Performance of Anatolian Merino and Akkaraman lambs fed triticale, Hungarian vetch or a mixture of the two forages

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Introduction

Forages from Hungarian vetch and triticale monocultures or mixtures that can be produced with relatively low cost are important feed sources for ruminants in spring particularly in the arid and semiarid regions. The feed intake and the response of different sheep breeds (Fraser *et al.* 2009) to forage resources that vary in feeding value may differ. Therefore it is critical to match forage to animal and crop production needs for more efficient production in integrated crop livestock farming system.

Methods

A pen feeding trial was conducted with a total of 32 weaned, male Akkaraman (19.7±1.2 kg) and Merino lambs (19.9±1.8 kg) to compare the feeding value of triticale (*Triticosecale wittmack*), Hungarian vetch (*Vicia pannonica*), and a mixture of the two (20:80) for a period of eight weeks from 18 April to 13 June in 2011. Two month old lambs from both breeds (16 lambs per breed) were randomly assigned to individual pens (1.7 x 1.5 m) equipped with feeding and watering troughs in a 2 × 4 factorial design. Lambs were allowed a 12–d adaptation period to their diet. Lamb liveweight gain (LWG) was monitored during the early (18 April – 16 May) and the late (17 May – 13 June) spring periods. Liveweights of lambs were recorded in 28 d intervals after lambs being fasted for 12 h. Lambs had *ad libitum* access to daily harvested fresh forages of either triticale, Hungarian vetch or a mixture of the two (20:80) with 100 g/d concentrate formulated mainly to meet mineral and vitamin requirements during the trial. Forage samples were analyzed for their nutritive values weekly. Crude protein (CP) was determined by Kjeldahl method (AOAC 2003). Metabolisable energy was calculated according to NRC (2001). Nutritive value data were analysed by ANOVA using a split plot design where forage was the main plot factor and the period was the subplot factor. Liveweight gain, intake and FCR data were analysed by ANOVA based on a fixed 2 × 4 × 2 factorial model using a model that accounted for the main effects of sheep breed, forage and period.

Results

There was an interaction (P<0.01) between forage and period for the crude protein content of forages (Fig. 1). The crude protein content of forages decreased from as the season progressed but the reduction was greater in triticale than other forages. The metabolisable energy content of forages decreased (P<0.001) from 9.1 on 18 April to 7.7 MJ ME/kg DM on 6 June 2011. There was no interaction (P=0.19) between forage and period for the metabolisable energy content of forages. Forage × period (P<0.05) interaction in the LWG of the lambs and forage × period and

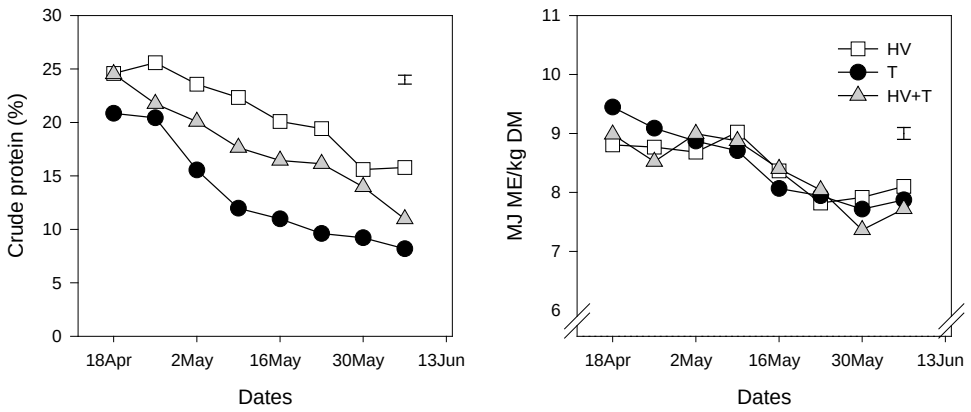

Figure 1. Weekly crude protein (%) and metabolisable energy (MJ ME/kg DM) content of Hungarian vetch (HV), Triticale (T) and a mixture of the two (HV+T). Bars represent SE for interaction.

Table 1. Daily liveweight gain (g/d) dry matter intake (g/d) and feed conversion ratios (FCR) of Akkaraman and Merino lambs

Breed	Forage	LWG g/d			DM Intake g/d			FCR		
		0-28 d	28-56 d	Mean	0-28 d	28-56 d	Mean	0-28 d	28-56 d	Mean
Akkaraman	H. vetch	160	167	164	763	966	865	4.9	5.8	5.4
	Triticale	176	111	144	758	1000	879	4.4	9.7	7.1
	HV+T	153	149	151	840	1041	941	5.9	7.3	6.6
	Mean	168	142	155	813	1070	942	5.1	7.6	6.4
Merino	H. vetch	153	164	159	766	1016	891	5.6	6.3	6.0
	Triticale	179	79	129	819	988	904	4.8	12.7	8.8
	HV+T	163	113	138	838	1097	968	5.2	10.2	7.7
	Mean	165	119	142	847	1105	976	5.2	9.7	7.5
Mean	H. vetch	156	166	161	765	991	879	5.2	6.1	6.1
	Triticale	177	95	136	789	994	891	4.6	11.2	11.2
	HV+T	158	131	144	839	1069	954	5.5	8.7	8.7
P_B			0.39			0.21			*0.05*	
P_F			0.26			*0.05*			*0.01*	
P_{BxF}			0.94			0.99			0.70	
P_P			*0.01*			*0.01*			*0.01*	
P_{BxP}			0.16			0.78			*0.05*	
P_{FxP}			*0.01*			0.84			*0.01*	
P_{BxFxP}			0.47			0.28			0.19	
SE†			18.1			33.2			0.84	

[1]Respective least significant differences for comparing crop x harvest means and [2]for comparing means within the same level of crop.
† SE for BxFxP interaction.

forage × breed interactions (P<0.05) in the feed conversion ratio (FCR) were detected. The LWG of lambs offered triticale decreased (P<0.05) from 178 g/head/d in the early spring to 95 g/head/d in the late spring period, as plant maturity increased. LWG did not change for the other forages during the same period. Dry matter intake of the forages from triticale-Hungarian vetch mixture was greater (P<0.05) than the other two forage type. Lambs had 282 g/d higher (P<0.05) dry matter intake in the late spring period compared to early spring period. However, lambs in both breed had poorer (P<0.05) FCR for the late spring period than the early spring period but the reduction in FCR was more pronounced in merino than Akkaraman lambs.

Conclusion

Akkaraman lambs demonstrated better utilization of the forages with lower nutritive value compared to Merino lambs. Thus, it is suggested that fat tailed Akkaraman lambs may be grown more efficiently in the arid and semiarid areas where crop and livestock are integrated in the farm system.

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