Grape pomace and grape seed extract in lamb diets: meat fatty acid profile and antioxidant activity

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1 INTRODUCTION

One of the main reasons for the deterioration of meat products during processing and storage is lipid peroxidation, whose control is indispensable to preserve their quality and shelf life. In this sense, winery by-products could be an alternative to synthetic products because of their high antioxidant activity, based on the presence of polyphenols. The possibility of using grape seed extract and grape pomace as natural antioxidants in animal feeding, could also allow a reduction in environmental impact and reduce the cost of the diets.

2 OBJECTIVE

The aim of this study was to investigate the effect of grape seed extract (GSE) and grape pomace (GP) from red wine compared with a control group (CTL) and a vitamin E group (VIT-E) on the muscle fatty acid composition and TBARS at 5 storage days in lambs.

3 MATERIAL AND METHODS

48 ♂ Merino lambs (12 lambs per treatment)
Fed *ad libitum* with **concentrate** + barley straw

CONTROL | VITAMIN E | GRAPE SEED EXTRACT | GRAPE POMACE

Slaughter (27 kg LBW)

M. Longissimus:

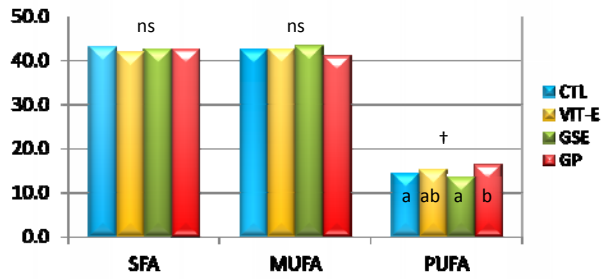
- Fatty acid profile → By gas cromatography
- Lipid oxidation (TBARS 5 days) → Maraschiello *et al.* (1999)

Experimental concentrates:

	CTL	VIT-E	GSE	GP
Ingredient (g kg^{-1} DM)				
Barley	740	740	740	701
Soya seed	200	200	200	189
Vitamin E (IU kg^{-1} DM)	50	550	50	50
Grape seed extract (mg kg^{-1} DM)	-	-	50	-
Grape pomace	-	-	-	50
Composition (g kg^{-1} DM)				
Ash	68.2	73.8	80.9	69.3
CP	189.1	188.8	187.2	187.2
NDF	153.5	156.7	153.2	172.1
ADF	56.6	61.1	61.8	81.1
EE	43.9	43.8	44.6	46.6

4 RESULTS

Intramuscular fat (% identified total fatty acids)



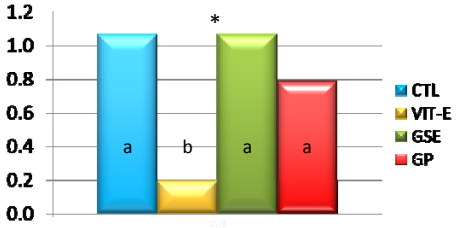
SFA = ∑(C10:0 + C12:0 + C14:0 + C16:0 + C17:0 + C18:0 + C20:0)
MUFA = ∑(C16:1 + C17:1 + *cis*-9 C18:1 + *trans*-11 C18:1 + C20:1)
PUFA = ∑(*cis*-9 *cis*-12 C18:2 + *cis*-9 *trans*-11 C18:2 + C18:3 + C20:4 + C20:5 + C22:4 + C22:5 + C22:6)

	CTL	VIT-E	GSE	GP	RSD	
C16:0	23.39	22.99	23.16	22.57	1.049	ns
C16:1	2.35	2.30	2.39	2.17	0.276	ns
C18:0	14.61	14.01	14.35	15.20	1.528	ns
cis-9 C18:1	37.37	37.53	37.96	36.11	2.113	ns
trans-11 C18:1	1.96	1.99	2.04	2.00	0.248	ns
cis-9 *cis*-12 C18:2	9.50	10.04	9.12	10.74	1.906	ns
cis-9 *trans*-11 C18:2	0.40	0.40	0.40	0.43	0.084	ns
C18:3	0.55	0.60	0.57	0.59	0.089	ns
C20:4	2.74	2.92	2.72	3.18	0.703	ns

ns, P > 0.05; †, P < 0.10; *, P < 0.05.

- The meat fatty acid profile of VIT-E treatment was not different (P > 0.05) when it was compared with the other treatments (CTL, GPE and GP).
- Meat from GP lambs tended (P < 0.1) to increase the PUFA content compared to CTL and GSE, and there were not differences (P > 0.05) between VIT-E and the other groups.

TBARS at 5 days (µg MDA g^{-1} meat)



- Vitamin E supplementation was the most effective treatment in preventing MDA formation. Significant differences (P < 0.05) in TBARS were found when vitamin E group was compared with the other treatments (CTL, GSE and GP) at 5 days of storage.

5 CONCLUSIONS

Vitamin E was the most powerful antioxidant used in this study. Grape pomace as ingredient in lamb diets tended to increase PUFAs content without effect on TBARS in meat. TBARS values in grape pomace group showed a lower numerical value than the control treatment.

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