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Two semen-thawing procedures compared by competitively mating beef cows

Abstract

Seventy-five cows were used to compare the fertilizing abilities of sperm packaged in 0.5-ml straws and thawed in warm water to similarly packaged sperm thawed in the inseminating gun. A system of competitive mating provided for inseminating each cow twice. After cows had estrus synchronized, each was artificially inseminated with one straw of Angus semen plus one straw of Simmental semen; semen in one straw was thawed in warm water, the other in the inseminating gun. Calves produced indicated the fertilizing sperm. Of the 20 cows that conceived at the synchronized estrus, 16 conceived to warm water-thawed semen and 4 to semen thawed in the gun. These data indicate that sperm thawed in warm water before breeding were more capable of fertilization when tested in the same cow against sperm thawed in the inseminating gun.

Keywords

Cattlemen's Day, 1980; Report of progress (Kansas State University. Agricultural Experiment Station); 377; Beef; Semen-thawing procedures

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Two Semen-thawing Procedures Compared by Competitively Mating Beef Cows

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Summary

Seventy-five cows were used to compare the fertilizing abilities of sperm packaged in 0.5-ml straws and thawed in warm water to similarly packaged sperm thawed in the inseminating gun. A system of competitive mating provided for inseminating each cow twice. After cows had estrus synchronized, each was artificially inseminated with one straw of Angus semen plus one straw of Simmental semen; semen in one straw was thawed in warm water, the other in the inseminating gun. Calves produced indicated the fertilizing sperm.

Of the 20 cows that conceived at the synchronized estrus, 16 conceived to warm water-thawed semen and 4 to semen thawed in the gun. These data indicate that sperm thawed in warm water before breeding were more capable of fertilization when tested in the same cow against sperm thawed in the inseminating gun.

Introduction

Properly thawing semen is essential for successful artificial insemination, so the best thawing method has been discussed in the artificial breeding industry for years.

Rapid thawing (35 C vs. 5 C water bath) of semen packaged in 0.5-ml straws increases motility and intact sperm cap percentages. However, there is little information on cow fertility with different thawing procedures, so we compared warm water semen thawing and gun thawing.

Experimental Procedure

Seventy-five Angus, Hereford, and Angus x Hereford lactating spring-calving cows were synchronized with Syncro-Mate B² (ear implant of 6 mg norgestomet for 9 days, and 3 mg norgestomet and 5 mg estradiol valerate intramuscular at implantation) and inseminated 48 hr after implants were removed.

Each cow was inseminated with two 0.5-ml straws, each containing one-half the normal number of sperm cells.³ One straw was thawed in 35 C (95 F)

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²Syncro-Mate B was provided by G. D. Searle Co.

³Semen was provided by Curtiss Breeding Service.

water for 20 seconds; the other, in the gun before and during insemination. Each cow was inseminated with one straw of Angus semen and one of Simmental semen, one warm water thawed and one gun thawed. The combination of thaw procedure and breed was alternated to remove any effect from breed or order of inseminating. The color of the calf identified the successful semen and, thus, the successful thawing method.

Clean-up bulls were withheld from the cows 15 days so we could positively identify sire of calf at birth.

Results and Discussion

Sixteen of the 20 cows that conceived after the synchronized estrus conceived to semen thawed in warm water, and 4 to semen thawed in the gun.

When 0.5-ml straws of frozen semen are placed in 35 C water, thawing is complete in approximately 13 seconds. Thawing time in an insemination gun is unknown, but it is much slower. Rapid thawing apparently allows more viable sperm cells to be presented to the uterus and may explain why warm water-thawed semen was 4 times as successful as gun-thawed. Rapid thawing may also improve sperm fertilizing ability and fertilizing lifespan.

Because semen is only one of many variables involved in cow conception, one should not expect a large advantage in conception rate from a warm water thaw over gun thaw. These data indicate that a warm water thaw is a preferable procedure; however, we cannot predict that a higher conception rate will be obtained from warm water thaw if the optimum number of viable sperm are inseminated after gun thaw.

HEAT SYNCHRONIZATION HORMONE APPROVED

On November 11, 1979, a major breakthrough for cattlemen occurred with the official clearance of a new heat synchronization compound. Lutalyse, The Upjohn Company trade name for prostaglandin $F_{2\alpha}$, will offer beef cattle producers the opportunity to take even greater advantage of artificial insemination (AI) because of the potential of reducing labor and management associated with heat detection. Presently, the only system of using Lutalyse recommended on the label is two injections given 11 days apart. Although this is the only system approved efficient by the Food and Drug Administration, other systems such as breeding AI for 5 days then injecting only the cows that have not shown heat may have merit depending on the producers goals. Lutalyse synchronizes heat only in cycling cattle and will not improve conception rates. It is only a management tool that allows you to have cycling cattle in heat at a predicted time.

The cattleman should first appraise the reasons he is attempting to synchronize heat, then weigh the possible benefits he can achieve against the cost of the product and the labor involved. He should also make sure he has the facilities, equipment and ability to AI the number of cattle he is going to synchronize.