

VOLATILE COMPOUNDS PROFILE OF DRY- AND WET- AGED BEEF

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I. INTRODUCTION

Aging of beef can be performed by two ways: dry- or wet- aging. These processes are known to make beef more tender and aroma and flavor are enhanced. These modifications in these sensory attributes for beef can influence consumers' acceptance. Beef aroma is given by a combination of different aldehydes, ketones and other compounds, generated by Maillard reaction or lipid oxidation. As there are few studies of beef aroma compounds comparing dry- and wet- aged beef from Brazilian animals, this study aimed verify the effects of different types of aging on the chemical profile of the main volatile compounds in Brazilian beef.

II. MATERIALS AND METHODS

Beef (*longissimus thoracis* muscle) from 75% Angus/Hereford crossbred animals submitted to dry or wet aging, for 28 days and non aged meat were analyzed. Twelve uncooked beef samples, four from each treatment (dry-aged, wet-aged and non aged beef) were grounded and placed in Falcon tubes and frozen. The volatile compounds extraction was performed by solid-phase micro extraction (SPME) technique and a CAR/PDMS (Carboxen/polydimethylsiloxane) fiber was used as stationary phase. Gas Chromatography coupled to Mass Spectrometry (GC-MS) was used to separate and identify the beef volatile compounds. A qualitative analysis was done, identifying volatile compounds which appeared in no aged, dry- and wet-aged beef. Area of ions of specific compounds of each volatile compound was selected, transformed to log₁₀ and analyzed by Principal component analysis (PCA) to see if there was any separation between the aging treatments within the studied effect based on the volatile compounds.

III. RESULTS AND DISCUSSION

One-hundred and three compounds were detected and forty-nine were selected as they were associated to beef characteristic aroma. The following compounds were found only in non aged beef: furan, 2-methyl-, pentanoic acid, heptanoic acid, 3-heptanone, 3,5-octadien-2-one, 2-nonanone, 2,4-octadienal, (E,E), 5,9-undecadien-2-one and 6,10-dimethyl-, (Z). Regarding to aging treatments, benzeneacetaldehyde and pentadecanal were found in both aging treatments. The volatile compound 1-hexanol, 2-ethyl-, with characteristic fatty flavor only appeared in wet-aged beef samples. Dry-aged samples showed 3-(methylthio)-propanal, with which is related to baked potato/grassy aroma and also found in small amounts in wine [1]. The lack of difference in the volatile compounds may be explained by the lower evaporation loss during the dry aging process (7.6%) which was observed in previous study [2], while the expected was higher than 20%. In the principal component analysis a clear separation among the aging treatments is observed, with the major part of compounds related to the non aged beef (Figure 1).

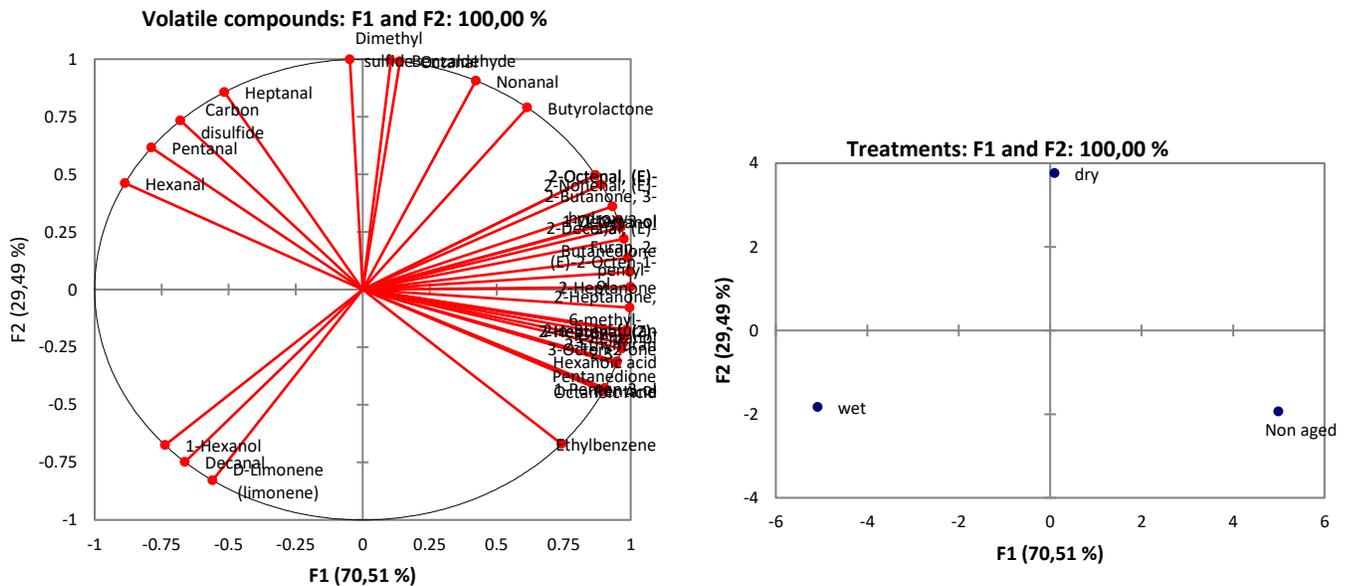


Figure 1. PCA analysis of volatile compounds in fresh, wet- and dry- aged beef.

IV. CONCLUSION

As dry- and wet- aging showed only one different compound each from fresh beef, even with a separation shown by PCA, the aging treatments in this experiment did not affect the qualitative profile of volatile compounds of beef for 28-days aging. Studies regarding to the aroma importance of these compounds are yet to be found.

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