

Comparison of Pregnancy Rate in Angus-cross Beef Cows following Insemination with Frozen Thawed or Fresh Extended Semen

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Introduction

Currently cattle producers in the United States are increasing their farm size for economic profit and using synchronization programs for a fixed time AI for better reproductive management. This requires insemination of large number of cows on a single day. With this trend, there is an opportunity to investigate the possibility of maintaining or improving the reproductive outcomes using fresh extended semen with low sperm numbers instead of frozen semen with high sperm numbers per insemination. The objective of this study was to compare fixed time AI pregnancy rate in Angus cross beef cows inseminated with frozen thawed or fresh extended semen.

Materials and Methods

Ejaculates from two Angus bulls collected serially two to three times using an artificial vagina were pooled within bull. After assessing the semen quality, the pooled semen from each bull was divided and extended using Caprogen® (Hamilton, New Zealand) to a concentration of 3×10^6 /straw or egg-yolk-glycerol extender to a concentration of 20×10^6 /straw. Until insemination, semen extended with Caprogen® diluents was maintained at room temperature and semen extended with egg-yolk-glycerol extender was frozen and maintained at -196°C . Semen straws were shipped to the breeding locations (N=6), and cows were artificially inseminated the next day (24 h after collection in two locations) and the following day (48h after collection in four locations). Angus

cross beef cows (N=714) randomly assigned within location to semen type (fresh [N=364] vs. frozen [N=350]) and bulls (1[N=359] vs. 2 [N=355]). All cows were synchronized with the CO-Synch+ CIDR protocol. For this protocol cows received 100 mg of GnRH and a CIDR on day 0, 25 mg of PGF and CIDR device removal on day 7, 100 µg of GnRH on day 9 (66 h after CIDR removal) and were inseminated at that time. Data were analyzed using GLIMMIX procedure of SAS 9.1 version.

Results

Accounting for other significant variables such as location ($P < 0.0001$) and dam's age ($P = 0.04$), timed AI pregnancy rates were not different between fresh extended and frozen thawed semen (58.5% vs. 54.9%; $P = 0.33$) and between bulls 1 and 2 (56.5% vs. 56.9%; $P = 0.89$). No semen type \times location and semen type \times bull interactions were observed. Insemination using fresh semen at 24 h (N=141) and (N=223) 48 h after collection did not affect the FTAI pregnancy rate (59.6% vs. 57.8%; $P = 0.73$). The pregnancy rate among locations ranged from 43% to 72%.

Significance

In conclusion, fresh extended semen with 3 million sperm per insemination dose can be successfully utilized in a fixed time AI synchronization program to achieve acceptable pregnancy rates in beef cows under US field conditions.