

UF-Gainesville Beef Cattle News Corner

S-1064: Genetic improvement of adaptation and reproduction to enhance sustainability of cow-calf production in the Southern United States

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The S-1064 is a multistate research project committed to improving beef cattle production systems in the Southern region of the United States. The 2017 annual meeting was held at Country Inn & Suites in Gainesville, FL from May 23 to 26. The meeting was attended by researchers from nine institutions (AR, FL, GA, KS, LA, MS, SC, TX, VI) who reported annual progress and findings related to four objectives of the S-1064 project to enhance beef cattle productivity and sustainability under various beef cattle production systems.

The Southern region of the United States has 11.8 million beef cows accounting for 40% of the nation's beef cow inventory (USDA, 2014). This region has environmental constraints that require animal adaptation to hot, humid conditions, reduced forage quality, and high parasitic loads. However, highly productive cattle of European origin lack adaptation to these harsh conditions. Thus, cattle breeders have crossed European breeds with Brahman to produce crossbred cattle that are both adapted and productive under southern subtropical conditions. Unfortunately, there are production challenges associated with the use of Brahman, including low production and fertility as purebreds, oscillating (year to year) reproduction rates, and variable beef quality. These problems could easily expand to temperate areas (at the present time) contingent upon the extent and severity of changing climatic conditions (Field et al., 2014).

Two broad areas of improvement that would greatly benefit cow-calf producers in this region include: 1) improvement of production and reproduction of Brahman, and 2) improvement of adaptation in cattle of European origin. It would be advantageous to approach such issues from a multi-state perspective to fully exploit the increasingly limited resources available for research at individual locations. This is especially important from a genetic perspective, as combined small sample sizes will increase the accuracy of hypothesis testing. Key areas of beef cattle production efficiency such as adaptability and reproduction, including their component traits, need to be assessed in the different sub-environments within the region. These traits are the least characterized in beef cattle research, especially among those types and breeds of cattle prevalent in the region. Results will therefore have a high impact potential in subtropical as well as tropical areas of the world. This multi-state project facilitates the cellular and molecular scientific characterization of these traits, and provide for unique research resources that can be utilized to study numerous scenarios that influence sustainable beef production in the US. It is also likely that these resources will attract additional research collaborations beyond the US Southern region, including international partnerships. Additionally, capitalizing on the multi-state group extension resources will allow for wide dissemination of impactful research to a broad geographical area, thus increasing its effect on profitability and sustainability of beef cattle operations in the Southern US.

The states comprising the Southern region produce approximately 40% of the cattle that enter the U.S. beef chain, with a large proportion possessing some Brahman inheritance. The two proposed areas for cow-calf regional improvement would also provide an updated evaluation of current bloodlines and types of Brahman cattle in the US, which could also be used to compare with previous characterizations of the breed. Particularly, traits relative to Brahman reproduction have been characterized to a very limited extent, and joint regional work offers an excellent opportunity to assess reproduction on a whole-animal basis and serve as a basis for investigation of component traits of reproduction within the breed.

Dr. Mauricio Elzo from the Department of Animal Sciences at the University of Florida (UF) planned and coordinated the 2017 annual meeting in Gainesville FL. Participants were welcomed by Dr. Geoff Dahl, UF Animal Science Department Chair, and the meeting was attended by Dr. Lakshmi Matukumali (National Program Leader for AFRI Animal Breeding, Genetics, and Genomics) who also provided insights into USDA-NIFA funding opportunities. Station reports from each location were presented and discussed during the two days of meetings. On Thursday, participants visited the research cattle herds at the University of Florida Beef Research Unit and Santa Fe River Unit where Danny and Michelle Driver provided insights on activities related to research projects involving the Multibreed Brahman-Angus and the Brahman herds (**Picture 1**). On Friday, the members of the S-1064 Regional Project visited the Kempfer Ranch, St. Cloud, FL where they had the opportunity to learn about the history of the ranch and gain insights of the cattle operation (**Picture 2**).

S-1064 Members: Bryan Kutz and Jeremy Powell, University of Arkansas; Amber Starnes and Brian Bolt, Clemson University; Raluca Mateescu and Mauricio Elzo, University of Florida; Romdhane Rekaya, University of Georgia; Megan Rolf, Kansas State University; Rhonda Vann and Trent Smith, Mississippi State University; David Riley, Jim Sanders, Andy Herring, and David Anderson, Texas A&M University; Bob Godfrey, University of the Virgin Islands; Administrative Advisor: Joe West, University of Georgia.



Picture 1. Danny Driver hosting the S-1064 participants at the UF Beef Research Unit and describing activities related to research projects involving the **Multibreed Brahman-Angus** and Brahman herds.



Picture 2. George and Billy Kempfer explaining the S-1064 participants the selection program at Kempfer Cattle Company - selection focused on fertility, fleshing ability on low quality forage, capacity, excellent udder quality, and gentle disposition with strong emphasis on carcass traits.