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Meat and Muscle Biology™

The Effect of Increased Pork Hot Carcass Weights on Loin Quality and Palatability

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Objectives

The objective of this study was to evaluate the effects of pork hot carcass weight on loin quality and palatability of top loin chops.

Materials and Methods

The pigs in this study were raised to exceed standard market weights. Pork loins ($N = 200$) were collected from 4 different hot carcass weight groups: light (LT; less than 111.8 kg), medium-light (MLT; 111.8- 119.1 kg), medium-heavy (MHVY; 119.1- 124.4), and a heavy (HVY; 124.4 and greater). Prior to fabrication, purge loss percentage, instrumental color, subjective color and marbling, and pH were taken for each loin. Following fabrication, chops were assigned to fat and moisture analysis, Warner-Bratzler shear force (WBSF), consumer sensory analysis, or trained sensory analysis. For WBSF, consumer, and trained panels, chops were thawed for 24 h prior to analysis. Chops were cooked on clam-shell style grills and removed from the heat with the internal temperature rising to a peak internal temperature of 71°C. Consumers ($N = 197$) evaluated each sample for tenderness, juiciness, flavor like, and overall liking on 0 to 100 continuous line scales. Consumers were also able to indicate "yes" or "no" if the chop was acceptable for all palatability traits and overall. Trained panelists evaluated each sample for initial juiciness, sustained juiciness, myofibrillar tenderness, connective tissue amount, overall tenderness, pork flavor, and off flavor on similar 0 to 100 continuous line scales.

Results

Loins from all weight groups differed ($P < 0.05$) in weight (LT < MLT < MHVY < HVY). No carcass weight effects ($P > 0.05$) were found for loin instrumental color, subjective color, subjective marbling, purge loss percentage, pH, WBSF, moisture percentage, fat percentage, and drip loss. Carcass weight did not affect ($P > 0.05$) juiciness or flavor like ratings but did affect ($P < 0.05$) tenderness ratings and overall liking ratings. Chops from the HVY group were rated as more tender ($P < 0.05$) compared to chops from the LT weight group. Additionally, chops from the HVY weight group had greater ($P < 0.05$) consumer overall liking rating compared to chops from both the LT and MLT weight treatments. Hot carcass weight treatment did not contribute ($P > 0.05$) to the percentage of chops rated acceptable for flavor and overall liking. Chops from the HVY weight carcasses had the greatest ($P < 0.05$) percentage of chops rated acceptable for juiciness. Chops from LT carcasses had the lowest percentage of chops rated acceptable for tenderness. Trained sensory results also reflected tenderness and juiciness differences among carcass weight treatments. For both initial and sustained juiciness, chops from MHVY carcasses were rated as juicier ($P < 0.05$) compared to chops from both MLT and LT carcasses. Additionally, chops from the LT hot carcass weight treatment had the lowest ($P < 0.05$) myofibrillar tenderness ratings. Chops from MHVY and HVY carcasses were similar ($P > 0.05$) with greater ($P < 0.05$) overall tenderness ratings compared to chops from LT carcasses.

Conclusion

These results indicate that as hot carcass weight increased, there were no negative effects on loin quality, and top loin chops from heavier weight carcasses had improved tenderness and juiciness compared to chops from lighter carcasses. This provides evidence that as the hot carcass weights of pigs in the United States continue to increase there will be no negative effects on quality and palatability.