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# Meat Quality, Aroma Profile and Consumer Preference of Dry-Aged Beef

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## Objectives

Aging is a method for improving some sensory characteristics of meat, enhancing flavor and tenderness. The effect of aging in tenderness is well known but not well established in the flavor of dry-aged beef. This study aimed to evaluate the meat quality, volatile compounds profile and consumer preference between fresh and dry aged beef.

## Materials and Methods

*Longissimus thoracis* and *lumborum* muscles (right side) from five steers of Canchim (5/8 Charolais × 3/8 Zebu) breed fed with the same pellet diet (25% peanut shell; 69.23% corn grain; 2.27% soybean meal; 1% sodium bicarbonate; 1.50% minerals; 1.00% urea and 0.03% monensine in dry matter) were used. Animals were slaughtered at 36 mo of age with 562 kg of average weight. After 24 h *postmortem,* from the muscles of approximately 30 cm length, half of each was deboned, cut into 2.5 cm width steaks ("fresh"). The other half, which were bone-in beef loins, were maintained at 1 ± 1°C and 70% relative humidity ("dry-aged") in a refrigerated chamber for 28 d, deboned and trimmed. Fresh and dry-aged samples were analyzed for meat quality (color, pH, water holding capacity, cooking loss, and Warner-Bratzler shear force). The remainder of these samples were vacuum packaged and frozen for sensory and volatile compounds analyses. Volatile compounds extracted by Solid-phase microextraction technique (SPME) were analyzed by Gas Chromatography/Mass Spectrometry (GC–MS). Consumer paired preference was performed in two sessions, where the preferred sample should be chosen and analyzed by using a table Standard Test Method for Directional Difference Test (ASTM E2164-08). Meat quality and volatile compounds results were analyzed by *t* test.

## Results

Color, pH, and shear force were significantly different ($p < 0.05$) between fresh and dry aged samples. Higher values ($p < 0.05$) of a* (20.6) and b* (16.8) parameters were found in the dry aged meat meaning greater red color intensity in the dry aged samples. Fresh samples showed the lowest values (5.45). The shear force values were lower ($p < 0.05$) for dry aged samples (3.60 kgf) if compared to fresh samples (7.9 kgf). A total of 58 volatile compounds were found in fresh and dry aging meat: 13 hydrocarbons (22.4%), 12 aldehydes (20.7%), 9 ketones (15.5%), 8 alcohol (13.8%), 6 aromatic compounds(10.3%), carboxylic acid (8.6%), 3 sulfur compounds (5.2%), 1 lactone (1.7%) and 1 pyrazine (1.7%). Thirty-nine compounds were common to both treatments being 37 of them with odoriferous importance. Only 3 compounds (2-ethyl, 1-hexanol, 3-ethyl-3-hexene, and octane) were found only in fresh meat. Thirteen compounds were found only in the dry aged meat samples, being the main ones of odoriferous importance: methional (cheddar cheese), heptanoic acid (cheese), 2, 3-butanediol (cocoa butter), dimethyl disulfide (kale), furan, tetrahydro-2-methyl- (roasted, crusted beef and chicken), butanoic acid (rancid), dimethyl trisulfide (sulfureous, grassy) and 3-Octanone (musty, mushroom, moldy and fermented cheese). In the paired preference test, 71 from 78 consumers preferred the dry aged sample, mentioning mainly the reason for the choice the tenderness and flavor.

## Conclusion

Dry-aged beef showed enhanced tenderness and red color compared to fresh beef. Many volatile compounds of odoriferous importance were found in the dry aged beef which contributes to its unique flavor, explaining why it was more preferred in this study.