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SEASONAL EFFECTS ON EMBRYO TRANSFER RESULTS IN BRAHMAN COWS

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SUMMARY

To determine factors affecting embryo donor reproductive performance in Brahman cows, 1,841 embryo collection records of 813 Brahman cows were analyzed. Maximal recovery of transferable embryos per donor cow occurred during the fall season (4.2) with a lower number (2.9) recovered during the winter season. Pregnancy rate in the recipients followed a seasonal pattern with lower (31.8%) pregnancy rates during the winter season and higher (41.0%) ones in the fall. Likewise, the number of blastocysts recovered per donor was affected ($P < 0.08$) by season. These data establish the concept of seasonal effects on embryo donor reproductive performance in Brahman cows.

INTRODUCTION

Embryo transfer has developed as an unique technique that offers breeders, ranchers and scientists new opportunities for cattle improvements, especially the purebred industry. Of interest to many producers are the environmental and management aspects affecting embryo donor reproductive performance in Brahman cows. Therefore, the objective of this study was to determine seasonal effects on embryo donor performance of Brahman cows.

PROCEDURES

Embryo collection records were obtained from 1,841 nonsurgical embryo donor collections from 813 Brahman cows during a period of 7 years (1978-1984), at two embryo transfer units located in Central Texas. The embryos were evaluated and embryo transfer pregnancy results recorded. All animals were maintained under the same management and embryo transfer procedures on both embryo transfer units.

Animals. All donor animals utilized in the collection regimes were nonlactating, purebred Brahman cows and heifers. Recipient females were of diverse genetic background. All donor females were checked by rectal palpation for evidence of possible reproductive

problems and at least two estrous periods were observed prior to any superovulation treatment. Cows were artificially inseminated with frozen semen three times: 1) at standing estrus, 2) 12-h post-standing estrus and 3) 24 hr post-standing estrus. Superovulated cows were nonsurgically flushed on the morning of day 7 after the first breeding.

Evaluation of Embryos. The stage of development of embryos was determined by examination of embryonic morphology. Each technician flushing embryos also searched the collection for embryos. Only morphologically normal embryos were transferred to recipient cows. Embryos that were structurally abnormal, degenerating, or fragmenting, and embryos that were retarded in development and unfertilized ova were discarded.

RESULTS

Tabulation of data of embryo donor parameters by season is shown in Table 1.

TABLE 1. MEANS OF DONOR COW PARAMETERS BY SEASON.

Parameter	SEASON			
	Spring	Summer	Fall	Winter
No. Transferable Embryos	3.4	3.9	4.2	2.9
Pregnancy Rate (%)	36.3	38.1	41.0	31.8
No. Pregnant Recipients	1.9	2.0	2.3	1.6
No. Blastocysts	2.8	3.0	3.1	2.0

Number of Transferable Embryos. Number of transferable embryos per donor flushed was affected by season ($P < 0.06$). Numbers of transferable embryos were lower (2.9) during the winter and higher (4.2, 3.9 and 3.4) during the fall, summer and spring, respectively (Figure 1). These data support previous studies of this research unit indicating that the season of maximum recovery of transferable embryos is the same as that of maximum fertility in *Bos indicus* cows.

Pregnancy Rate per Donor. Pregnancy rate per donor cow was affected by season ($P < 0.02$). Pregnancies per donor were higher during

fall, summer and spring (41.0, 38.1 and 36.3, respectively), and lower (31.8) during the winter season (Figure 2).

Number of Pregnant Cows per Donor. Number of pregnant recipients per donor was affected by season ($P < .04$). Since pregnancy rate and number of pregnant cows are highly correlated, it is expected that the seasonal variation between these two variables will be affected equally. Therefore, the seasonal effect seems to be the major factor producing the variation in the number of pregnant recipient cows per donor (Figure 3).

Number of Blastocysts Recovered. Number of blastocysts recovered per donor cow was affected by season ($P < .08$). Numbers of blastocysts recovered per donor were lower (2.0) during the winter than during the fall (3.1; Figure 4).

