EFFECT OF FEEDING SYSTEM ON FATTY ACID PROFILE OF LAMBS OF THREE VENETO REGION ALPINE BREEDS

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AIM

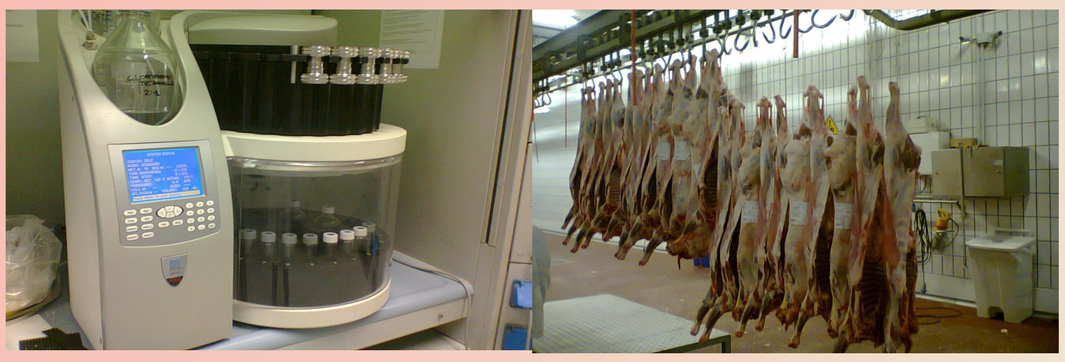
To investigate the effect of the diet (pasture, penned in an open barn and fed with hay and concentrate and penned in the open barn and fed with hay and concentrate added with *rp*CLA supplement), breed, gender and the tissue on the fatty acid (FA) profile of lambs of three native Italian sheep breeds.

MATERIAL AND METHODS

36 lambs of the Alpagota, Brogna and Foza breeds, belonging to flocks subjected to an *in situ* conservation program were used. Lambs were divided in 3 groups characterized by different feeding systems:

- pasture
- open barn and fed with hay and concentrate (HC)
- open barn and fed with hay and concentrate supplemented with *rp*CLA (HC-CLA).

After the slaughter (225 d) samples of muscles, fat depots and liver were collected and analyzed for FA profile. FA were extracted using *Accellerated Solvent Extraction* (ASE) esterificated by basic method (Sodium Methoxide 1M) and analyzed through *Two Dimensional Gas Chromatography* (GCxGC).



A PROC MIXED of SAS was used to assess the effect of the feeding system, breed, gender, age and tissue. The random effect of animal was used to test feeding system, breed, gender and age. The effects of tissue and corresponding interactions were tested on the residual.

CONCLUSIONS

Diet affects the fatty acid profile:

- Pasture increases: vaccenic, linoleic, α-linolenic, other CLA, omega 3, omega 6 contents and omega3/omega6 ratio.
- HC and HC-CLA increase SFA, MUFA and PUFA.
- CLA supplementation (HC-CLA *vs* HC) increases CLA isomers's content, in particular of C18:2 cis9, trans11 and C18:2 trans10, cis12 isomers.

Significant differences among tissue were observed.

No significant effect of breed and gender were observed.

RESULTS

Table 1. Effect of the diet on the main saturated (SFA), mono-unsaturated (MUFA), poli-unsaturated fatty acids (PUFA), the total amount of SFA, MUFA and PUFA.

	Experimental groups			Animal MSE
	Pasture	Hay+Conc. (HC)	HC-CLA	
SFA	55.95	56.64	57.15	1.72
C14:0 miristic	2.68	2.97	2.95	0.56
C16:0 palmitic	20.68*	22.01	21.63	1.11
C18:0 stearic	26.30*	24.09	24.89	1.73
MUFA	32.48	32.82	31.65	1.23
C18:1 vaccenic	4.35**	3.72	3.99	0.45
C18:1 oleic	26.29	27.17	25.80	1.21
PUFA	5.85	5.59	6.16	0.64
C18:2 linoleic	2.90**	3.24	3.46	0.27
C18:3 γ linoleic	0.11	0.12	0.14	0.05
C18:3 α linoleic	1.43**	0.71	0.73	0.15
C18:4n3 stearidonic	0.06	0.07	0.73	0.01
C20:4n6 arachidonic	0.65*	0.90	0.97	0.17
C18:2 cis9, trans11 CLA	0.55	0.42	0.53**	0.07
C18:2 trans10, cis12 CLA	0.07	0.06	0.14*	0
Other CLA	0.21***	0.11	0.11	0.03
Omega 3	1.47***	0.76	0.77	0.16
Omega 6	3.73***	4.35	4.71	0.48
Omega 6/ Omega 3	3.28***	6.32	6.01	0.97

** P = 0.05 * * P = 0.01 * ** P < 0.001*

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