

ELECTRICAL STIMULATION AND POSTMORTEM CHILLING EFFECTS ON PORK QUALITY

D.D. CRENWELGE, R.N. TERRELL, T.R. DUTSON, G.C. SMITH and Z.L. CARPENTER

Texas A&M University, College Station, Texas, U.S.A.

Three studies have been conducted to determine the effects of electrical stimulation and rapid chilling on the postmortem properties of porcine muscle. In Study No. 1, 20 pigs were slaughtered and assigned to one of four treatment-chilling groups (intact carcasses stimulated after bleeding; intact carcasses stimulated after dehairing; individual sides stimulated after splitting; and non-stimulated controls). Sides from all pigs were either: (a) chilled conventionally (2°C) or (b) chilled in a blast freezer (-34°C) for 3 hr and subsequently chilled at -2°C. In Study No. 2, 20 pigs were slaughtered and split longitudinally; left sides were electrically stimulated (ES), right sides were not electrically stimulated (NS) and sides from ES and NS treatments were assigned to the same chilling treatments used in Study No. 1. In Study No. 3, 10 pigs were slaughtered and paired sides (ES vs NS) were assigned to the following treatment-chilling groups: ES-conventional; ES-blast; NS-conventional; NS-blast. In all three studies, a trained panel evaluated sides for color and firmness (longissimus muscle) and for muscle separation (ham and shoulder) at various postmortem time intervals. Sides which were electrically stimulated as intact carcasses had less desirable muscle color and were softer than those sides which were stimulated after splitting, regardless of chilling treatment. Sensory panel ratings for juiciness, tenderness, flavor desirability and overall palatability of loin chops and ham slices were not significantly different among the treatment-chilling groups. Color scores for the ham, loin and shoulder (11 hr postmortem) of NS-blast chilled sides were numerically superior to those from the ES-blast chilled, ES-conventionally chilled, and NS-conventionally chilled carcasses. Likewise, the scores for muscle separation and firmness were superior for NS-blast chilled sides as compared to ES-blast chilled, ES-conventionally chilled, and NS-conventionally chilled sides. Among all comparisons, ES produced softer muscles and greater muscle separation than did NS; however, rapid chilling improved the color and firmness of muscles.

MANUSCRIPT NOT AVAILABLE