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COMPARISON OF GROWTH AND SEXUAL DEVELOPMENT OF TEMPERATE AND TROPICALLY ADAPTED BREEDS OF BULLS

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Background. The Boran is an African Zebu (Bos indicus) breed which originated in southern Ethiopia. This hardy breed soon spread to neighboring countries with nomadic tribes and is known as Tananaland Borana in northern Kenya and Avai cattle in western Somalia. Boran cattle are also used in commercial ranching in several African countries, as a straight breed or in crossbreeding programs. The Tuli is a Sanga breed of cattle, originating in the southwest corner of Zimbabwe as an offshoot of the Tswana cattle (a Sanga breed from Botswana). Sanga cattle originated in Africa, through interbreeding of humpless (Bos taurus) and humped (Bos indicus - Zebu) cattle, during ancient migrations of the Bantu and Hottentot tribes. Studies done on the productivity and physiology of the Sanga breeds, have shown that Sanga cattle are highly productive due to high reproductive rates and low mortality. Sanga breeds have been shown to be early maturing, have a short postpartum anestrous, conceive in suboptimal body condition, are tick resistant and have good feed conversion rates. The objectives of this study were to compare growth rates and sexual development of Angus, Brahman, Boran x Brahman, Angus x Brahman, Tuli x Brahman and Tuli x Angus bulls.

Research Findings. Twelve Angus (A), 16 Brahman (Bh), 7 Boran (Bo) x Bh, 12 A x Bh, 14 Tuli (T) x Bh and 5 T x A were used in this experiment. After weaning (at $\pm$ 205 days) all bulls were kept on a rye-ryegrass pasture overseeded on a Coastal bermudagrass sod (fall and winter 1992-93). The bulls were fed a concentrate ration at 1.1% of their body weight containing 83.5% corn and 16.5% soybean meal. Coastal bermudagrass hay, minerals and water were available free choice. At 28-day intervals bulls were weighed and scrotal circumference measured. Bulls were electroejaculated after reaching 10-month of age or 21 cm of scrotal circumference and at 28-day intervals thereafter. Bulls were electroejaculated at 14-day intervals after reaching 23 cm of scrotal circumference, or when the first ejaculate with motile sperm cells was obtained. Body weight, body condition score (0=extremely thin, 9=very obese) and average daily gain data for a 77-day period are presented in Table 1.

Table 1. Body weight, body condition score (BCS) and average daily gain (ADG) for a 77-day period.

Breed Type	Day 0 Wt. (lb)	Day 0 BCS	Day 77 Wt. (lb)	Day 77 BCS	ADG (lb)
Brahman	484.9±20.6[a]	5.3±0.2[a]	523.8±22.8[a]	5.5±0.2[a]	0.5±0.1[a]
Angus	455.1±20.6[a]	5.4±0.2[a]	544.9±22.8[a]	5.80.2[a]	1.2±0.1[bc]
T x Bh	472.4±20.6[a]	5.6±0.2[a]	528.7±22.8[a]	5.8±0.2[a]	0.7±0.1[a]
Bo x Bh	499.9±29.2[a]	6.3±0.2[b]	534.1±32.3[a]	5.7±0.3[a]	0.4±0.2[a]
A x Bh	499.3±22.3[a]	6.0±0.2[b]	589.3±24.6[a]	5.9±0.2[a]	1.2±0.1[bc]
T x A	358.4±34.5[b]	5.0±0.3[a]	425.4±38.2[b]	4.7±0.3[b]	0.9±0.2[abc]

[abc]Means with different superscripts are statistically different (P<0.05).

There were large differences (P<0.001) in the proportion of animals per breed type that had produced first sperm cells by the middle of March 1993. All Angus and T x A bulls had produced sperm cells. Fifty percent of the T x Bh and A x Bh had an ejaculate with sperm cells and only 8% and 16% of the Bh and Bo x Bh bulls produced sperm cells, respectively. In Table 2, data on age, weight and scrotal development of Angus and T x A bulls at the time of production of first sperm are presented.

Table 2. Age, weight and scrotal circumference at time of first sperm production for Angus and T x A bulls.

Breed Type	Age (days)	Body Weight (lb)	Scrotal Circumference (cm)
Angus	291.1± 7.0[a]	521.6±10.9[a]	25.6±0.[a]
Tuli x Angus	317.0±11.6[a]	442.3±17.9[b]	23.6±0.5[b]

[ab]Means with different superscripts are statistically different (P<0.05).

Application. These data show that growth rates during the cold months were highest in temperate and temperate x tropically adapted breeds. The Angus and Tuli x Angus bulls developed sexually at more rapid rates than the crosses with Brahman. The Tuli x Angus bulls were as sexually mature at a given age but lower body weight compared to the Angus bulls.