

# Graduate Student Research Poster Competition

## Effect of Breed and Implant on Carcass Traits and Palatability of Bullock Beef

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Two hundred young bulls, 100 Angus (A) and 100 Gelbvieh crossbred (GX), were assigned, using breed and weight stratification, to eight groups with one pen from each breed treated with either Ralgro (R), Synovex-H (SH), Synovex-S (SS) or as a control (C). Bulls were implanted during both a growing phase (92 days) and a finishing phase ( $\bar{x}$  = 105 days). Chill down temperatures of the longissimus dorsi were monitored at 1, 2, 4, 6, 8, 10 and 22 hours post-mortem by inserting a thermometer in the approximate geometric center of the l.d. muscle opposite the twelfth thoracic vertebrae. Significant positive correlations were observed between external fat thickness and all seven post-mortem temperatures. Carcass traits were not significantly affected by breed x implant. The GX had heavier carcasses, larger rib eye areas, less fat cover, lower yield grades, lower marbling levels and lower quality grades ( $P < .01$ ). The result of implant on fat thickness (cm) was  $C < R < SH = SS$  (.75 < .84 < .93 = .99). Bulls implanted with SS had higher yield grades than the other three groups, while R implants had lower yield grades than SH implants. Breed x implant did not significantly affect Warner-Bratzler shear or sensor evaluation. Breed effect ( $P < .01$ ) was seen in trained taste panel evaluation of tenderness and connective tissue amount with A more tender and having less connective tissue. Overall desirability was also in favor of the A ( $P < .05$ ).

## Effects of Storage and Processing Temperature on the Rheological Properties of Liver Paté

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Today's consumer has created an increased demand for more convenience food items. One such item could be a spreadable liver paté. The objectives of this experiment were

to determine the effects of processing temperature and frozen storage on the rheological properties of spreadable liver paté. Three processing temperatures were investigated (60, 70 and 80°C) using a Seydelmann cooking cutter. A standardized formulation and processing procedure was used. The samples were then subjected to either -37 or 1.7°C storage temperature. Frozen samples were thawed at 1.7°C for 24 hr. Laboratory analyses included proximate composition, emulsion capacity, emulsion stability and Instron measurements. Area under the curve ( $cm^2$ ) was measured during compression (ACC), cohesion (ACCO) and extrusion (ACE) tests. Peak forces (gm) for each test were also recorded (PFC, PFCO and PFE, respectively). All samples for Instron analyses were tested at a constant temperature and were adjusted for weight. Proximate composition indicated slight differences for moisture and protein but showed no difference in fat content between the three processing temperatures. The 60°C processing treatment had significantly higher values for emulsion capacity and total fluid loss (emulsion stability) than the other temperature treatments. No differences in emulsion stability or capacity between 70 and 80°C treatments were observed. For all Instron parameters, the 60°C processing treatment had lower values ( $P < .05$ ) than the 70°C treatment. The 80°C treatment exhibited values equal to or below the 70°C treatments for all Instron parameters. Non-frozen samples processed at 70 and 80°C had higher ( $P < .05$ ) values for ACC, PFC and PFCC than did frozen samples. Freezing had little effect on Instron measurements obtained on paté processed to 60°C. When considering a frozen liver paté, a processing temperature of 70°C should be used to obtain optimal stability of rheological properties.

## Pre- and Post-rigor Sectioned and Formed Beef Steaks Manufactured with Different Salt Levels, Mixing Times and Tempering Times

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To obtain the benefits of pre-rigor meat in restructured beef products, processing procedures must be developed which reduce problems associated with tenderness and cooked deformation. The objective of this study was to identify optimal processing parameters for the incorporation of pre-rigor beef in sectioned and formed steaks. Meat logs were prepared

from pre- or post-rigor beef muscle with 0, 0.5 or 1.0% salt, mixed for 0, 6, 12 or 18 min, frozen and then tempered to  $-3^{\circ}\text{C}$ . Logs were pressed and cleaved after 0, 24, 48 or 72 hr tempering. The R values and pH were determined to indicate the extent of metabolic activity. Peak break force (PBF) and peak Lee-Kramer shear force (PSF) were obtained from Instron analyses of cooked steaks. Cooking yields were also calculated. Considerable deformation of pre-rigor steaks was noted when short tempering times were involved. Resultant pH and R values indicated that extended tempering of logs at sub-freezing temperatures allowed metabolic activity to occur. Significant main effects were observed for PSF. The presence of salt (0.5 or 1.0%) or increased mixing times resulted in

reduced PSF. No differences were found in PSF or pre- vs. post-rigor steaks. A significant temper x rigor state x salt level interaction was observed for PBF and cooking yields. Increased salt levels resulted in increased cooking yields and PBF for pre-rigor steaks, although to a different degree for each temper time. Post-rigor steaks manufactured with no salt always had the lowest PBF. Cooking yields for post-rigor steaks increased as salt increased for most temper times. As mixing time was extended, differences in cooking yields over temper time were reduced for pre- or post-rigor steaks. It appears that pre-rigor meat can be used in sectioned and formed beef steaks if appropriate modifications in the processing parameters are made.