

UF-Gainesville Beef Cattle News Corner

Importance of *Bos indicus* breeding for crossbreeding systems in Florida.

Raluca Mateescu, Department of Animal, University of Florida

Adaptation to environmental conditions is essential if beef cows are to achieve maximum productivity which can be measured by high reproductive rates and heavy calf weaning weight. In Florida, introduction of Brahman genetics in beef cattle herds produces animals that are able to maintain normal body temperature throughout the extreme heat of summer months. Although it is possible to produce *Bos taurus* cattle that are adapted and productive in the Southeast – this would require many generations of selection under Florida conditions. On the other hand, adapted and productive animals can be immediately produced by crossing Brahman x *Bos taurus*. The high level of maternal heterosis expressed by the Brahman x *Bos taurus* F1 female in the southeastern US results in much higher productivity than crossbred females without Brahman influence can achieve (Table 1). The productive advantage of *Bos indicus* x *Bos taurus* crossbred cows is partially due to higher levels of milk production later in lactation than *Bos taurus* x *Bos taurus* crossbred cows are able to achieve under subtropical conditions. Additionally, the *Bos indicus* (and *Bos indicus* crossbred) female has the ability to restrict the birth weight of her calf by 10 lb or more, resulting in less calving difficulty. There is also evidence that the greater pelvic area and unique pelvic structure of *Bos indicus* females may help explain their greater ease of calving compared to *Bos taurus* females. The *Bos-indicus* - sired dam's ability to restrict her calf's birth weight and to calve easily permits a producer to breed Brahman-crossbred cows to bulls of large breeds such as Simmental, Gelbvieh, or Charolais with little concern for calving difficulty. The calves from such a mating (three-breed terminal cross), while relatively small at birth, have the genetic potential for very rapid growth due to a combination of effects: 50% of their genes are from the large sire breed, plus both individual and maternal heterosis positively affect growth. This genetic potential for growth, along with the high and sustained milk yield of the *Bos indicus* x *Bos taurus* crossbred cow, can result in exceptional calves at weaning.

Brahman cattle have been used in Florida in two- and three-breed rotational crossbreeding systems with Angus and Hereford breeds. In a two-breed rotational crossbreeding system, the daughters of one breed (e.g., Angus) are bred to bulls of another breed (e.g., Brahman) and vice versa (daughters of Brahman bulls bred to Angus bulls). The two-breed rotational system has sometimes been called a *crisscross* breeding system. The three-breed rotational system is similar but more complex, using three breeds in rotation instead of two. In a three-breed rotation that utilizes Brahman, Angus, and Hereford breeds, daughters of Brahman bulls are bred to Hereford bulls, daughters of Hereford bulls are bred to Angus, and daughters of Angus bulls are bred back to Brahman. Over the past years, cattle producers in Florida have increasingly used rotations that include the Brahman-derivative breeds (Brangus, Braford, Beefmaster, Simbrah, etc.) - in exclusively Brahman-derivative rotations and in rotations that utilize *Bos taurus* breeds as well - to capitalize on desirable traits of the

Brahman without the penalty of price discounts which accompany production of animals with more than 50% Brahman breeding. The two-breed rotation of Brangus with Braford (daughters of the Brangus x Braford cross are bred to Brangus bulls, and their progeny, in turn, are bred to Braford bulls) produces calves that are 3/8 Brahman in breed composition - a quantity likely to provide sufficient adaptation to the central and south Florida environment and yet produce calves that are generally acceptable to feeder-calf buyers.

Table 1. Average heterosis levels for economically important traits of beef cattle.

| Trait | Type of Cross | |
|----------------------|---------------------------------------|----------------------------------------|
| | <i>Bos taurus</i> x <i>Bos taurus</i> | <i>Bos indicus</i> x <i>Bos taurus</i> |
| Individual Heterosis | | |
| Birth weight | 2.40% | 11.10% |
| Weaning weight | 3.90% | 12.60% |
| Postweaning gain | 2.60% | 16.20% |
| Maternal Heterosis | | |
| Calving rate | 3.70% | 13.40% |
| Calf survival | 1.50% | 5.10% |
| Birth weight | 1.80% | 5.80% |
| Weaning weight | 3.90% | 16.00% |

Adapted from: L.V. Cundiff, L.D. Van Vleck, L.D. Young, K.A. Leymaster and G.E. Dickerson. 1994. Animal Breeding and Genetics. In: Encyclopedia of Agricultural Science, Vol. I. pp 49-63. Academic Press Inc.