In summary, a seasonal influence on donor cow performance was significant across donor cow reproductive parameters in Brahman cows. There was a consistent trend toward low donor performance during the winter season compared with the other seasons of the year.

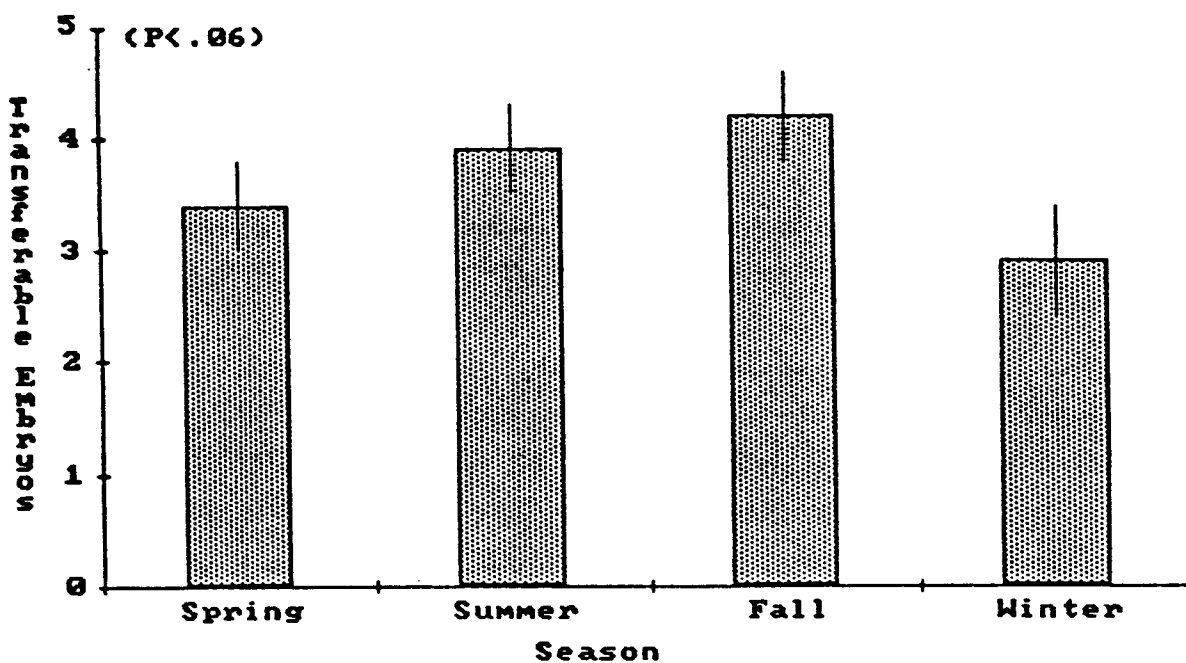


Fig. 1. Least-Squares Means and Standard Errors of Transferable Embryos per Donor per Season

