RESEARCH ABSTRACT

PORK QUALITY

Title: PSE Development and Detection ***- NPB* # 00-117**

Investigator: David E. Gerrard

Institution: Purdue University

Co-Investigators: Mark Morgan
John Forrest
Alan Grant

Date Received: 6/13/2001

Abstract: Wide variation in the color of fresh pork cuts, and the incidence of cuts with high drip loss continue to plague the pork industry worldwide. While the basic causes of these variants have been know for 4 decades, the details needed to detect and prevent these quality problems still elude the industry. This study of PSE development and detection establishes pork carcass electrical stimulation as a means of dropping muscle pH rapidly and raising carcass temperature, which are hallmarks of PSE development. This allows the creation of the condition for research purposes to develop detection and other preventive measures. Additional studies in which ES was applied at different times after exsanguination showed that the susceptibility of a pig carcass to development PSE (via ES) resides within the first 25 min post-exsanguination. Agreement between our biochemical data and those reported by Kastenschmidt et al. (1968) further supports the use of electrical stimulation as a model to study PSE without confounding the study with genotype. These additional data help identify more precisely the rate-limiting steps of glycogenolysis and glycolysis and provide a more comprehensive understanding of how adverse pork quality develops within a genotype as environmental stimuli change. To further understand the development of changes in the ability of muscle to bind the naturally occurring water within it's cells during the changes that occur during PSE development a new technique was developed. Absorptive cotton implants are absorbent and detect the release of water from cells. Utilization of cotton implants may prove valuable in gaining an understanding of water release from pork muscle at the various stages of conversion of muscle to meat and be helpful in elucidating differences in treatments and genotypes with regard to the development of drip loss problems. Previous work has shown that near infrared spectroscopy, may have application in the early detection of drip loss problems, but results have been inconsistent from one data set to another. For the first time, non-ratioed spectra were observed to have predictive value. The implications of being able to utilize non-ratioed spectra are important to the eventual application of NIR to on-line applications because non-ratioed spectra require less probe time to sense the required information. This observation is encouraging and appears to merit further study.

For more information contact:
National Pork Board, P.O. Box 9114, Des Moines, Iowa USA
800-456-7675, **Fax:** 515-223-2646, **E-Mail:** porkboard@porkboard.org, **Web:** http://www.porkboard.org/