

PORK QUALITY

Title: Influence of Early Postmortem Factors on Water-Holding Capacity and Tenderness of Fresh Pork - **NPB# 00-059**

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Date Received: 3/11/2002

Abstract: Accelerated mu-calpain autolysis and lower calpastatin activity were hypothesized to result in increased proteolysis and subsequently affect drip loss and meat tenderness. Halothane negative Duroc pigs (n=16) were harvested. Temperature and pH measurements were made on the longissimus dorsi (LD), semimembranosus (SM), and psoas major (PS) at 45 min, 6 h, 12 h, and 24 h postmortem (PM). Samples were taken from the LD, SM, and PS at 45 min, 6 h, and 24 h PM and extracted in 3 vols of 10 mM EDTA, 0.1% β -mercaptoethanol, 2 mM PMSF, 100 mg/L ovomucoid and 100 mM Tris, pH 8.3. After centrifugation, a portion of each supernatant was used for immunoblotting with an antibody against the mu-calpain 80-kDa subunit. The remainder of the supernatant was used to determine CPST activity. Samples were collected from each muscle at 45 min, 6 h, 24 h, 48 h, and 120 h PM for examination of titin and nebulin by SDS-PAGE. Drip loss was measured on LD, SM, and PS chops taken at 24 h PM and held for an additional 24 h and 96 h at 4°C. Warner-Bratzler shear (WBS) force measures were evaluated on chops (LD, SM, and PS) at 24 h, 48 h, and 120 h PM. At 45 min, the PS had a significantly lower pH (5.50) than the LD (5.97) and SM (6.05) and had partial autolysis of the mu-calpain 80-kDa (catalytic) subunit. All PS samples showed extensive degradation of titin by 24 h PM. The PS had lower ($P < .01$) drip loss after 96 h of storage than the SM and LD. The SM had higher ($P < .0001$) WBS at 48 h PM than the LD and PS. The SM had higher ($P < .05$) CPST activity at 6 h and 24 h compared to the LD (and PS). The LD also had higher ($P < .05$) CPST activity than the PS at 6 h and 24 h PM. These results indicate differences between muscles in mu-calpain autolysis, pH, and calpastatin activity play a role in the tenderness and drip loss of fresh pork products.

These research results were submitted in fulfillment of checkoff funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer reviewed

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