

Title: Relationship between glycolytic oscillations and pork color and water-holding capacity - **NPB#02-082**

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Abstract: Our objective was to determine the relationships between pork loin color, water-holding capacity and 1) the pattern of glycolysis dictated by characteristics of soluble muscle proteins, and 2) the influence of glycolytic metabolites on the pattern of glycolysis. Characteristics of superior (n=6) and inferior (n=6) quality loins, respectively, were as follows: 45 min pH (6.40 ± 0.06 vs 5.92 ± 0.10), percent fluid loss after centrifugation (10.22 ± 0.47 vs 20.70 ± 0.32), percent drip-loss by the suspension method (0.66 ± 0.08 vs 3.23 ± 0.45), and day 1 L^* (51.37 ± 0.66 vs 56.68 ± 0.86). Longissimus muscle samples were obtained at 20 min postmortem and were immediately frozen in liquid nitrogen and stored at -80°C until analysis. Soluble muscle proteins were extracted, gel-filtered and used to determine *in vitro* patterns of glycolysis. Aliquots of glycolytic reaction mixture were removed every 2 min for 46 min and acidified to halt enzyme activity. Enzymatic assays were used to quantify concentrations of ADP, ATP, and lactate. An oscillatory pattern of glycolysis was observed using extracts from both superior and inferior quality pork. No differences in the average ATP:ADP ratio or the overall mean concentrations of lactate or adenine nucleotides were observed in reactions using extracts from superior and inferior quality samples ($P > 0.05$). Thus, sarcoplasmic protein extracts do not appear to produce distinct patterns of glycolysis that are associated with differences in pork quality. However, the rate of glycolysis in this system increased with addition of myofibrils (ATPase) and decreased with addition of citrate. This system will permit identification of specific biochemicals that cause differences in the pattern of postmortem glycolysis and muscle acidification.

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