



Estrous Synchronization and Artificial Insemination in Beef Replacement Heifers

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Summary:

Estrous Synchronization (ES) and Artificial Insemination (AI) can be profitable management tools. The amount of money that is returned is variable and depends on several factors. The calves from the 2001 breeding season will be weighed at weaning in fall, 2002 so that accurate returns can be calculated.

This is a report from a two-year study looking at the value of ES and AI in beef replacement heifers.

Objective:

Estrous synchronization (ES) is used to reduce the amount of labor associated with heat detection in an artificial insemination (AI) program. Pregnancy rates in females that respond to ES averages 50%. Money can be made or lost with ES and AI depending on pregnancy rates to synchronization, subsequent calf performance, cost of ES and AI, and market prices for calves.

Materials and Methods:

Beginning on May 9, 2001, seventy-eight purebred Angus heifers were given treatment for ES using two injections of Lutalyse[®] given 11 days apart. At the second injection, a Kmar[®] heat mount patch was placed on the tail head of each heifer as an aid in heat detection. Beginning 24 hours after the second injection, heat detection was done twice daily for 5 days. Heifers that responded to treatment displayed heat beginning May 23 to May 26. Each heifer that responded was artificially inseminated 10 to 12 hours after their first signs of heat. About 10 days after the synchronized AI period, heifers were naturally mated for approximately 50 more days to allow those not conceiving to AI a chance to become pregnant.

Results and Discussion:

Fifty-five of 78 head (70%) responded to ES treatment by displaying heat, and 25 of the 55 (45.5%) became pregnant to AI. Calves from the 25 heifers that conceived to AI were born over a five day window beginning February 28 through March 3, 2002. Calves from heifers that did not conceive to AI, but conceived at natural mating after the AI period, were born within the next 45 days. Average birth date of the AI sired calves was 33 days earlier than calves sired naturally following the synchronized AI period. All calves were weighed at fall weaning (December 17, 2002).

The earlier birth date of the AI sired calves allowed them to grow over a longer period, compared to the calves that were naturally sired, and resulted in an average weight difference of 104 lbs per calf favoring the AI sired calves. In a report generated last year, the 25 AI sired calves were projected to generate approximately 3,700 pounds of calf above what would be achieved without ES. Actual added pounds were 2,600. The value of these added pounds amounted to \$2,228.20 (2,600 lbs x \$0.857 - average price per pound of steers and heifers combined on December 17, 2002 at Lampasas, TX). Total cost to synchronize heat was \$624 (78 head x \$7, plus \$78 for heat mount patches), and total cost to AI fifty-five head was \$1,210 (55 head x \$22). Estimated labor cost was \$336. All costs amounted to \$2,170.

The added weight in AI sired calves translated to \$58.20 (\$2,228.2 - \$2,170) additional income to the herd which was a 2.7 % return over the cost of ES and AI. Thus, the cost of implementing ES and AI in these heifers was covered by actual weight advantages in the AI sired calves.

ES and AI can be profitable management tools, but the amount of money that is returned is variable and depends on several factors including cost to implement these practices, percent of females conceiving to AI, genetic potential for growth in the AI sire, amount of added calf weight due to earlier birth dates, and feeder calf prices. The 2.7% return above the cost of implementing these practices compared favorably to an 18 month certificate of deposit which averaged at 2.2 % from May, 2001 to December, 2002.

Had these heifers been exposed to a second AI mating during the 21 days after the synchronized mating, more conceptions would have occurred to the AI sire who had genetics for accelerated growth compared to the natural mating sires. The result would have been additional pounds of calf with increased value above what was generated by a single AI mating. Likewise, the response rate of these heifers to ES treatment was only 70 %. A more typical response is 90 %, and had that been the case in this herd, 32 heifers would have conceived. At the same weight advantages generated by the original 25 calves, 7 more calves would have generated enough weight to increase the income up to \$2,852.10 which translates to a 3.14 % return above the cost of implementing ES and AI in this herd.

It should be noted that this financial analysis was done under the assumption that all these calves would have been sold on December 17, 2002 (day of weaning) and received commercial

feeder calf prices. However, these were purebred calves which clearly would have had more value than was used in the analysis. In addition, all sires used in this study had particular genetic characteristics that had value not necessarily associated with added weight alone. Furthermore, it is likely that some of the female offspring from these matings would have been retained as replacement heifers to be mated in 2004. Their eventual offspring would have potentially increased lifetime value above their dams since they were a result of highly selected matings.

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