

INFLUENCE OF SEASON OF BIRTH ON REPRODUCTIVE DEVELOPMENT OF BRAHMAN BULLS

S. R. Tatman, D. A. Neuendorff, T. W. Wilson, and R. D. Randel

Background: Research has shown that Brahman cattle exhibit decreased reproductive potential during the winter months. Brahman females have a shorter duration of estrus and increased incidence of anestrus, while the Brahman male has decreased semen quality, sperm concentration, and decreased testicular size during the winter. Due to these seasonal differences in reproduction, this trial evaluated the effect of season of birth on the growth and reproductive development of Brahman bulls. Eight fall born (born between August and October) and 10 spring born (born between March and May) purebred Brahman bulls, from a common breeding herd, were studied. Bulls were maintained together and fed a corn/soybean meal (3:1) ration supplemented with 200 mg lasalocid/hd/day fed at 1.5% of body weight. Bulls had free access to water, Coastal bermudagrass hay, and a salt/mineral supplement. Measurements regarding growth (body weight), body condition score, reproduction (scrotal circumference), and sperm concentration were taken at every two weeks. Measurements began prior to reaching 21 cm scrotal circumference. Upon attainment of 21 cm scrotal circumference, bulls were electroejaculated for semen analysis. Measurements continued through puberty (classified as an ejaculate with $\geq 50 \times 10^6$ sperm with $\geq 10\%$ motility), concluding with the attainment of sexual maturity (classified as an ejaculate with $\geq 500 \times 10^6$ sperm with $\geq 50\%$ motility).

Research Findings: No differences were found for body weight, body condition score, or scrotal circumference between fall- and spring-born bulls at first sperm or puberty. However, age at sexual maturity was delayed in fall-born bulls when compared to spring-born bulls. Due to their increased age at sexual maturity, fall-born bulls tended to be heavier, have higher body condition scores, and larger scrotal circumference than their spring-born counterparts. Evaluation of the interval from puberty to sexual maturity revealed that fall-born bulls required approximately 39 additional days to reach sexual maturity compared to spring-born Brahman bulls, although, daily interval gain for all measured traits during this period was similar between the fall and spring born bulls.

Table 1. Growth traits of spring/fall bulls at different stages of development.

	First sperm		Puberty		Sexual maturity	
	Fall	Spring	Fall	Spring	Fall	Spring
Age (days)	413±13 ^a	381±12 ^b	455±16 ^a	427±15 ^a	527±13 ^a	453±12 ^c
BW (lb)	792±34 ^a	763±31 ^a	865±44 ^a	867±39 ^a	1034±40 ^a	920±37 ^c
BCS	5.9±.1 ^a	5.5±0.1 ^b	6.7±.6 ^a	5.7±.6 ^a	6.3±.1 ^a	5.7±.1 ^c
SC (cm)	25.4±.8 ^a	24.8±.7 ^a	28.0±.9 ^a	28.0±.8 ^a	32.8±.9 ^a	30.2±.9 ^b

Superscripts that differ within column: ^{ab}P<.07; ^{ac}P<.05.

Table 2. Interval change in traits from puberty to sexual maturity.

	Interval gain		Daily interval gain	
	Fall	Spring	Fall	Spring
Age (days)	72 ±12 ^a	33±11 ^b		
BW (lb)	170±24 ^a	66±23 ^b	2.4±.3	2.0±.3
SC (cm)	4.8±.9 ^a	2.4±.8 ^b	.07±.02	.06±.02

Superscripts that differ within column: ^{ab}P<.07; ^{ac}P<.05.

Application. Fall born Brahman bulls undergo a delay in their sexual development during the interval from puberty to sexual maturity. This delay did not occur in spring born bulls as they reached this period during the warmer months with longer photoperiods, whereas fall-born bulls reached this interval during the colder months which have shorter photoperiods. Although the fall born bulls appeared to grow and develop normally from a phenotypic standpoint (daily gain for all measured traits was similar between the groups), reproductive development was delayed. This could affect both producers and breeders who plan on using/marketing young Brahman bulls in their breeding programs.