

# Contribution of Lean and Fat Components on Beef and Pork Species Flavor



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**Objectives:** Investigate four aspects of meat flavor:

- Species specific differences in lean and fat tissue
- Effect of degree of doneness on flavor
- Effect of varying levels of fat on flavor intensity
- Flavor differences between light and dark muscles

## Trial Design

- Three separate studies:
  - Species specific study
    - Degree of doneness
  - Fat concentration study
  - Muscle color study

## Materials and Methods

- Beef lean from chuck and round trimmed of excess fat
- Pork lean from shoulder and ham trimmed of excess fat
- Fat from both species collected and trimmed of excess lean
- Samples were ground through a 1.27cm plate, mixed by hand, and then ground again
- Sub samples were analyzed for proximate composition using an 87:13 azeotropic mixture of chloroform and methanol
- Ground samples were made into patties weighing 113.4 g
- Cooked to an internal temperature of 71°C (66°C and 71°C for species specific study)
- Samples served to a 6 member trained sensory panel
  - 2 panels served per day for 3 days for each study
  - Samples were scored for Beef Flavor, Pork Flavor, Metallic/Serumy, and Acidic/Sour flavors on a 15 cm unstructured line scale

## Species Specific Study

- 80:20 lean to fat mixtures were made of the following combinations
- Beef lean / beef fat
- Beef lean / pork fat
- Pork lean / pork fat
- Pork lean / beef fat

## Fat Concentration Study

- Fat levels 5%, 10%, 15%, and 20% in both beef and pork
- No mixing species

## Muscle Color Study

- 80:20 lean to fat mixtures
- No mixing species
- Dark Muscles - shank, psoas major, supraspinatus, serratus ventralis
- Light Muscles – semimembranosus, semitendinosus

## Results

### Species Specificity

- No differences in flavor between 66°C and 71°C
- Lean portion imparts species specific flavor, regardless of fat source

Table 1

	Beef Lean		Pork Lean		SEM
	Beef Fat	Pork Fat	Beef Fat	Pork Fat	
Beef Flavor <sup>1</sup>	6.03 <sup>a</sup>	5.33 <sup>a</sup>	1.34 <sup>b</sup>	0.68 <sup>b</sup>	0.29
Pork Flavor <sup>1</sup>	0.48 <sup>a</sup>	0.88 <sup>a</sup>	4.18 <sup>b</sup>	5.21 <sup>c</sup>	0.215

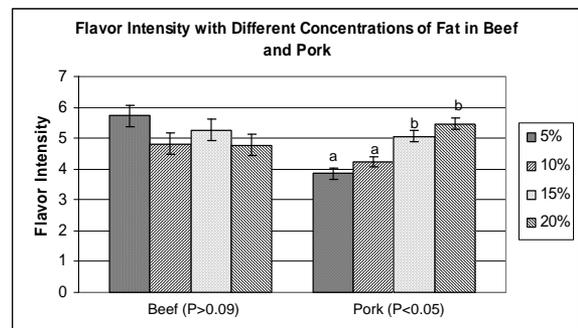
<sup>a,b,c</sup> Within a row, means with different superscripts differ ( $P < 0.05$ ).

<sup>1</sup>Flavor measured on a scale from 0 (no flavor) to 15 (strong flavor)

### Fat Concentration

- In beef samples, increasing fat content did not increase beef flavor
- In pork, increasing fat enhanced pork flavor intensity

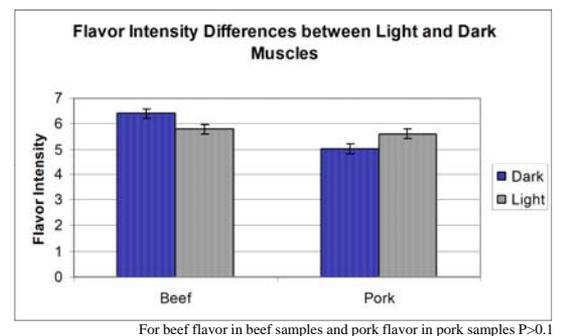
Figure 1



### Muscle Color

- No differences were detected between dark and light muscles

Figure 2



For beef flavor in beef samples and pork flavor in pork samples  $P > 0.1$

## Conclusions:

- The lean meat has more influence on flavor than the fat source (no flavor differences between 66°C and 71°C)
- In beef, adding extra fat does not increase beef flavor, while added fat in pork will increase pork flavor intensity
- Meat from darker muscles does not have a flavor difference than lighter muscles in a ground product with added fat