

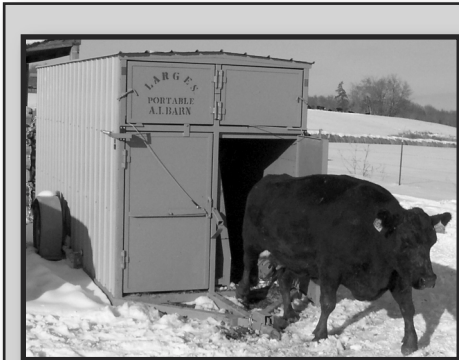
Artificial Insemination Economics

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The objective of the study was to compare gross sale income between calves sired by artificial insemination (AI) utilizing proven sires with high accuracy percentages and natural service sires. Study was conducted at the David M. Barton Agriculture Research Center Gordonville, Missouri. Use of artificial insemination (AI) in beef cattle is limited because of

Cows were Fixed-time AI following a CIDR-based protocol that included GnRH. The cow CIDR based protocol was day 1 GnRH injection and CIDR placed into their vagina, day 7 - 5 ml Lutalyse injection, CIDR removed, and 66 hours post Lutalyse injection timed AI and GnRH (Cystorelin) injection (2 ml) at the time of insemination. One proven AI sire was used for all AI services (heifer and cows). Cows were randomly assigned to one of two experienced AI technicians, stratified by age of cow, days postpartum, and body condition score. Natural service bulls were introduced 14 days after fixed-time AI. Pregnancy diagnosis was determined by ultrasonography 62 days after the date of times insemination.



The benefit of an AI Barn is the increase in AI conception when the barn technology is utilized. Southeast Missouri State University increased AI conception six percent, because of the AI Barn.

Inside the barn the females stand in a darkened area. The cows act just like we do, when entering a dark room we immediately stop and strive to find the light switch. Cows are not accustomed to the light, however they stand very calmly.

Cows that stand calmly & quietly are much easier to breed artificially, thus the higher conception rate is realized.

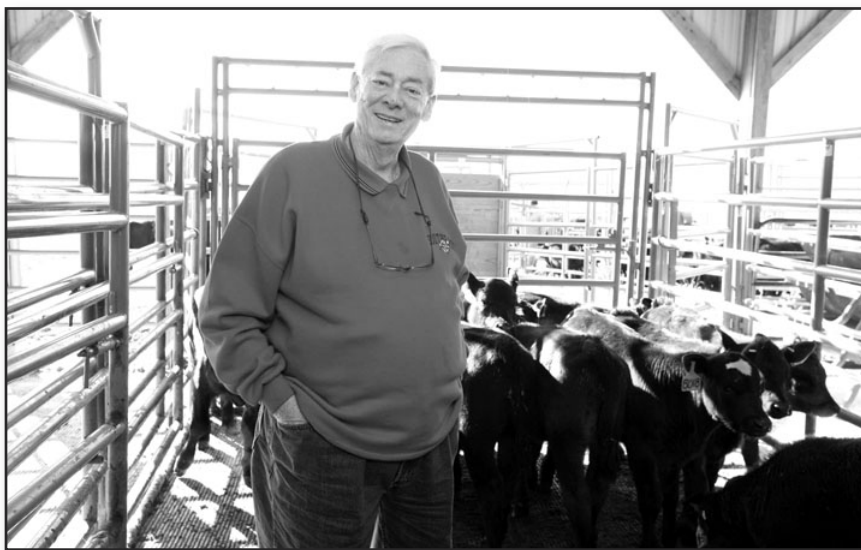
technicians, stratified by age of cow, days postpartum, and body condition score. Natural service bulls were introduced 14 days after fixed-time AI. Pregnancy diagnosis was determined by ultrasonography 62 days after the date of times insemination.

the technique difficulty and time required in detecting the onset of estrus. Beef producers with a diversified farming enterprises do not have the time for a traditional AI breeding program. Synchronization of estrus has the potential of shortened the calving season, increased calf uniformity, and enhances the possibility of incorporating AI into your herd management. Synchronization of estrus requires additional expenses for chemical protocols and semen. Fixed time AI for beef cattle will require precise control of their estrus cycle by coordinating both follicular growth and corpus Luteum regression. AI allows beef producers to make improvement in calves by the use of genetically proven sires with high accuracy percentages. National wide only a small percentage of beef producers are using AI. This lack of technology utilization by the United States beef industry yields a concern as to which country will be producing highest quality beef in the future. Beef semen sales from 1993 to 2003 demonstrate that the U. S. decreased semen sales -8 percent and Brazil increased +161 percent. Producers are concerned with the cost, procedure, and time required of incorporating AI into their herd management. Beef cow-calf enterprise is at a unique point because of available technologies to control cattle estrus cycle. These technologies will impact cow-calf enterprises globally. Beef cow-calf producers need economic data to assist them in determining if they should utilize current AI technology. Therefore, the objective of this study was to compare gross sales income from proven sires utilizing estrus synchronization, and timed AI compared to natural service mating programs.

The experiment was conducted at Southeast Missouri State University Research Farm utilizing undergraduate students. One hundred and twenty animals were enrolled in the study (12 heifers, 108 cows). A 30-day CIDR-based AI protocol was used for heifer estrus synchronization. The thirty day controlled internal device release (CIDR) based synchronization protocol was CIDR (25 mg. PG F2 α) days 1 through 14, CIDR was removed from heifers on day 14, day 23 GnRH (2 ml of Cystorelin intramuscular, day 30 - 5 ml of Lutalyse intramuscular, heifers were time bred artificially 72 hours after the Lutalyse injection and each heifer received 2 ml Cystorelin at the time of insemination.

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Pregnancy diagnosis following estrus synchronization and timed AI with Cystorelin was 70/120 (58 percent) and pregnancy rate after the breeding season (AI plus natural service) was 113/120 (94 percent). There were 66 AI and



Dr. William Ellis discusses the study of comparing gross sale income between calves sired by artificial insemination and natural service sires. The study was conducted at the David M. Barton Agriculture Research Center Gordonville, Missouri. Photo by John LaRose, Jr.

42 natural service calves born. Calves were marketed as bred heifers (n=54, 26 AI) or harvest weight steers on a grid system (n=54, 40 AI). Overall, gross income per calf from AI and natural service sires averaged \$1169.97 \pm 33.76 and \$952.15 \pm 60.76, respectively. Gross income per calf was significantly different between proven sire and natural service sire for harvest weight steers (p<0.05) but not bred heifers (p>0.5). Bred heifer buyers were knowledgeable of their mode of conception (AI or natural). Gross income per bred heifer averaged \$34 higher for AI over natural service bulls while gross income per harvest weight steer averaged \$131 higher for AI. The cost of synchronization and AI was \$31.29 per female and \$56.89 per AI calf sold. The cost of synchronization and AI was recovered through higher sale income per AI calf in harvest weight steers but not in bred heifers for these data.

This study significantly identifies the superiority of the AI sire as compared to natural service sires for steers sold based on yield and grade at harvest weight. Many beef producers feed their calves to harvest weight and there are many proven AI sires that will enhance income from a calf feeding enterprise. If anyone has further questions please contact Dr. Ellis at the Department of Agriculture Southeast Missouri State University (573-651-2797 or wellis@semo.edu). Δ

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