

Incorporation of Sexed Semen into the 7-day CO-Synch + CIDR Estrous Synchronization Protocol

Objective

Evaluate pregnancy rates, future calf performance, and overall profitability of suckled beef cows exposed to the 7-day CO-Synch + CIDR estrous synchronization protocol and inseminated with sexed or conventional semen.

Review of Pertinent Literature

Reproduction is a major limiting factor to production efficiency and profitability of beef cattle. Given that gestation length limits beef cows to produce one calf per year, reproductive performance of the cowherd largely determines the annual income in cow-calf operations. (Wiltbank et al., 1961). Shortening postpartum anestrus, enhancing first service conception rates, and alleviating embryonic loss are all factors that contribute to increasing the beef producer's annual calf crop and consequent economic returns (Call and Stevenson, 1985; Short et al., 1990; Jolly et al., 1995). With recent advances in semen sorting, breeding cows with sexed semen is an additional alternative to add value to the calf crop. As an example, in typical Oregon cattle auctions, weaned beef steers are worth 15% more than contemporary heifers (Central Oregon Livestock Auction, 2010). Moreover, feeder steers generally have increased feedyard performance, efficiency, and carcass merit compared to heifer cohorts (Hassen et al., 1999). Hence, breeding beef cows with semen sorted for males will benefit beef producers that market the calf crop after weaning, as well as producers that retain ownership through the feedyard. Nevertheless, early research demonstrated that sexed semen may yield lower pregnancy rates when compared to conventional semen (Seidel, 2010), which may prevent optimal reproductive performance of the cowherd and annul any benefits on calf crop potential. However, with advances in semen sorting and freezing, pregnancy rates to sexed semen are improving and reaching comparable results to conventional semen, although additional studies with larger groups of beef animals are warranted to validate this outcome (Hall et al., 2010). Further, no research studies to date evaluated effects of sexed semen on calf crop overall performance and economical returns. Therefore, we propose that with the advancing technologies in production, sexed semen is a viable alternative to promote overall returns per beef cow inseminated, independently if the beef calf is sold at weaning or ownership is retained until harvest. **We expect to demonstrate that incorporation of sexed semen into the 7-day CO-Synch + CIDR protocol will benefit overall production efficiency and profitability of cow-calf operations.**

Methods and Materials

The proposed research will be conducted over two years in lactating, postpartum beef cows originated from the Oregon State University – Eastern Oregon Agricultural Research Station (Burns location, n = 250 cows per year, Union location n = 200 cows per year). Cows will be synchronized with the 7-day CO-Synch + CIDR estrous synchronization protocol (Larson et al., 2006). Cows will be stratified according to breed, age (primiparous versus multiparous), and days postpartum (at CIDR insertion) and assigned to be inseminated with: 1) Conventional semen (total n = 450); and 2) GenChoice 90™ sorted for male calves (Genex Cooperative, Inc., Shawano, WI; total n= 450).

Blood samples will be collected on d -14 and -7 relative to CIDR removal to determine concentrations of progesterone. Serum concentrations of progesterone will be determined to assess establishment of luteal function and assumed normal estrous cycles.

Transrectal ultrasonography will be performed 150 days after insemination to determine semen source effects on pregnancy rates. To evaluate semen source effects on the future calf crop performance, gender ratio will be calculated, and calf body weight will be recorded at birth, weaning, feedlot entry, and slaughter. Calf growth rates will be calculated from birth to weaning, weaning to feedlot entry, and feedlot entry to slaughter. The following carcass characteristic will be obtained 24 h

post-harvest: USDA Yield Grade, hot carcass weight, 12th-13th rib adjusted fat thickness, longissimus area, KPH%, USDA Quality Grade, and USDA marbling score. Final carcass value will be assessed based on the aforementioned carcass traits and contemporary carcass prices. Economical analysis will be conducted to evaluate semen source effects on overall cow profitability according to final calving rates, weaning weights (simulate calves sold at weaning) and final commercial carcass value (simulate ownership retained until slaughter).

Outcomes

Variables of interest will include: pregnancy rates and actual calving rate; gender ratio, initial (birth to weaning) and long-term (weaning to slaughter) calf performance; calf weaning value or final carcass value; and overall return per cow inseminated.

Immediately after the completion of the study, results will be analyzed and interpreted in collaboration with the sponsor. Results will be then summarized, integrated into beef cattle extension material, and reported into popular press and extension publications. We also expect to submit 2 research abstracts for scientific conferences, and 1 research article for publication into a scientific journal.

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