Public Abstract

First Name:Danell

Middle Name:Louise

Last Name:Dow

Adviser's First Name:Carol

Adviser's Last Name:Lorenzen

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:SS 2010

Department:Animal Sciences

Degree:MS

Title:DETERMINATION OF FAT PERCENTAGE USING THREE DIFFERENT METHODS WITHIN MARBLING SCORES ON BEEF LONGISSIMUS MUSCLE

Fat percentage determination in raw meat products has changed with technological advances. The development of rapid fat analysis methods has allowed the meat industry to implement these methods into commercial packing plants to aid in ensuring quality. The objective of this study was to determine fat percentage within marbling scores and compare three fat analysis procedures. Steaks ($n = 119$) were selected by USDA grading system using an E + V Vision Grading camera at a commercial beef plant during one day. Two samples per carcass were cut from the 13th rib, both sides, and transported to University of Missouri meat lab. The sample from the right side of the carcass was allotted to Warner-Bratzler shear force and the sample from the left side, which was graded by the camera, was allotted to fat extraction. Warner-Bratzler shear force samples were cut into 2.54 cm steaks and aged for 14 d. Steaks allotted to fat extraction were trimmed of all external fat and twice ground using 8 and 4 mm grinding plates. The finely ground beef was then split into its allotted fat extraction methods. The three methods used in fat extraction were 2:1 chloroform/methanol (**Folch**), ether-extractable fat (**Ether**) and microwave drying and nuclear magnetic resonance (**CEM**). Warner-Bratzler shear force values were not different between marbling scores ($P > 0.05$). Regardless of fat extraction method, fat percentage increased as marbling score increased ($P < 0.05$). Regression equations for fat percentage using all extraction methods were linear. Prediction equation for CEM was fat percentage = $-3.46 + 0.016$ (marbling score), R^2 of 0.824 ($P < 0.0001$). Prediction equation for Ether was fat percentage = $-3.08 + 0.017$ (marbling score), R^2 of 0.859 ($P < 0.0001$). Folch prediction equation was fat percentage = $-3.42 + 0.019$ (marbling score), R^2 of 0.816 ($P < 0.0001$). When CEM, Folch and Ether methods were compared, CEM and Folch regression lines had different slopes ($P < 0.05$). The slope of the regression line for Ether was not different ($P > 0.05$) from CEM or Folch. Overall, tenderness was not affected by marbling score, but as expected, as marbling score increased fat percentage also increased regardless of fat extraction method.