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Relationship of age at puberty and postpartum interval to estrus in Angus x Hereford and Brahman x Hereford Females

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Relationship of Age at Puberty and Postpartum
Interval to Estrus in Angus x Hereford and
Brahman x Hereford Females

D.J. Patterson, L.R. Corah, J.R. Brethour,¹
and W.R. Negus¹

Summary

Records of age at puberty (AAP) and postpartum interval to estrus (PPI) for heifers calving first at 2 years of age were used to determine the relationship between the two reproductive parameters. In Brahman x Hereford (BxH) females, there was no relationship between AAP and PPI. In Angus x Hereford (AxH) females, PPI increased as AAP decreased. The data suggest that heifers heavier at weaning reach puberty younger, but PPI may be longer following their first calving. Heifers larger at weaning may need to be managed differently to improve performance during the first postpartum period.

Introduction

Numerous studies have dealt with age at puberty (AAP) and factors affecting the postpartum interval (PPI) in beef cattle; however, none has shown whether the two parameters are related. With this objective, we analyzed available data to determine whether a relationship exists between AAP and PPI.

Experimental Procedures

Records of AAP and PPI for heifers calving first at 2 years of age were used. Two biological types were represented in the original data set: 148 Angus x Hereford (AxH) and 148 Brahman x Hereford (BxH) females. Of these, 121 AxH and 97 BxH entered breeding herds following their first calf. After heifers were weaned, and continuing through their first breeding season, heifers within each breed group were assigned in a factorial design to one of two energy levels (high or low) and to one of two weight groups (heavy or light).

Puberty was determined by heifers meeting three criteria: 1) behavioral estrus, 2) presence of a palpable corpus luteum, and 3) rise in serum progesterone above 1 ng/ml. At the end of their first breeding season, heifers were transferred from drylot to pasture and nutritional treatments were discontinued. Postpartum interval length was defined as the period from calving to first observed estrus. A summary of the first year's puberty data was published in the 1986 Cattlemen's Day Report, whereas the postpartum data are presented on page 60 of this report.

¹Fort Hays Branch Experiment Station.

Results and Discussion

Table 19.1 summarizes average ages at puberty and postpartum intervals for the various breed, energy level, and weight groups involved. Data were analyzed within breed and included only records for which both AAP and PPI were available. Pearson correlation coefficients between AAP and PPI were $r=-.12$ ($P=.20$) for AxH and $r=.05$ ($P=.71$) for BxH females. Eliminating animals from the analyses that experienced dystocia yielded correlations of $r=-.27$ ($P=.02$) for AxH and $r=.06$ ($P=.65$) for BxH heifers. Analysis of variance indicated that PPI among AxH heifers ($n=73$) was influenced most by weight at the start of the trial ($P=.01$), and not energy level ($P=.23$) or energy level x weight group interaction ($P=.48$). After weight group was accounted for, the correlation between AAP and PPI for AxH heifers was $-.19$ ($P=.11$). Hence, although there was a negative relationship between AAP and PPI among AxH females, no such relationship was found for BxH heifers.

Table 19.1. Age at Puberty and Postpartum Interval to Estrus
Summary¹

Energy Level ² and Weight Group	Beginning Weight (lbs)	Age at Puberty (days)	Weight at Puberty (lbs)	PPI Length (days)
Angus x Hereford				
Low Target Wt. Light group	442	365	543	80.1
Low Target Wt. Heavy group	516	358	564	90.5
High Target Wt. Light group	436	376	592	78.5
High Target Wt. Heavy group	504	348	590	84.3
Brahman x Hereford				
Low Target Wt. Light group	426	328	540	77.4
Low Target Wt. Heavy group	502	348	571	74.4
High Target Wt. Light group	431	340	598	75.9
High Target Wt. Heavy group	505	338	613	79.2

¹ Least squares means.

² Heifers had been nutritionally manipulated so that they weighed 55% (low energy) or 65% (high energy) of their expected mature weight at the start of their first breeding season.