Electrical Conductivity, Color, and Tenderness Values of Fresh and/or Cooked Beef. 

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Abstract: A study with fresh and cooked beef loins, beef jerky, and water types was conducted to evaluate electrical conductivity (EC) measurements as a procedure in quality appraisal. Six full strip loins x 6 steaks per loin x 2 types provided 72 electrical conductivity (CV) observations, and 72 measurements of color variables (chroma, hue, L*, a* b*) of loins. Six core samples per cooked steaks provided 216 Warner-Bratzler shear force (WBSF) values. EC was also measured on three water types and saline (n=20), and commercial beef jerky samples (n=72). Procedures used for EC were developed in our lab and consisted of using emulsified samples enclosed in a silicon vessel with copper electrodes connected to a digital multimeter. Microsiemens (µS) were measured over 60 s with a sampling rate of two per s. Color variables were measured using a Varian Cary 50 Series Spectrophotometer. Data were analyzed using ANOVA and Pearson correlation coefficients. EC means (µS) were 14.4, 42.5, 34.9, 22.9, 16.1 and 24.7 for fresh steaks (P=.07); and 7.8, 16.5, 6.4, 10.7, 5.2, and 8.0 for cooked steaks (P=.36). Means for all color variables were different (P< 0.05) across fresh steaks. Correlation of EC to each color variable was negative: chroma -0.013, hue -0.050, L*-0.009, a*-0.131, b*-0.110. Only a* was significantly correlated (P< 0.05) to EC. WBSF tenderness (kg/f) means were not different (P > 0.05) across steaks but did differ (P< 0.05) within steaks. Correlations of EC to tenderness was not significant (P > 0.05). EC mean of beef jerky was 106.9 (SEM 5.05). EC of water types differed (P< 0.05) - deionized 0.40, purified 1.56, tap 1.30. EC for saline was 0.04. These data indicate that EC of beef can be effectively measured, but high variations across EC, color, and tenderness values decreased the overall probability of finding relationships.  

Keywords: beef, color, electrical conductivity, tenderness

Comparison of Intramuscular fat Deposition in Different Muscles of Beef Cattle. Noah P. Jesko¹, John T. Richeson¹, Ty E. Lawrence¹, Tommy L. Perkins¹, ¹West Texas A&M University

Abstract: Two groups (light = 740 lbs and heavy = 942 lbs) of Akaushi cross steers (n = 20), were ultrasounded for carcass traits by an Ultrasound Guidelines Council Certified Technician every 28 days to quantify differences in intramuscular fat deposition occurring in three distinct muscles (longissimus dorsi, biceps femoris and semitendinosus). Cattle were fed at the West Texas A&M University Research Feedlot and scanned with an Aloka 500 ultrasound unit using Beef Image Analysis (BIA) Feedlot software from Designer Genes Technologies, Inc. (Harrison, AR). Carcass ultrasound measurements included 12-13th rib ribeye area (REAU), subcutaneous fat thickness (FTU), intramuscular fat percentage along the longissimus dorsi (IMFULD), rump fat thickness (RFU) as well as intramuscular fat percentage of the biceps femoris (IMFUBF) and semitendinosus (IMFUST). A difference was detected in IMFULD for the duration of the study (P < 0.05). However, no differences occurred from day 0 to day 56 (P = 0.34), or from day 84 to day 140 (P = 0.17) for IMFULD. There was a slight numerical decrease (0.1505%) in IMFUBF from day 0 to day 56, with an increased difference from day 56 to day 84 (P < 0.05). There was a positive change from 4.113% to 5.728% in the heavy group (P = 0.08) and a change from 4.113% to 4.456% in the light group (P = 0.42) for IMFUBF. There was a significant change in IMFUST from day 56 to 84 (P < 0.05). Of note, there was a decrease in IMFULD, IMFUBF and IMFST from day 140 to day 168 which could be associated with adverse winter weather events. The data present a positive increase throughout all muscles studied for beef cattle while on feed, though weather events have the possibility to negatively affect gains more rapidly than progressive effects associated with feed and growth. 

Keywords: longissimus dorsi, semitendinosus