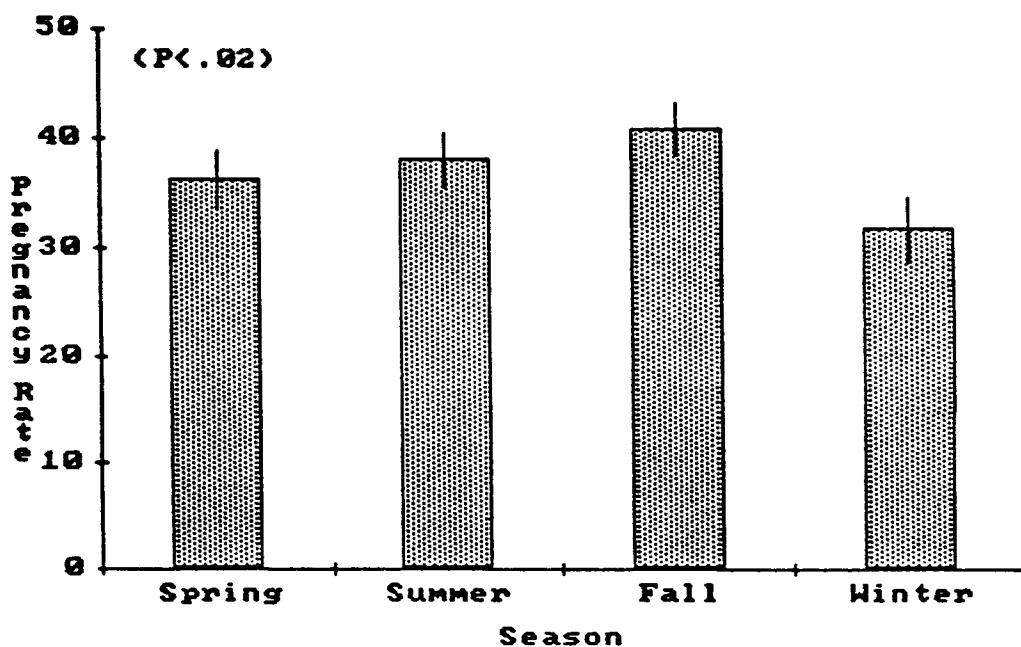


Fig. 2. Least-Squares Means and Standard Errors of Pregnancy Rate per Donor per Season

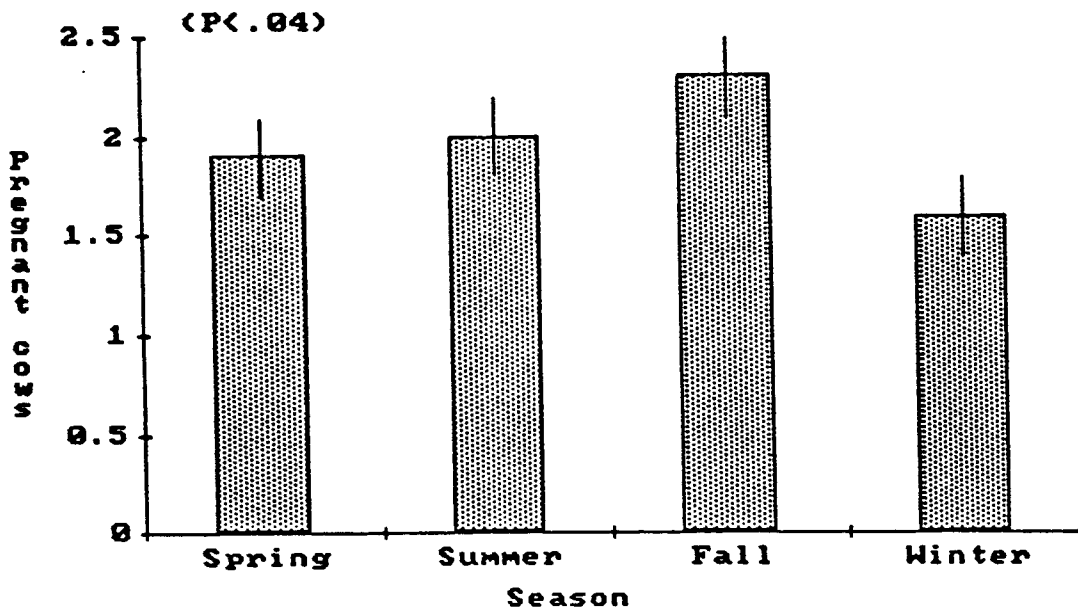


Fig. 3. Least-Squares Means and Standard Errors of Number of Pregnant Cows per Donor per Season

