GROWTH AND CARCASS QUALITY OF PROLIFIC CROSS BRED LAMBS FED SILAGE

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In lamb production, two pure breeds (one prolific and the other maternal) are mated together to obtain an hybrid female, which will be bred to a male from meat breed to produce market lambs. In this production system, most of the hybrid producers perceive that hybrid male lambs have low commercial value due to their poor carcass quality. However, little information is available on the best way of feeding prolific breeds and their crosses.

One experiment was carried out at the Sheep Research Farm at La Pocatière, Québec, to increase our knowledge on the effect of the type of supplement on growth and carcass quality when prolific cross bred lambs are fed silage. The two objectives were to determine the effect of breed type and to compare performance of lambs fed a good quality silage with fish meal or different levels of concentrate.

One hundred cross bred male lambs (60 Romanov x Dorset, RVDP) and 60 Romanov x Suffolk, RVSU) were allotted randomly to 30 pens of 4 lambs each, with 15 pens of 4 RVDP males and 15 pens of 4 RVSU males. The lambs were fed from an initial weight of approximately 23 kg to a slaughter weight of approximately 45 kg live weight. Average age of lambs at the beginning of the feeding period was 83 days for RVDP and 75 days for RVSU. Pens within a breed type were assigned randomly to 5 treatments with 3 pens per treatment.

The five diets consisted of silage alone (SI), silage supplemented with 100 g/day of fish meal (FM), and silage supplemented daily with concentrate at either 200 g/day (C1) or 400 g/day (C2) per animal, or ad libitum intake (C3). The concentrate contained 16% CP. Diets FM and C2 were designed to provide similar CP intakes from the supplement. Forage was harvested at the boot stage at the beginning of June, 1991, from the primary growth of a grass stand containing approximately 67% bromegrass, 12% orchardgrass, 11% quackgrass and 10% dandelion; the grass was harvested at approximately 20% DM and ensiled in a heap silo without preservative and compacting. The silage (pH = 4.17, 25.8% DM, and 18.1% CP) was fed once daily in quantities to allow daily orts of 5 to 10%. Twenty-five milligrams of lasalocid was

fed per lamb per day to prevent coccidiosis.

Slaughter data consisted of carcass weight, dressing percentage, fat covering (coded 1, 2, or 3 to represent excessive, normal, or deficient covering), and conformation (coded 1, 2, or 3 to represent excellent, good, or poor muscling).

The two breeds responded in a similar manner to the five diets; therefore, only the main effects are presented in the tables. As expected, the average daily gain (ADG) was lower for lambs fed only silage, and increased with the amount of concentrate fed (Table 1). Lambs fed FM had an ADG similar to those fed C1 and C2, but lower than those fed C3 and higher than those fed SI. The ADG was higher for RVSU than RVDP lambs. Finishing period was longer for lambs fed SI and lower for those fed C3; there was no difference between the two breeds. Dressing percentage was higher for lambs fed C3 than for those fed SI, but similar for the two breeds. Fat thickness was similar for SI (2.44 mm), FM (2.94 mm), C1 (2.71 mm), C2 (2.96 mm), and C3 (2.73 mm), but higher for RVDP (2.95 mm) than RVSU (2.59 mm).

The costs of feed per lamb per day and per lamb for the entire growth trial were calculated using the Canadian prevailing prices at the time this experiment was conducted: $53, $230 and $750 per tonne of DM, respectively, for silage, concentrate and FM. Lambs fed C3 had a higher cost per lamb per day than those fed the other diets. Daily costs were similar for lambs fed FM, C1, and C2, but the costs were higher for FM and C2 than SI.

Conformation of carcasses (Table 2) was grouped to compare carcasses with excellent and good muscling (coded 1 and 2, respectively) to carcasses with poor muscling (coded 3, Table 4). Lambs fed FM had a higher percentage of carcass with excellent and good muscling than lambs fed SI. Lambs fed SI had the highest percentage of carcasses with poor muscling. Conformation of carcasses of lambs fed FM was similar to that of lambs fed C1, C2 and C3. Although no statistics were performed on the following comparison, lambs fed C1 had a percentage of carcasses with excellent to good muscling intermediate between lambs fed FM, C2 and C3, and those fed SI. This would suggest that consumption at more than 200 g/d of concentrate is required to improve carcass muscling.

Fat covering of carcasses was grouped to compare carcasses with excessive or deficient covering (coded 1 and 3, respectively) to carcasses with normal covering (coded 2, desirable characteristic). Lambs fed SI and C3 had more carcasses with less desirable fat covering (excessive or deficient) than lambs fed FM. Lambs fed FM had a similar percentage of carcasses with desirable fat covering than lambs fed C1 and C2. Diet had no effect on the number of carcasses grading A1 and A2. However, lambs fed C3 had more carcasses grading A3 (excessive fat covering) than lambs fed FM, and lambs fed SI had more carcasses grading B (deficient fat covering) than lambs fed FM.

