

Outcomes of Synchronization and Timed Insemination Coupled with Retained Ownership in a Commercial Beef Cattle Operation

W. Dee Whittier, DVM, MS

Department of Large Animal Clinical Sciences, Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech, Blacksburg, VA 24061-0442

Introduction

GnRH-based estrous synchronization programs have allowed for outstanding success in getting cows pregnant with timed insemination (TAI). This technology allows pregnancy rates approximating those of natural service to a single insemination. The system minimizes the requirement for estrus detection with its attendant error rates and high demand for labor. The overall method allows producers to select semen from superior sires with known progeny performance to meet the outcomes that are most economical for their operations. These outcomes include traits that provide for desirable parturition outcomes, high rates of growth and feed efficiency, and the production of carcasses that are sold for a premium because they receive desirable quality and yield grades.

Retained ownership beef cattle production schemes are different from traditional beef cattle management approaches wherein calves change ownership from the cow/calf operation to the growing phase and finally to the finishing or feedlot phase. Retained ownership through the feedlot and then marketing finished cattle through a value-based program allows the cow/calf producer to be compensated for the actual value of the beef produced. Because most calf marketing schemes tend to value cattle based on industry averages, there is the potential to augment income through retained ownership if cattle have characteristics that result in performance and end-product that is superior to industry average.

Materials and Methods

This study involved crossbred beef cows that are part of a commercial beef enterprise in southwest Virginia. Cows were managed in either a fall-calving herd or a spring-calving herd. Fall-calving cows were bred in late November with a September and October calving season. Spring-calving cows are bred in May with a mid-February to mid-April calving season. Cows ineligible for TAI included cows less than 30 days postpartum at the beginning of synchronization as well as cows destined to be culled following calf weaning.

Cows were synchronized using the Ovsynch system. All eligible cows were given 125 mcg of GnRH on

day 0, 30 mg of cloprostinol on day 7, 125 mcg of GnRH on day 9 and then inseminated on day 10 at approximately 16 hours following the last injection of GnRH (TAI). Heat detection was performed from day 7 forward, and any cow detected in estrus prior to 3 pm on day 9 was inseminated using the am/pm rule (insemination approximately 12 hours after heat detection). Natural service sires were placed with cows approximately 7 days following TAI so that cows not conceiving to the TAI had a chance to conceive to natural service; they remained with the cows for about 60 days.

Semen was selected from sires based on traits believed to be economically important to the system: birth weight, weaning weight, yearling weight, maternal milk, carcass weight, back fat, marbling or percent intramuscular fat, hip height and scrotal circumference.

Eleven breeding seasons were summarized for this report—2558 cow breeding records were collected for the eleven seasons. Cows ranged in age from two years to 17 years with approximately 20% of cows in each season being primiparous 2-year-olds.

Calves were weaned at approximately 200 days of age and fed a growing ration for 40 to 90 days following weaning. All steers and about one-half of heifers were then designated as feeder cattle. The balance of heifers was developed on the home farm and bred and returned to the herd as replacements. Feeders were transported to a feedlot near Henderson, Nebraska where they were managed in a typical feedyard setting. At the point that harvest was judged to be most economical, cattle were marketed on a carcass basis through a quality grade/yield grade grid-based system, and carcass data were collected. Data on quality and yield grades for a typical year, 2005, were studied to look at sire effects on carcass grades and pricing. By this point about one-half of cows in the herd were themselves sired by artificial insemination.

Economic evaluations were performed by estimating costs for synchronization and artificial insemination, costs for the use of natural service sires and by calculating returns from the sale of harvested cattle.

Results

Cows conceiving to artificial insemination following synchronization TAI averaged 64.8%, with a season

range of 62.3 to 68.6%. Overall season pregnancy rates averaged 96.8%, with a range of 93.7 to 98.8%. A total of 92.3 % of all cows in the herd were subject to synchronization and inseminations with an increasing percentage of cows subjected to the protocol in the more recent breeding seasons.

Each TAI insemination was calculated to cost \$26.65 in 2005 dollars. Assuming a 65% estimated AI pregnancy rate, this equates to \$41 per TAI pregnant cow. Natural service sire costs were estimated to be \$24.38 per exposed cow. Assuming a 90% pregnancy rate, this equates to \$27.09 per natural service pregnant cow.

Significance

Additional benefits from the TAI scheme include:

- Increase pregnancy rate by 2% adds \$11.60 in value.
- Fewer assisted births: 1.3% TAI sired calves versus 2.9% natural service sired.
- Lower death loss: 3.5% AI sired versus 5.5% natural service. Adds \$12.21 in value.
- Shorten calving season: 87% calved in first thirty days of the calving season in spring 2005.
- Increased calf age by 16 days overall; AI sired calves are on average 27 days older than natural service sired calves.

Timed insemination coupled with retained ownership of calves in this commercial beef cattle operation proved to be a valuable approach to increasing profitability. Pregnancy rates similar to natural service outcomes were achieved with TAI. Calves sired by AI outperformed natural service sired herd mates, as did the cows that eventually resulted from this system. Costs for TAI were slightly greater than for natural service, but the additional value of calves resulting from TAI more than compensated for the increased costs.

Table 1. Summary of weaning weights for spring 2005 born calves.

Group	Average weight	Age	WDA
AI on AI 1	747 lb	230 days	2.92 lb
AI on Non-AI 2	691 lb	223 days	2.76 lb
Non-AI on AI 3	720 lb	205 days	3.15 lb
Non-AI on Non-AI 4	625 lb	195 days	2.82 lb

AI on AI 1 = calves sired by TAI sires with dams sired by TAI sires.

AI on Non-AI 2 =calves sired by TAI with dams not sired by TAI sires.

Non-AI on AI 3 = calves sired by natural service sires with dams sired by TAI sires.

Non-AI on Non-AI 4 = calves sired by natural service sires with dams not sired by TAI sires.

Table 2. Summary of feedyard performance for calves born in the fall of 2004.

Group	Live Wt	Days on feed	ADG
AI on AI 1	1373 lb	165	3.79 lb
AI on Non-AI 2	1310 lb	165	3.75 lb
Non-AI on AI 3	1273 lb	170	3.25 lb
Non-AI on Non-AI 4	1258 lb	180	3.52 lb
Overall	1297 lb	170	3.71 lb

AI on AI 1 = calves sired by TAI sires with dams sired by TAI sires.

AI on Non-AI 2 =calves sired by TAI with dams not sired by TAI sires.

Non-AI on AI 3 = calves sired by natural service sires with dams sired by TAI sires.

Non-AI on Non-AI 4 = calves sired by natural service sires with dams not sired by TAI sires.