

PORK QUALITY

Title: Role of Muscle Cytoskeletal and Intermediate Filament Proteins in the Development of Soft and Exudative Pork - **NPB#02-030**

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Date Received: December 23, 2003

Abstract: This project addresses an important topic, the reduction in the amount of pale and exudative pork from non-halothane positive pigs. The central hypothesis for this project is: *Degradation of proteins involved in tying together adjacent myofibrils and the myofibrils to the cell membrane will improve the ability of the muscle cell and ultimately the muscle itself to retain water.* This central hypothesis was tested by accomplishing the following specific research objectives: 1.) Investigate the relationship between early postmortem degradation of intermediate filament (other than desmin) and intermediate filament associated proteins with water-holding capacity of fresh pork. The hypothesis behind this objective is: Specific proteins involved in linking myofibrils to the cell membrane may be degraded earlier than desmin and provide earlier indications of water holding capacity of fresh pork. 2.) Determine the role of intermediate filament protein degradation in water-holding capacity of enhanced pork. The hypothesis behind this objective is: Variation in degradation of intermediate filament and intermediate filament associated proteins is responsible for inconsistent responses to the enhancement process. This study used pork longissimus dorsi from that varied widely in their three hour postmortem pH. Product that had low 3 hour pH had less degradation of the proteins desmin and talin. Furthermore, enhanced product that had more intermediate filament protein degradation had better water-holding capacity. The results of this experiment demonstrate that degradation of intermediate filament proteins such as desmin is at least associated with improved water holding capacity of fresh pork loins. This conclusion supports the hypothesis that proteolysis of specific proteins can improve the water holding capacity of fresh and moisture enhanced pork. Exudative product continues to be a major concern in the pork industry. In order to minimize the incidence of soft, exudative pork, the mechanism underlying the development of this condition must be determined. This research focused on recently discovered relationships between degradation of structural components of the muscle cell and drip loss. Understanding this relationship will provide valuable information regarding direction for research to develop future technologies that will improve pork quality.

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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