75 Analysis of lean and fat components at the rib-loin interface to predict beef carcass fabrication yield. R. Farrow*, G. Loneragan, J. Pauli, and T. Lawrence, *West Texas A&M University*, *Canyon*.

Forty-four fed cattle were harvested at the West Texas A&M University Meat lab to determine what measurements taken at a transverse cut between the 12th and 13th ribs could most accurately predict the percentage of closely trimmed retail product. Cattle were selected to represent the range of potential fabrication yields typical of commercial operations. The carcasses graded 41 and 59 % Choice and Select, respectively with 2.2% YG 1, 27.3% YG 2, 50% YG 3, 18.2% YG 4, and 2.2% YG 5. Minimum and maximum carcass weights were 276 and 466 kg, respectively. The longissimus muscle and subcutaneous fat cross-section between the 12th/13th ribs was scanned to provide an image for subsequent evaluation using commercially available image analysis software. Subcutaneous fat width (SFW) was measured at 25, 50, 75 and 100% of the length of the longissimus muscle from the chine bone end. Subcutaneous fat area (SFA) adjacent to the longissimus, from 25 to 100% length of the longissimus muscle from the chine bone end, and the longissimus muscle area (LMA) were measured. Maximum longissimus length (LL) and longissimus width (LW) at the midpoint were also measured. Variables were calculated including: SFA ÷ hot carcass weight (HCW); LMA ÷ HCW; LMA ÷ SFA; LW ÷ SFW adjacent to 50% LL; LL ÷ LW; SFW adjacent to 25% LL ÷ HCW; SFW adjacent to 50% LL ÷ HCW; SFW adjacent to 75% LL ÷ HCW; SFW adjacent to 100% LL ÷ HCW. The right carcass sides were fabricated into subprimal cuts according to Institutional Meat Purchase Specifications. All subprimals and trim components were weighed to the nearest 0.4 kg. Total carcass lean subprimals and lean trim ranged from 51 to 67%, whereas total fat trim ranged from 14 to 31%. Stepwise linear regression models were developed to predict percentage of total lean cuts and lean trim, and percentage of fat trim using SAS (Proc Stepwise).

Total percentage lean cuts and lean trim = 0.53102 + 0.00549(LMA, cm^2 ÷ SFA, cm^2) – 0.01548(SFW adjacent to 25% LL, cm) – 0.00692(kidney-pelvic-heart fat, kg) + 0.42439(LMA, cm^2 ÷ HCW, kg); $R^2 = 0.6496$.

Total percentage fat trim = 0.55852 – 0.02039(LMA, cm^2 ÷ SFA, cm^2) – 0.45988(LMA, cm^2 ÷ HCW, kg) – 8.41168(SFW adjacent to 75% LL, cm ÷ HCW,kg) – 0.03742(LL, cm ÷ LW, cm); $R^2 = 0.7324$.

The carcass parameters (SFW adjacent to 75% LL, LMA, estimate of percentage kidney-pelvic-heart fat and HCW) used to predict percentage of boneless closely trimmed rib, loin, chuck and round (BCTRLCR) were forced to fit total percentage of lean cuts and lean trim. The resulting regression equation had an $R^2 = 0.4317$. These data suggest that the current methodology for the calculation of retail yield can be improved through the use of measurements that are not currently incorporated into the USDA BCTRLCR equation. With the enhanced use of instrument grading, multiple measurements can be instantly evaluated and calculated to better predict the red meat yield of beef carcasses.