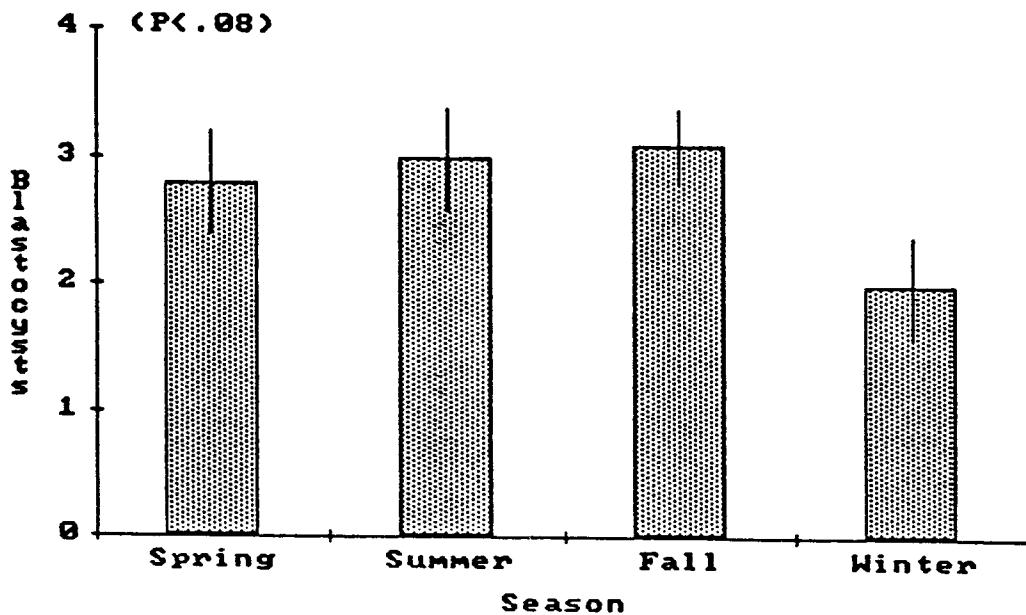


Fig. 4. Least-Squares Means and Standard Errors of Number of Blastocysts per Donor per Season

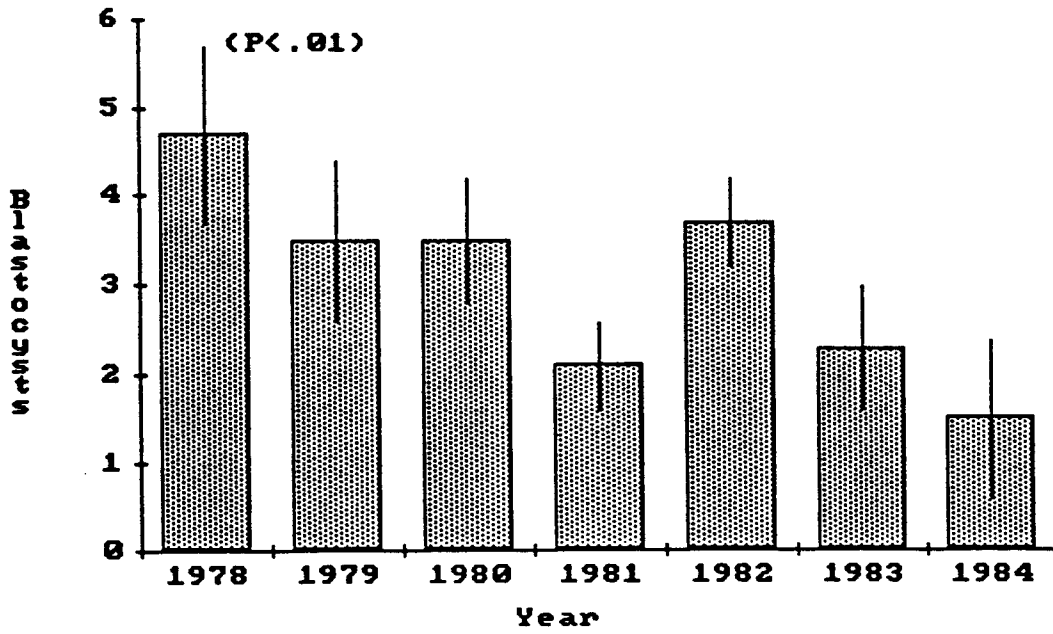


Fig. 5. Least-Squares Means and Standard Errors of Number of Blastocysts per Donor per Year