

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

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ABSTRACT

Consumers are concerned with fat consumption from meat products and the ability to determine fat has changed with recent technological advances. 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. Samples were taken at the 13th rib from both sides of the carcass and aged for 14 d. The right side of the carcass was allotted to Warner-Bratzler shear force and 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. Steaks allotted to fat extraction were trimmed of all external fat, twice ground using 8 and 4 mm grinding plates, and split into their allotted fat extraction method. 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 ($P > 0.05$). Fat percentage increased as marbling score increased ($P < 0.05$). Regression equations were linear for all methods. The R^2 values for CEM, Ether, and Folch were 0.824 ($P < 0.0001$), 0.859 ($P < 0.0001$), and 0.816 ($P < 0.0001$). 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, marbling score did not affect tenderness and, as expected, fat percentage increased as marbling score increased regardless of fat determination method.