn't receive the probiotic (Izquierdo et al., 2014). *Bacillus*-based probiotics are easy to add to cattle feed, and can be mixed with cubes, molasses, or loose meal supplements, making them convenient for producers. Currently, we are conducting two studies to test the benefits of probiotic supplementation for replacement beef heifers and mature cows throughout the year. In this report, I'll share preliminary results from the heifer study, with future articles covering the mature cow study.

In 2023, our team began a study to evaluate the use of *Bacillus*-based probiotics in developing replacement beef heifers and their impact on growth and reproductive outcomes. We worked with 64 Brangus heifers, splitting them into two groups: 32 heifers received regular concentrate supplementation without probiotics (NOBAC), and 32 heifers received the same concentrate supplementation added with 3 grams of *Bacillus*-based probiotics per heifer per day (BAC). Heifers were on their respective diets for 300 days, starting 30 days after weaning and continuing until pregnancy diagnosis.

Contrary to our expectations, both groups of heifers showed similar growth and average daily gain throughout the study (Table 1). However, we observed that the group receiving probiotics had numerically higher percentage of heifers reaching puberty before the breeding season began and a slightly higher conception rate after artificial insemination (Table 1). This is important because heifers that breed early in their first breeding season tend to have better long-term productivity. They calve earlier, wean heavier calves, and have higher pregnancy rates and longevity for the next six generations compared to those that breed later in the season.

Adding probiotics to heifer supplement for 300 days was relatively inexpensive, increasing feed costs by just \$10.50 per heifer. Our year 1 results suggest that probiotics could be a promising

tool for cow-calf producers in Florida. However, to make more confident recommendations, we need to test this on a larger scale with more than 50 heifers per treatment group. That's why we're repeating the study for a second year to confirm our findings. We thank the Florida Cattle Enhancement Board for funding both years of this study. We'll share the final results in future articles and through extension programs. Overall, these preliminary findings are promising, and this supplementation program could be a game-changer for improving heifer reproductive success in Florida.

References

Izquierdo, V. S., B. I. Cappellozza, J. V. L. Silva, G. C. M. Santos, A. Miranda, J. H. J. Bittar, A. Pickett, S. Mackey, R. F. Cooke, J. M. B. Vendramini, and **P. Moriel**. 2024. Maternal pre- and postpartum supplementation of a *Bacillus*-based DFM enhanced cow-calf performance. *J. Anim. Sci.* 102:skae110. [doi:10.1093/jas/skae110](https://doi.org/10.1093/jas/skae110)

Table 1. Performance of developing replacement Brangus heifers offered daily concentrate supplementation (2% of their body weight) added or not with a *Bacillus*-based probiotic (3 grams per heifer per day) from August 2023 to May 2024.

Item	Supplement treatment		P-value
	NOBAC	BAC	SUPP
% of mature body weight at the start of breeding	70.3	70.0	0.77
Average daily gain, lb/day			
From weaning to start of breeding season	1.81	1.78	0.76
From weaning to end of breeding season	1.63	1.62	0.92
Pubertal heifers at the start of synchronization, % of total	6.7	24.1	0.06
Reproductive tract score (Scale of 1 to 5)	3.72	4.00	0.12
Pregnant heifers, % of total			
Artificial insemination	37.5	52.5	0.24
Artificial insemination + Bull breeding	73.3	72.4	0.94

Upcoming Events

Cattle Management for Women – Nov. 1, 9:00 a.m. – 3:00 p.m. Location: 18724 Hancock Farm Road, Dade City. Space is limited. Registration: \$40 on Eventbrite.

Managing Cattle Enterprises for Success – Nov. 7, 5:30 – 8:00 p.m. Topic: Breeding Season Management. Location: Pasco Co. Learn more and register on Eventbrite.

Ona Highlight – A Soil & Water Program Update – Nov. 22, 11:00 – 11:45 a.m. with Dr. Maria Silveira, a Soil and Water Specialist at the UF/IFAS Range Cattle REC in Ona. Visit our website calendar to register for the Zoom or call us to attend in person. 863-735-1001

UF/IFAS Range Cattle REC - 3401 Experiment Station Rd., Ona - <http://rcrec-ona.ifas.ufl.edu/>