# UF-Gainesville Beef Cattle News Corner

## Importance of beef mineral content in a healthy diet.

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Last month I presented information regarding the type of fats in beef and their impact on human health. I want to focus this month on other essential components of human diet which are present in beef – minerals.

While the prevalence of obesity is rapidly increasing and has reached a 33.8% high among US adults, many Americans are not meeting the recommended daily intake for many nutrients (USDA-ARS, 2011), i.e., they are "overfed and undernourished". Among all diet components, meat has the unique status of providing, per unit of energy, the highest amount of high quality protein along with many other nutritive factors important for human health. Given its high nutrient density, meat can, and should, play a critical role in addressing the "undernourished" problem. Beef is already an important food group in the diet for many consumers and improvement of its healthfulness will be an efficient way to provide health benefits to a large proportion of the population, without dramatically changing dietary habits or affecting food quality, convenience and costs.

Dietary minerals are essential components of human diets, and most dietitians recommend that these minerals be supplied from foods in which they occur naturally. Of the commonly consumed protein foods, red meat is one of the best sources of readily absorbed iron and zinc. However, limited information is available regarding the content and natural variation in many nutrients in beef, or the extent to which that variation is the result of genetic differences or associated with meat palatability traits. This information is necessary to evaluate the current and potential future role beef plays as contributor of several essential minerals and trace elements to the human diet. Evaluation of relationships between the concentrations of these nutrients and sensory traits is essential for understanding the impact of this natural variation on traits like tenderness, juiciness, and flavor, which represent critical aspects of consumer acceptance and satisfaction.

A study conducted on 2,285 Angus-sired cattle (Mateescu et al., 2013) quantified the genetic and environmental components of observed variation in the concentrations of several minerals in ribeye steaks, and estimated genetic parameters and their associations with a wide portfolio of beef palatability traits. The iron concentration in this data set was 14.44 µg/g muscle, representing on average 1.44 mg iron per 3.5 oz serving of beef. The current recommended daily allowance varies depending on gender and age from 8 to 18 mg per day. In this context, a 3.5 oz serving of beef would provide between 8 and 18% of the recommended daily allowance. The iron and zinc found in red meat is more bioavailable than in alternative food sources, therefore red meat can play a critical role given that inadequate intakes of iron and zinc remain a concern for some population subgroups, even in developed countries. In particular, infants, children and adolescents (particularly young females), women of childbearing age and older adults are more at risk of low iron and zinc intakes (Wyness et al., 2011).

Ongoing research in the Department of Animal Sciences at University of Florida is focusing on characterizing the nutritional and health value of beef from *Bos Indicus* influenced cattle. As part of this research, minerals content was measured on 140 ribeye steaks from the Angus-Brahman multibreed herd (cattle spanning the range from 100% Angus to 100% Brahman). Although this represents a small dataset (more animals are analyzed every year) there were two important results I would like to point out. First, the average iron concentration in our *Bos Indicus* influenced cattle was 14.50 µg/g muscle, almost identical to the average iron concentration in Angus cattle. This average was similar across all breed groups, from 100% Angus to 100% Brahman, with no effect of the Brahman percentage. Second, just like in Angus cattle, there is a great amount of natural variation in iron concentration (**Figure 1**). The maximum iron concentration in this study was 27.44 µg/g muscle representing between 15 and 34% of the recommended daily allowance depending on gender and age.

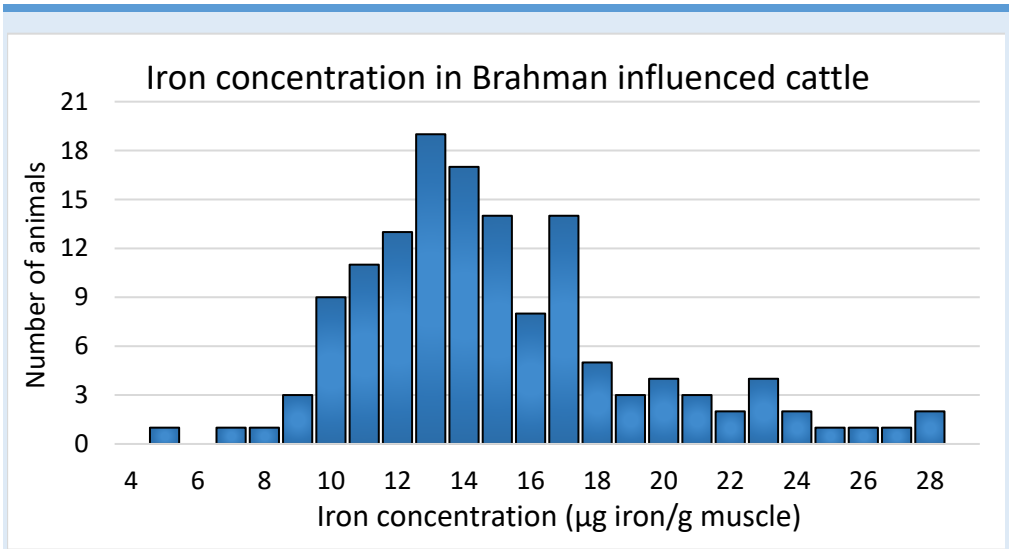


**Figure 1.** Histogram of iron concentration in ribeye steaks of Brahman-influenced cattle. The average iron concentration was 14.50 µg/g muscle and ranged from 4.76 to 27.44 µg/g muscle illustrating the amount of natural variation present in our population.

Following recent trends, consumers are likely to continue to pay increased attention to the effect of diet on health. Red meat is a very nutritious but, unfortunately, the average consumer is not familiar with these benefits. An online poll conducted for American Meat Institute by Harris Poll revealed that most consumers do not fully recognize the unique nutritional benefits that beef has to offer. For example, only 12% of consumers correctly identified animal products like beef and poultry as the only natural source of vitamin B12. In the same poll, 20% of the consumers said cruciferous vegetables such as broccoli and cauliflower while 13% said citrus fruit were the natural source of vitamin B12, when in fact neither of these types of foods contains vitamin B12.

I believe the beef industry is in a good position to respond to the demands of health-conscious consumers. Beef is already an important food group in the diet for many consumers and improvement of its healthfulness is an efficient way to provide health benefits to a large

proportion of the population, without dramatically changing dietary habits or affecting food quality, convenience and costs. To capitalize on this opportunity, the industry needs to focus its research and promotion efforts toward nutritional and health benefits of meat consumption.