FATTY ACID COMPOSITION AND CHOLESTEROL CONTENT OF F1 DORPER CROSSBRED SHEEP

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Introduction

Interest in the study of fatty acids, particularly the total quantity of saturated and unsaturated fatty acid in muscle, is mainly to understand their role in affecting human health. A previous study suggested that a decrease in saturated fatty acid (SFA) level and a concomitant increase in the monounsaturated (MUFA) and polyunsaturated fatty acids (PUFA) content of ruminant meat may confer benefits to human health (1).

The present study was undertaken to assess the intramuscular fatty acid composition and cholesterol content of different muscles taken from F1 Dorper crossbred carcasses (n=7). The sheep were slaughtered with an average weight of 46 kg and age 18 mo.

Methodology

Meat samples were taken from longissimus dorsi region (LD, between the 12th and 13th rib) (n=7) and distal region of semi-tendinosus muscle (ST) of front (n=7) and back legs (n=7). A total of 21 samples were analysed for cholesterol and fatty acid composition using GC-MSD and GC-FID, respectively.

The data were analysed using the Minitab 16.0. The mean concentration of cholesterol and fatty acids of the samples obtained from the three regions were analysed statistically by one-way ANOVA and mean comparison was done using Tukey Method at a significant level p=0.05.

Discussion

- ✓ Results showed that cholesterol content was not significantly different between ribeye LD. compared to front and back ST (Table 1).
- ✓ Fatty acid composition was primarily composed of oleic acid, followed by palmitic and stearic acids (Table 2). Muscle tissue of the muttons contained on average 56.56% and 46.36% of SFA and unsaturated fatty acids (UFA), respectively. The ratios of UFA/SFA ranged from 0.82-1.08 in both LD and ST regions. Conjugated linoleic acid (CLA) in the front and back ST was slightly higher (p>0.05) compared to CLA in the ribeye LD

Conclusion

Fatty acid composition and cholesterol content of F1 Dorper Crossbred sheep are consistent to those reported in Spanish and British lambs (2).

References

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The authors are gratefully acknowledge Department of Veterinary Services Malaysia for the financial and facility used

Results

Parameter	Ribeye LD (n = 5) mean + stdev	Front ST (n = 6) mean + stdev	Back ST (n = 5) mean + stdev
Cholesterol	43.864 ± 14.04	61.873 ± 14.66	63.692 ± 4.91

Table 1. Cholesterol content (mg/100 g meat) of Dorper crossbred sheep

Fatty acid concentration	Ribeye LD (n = 6)	Front ST (n = 7)	Back ST (n = 6)
C4:0 (Butyric acid)	3.51	4.84	3.12
C12:0 (Lauric acid)	0.88	4.07	1.44
C14:0 (Myristic acid)	4.85	3.89	3.6 9
C15:0 (Pentadecanoic acid)	2.13	2.90	4.26
C16:0 (Palmitic acid)	22.22	19.85	19.83
C17:0 (Heptadecanoic acid)	1.17	0.76	0.71
C18:0 (Stearic acid)	17.45	15.11	14.62
C20:0 (Arachidic acid)	0.19		
C21:0 (Heneicosanoic acid)	0.35	0.38	0.46
C22:0 (Behenic acid)	0.72	1.03	1.15
C23:0 (Tricosanoic acid)	3.09		
∑ SFA	**54.05^{a}**	**49.20^{ab}**	**48.16^{b}**
C14:1 (Myristoleic acid)	0.47	0.49	0.43
C15:1 (cis-10-Pentadecenoic acid)	0.22	0.26	0.56
C17:1 (cis-10-Heptadecenoic acid)	0.66	0.78	1.00
C18:1n9c (Oleic acid)	31.87	30.08	29.76
∑ MUFA	**33.00^{a}**	**31.43^{a}**	**31.59^{a}**
C18:3n3 (Linolenic acid)	0.61	0.93	0.97
C20:3n6 (cis8, 11,14-Eicosadienoic acid)	0.25	0.41	0.49
C20:3n3 (cis-11,14,17-Eicosatrienoic acid)		4.99	1.54
C20:4n6 (Arachidonic acid)	1.67	2.84	3.46
C20:5n3 (cis-5, 8,11,14,17-Eicosapentaenoic acid)	0.60	0.58	0.68
∑ PUFA	**2.35^{a}**	**5.00^{a}**	**4.89^{a}**
C16:1 (Palmitoleic acid)(omega 7)	2.12	2.12	2.15
C18:1n9t (Elaidic acid)	1.45	1.13	1.01
C18:2n6t (Linolelaidic acid)	0.05	0.06	0.06
∑ TFA	**3.33^{a}**	**3.28^{a}**	**3.17^{a}**
C18:2n6c (Linoleic acid)	6.39	10.16	11.21
∑ CLA (conjugated Linoleic acid)	**6.39^{a}**	**10.16^{a}**	**11.21^{a}**

Table 2. . Fatty acid concentration (percentage of total acids) of longissimus dorsi (LD) and semitendinosus muscle (ST)