UF-Gainesville Beef Cattle News Corner

Another great year … a look back at 2019 in Mateescu's research group

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It's that time of year when we reflect – what the past year has brought us, what it has taught us and all the blessings we are grateful for. For me, the highlights of this year have been the opportunity to continue collaborating with some extraordinary producers on different issues impacting their bottom line where genomics can help, the ability to attract funding which allowed my group to continue working on different beef cattle genomic research projects, and the blessing of working in a place where I collaborate with world-renowned researchers and train and educate some extraordinary students.

My research relates to development of genetic tools to improve economically important traits in beef cattle with special attention given to nutritional and health value of beef and understanding the genetic mechanism of thermotolerance in *Bos indicus* influenced beef cattle. We are making progress on all these projects this year and I will report a short summary on each individual project.

Genomic tools to improve meat quality traits in *Bos Indicus* influenced cattle. Ability to deliver a consistently superior quality product is important if beef industry is to maintain and expand its share of the market. These issues are of particular importance for *Bos Indicus* influenced cattle as they are routinely penalized for relatively low marbling score and perceived inferior tenderness. A sustainable strategy to address these issues is via the development of effective selection and management genomic tools. **Objective:** To identify a set of genetic markers strongly associated with the most important beef quality traits in *Bos Indicus* influenced cattle, particularly tenderness and marbling. **Findings:** 1). There is considerable variation in the degree of tenderness within each quality grade. The average tenderness increases slightly from the *Standard* to the *Prime* quality grade but the bulk of variability in tenderness is within each quality grade. The steaks graded *Select* or *Choice* (the majority of our animals) varied from very tender to very tough. This highlights the limitation of the USDA grading system to predict eating quality or tenderness. 2). Most genetic markers for tenderness developed in other breeds (Angus) are not predictive in Brahman and Brahman-influenced cattle, indicating the need for identifying genetic markers specific for indicine influenced cattle. Our lab is at the cusp of finding these markers as we have collected the tenderness phenotype on a sufficiently large number of animals, and we are hopeful funding for genotyping will become available.

Healthfulness and nutritional value of beef. Improving the fatty acid composition and increasing the concentration of various components with positive effects on human health (CLA, vitamins D and E, iron content, etc.) could offer excellent opportunities for the beef industry to benefit from increased consumer demand for health promoting diets. **Objective:** Characterize the nutritional

and health value of beef from *Bos Indicus* influenced cattle, develop genomic tools to identify genetically superior animals and use this information for selection, management, and marketing. Create a beef demand model to determine the economic value of increasing the healthfulness and nutritional value of beef. **Findings:** A beneficial trend as the percentage of Brahman increased from 0 to 100% was found in both the saturated and polyunsaturated fatty acids (omega 3, omega 6) with the saturated declining from 51.3% to 47.5% and the polyunsaturated increasing from 4.3% to 6.9%. These results indicate that Brahman influenced cattle may have a healthier fatty acid composition and this advantage could be a marketing opportunity for our producers and more research to exploit this advantage is needed.

Genetics of heat tolerance in beef cattle. Heat stress is a principal factor limiting production of animal protein in subtropical and tropical regions, and its impact is expected to increase dramatically. **Objective:** Use of genetic tools to produce a cow with superior ability for both thermal adaptation and food production represents a sustainable approach to meet the challenge of global climate change. **Findings**: 1). A minimum of 4/8 Brahman genetics was required to increase the ability to regulate body temperature and at least 6/8 Brahman when heat stress was severe. 2). Hair characteristics are highly heritable and as Brahman breed percentage increased, both hair length and body temperature decreased. 3). Temperament played an important role in both sweating rate and body temperatures, with calm cattle having lower sweating rates and maintaining lower body temperatures, suggesting heifers with a calmer demeanor respond better in hot conditions.

I am grateful for the opportunity to work with many dedicated producers, with so many talented researchers, to meet some great supporters of our work and the beef industry in general, and get to share my enthusiasm about genomics and beef cattle with a handful of extraordinary students who chose to learn more about this field and who will have an impact in this field in the future. I hope your year was as full of blessings as mine, and I look forward to working with you and for you in the coming year. #shareyourheritage #shareyourpassion

For more information on any of these projects, please contact Raluca Mateescu directly by email/phone or visit the website: https://www.ralucamateescu.com/