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Growing and slaughtering performance of Apennine heavy lamb finished at pasture in Central Italy

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ABSTRACT - Twenty-six Apennine male lambs were allotted into 2 groups, under different finishing systems: group P (maximum pasture allowance) and group S (intensive finishing). Lambs were slaughtered either at 30 kg of weight or at 110 days of age (in case they couldn't reach final weight because of a sharp decline in pasture productivity in summer). Post-weaning ADG were significantly higher in the S group (about 77 g/d) and P lambs had lower weights, dressing percentage (due to higher gastro-intestinal apparatus content) and SEUROP conformation scores. Finishing lambs at pasture could have better results after an early weaning or using different mating strategies to escape the dramatic fall in pasture dry matter availability during summer.

Key words: Heavy lamb, Apennine breed, pasture, slaughtering performance.

Introduction - In Italy it is difficult to finish both light and heavy lambs using pasture because: (i) the lambing season is usually between October and February, when pasture productivity is low or null, but lamb meat prices are higher because of an increased consumption in the Christmas and Easter period; (ii) light lambs, which are most commonly marketed for meat production, are fed on mother's milk and receive little amounts of hay and/or concentrate until slaughter; (iii) finishing heavy lambs after weaning is made less convenient because of recent marked price fluctuations of feed (hay or concentrate) and because of competition with imported light or heavy lambs, in the internal market. Only few farming systems use pasture to finish lambs (e.g. in Northern Italy, some type of heavy lamb of Bergamasca breed). Moreover, in recent years, in several areas, prolonged harsh climate periods negatively affected the programmed mating season, resulting in lower fecundity and, therefore, the lambing period was prolonged over spring. Thus, meat lambs were not ready to be marketed during Easter and had to be sold during the phase of decrease for lamb meat prices (ISMEA, 2008). In such cases, finishing lambs under extensive systems, by using pasture to reduce production costs, could become particularly profitable. In fact, in Central Italy, spring could be particularly suitable as a season to finish heavy lambs, at pasture, before the summer dramatic fall in pasture productivity. The aim of the work was to finish Apennine lambs born in late winter, using pasture as far as possible, Apennine being an autochthonous meat breed of Central Italy.

Material and methods - Twenty-six Apennine male lambs that were born in late winter, in an Umbrian farm, were weaned at 48 ± 7 days, transferred to the experimental farm of the University of Perugia, allotted into 2 groups as follows: (i) in group P, 14 subjects were extensively finished by grazing on a natural pasture, rich in grasses (2 lots of about 4000 m², with rotational technique) during the day and received 100 g/d of concentrate feed (39.1% flaked maize, 32.2% flaked barley, 26.4% soybean meal, 2.3% mineral and vitamin supplement). Animals were allowed to graze all along the trial (up to 47 days). In days where grazing was not advisable, animals received hay of natural meadow *ad libitum*.

tum as described in Table 1; (ii) in group S, 12 subjects were intensively finished in multiple pens and received the same hay and concentrate (ratio hay to concentrate: 30/70) administered as reported in Figure 1. On average, the P lambs had a higher weaning weight (WW) than the S ones (20.8 ± 2 kg vs 17.1 ± 1 kg, respectively) to account for any possible higher energy expenditure due to adaptation to environmental conditions and grazing activity. Individual weights of lambs were recorded and average daily gain (ADG) was calculated weekly.

Table 1. Chemical characteristics of hay, concentrate and average value of pasture during test.

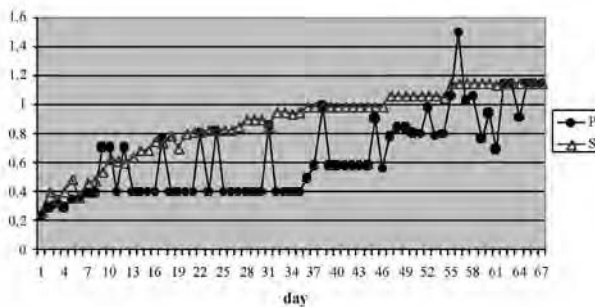
		Concentrate	Hay	Pasture (19 may)	Pasture (11 July)
Dry Matter (DM)	%	87.50	87.16	38.62	45.09
Organic Matter	% DM	98.14	92.74	89.39	90.20
Ether Extract	"	1.94	1.75	2.18	1.53
Ash	"	1.86	7.26	10.61	9.80
Crude Protein	"	9.53	17.86	7.45	8.00
Soluble Sugars	"	84.23	48.29	50.99	48.76
Crude Fiber	"	2.44	24.85	28.77	31.92
NDF	"	16.80	39.33	58.11	61.59
ADF	"	5.35	30.12	39.37	42.40
ADL	"	1.40	7.03	6.76	6.31
Gross Energy	MJ/kg DM	17.37	17.67	17.22	17.16

Lambs were slaughtered either at 30 kg of weight or at 110 days of age (in case they couldn't reach final weight because of a sharp decline in pasture productivity in summer). Animals were reared, transported and slaughtered according with welfare UE Rules. At the slaughterhouse, in vivo and slaughtering parameters were recorded or calculated (A.S.P.A., 1991). The analysis of in vivo and slaughtering characteristics was performed with a SAS software (SAS, 2000) using weaning weight as covariate; weight trends and ADG were submitted to regression analysis.

