EVALUATION OF FATTY ACIDS, AND SENSORY PROPERTIES OF MEAT (*Bos taurus*) PROCESSED BY SOUS VIDE TECHNOLOGY

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I. INTRODUCTION

Sous-vide is applicable to almost all type of foods. In sous-vide meat is generally cooked for a long time at 55–80 °C. In relative low temperature juiciness of meat is maintained while the flavour and tenderness are improved [1]. Cooking process highly impact the properties of food which are relevant to consumer preferences such as aroma, flavour, colour, chewiness etc. cooking not only changes food properties but also make food free from pathogens. Cooking also affects the nutritional value of food either positively or negatively. Traditional cooking uses high-temperature which contributes to a loss of nutritional components, flavour and colour etc. 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 [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]. Therefore, the aim of this study was to contribute to the knowledge of the composition of fatty acid and sensory characteristics of meat (*Bos taurus*).

II. MATERIALS AND METHODS

The meat (Round) was cut into cubes of 5 cm, square to then be vacuum packed, to submit to different cooking treatments by sous-vide, the composition of fatty acids was analyzed with Chromatograph Agilent Technologies 6890N and sensory analysis were evaluated. The T1=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 ($P < 0.05$).

III. RESULTS AND DISCUSSION

Table 1. Gives the fatty-acid composition, 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. Except for some minor exceptions, individual fatty acids of the two treatments T3 and T4 showed no significant difference, although they showed significantly different amounts, with total fractions of 30.08 and 44.73, respectively. These differences were mainly attributed to the differences found for stearic acid (C18:0), followed by oleic acid (C18:n-9) and palmitic acid (C16:0), which were quantitatively more affected by the substitution of either meat or hump fat. In this respect, MUFA and PUFA composition of T5 was significantly lower than other meats, with a total fraction amount at the end of cook. Concerning the MUFA, 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 values for meats.

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

FATTY ACIDS (FA)	T1	T2	T3	T4	T5
Myristic C 14:0	1.8±0.36^{c}	2.13±0.02^{a}	2.07±0.02^{b}	0.97±0.03^{a}	0.61±0.03^{c}
Pentadecanoic C 15:0	0.3±0.01^{a}	0.61±0.01^{a}	0.45±0.01^{c}	0.20±0.01^{a}	N.D.
Palmitic C 16:0	21.67±0.42^{a}	27.27±0.07^{c}	24.13±0.10^{b}	21.40±0.17^{d}	14.79±0.16^{e}
Palmitoleic C 16:1	2.04±0.28	1.71±0.01^{c}	2.96±0.01^{c}	1.42±0.02^{a}	1.30±0.06^{b}
Heptadecanoic C 17:0	1.01±0.07^{d}	1.85±1.01^{b}	1.49±0.03^{b}	0.67±0.06^{a}	0.23±0.02^{c}
Stearic C 18:0	35.56±0.14^{b}	26.10±0.02^{bc}	21.23±0.06^{c}	38.63±0.09^{c}	47.00±0.39^{a}
Oleic C 18:1n9c	27.7±0.17^{b}	34.43±0.01^{c}	41.41±0.05^{b}	28.61±0.13^{c}	23.20±0.44^{a}

Linoleic C 18:2n6c	4.82±0.18^{a}	1.25±0.02^{b}	1.21±0.03^{c}	2.40±0.03^{bc}	2.12±0.03^{c}
Arachidic C 20:0	1.84±0.05^{a}	0.41±0.02^{b}	0.34±0.04^{a}	0.38±0.02^{b}	N.D.
Eicosenoic C 20:1n9c	0.34±0.03^{a}	0.26±0.02^{a}	0.36±0.10^{a}	0.21±0.02^{a}	0.52±0.13^{a}
AGM(MUFA)	30.08±0.40^{a}	36.4±0.02^{a}	44.73±0.15^{a}	30.24±0.13^{a}	25.03±0.42^{b}
AGP(PUFA)	4.82±0.18^{a}	1.25±0.02^{b}	1.2±0.03^{c}	2.40±0.03^{b}	2.12±0.03^{c}

T1=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).

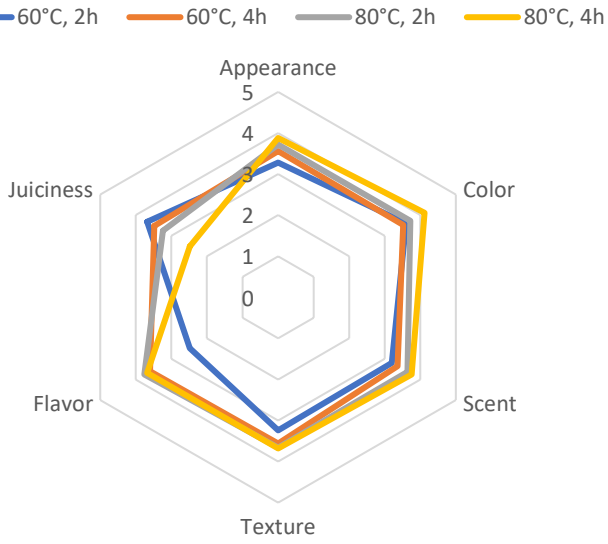

Fig. 1. Sensory evaluation of meat treatments by sous-vide.

IV. CONCLUSION

The effect of temperature and cooking time using sous vide technology showed significant effects on fatty acid profile, where a temperature increases. An effect was shown in the sensory evaluation of meat through sous vide technology at long times and low temperatures where it was possible to observe that the sample 80°C/2h and 80°C/4h treatments are the best in aroma and color; in texture and flavor the best treatments are 60°C/4h and 80°C/4h. Regarding the juiciness of the 80°C/2h treatment was the best and in appearance.

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