

FINAL REPORT – Project #00125137

Title: Impacts of estrus synchronization (ES) and fixed-time artificial insemination (TAI) on pregnancy and calving distribution of Florida beef herds

Principle Investigator: Dr Cliff Lamb and Nicolas DiLorenzo, North Florida Research and Education Center

Relevance to Florida Cattle Industry: Developing strategies and altering estrous synchronization protocols to enhance fertility to TAI for Brahman-influenced cattle is essential to enhancing productivity of Florida beef cattle operations. Infertility that leads to failure of a cow or heifer to become pregnant and delivery a calf, results in the single largest economic loss of cow-calf production systems. Therefore, incorporating ES and TAI in Florida beef cattle operations has the potential to alter breeding season pregnancy rates, improve calving distribution and improve longevity of females in Florida beef cattle operations.

Objective: To determine if incorporation of estrus synchronization and artificial insemination enhances pregnancy rates, alters calving distribution and improves reproductive efficiency of Florida beef cattle operations.

Methods: Seven hundred fifty one replacement beef heifers at two locations were assigned to one of two treatments (Figure 1): 1) Estrus Synch (n = 371); were exposed to estrus synchronization (ES) and fixed-time artificial insemination (TAI) using the 7-day CO-Synch+CIDR protocol; and 2) Control (n = 381); heifers were mated by natural service with no ES and TAI. Pregnancy was determined by transrectal ultrasound diagnosis at 45 days after TAI and will be determined again 30 days after completion of the breeding season. Blood samples were collected at 10 and 0 days prior to initiation of ES to determine concentrations of progesterone (P4) to determine cycling status of heifers.

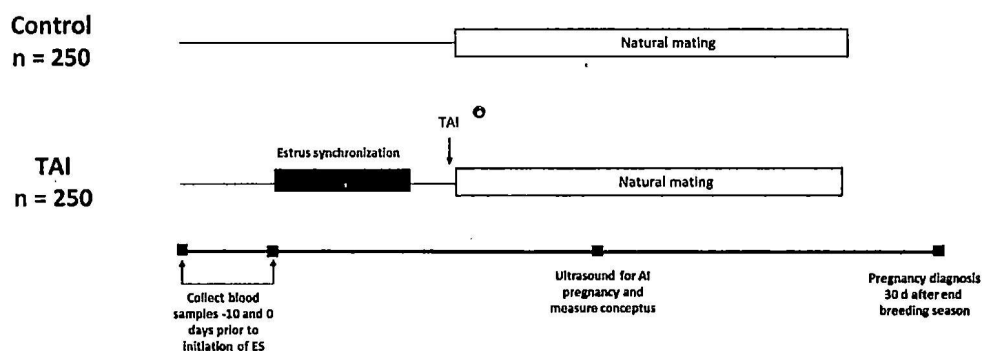


Figure 1. Schematic of treatments.

Results: Within 21 days of the breeding season a greater ($P < 0.05$) proportion of Estrus Synch heifers (54.4%) had conceived than the Control heifers (48.2%); however, the percentage of heifers conceiving after 21 days was similar between treatments (Figure 2). In addition, survival analysis demonstrated that heifers exposed to Estrus Synch conceived earlier during the breeding season than Control heifers (Figure 3). In spite of initial earlier establishment of pregnancy, overall pregnancy rates at initial pregnancy diagnosis (57%) and

at final pregnancy diagnosis (91%) did not differ between treatments. However, pregnancy rates between locations differed ($P < 0.001$) at initial and final pregnancy diagnosis. At initial pregnancy diagnosis pregnancy rates were 50% and 80% for locations 1 and 2, respectively, whereas at final pregnancy diagnosis pregnancy rates were 89% and 97%, for locations 1 and 2, respectively.

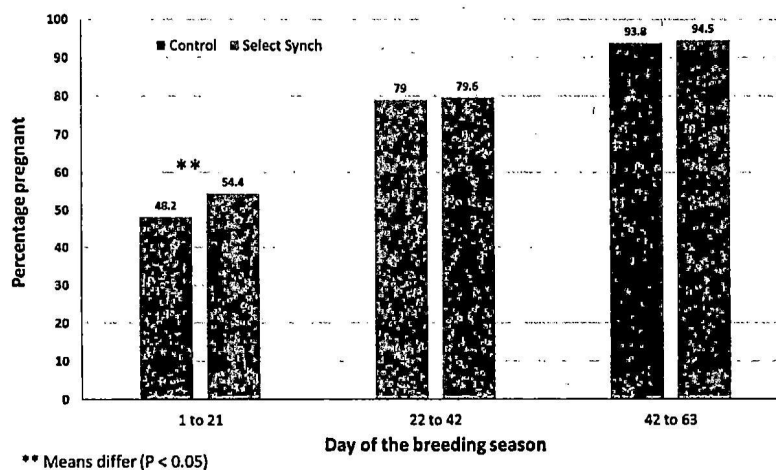


Figure 2. Percentage of heifers pregnant during three intervals during the breeding season.

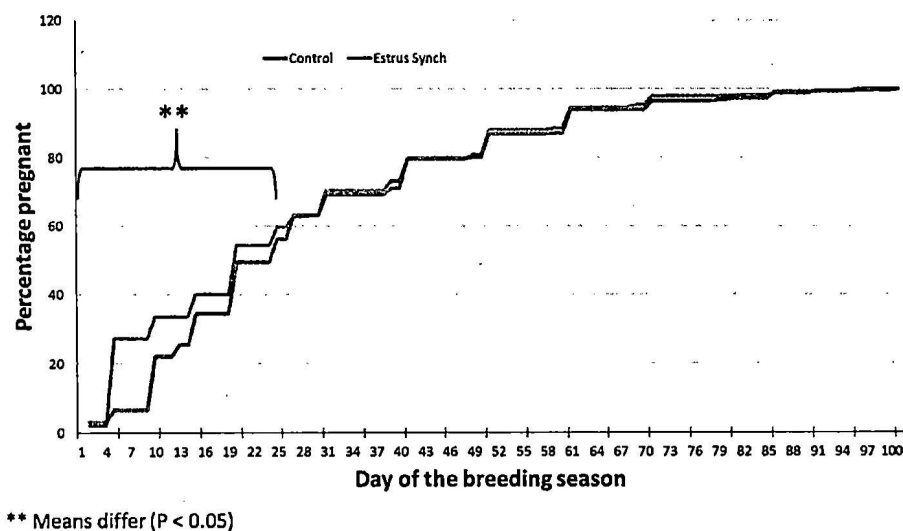


Figure 3. Survival analysis of pregnancy establishment during the breeding season

Conclusion: Use of estrus synchronization and TAI in *Bos indicus* beef heifers increased the percentage of heifers pregnant early in the breeding season compared to heifers not exposed to estrus synchronization and TAI.