FATTY ACID COMPOSITION OF SUBCUTANEOUS FAT TO DIFFERENTIATE IBERIAN HAM QUALITY CATEGORIES

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I.   INTRODUCTION

Dry-cured hams from Iberian pigs, an autochthonous porcine breed in Spain, are highly rated by consumers worldwide. Iberian hams are classified in four quality categories based on the crossbreeding and feeding of the pigs [1] (Real Decreto 4/2014, de 10 de enero, 2014), being each category labelled with a different colour: "White", from pigs that are at least 50% Iberian breed and reared in an intensive system; "Green", from pigs that are at least 50% Iberian breed and reared in extensive farms with pasture, acorns and complemented with concentrate feeds; "Red", from pigs fed on acorns and grass in an extensive system (montanera) and with at least 50% Iberian breed; "Black", corresponding to 100% Iberian pigs exclusively fed on acorns and grass in an extensive system (montanera). The proportions of major fatty acids (FA) (palmitic (C16:0), stearic (C18:0), oleic (C18:1 n-9) and linoleic (C18:2 n-6) acids) of the subcutaneous fat taken in the carcass, from the anatomical area delimited by the last vertebra of the sacral vertebra and all the coccyx vertebrae, is usually applied by the Iberian meat industry [2] to classify Iberian meat products. This study evaluated the use of the proportions of saturated, monounsaturated, and polyunsaturated FA (SFA, MUFA and PUFA, respectively) of subcutaneous fat from pig carcass (CAR) and from dry-cured ham (DCH).

II.   MATERIALS AND METHODS

Two sampling locations (CAR and DCH) from Iberian pigs labelled "White", "Red", "Green" and "Black" were considered in this study, having 16 samples per group. The fatty acid composition of samples was analysed by GC-FID [3], determining the proportion of SFA, MUFA and PUFA. Differences among quality categories were evaluated by one-way analysis of variance (ANOVA). When a significant effect ($P < 0.05$) was detected, paired comparisons between means were conducted using the Tukey's test. Principal Components Analysis was applied. The IBM SPSS v.22 (IBM Co., New York, USA) statistics software package was used.

III.   RESULTS AND DISCUSSION

Significant differences ($P < 0.01$) were found in the percentage of SFA, MUFA and PUFA among quality categories in CAR and DCH locations, but not observing the same differences between quality categories in the two locations (Figure 1). In CAR, "White" and "Green" samples showed higher SFA and lower MUFA percentages than "Red" and "Black" ones. This trend is also observed in DHC but having differences among "White" and "Green" (with the highest SFA and the lowest MUFA percentages), "Red" (intermediate SFA and MUFA percentages) and "Black" samples (with the lowest SFA and the highest MUFA percentages). In concordance, PCA plot on DCH (Figure 2) showed three groups of samples: "White"+"Green", "Red" and "Black", while a clear differentiation among quality categories was not observed in PCA plot on CAR (Figure 2). These are expected results and agree with previous studies analysing subcutaneous fat from Iberian pig carcass [4], however, no previous studies at evaluating the capability of the subcutaneous fat of dry-cured hams to differentiate quality categories have been found among the scientific literature. The use of this type of sample from dry-cured hams may enhance the quality control of these high-prized meat products.
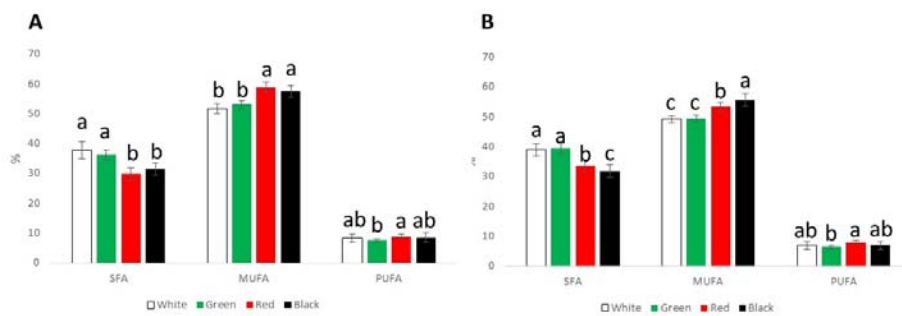
Figure 1. Percentage of SFA, MUFA and PUFA in subcutaneous fat from carcass (A) and from dry-cured hams (B) of Iberian pigs with different quality categories. Different letters indicate significant differences between quality categories.
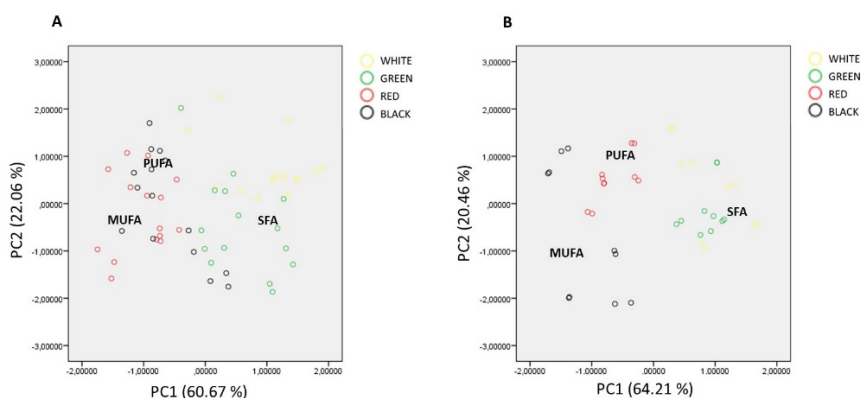

Figure 2. Principal Component Analysis (PCA) of fatty acid composition of subcutaneous fat from carcass (A) and from dry-cured hams (B) of Iberian pigs with different quality categories.

IV.   CONCLUSION

The fatty acid composition of subcutaneous fat from dry-cured hams allows to differentiate main quality categories and it may be considered and implanted to enhance the quality control of these type of high-prize meat products.

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