Fatty acid supplementation and pregnancy rates of beef cows

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Reproduction is the main factor limiting productivity in cow-calf systems, and pregnancy loss has been recognized as the main reproductive challenge in beef cattle. More specifically, 90 to 100% of fertile beef females successfully conceive after a single service, whether natural service or artificial insemination (**AI**) is utilized. However, less than 70% of these females remain pregnant 30 days after service, and even fewer females give birth to a live calf. Hence, nutritional interventions to promote early embryonic survival are crucial to achieve optimal reproductive efficiency of cow-calf operations.

Supplementing **calcium salts of soybean oil** (**CSSO**) to beef cows provides **specific polyunsaturated omega-6 fatty acids, such as *linoleic acid***, which benefits cattle reproductive function by reducing pregnancy losses in both dairy and beef cattle (Cooke, 2019). For example, studies were conducted with Nelore (*Bos indicus*) cows grazing tropical pastures and cows were assigned to fixed-timed AI and supplemented or not with 0.22 lb/day of CSSO for 21 days after AI. Overall, CSSO supplementation increased pregnancy rates from 38% to 49%. These outcomes were also observed in *Bos taurus* beef cows consuming temperate forages and assigned to fixed-time AI. Collectively, supplementing CSSO to over 6,000 cows promoted maternal pregnancy recognition and increased pregnancy success in beef cows (Cooke, 2019). However, all studies mentioned above supplemented CSSO to cows undergoing a synchronization protocol and AI. Similar studies using CSSO supplementation during natural breeding have not been conducted yet. **Hence, we conducted our study to evaluate the effects of supplementing omega-6 fatty acids (CSSO) during the entire breeding season of beef cows placed with bulls (no protocols or AI) on pregnancy rates and calving distribution of beef cows.**

The experiment was **funded by the Florida Cattle Enhancement Board** and conducted at the Range Cattle REC (Ona, FL) from January 2023 to July 2024. In January, Brangus cow-calf pairs were allocated bahiagrass pastures (12 to 20 cow-calf pairs/pasture; 280 cows total) and placed with mature Brangus bulls for a 90-day breeding season. Cows received free choice access to molasses-based protein blocks with 0.22 lb/day of saturated fat (**CONTROL**) or 0.22 lb/day of calcium salts of soybean oil (**CSSO**) for the entire breeding season. Target intake of the

molasses blocks was 1 lb/cow/day to achieve an intake of 0.22 lb/day of CONTROL or CSSO fat.

Results: Unexpectedly, cows consumed slightly less than 50% of the target intake throughout the breeding season (Figure 1) and did not achieve the desired block intake, regardless of fat source. All cows also received access to liquid molasses + urea supplementation in addition to blocks, which likely influenced daily block intake. Final pregnancy rates obtained in June 2023 did not differ between treatment (89.7% vs. 87.9% for CONTROL and CSSO, respectively; $P = 0.77$), which was not surprising since cows did not consume the target amount of CSSO. Calving will begin in October 2023 and end in December 2023. It is possible that, although pregnancy rates did not differ, cows offered CSSO supplementation conceived early and will calve earlier than CONTROL cows, which will lead to older and heavier calves at weaning (July 2024). Supplementing CSSO increased incorporation promoted maternal pregnancy recognition and increased pregnancy success in *Bos taurus* and *Bos indicus* beef cows submitted to a fixed timed-AI program (Cooke, 2019). However, for cows submitted to natural breeding, CSSO supplementation via protein tubs did not impact overall pregnancy rates when also supplemented with liquid molasses + urea. Benefits to calving distribution might still be possible.

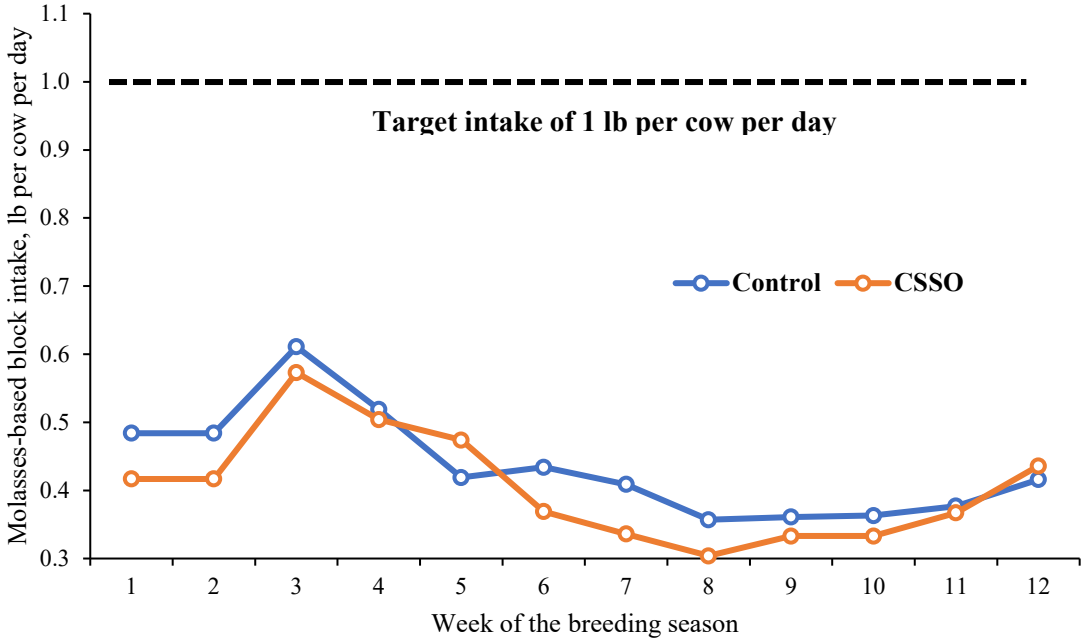

Figure 1 – Average daily intake (lb per cow per day) of molasses-based protein blocks containing a saturated fat source (CONTROL) or poly-unsaturated fatty acid source (CSSO) for 90 days (week 1 to 12 of the breeding season). Target intake for both supplements was 1 lb per cow per day.

Reference

Cooke, R. F. 2019. Early career achievement award: supplementing omega-6 fatty acids to enhance early embryonic development and pregnancy establishment in *Bos indicus* and *B. taurus* beef cows. J. Anim. Sci. 97, 485–495. doi: 10.1093/jas/sky414

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Upcoming Events

October 19, 9:00 a.m. - 2:00 p.m. **Building Sustainable Pastures for Healthy Livestock** Location: UF/IFAS Range Cattle REC, Ona. Register by 10/13 to attend. General registration fee is $25, students are free. Lunch included. Learn more and register on Eventbrite.

October 24, 11:00 – 11:45 a.m. **Ona Highlight webinar with guest presenter Dr. Augustine Obour** "Grazing of cover crops and annual forages to improve soil health in dryland cropping systems in the semi-arid Great Plains." Dr. Obour is a professor of soil science at Kansas State University and a former PhD student of Dr. Maria Silveira. For more information or to register call 863-735-1001.

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