

Classification of Pork Loin Based on Lipid Composition to Predict Sensory and Textual Properties

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Summary and Implications

There is significant interest in developing quality standards to predict eating quality in fresh pork. We classified 1976 pork loin chops into 6 groups based on lipid composition. Lipid classification did affect pork texture and sensory tenderness, but did not contribute to variation in juiciness or flavor of pork. Factors other than lipid content should be considered when developing quality standards for fresh pork.

Introduction

Improving the consistency and quality of fresh pork is of significant importance to the swine industry. Lipid content has often been reported to have a measure of influence over sensory traits of texture, tenderness, flavor and juiciness. Marbling has also often been used to classify fresh pork for specific markets. It has become apparent that the lipid profile of fresh lean pork is influenced by genetic background in addition to lipid profile of feedstuffs. The objective is to determine how normal variation in fresh pork lipid composition influences tenderness, juiciness and flavor of fresh pork.

Materials and Methods

Pigs (n=1976) were used in this study. Diets were uniform within test and across breeds. Pigs were slaughtered at 105 kg body weight, and samples of the LD were obtained from each carcass at the 10th rib. Total lipid content was determined on the lean portion of each loin chop. A broiled loin chop was cut such that 3, 1.3-cm cubes were removed from the center of the chop. A trained sensory panel assigned juiciness, tenderness, chewiness and pork flavor scores to each loin chop. Two broiled chops were evaluated for instrumental texture. A lipid classification was determined based on percent intramuscular lipid. Class 1 (n=423) contained between 0 and 1.99 % lipid, Class 2 (n=778) between 2 and 2.99 % lipid, Class 3 (n=461) between 3 and 3.99 % lipid, Class 4 (n=198) between 4 and 4.99 % lipid, Class 5 (n=71) between 5 and 5.99 % lipid, and Class 6 (n=45) greater than 6 % lipid.

Data were analyzed using a mixed linear model including test, gender, halothane genotype, breed, and breed-by-gender interaction as fixed effects, with sire and dam within breed included as random effects.

Results and Discussion

Table 1 documents means for each lipid classification. Lipid classification was significant in models for Star Probe, sensory tenderness and sensory chewiness, but not for sensory juiciness or sensory flavor. Relatively minor, yet statistically significant improvements in sensory scores were observed in Class 3 (Tenderness, 3.8; Chewiness, 2.8) compared to class 2 (Tenderness, 3.7; Chewiness, 2.9). Lipid class means for Star Probe support the conclusion that increasing lipid content above 6 % lipid will improve tenderness of fresh pork loin. It is concluded that factors other than lipid composition contribute to variation in sensory and texture traits of fresh pork.

Table 1. Pork loin texture and sensory traits within each lipid class.

Lipid Class	Star Probe (kg)	Sensory Tenderness	Sensory Chewiness	Sensory Flavor	Sensory Juiciness
1	6.5 ^a	3.8 ^{cde}	2.9 ^a	2.0	3.6
2	6.4 ^{ab}	3.7 ^{ce}	2.9 ^a	2.0	3.5
3	6.3 ^c	3.8 ^{ad}	2.8 ^b	2.0	3.5
4	6.0 ^d	3.9 ^{ab}	2.7 ^b	2.0	3.5
5	6.2 ^{bcd}	3.8 ^{ac}	2.7 ^b	2.1	3.5
6	5.6 ^e	4.0 ^a	2.5 ^b	2.1	3.7

^{a-e} Within a column, means with different superscripts are significantly different (P<0.05)