

33 Relationships between sensory descriptors, consumer acceptability and volatile flavor compounds of American dry-cured ham. A. J. Pham*, M. W. Schilling, W. B. Mikel, P. C. Coggins, J. M. Martin, J. B. Williams, and Y. Yoon, *Mississippi State University, Mississippi State.*

Dry-cured ham is a high quality meat product that is characterized by its unique flavors and ability to meet niche markets. Research was designed to determine the sensory descriptors that describe and differentiate the hams and to relate these descriptors to consumer acceptability and the volatile flavor compounds associated with the hams.

Eight dry-cured ham products were chosen based on regional location, aging time (short or long), ingredient incorporation, and processing conditions (smoked or not smoked). A trained descriptive panel (n=7) evaluated the sensory profiles (aroma, appearance, feeling factors, flavor and texture) of the products using a 15-point line scale. Consumers (n=71) evaluated the dry-cured ham products for overall acceptability, flavor, aroma, appearance and texture using a 9-point hedonic scale. The volatile, aroma impact compounds from the hams were identified using solid phase microextraction (SPME), gas chromatography coupled with a mass selective detector (GC-MSD), and OSME-gas chromatography-olfactometry (GCO-OSME). External preference mapping was performed to determine which sensory descriptors and aroma active compounds drive consumer acceptability. A randomized complete block design with three replications was utilized to determine if differences ($P<0.05$) existed in consumer acceptability, sensory descriptors, and volatile compound concentrations.

On average, consumers preferred ($P<0.05$) the younger aged hams, but almost all hams had average consumer scores between 6 and 7, signifying like slightly to like moderately. Consumers were clustered into 6 segments with distinct liking patterns of the products. Preference of five clusters (37%, 17%, 11%, 11% and 10%) was determined by a similar set of descriptors. In the majority of clusters, consumers preferred ($P<0.05$) hams that had more intense ($P<0.05$) caramelized and smoky aromas as well as more intense ($P<0.05$) savory flavor. These hams also had lower scores for aroma descriptors such as earthy, fermented and pork complex and flavors such as bitter, salty, cured, aftertaste, rancid, and pork complex.

Fourteen aroma active compounds were identified from the headspace volatiles of dry-cured ham samples with essentially similar compounds in both short and long aged hams. The two clusters with the highest acceptability scores preferred ($P<0.05$) hams that were characterized by 4-methyl-2-methoxyphenol (sweet ham), 2-methoxyphenol (smoky, cocoa), and 2,6-dimethoxyphenol (smoky ham, savory). Cluster 5 (14% of the consumers) preferred ($P<0.05$) two hams from the same manufacturing company that were characterized by methional (baked potato odor). Consumer acceptability scores were lower for hams that were either characterized by methanethiol (sulfur), carbon disulfide (sulfur), 2-butanone (sweet), 3-methylbutanal (malty, fermented), 2-heptanone (coffee, burnt meat), hexanal (fresh cut green grass), benzeneacetaldehyde (floral, rose), 1-octen-3-ol (mushroom), or characterized by benzaldehyde (burnt meat, cooked meat) and limonene (citrus, oxidized).

This study reveals how relationships between sensory descriptors, consumer acceptability and volatile flavor compounds can be determined using external preference mapping and used to comprehend the nature of dry-cured ham flavor as it is perceived by a consumer panel.