Results and conclusions - According to Figure 1, during first part of the trial, the P group consumed hay only occasionally, but, with the progress of the season, pasture became less productive due to hot and dry weather and animals were administered hay more often, with an irregular pattern. On the contrary, the intensive group (S) showed a regular consumption of hay and concentrate, but the ratio of hay to concentrate that were effectively consumed (as recorded after inspection of feed residues) resulted below 30/70 in the first part of the trial and increased thereafter, thus approaching 40/60 on average for the whole period.

Hay and concentrate feeding efficiency patterns showed variable values during the finishing period both in P (ranging between 2.5 and 8) and S lambs (ranging between 2.8 and 6.8), but P lambs reached

Figure 1. Daily DM intake of hay and concentrate in P and S lambs.



lower mean values, specially in the last phase, when pasture allowance did not meet nutrient requirements.

Figure 2 shows live weight (LW) as LW/age and ADG/age data dispersion and regression curves, both significantly different between groups.

In Table 2 the growing and slaughtering characteristics of the two groups are presented. Covariate correction permitted to have similar weaning age, while finishing period resulted significantly superior in P. Post-weaning ADG were significantly higher in the S group

Figure 2. Within regression LW/age and ADG/age in different groups (P and S).

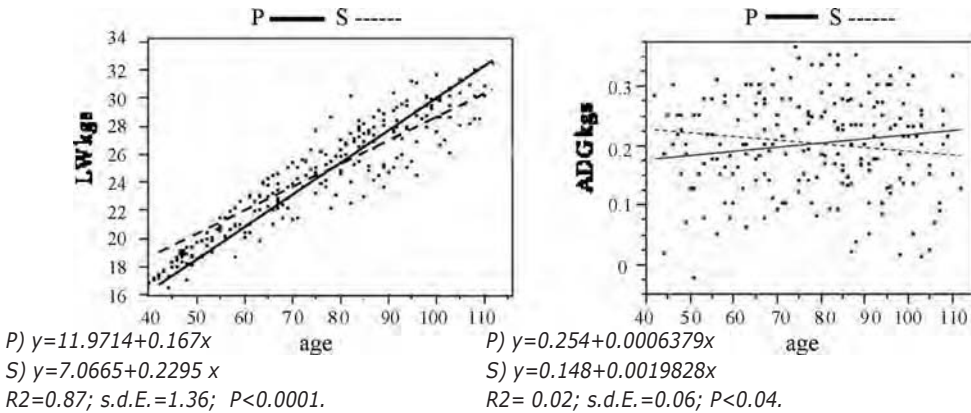


Table 2. LS means of some growing and slaughtering characteristics in P and S lambs.

		Farming system (FS)		P<F	WW*	RMSE
		P	S			
ADG	kg/d	0.132	0.209	0.0001	0.02	0.02
Weaning age	d	48	48	0.32	0.0001	0.25
Finishing period	d	64	58	0.02	0.0002	4.12
Slaughtering weight	kg	27.48	30.15	0.001	0.0001	0.94
Warm dressing	%	45.59	50.13	0.0007	0.29	0.71
SEUROP Conformation		5 (O)	7 (R-)	0.004	0.05	1.0
SEUROP Fatness		7.1 (3-)	7.4 (3-)	0.67	0.049	0.95

* weaning weight used as covariate

(about 77 g/d). When considering slaughtering performance, P lambs had lower weights, dressing percentage (due to higher gastro-intestinal apparatus content) and SEUROP conformation scores, as found also by Zervas *et al.*, (1999). Fattening Apennine lambs at pasture in the end of spring, in conclusion, has some drawbacks due to harsh climate but, nevertheless, it could be conveniently realized by weaning lambs early in spring so as to terminate fattening before the fall of pasture productivity in summer. Moreover, better performances largely depend on the quality of pastures. Lastly, under an economic point of view, intensive finishing lambs resulted more convenient by € 3/head, as calculated taking into account out paid expenses at the current prices (January 2009).

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