EVALUATION OF FATTY ACIDS, AND SENSORY PROPERTIES OF ALPACA MEAT (*VICUGNA PACOS*) PROCESSED BY SOUS VIDE TECHNOLOGY

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I. INTRODUCTION

The food processing industry in the European Union is facing an increasing demand for high-quality food products made from minimally processed, local raw materials. A paradigm shift in the consumer preference towards more concern for health, awareness, and sustainability is currently recognized [1]. Sous vide is a cooking technique that processes the raw food sealed in a heat-stable vacuum pouch and cooks using a water bath at precise temperature and duration. Sous vide utilize the concept of low temperature long time (LTLT) cooking [2]. The consumer believes that chicken breast meat is a choice for healthier diet because of high protein, low fat and low cost [3]. Meat is certainly a nutritious food and it is worth to be explored in sous vide application to be served as a ready-to-eat product [4]. Alpacas represent an important meat resource for rural Andean families [5]. Therefore, the aim of this study was to contribute to the knowledge of the composition and sensory characteristics of alpaca meat.

II. MATERIALS AND METHODS

The meat was cut into cubes of 5 cm, square to then be vacuum packed, to submit to different cooking treatments by sous-vide, later the composition of fatty acids and sensory analysis were evaluated. The analysis of variance (ANOVA), Duncan's multiple-range test were carried out using SPSS, 27. The significance level was 0.05.

III. RESULTS AND DISCUSSION

Table 1. Gives the fatty-acid composition, SFA, MUFA and PUFA of meats samples. Differences in fatty-acid profile among all batches are possibly due to the different sources of fat used in their formulation. In relation to the SFA fraction, except for some minor exceptions, individual fatty acids of the two treatments T3 and T5 showed no significant difference, although they showed significantly different amounts, with total fractions of 49.61 and 57.19, respectively. These differences were mainly attributed to the differences found for stearic acid (C18:0), followed by myristic acid (C14:0) and palmitic acid (C16:0), which were quantitatively more affected by the substitution of either alpaca meat or hump fat. In this respect, SFA composition of T2 was significantly lower than other meats, with a total fraction amount of 49.61at the end of cook. Concerning the MUFA fraction, the difference between beef fat and hump fat for oleic acid (C18:1) and palmitoleic acid (C16:1) was clearly reflected in the final product values, with significantly higher total fraction values for meats.

Table 1. Fatty acid profile (g/100 g of fatty acids) and nutritional significant ratios of different treatments.

FATTY ACIDS (FA)	T1	T2	T3	T4	T5
Myristic C 14:0	0.620±0.011^{c}	N.D.	0.733±0.011^{b}	1.011±0.020^{a}	0.632±0.054^{c}
Pentadecanoic C 15:0	N.D.	N.D.	0.142±0.013^{c}	0.424±0.002^{a}	0.221±0.043^{b}
Palmitic C 16:0	27.926±0.102^{a}	16.982±0.250^{c}	22.011±0.899^{b}	15.582±0.011^{d}	12.041±0.022^{e}
Palmitoleic C 16:1	N.D.	0.294±0.030^{c}	0.275±0.110^{c}	1.852±0.033^{a}	1.212±0.041^{b}

Heptadecanoic C 17:0	0.142±0.011^{d}	N.D.	0.311±0.054^{b}	0.443±0.010^{a}	0.241±0.014^{c}
Stearic C 18:0	35.160±0.489^{b}	32.631±1.601^{bc}	31.165±0.366^{c}	32.152±1.550^{c}	43.544±0.575^{a}
Elaidic C 18:1n9t	N.D.	N.D.	0.820±0.032^{b}	N.D.	0.962±0.110^{a}
Oleic C 18:1n9c	16.390±0.030^{c}	16.348±0.694^{c}	16.042±0.001^{c}	13.582±0.110^{b}	10.183±0.071^{c}
Linoleic C 18:2n6c	5.492±0.267^{a}	4.420±0.245^{b}	3.852±0.101^{c}	4.284±0.111^{bc}	3.881±0.020^{c}
Arachidic C 20:0	N.D.	N.D.	1.862±0.033^{a}	0.752±0.061^{b}	0.541±0.092^{c}
Eicosenoic C 20:1n9c	2.311±0.143^{a}	1.456±1.220^{a}	1.241±1.396^{a}	2.865±0.011^{a}	3.120±0.015^{a}
Linolenic C18:3n3c	0.330±0.010^{a}	N.D.	N.D.	N.D.	N.D.
AGS(SFA)	63.813±0.626^{a}	49.611±1.866^{c}	56.200±1.294^{b}	50.330±1.573^{bc}	57.193±0.510^{b}
AGM(MUFA)	18.701±0.172^{a}	18.044±0.577^{a}	17.554±1.513^{a}	18.291±0.082^{a}	14.491±0.112^{b}
AGP(PUFA)	5.812±0.279^{a}	4.421±0.255^{b}	3.850±0.101^{c}	4.288±0.110^{b}	3.880±0.021^{c}

T1=Control: raw meat; T2=60°C/2h.; T3: 60°C/4h.; T4: 80°C/2h; T5: 80°C/4h. The values are expressed as mean ± S.E.M. (n = 3). Means with different superscript letter are significantly different (P < 0.05).

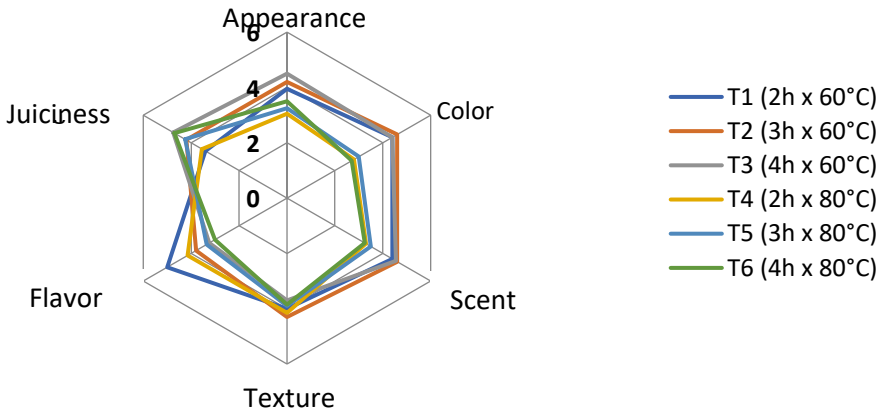

Figure 1. Sensory evaluation of meat treatments by sous-vide.

IV. CONCLUSION

The effect of temperature and cooking time using sous vide technology showed significant effects on lipid oxidation, where a temperature increases, lipid oxidation increases. An effect was shown in the sensory evaluation of alpaca meat through sous vide technology at long times and low temperatures where it was possible to observe that the T4 and T6 treatments are the best in aroma and color; in texture and flavor the best treatments are T3, T5 and T6. Regarding the juiciness of the control, the T4 treatment was the best and in appearance.

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