

Effect of Embryo Transfer on Semen Characteristics and Scrotal Circumference of Performance Tested Bulls

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Story in Brief

Performance tested bulls resulting from embryo transfer were compared to bulls resulting from normal conception and pre-natal development for characteristics associated with bull fertility. Scrotal circumference and semen motility and morphology were compared over a 2-yr period on 1066 bulls (Embryo transfer n=162; normal n=904). Bulls resulting from embryo transfer had larger scrotal circumference. The semen motility was similar between the two groups but semen morphology and some specific semen characteristics showed a small disadvantage for bulls resulting from embryo transfer. While the differences were small, these morphology differences warrant further examination as more bulls resulting from embryo transfer enter performance test stations.

Key Words: Beef Cattle, Performance Testing, Breeding Soundness

Introduction

Fertility is an economically important trait in beef cattle with regard to production efficiency. There is question as to whether bulls that result from embryo transfer have lower fertility levels. Bulls resulting from such procedures have increased in popularity in the last decade in the purebred beef industry. Embryo transfer is utilized to obtain a greater number of offspring from superior producing cows or cows with rare genetics. The objective of this study was to determine if the fertility of bulls resulting from an embryo transfer differed from that of bulls conceived naturally.

Materials and Methods

Angus bulls consigned to Midland Bull Test, located in Columbus, MT, over a 2-yr period (1999 and 2000) were performance tested for postweaning growth and fertility during a 130-d performance test. These bulls originated from several states across the country and had different environmental conditions prior to arrival at Midland. The testing environment was in large pens with approximately 40 to 45 bulls in each pen.

The fertility data for the bulls were collected, in March of each year, by a local veterinarian. The Breeding Soundness Evaluation (BSE) consisted of observing the scrotum, palpating the reproductive tract, collecting a semen sample via electrojaculation and conducting an external exam. The semen was evaluated for motility and morphology. In order for a bull to be deemed a satisfactory breeder, a BSE score of 60 or above must be met. Bulls that had lower scores were deemed questionable breeders and some were re-tested in 45 or 60 d. Motility was classified as very good, good, fair, or poor and these classifications were assigned a score of 10, 7.5, 5, and 2.5, respectively. Morphology was recorded as the percentage of normal cells.

Data were analyzed using least squares analysis of variance. The model for all variables included the effects of year and type of conception (natural vs embryo transfer).

Results and Discussion

The embryo transfer bulls (n=162) displayed a larger ($P<.01$) scrotal circumference (37.06 cm) compared with bulls conceived naturally (n=904, 36.29cm) (Table 1). Motility was similar ($P>.20$) between the two groups (ET bulls, 6.51; Natural bulls, 6.58). Morphology was slightly decreased ($P=.07$) in ET bulls (ET bulls, 76.36 %; Natural bulls 77.87%).

Several individual abnormalities were observed in the semen of these bulls. For the most part the incidence of abnormalities did not differ significantly between the bulls that came from embryo transplant vs those conceived normally. There were some exceptions including percentage of coiled tails, free normal heads, double heads, and bent tails. In each case the embryo transfer bulls had a larger frequency of the abnormality than the bulls conceived naturally.

The differences in morphology were not large but could contribute to a lower breeding soundness exam score. While not enough to raise much concern, continued vigilance concerning breeding soundness of bulls, however they are conceived, is appropriate.

	n	Scrotal circumference (cm)	Motility score	Morphology score
Embryo transfer	162	37.06 ± .20	6.51 ± .14	76.37 ± .78
Natural	904	36.29 ± .08	6.59 ± .06	77.87 ± .33

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