Conformation of RVDP lambs was better than that of RVSU lambs with more carcasses with excellent and good

muscling, and fewer carcasses with poor muscling than RVSU lambs. There was a higher percentage of carcass with normal fat covering for RVDP than for RVSU lambs. Both breeds had similar A1 and A3 grades, but RVDP lambs had more carcasses grading A2 and less grading B than RVSU lambs. Carcass quality of RVDP lambs was better than that of RVSU lambs as shown by better muscling, better fat covering, and more carcasses grading A1 and A2.

Implications

Feeding silage alone results in carcasses with poorer muscling than feeding silage supplemented with fish meal, demonstrating that high quality silage needs low ruminally degradable protein supplementation to improve carcass quality of prolific crossbred lambs. Ad libitum access to concentrate results in the highest average daily gain but in excessive fat covering of the carcass and highest feeding costs. Fish meal supplementation results in the highest number of carcasses with highly desirable characteristics. Feeding 200 or 400 g/d of concentrate resulted in carcass quality similar to that obtained by feeding 100 g/d of fish meal. Romanov x Suffolk lambs had better performance than Romanov x Dorset lambs but carcass quality of Romanov x Dorset lambs was better than that of Romanov x Suffolk lambs.

Table 1. Performance of lambs fed silage with fish meal or different amounts of concentrate

	Diet[a]					Breed[b]	
	SI	FM	C1	C2	C3	RVDP	RVSU
DMI, g/d							
Silage	1309[c]	1058[d]	1026[de]	841[e]	274[f]	909	894
Total	1309	1153	1216	1221	1146	1197	1202
DMI, % of BW							
Silage	3.86[c]	3.08[d]	3.02[de]	2.44[e]	.78[f]	2.64	2.63
Total	3.86	3.36	3.58	3.41	3.25	3.47	3.51
ADG, g/d	197.0[f]	270.1[de]	245.1[e]	288.1[d]	373.6[c]	262.9[c]	286.6[d]
Gain:Feed	0.15[e]	0.24[d]	0.20[de]	0.25[d]	0.33[c]	0.23	0.24
Time of fattening, d	105[c]	85[d]	89[d]	80[de]	66[e]	87	84
Dressing, %	44.6[d]	45.1[cd]	45.2[cd]	46.2[cd]	46.9[c]	45.8	45.4
Cost per lamb							
Per day	0.06[e]	0.11[d]	0.08[de]	0.10[d]	0.18[c]	0.11	0.11
For the growth trial	6.09[e]	9.08[cd]	7.31[de]	8.13[de]	11.93[c]	8.58	8.43

[a]SI = silage only, FM = silage and 100 g of fish meal, C1 = silage and 200 g of concentrate, C2 = silage and 400 g of concentrate, C3 = silage and concentrate ad libitum.
[b]RVDP = Romanov by Dorset, RVSU = Romanov by Suffolk.
[c,d,e,f]Means in the same row within diet or breed that do not have a common superscript differ ($P < .05$).

Table 2. Percentage of carcasses of lambs fed silage with fish meal or different proportions of concentrate classified for conformation, fat covering, and grading of carcass

	Diet[a]					Breed[b]	
	SI	FM	C1	C2	C3	RVDP	RVSU
Conformation[c]							
1 + 2[eg]	14.3	19.3	16.8	18.5	19.4	48.7	39.5
3[eg]	5.9	0.8	3.4	0.8	0.8	1.7	10.1
Fat covering[d]							
2[efg]	15.1	19.3	19.3	16.0	14.3	46.2	37.8
1+ 3[efg]	5.1	0.8	0.8	3.3	5.8	4.2	11.8
Grade							
A1	5.1	8.6	7.7	4.3	7.7	12.8	20.5
A2[g]	7.7	10.3	7.7	11.1	6.0	32.5	10.3
A3[f]	1.7	0.9	0.9	2.6	6.0	3.4	8.6
B[eg]	6.0	0.9	3.4	0.9	0.9	1.7	10.3

[a]SI = silage only, FM = silage and 100 g of fish meal, C1 = silage and 200 g of concentrate, C2 = silage and 400 g of concentrate, C3 = silage and concentrate ad libitum.
[b]RVDP = Romanov by Dorset, RVSU = Romanov by Suffolk.
[c]Conformation: coded 1, 2 or 3 to represent excellent, good or poor muscling.
[d]Fat covering: coded 1, 2 or 3 to represent excessive, normal or deficient covering.
[e]FM vs SI, $P < .05$.
[f]FM vs C3, $P < .05$.
[g]RVDP vs RVSU, $P < .05$.