

EFFECTS OF SEX AND SLAUGHTER AGE ON LIPID FATTY ACIDS PROFILE IN MEAT OF CROSSBRED DONKEY FOALS

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I. INTRODUCTION

Donkey meat has been produced in the past slaughtering animals at the end of their working activities; consequently, meat was considered not tender and sometimes, in order to facilitate human consumption, it was most convenient producing salami or other kind of ripened products rather than selling fresh donkey meat [1]. The dramatic decrease of donkey population in Italy and in many other western countries, started at the end of the second world war, and has recently been stopped because of the interest in the nutritional characteristics of donkey milk, used for feeding children affected by cow milk protein allergy [2]. Not all female donkeys reared on farms can be used for breeding; both young female and male donkey foals can be used for meat production, considering the good nutritional properties recently determined in this food [3]. In the south of Italy, particularly in Apulia region, consumption of both horse and donkey meat is traditional [4]. The aim of this study was to investigate on the effects of sex and slaughter age on fatty acid composition of muscle *Longissimus Thoracis* taken from 8 female and 9 male crossbred donkey foals slaughtered at two different age, 8 and 13 months, in order to deepen the knowledge about donkey meat nutritional properties.

II. MATERIALS AND METHODS

For this study, 17 crossbred donkey foals, Ragusano x Romagnolo, have been used. Eight foals (4 males and 4 females) were slaughtered at the age of 8 months, with an average final body weight of 113 ± 10 kg, while 9 foals (5 males and 4 females) were slaughtered at an age of 13 months and an average final body weight of 139 ± 16 kg. Immediately after slaughtering, carcasses were chilled at 3°C in a cold room for 24 h, when muscle *Longissimus Thoracis* (LT) was sampled (90 g) from the left half of each carcass, between the ninth and the thirteen rib. Fatty acid composition was determined in all the samples; fatty acid identification was made by comparing gas chromatographic retention times with the antioxidant standard butylated hydroxytoluene (BHT) [5]. Data were subjected to the analysis of variance in general linear model (GLM) procedure of SAS. The model included a fixed effect of sex and a fixed effect of slaughter age. Significant differences were indicated when $P < 0.05$.

III. RESULTS AND DISCUSSION

The intramuscular fatty acid composition is shown in Table 1. Saturated Fatty Acids (SFA) was the most abundant category in this study, followed by Mono-Unsaturated Fatty Acids (MUFA) and finally Poly-Unsaturated Fatty Acids (PUFA). These results confirmed those obtained in Galician Mountains foal breed slaughtered at 9 and 12 months of age [5]. Within the SFA the predominant fatty acid was palmitic acid (C16:0), while oleic acid (C18:1) was the most abundant among the MUFA, and linoleic acid (C18:2 *n*-6) was the predominant fatty acid in PUFA, confirming the results obtained in Burguete horse breed slaughtered at 16 and 24 months [6], and also in Hispano-Bretón horse foals slaughtered at the age of 24 months [7]. Sex and slaughter age (8 vs 13 months) showed no significant differences.

Table 1 Fatty acid profile of intramuscular fat in donkey muscle LT (% fatty acid methyl esters).

	Sex		Slaughter age		P value	
	Male (n = 9)	Female (n = 8)	8 months (n = 8)	13 months (n = 9)	Sex	Age
C12:0	0.30	0.34	0.28	0.36	0.820	0.810
C14:0	3.90	3.57	3.88	3.79	0.660	0.780
C16:0	31.8	30.5	31.9	30.8	0.810	0.880
C16:1	6.24	5.96	6.21	5.93	0.740	0.830
C18:0	7.93	7.62	7.81	7.26	0.660	0.750
C18:1	28.4	29.7	28.8	29.2	0.710	0.690
C18:2 <i>n-6</i>	18.1	17.9	17.8	18.4	0.880	0.780
C18:3 <i>n-3</i>	1.28	1.31	1.22	1.30	0.890	0.820
C20:1	0.75	0.87	0.65	0.63	0.680	0.700
C20:4	1.67	2.32	1.58	2.41	0.720	0.600
ΣSFA	43.9	42.0	43.9	42.2	0.770	0.760
ΣMUFA	35.4	36.5	35.7	35.8	0.900	0.800
ΣPUFA	21.0	21.5	20.6	22.1	0.950	0.570

IV. CONCLUSION

Although in Italy donkey breeding is often only a complementary activity, it shows good potential for future development, considering the great attention given by the consumers to local foods and to organic production. Looking at the level of unsaturation of the intramuscular fat, donkey meat can be considered a valid alternative to other traditional red meats, such as beef and/or lamb. Sex and slaughter age did not significantly affect meat fatty acid profile.

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