Effect of Feed Restriction on Compensatory Growth and Body Dimensions in Ujumuqin Lambs

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Key words: lambs, compensatory growth, restriction, Weight, body dimensions, grazing behavior

Introduction Livestock production in northeast mixed cropping and animal husbandry of China depends on natural pasture and crop residues. It is largely influenced by availability that fluctuates. Without influencing the early growth of pasture but maintaining the compensatory growth ability of animals, it is feasible to feed the animals restrictedly in early spring in order to take full advantage of pasture and exploit the growth potential of animals One of the objectives of this experiment was to determine the effects of different levels of feed restriction on growth rate and body dimensions of re-fed lambs in spring. Another objective was to investigate if there is certain difference of grazing behavior between the restricted groups and control group and which affect the intake.

Materials and methods A total of 20 crossbred Ujumuqin lambs weaned at approximately 5 months were used in this study. The animals were then randomly assigned to five treatments as follows: grazing for the entire experimental period (C), ad libitum feeding during restriction (A), 10% weight loss (R_1), 15% weight loss (R_2) and 20% weight loss (R_3) (results reported here for C, A and R2). On the live animal, a series of body measurements was recorded, including live weight (LW); trunk length (TL); withers height (WH); hip width (HW); chest girth (CG). We also measured the intake time, bite rate and intake per bite in the C animals and the R_2 animals after restriction.

Results At the end of the restriction period, means of restricted groups and A group differed significantly ($P < 0.05$) from the means of the C group for all measurements. After the removal of the restriction, the A and the restricted groups grew at a higher rate compared to the C group. At the end of the experiment, there was no significant ($P < 0.05$) treatment effect on all measures among the C, A and R_2 group. We found that the R_2 group had a significant longer intake time than the C group. The rate of intake of the former group was slightly larger than that of the latter one. However, there is no significant difference of intake per bite between the C and R_2 group.

Table 1 *Means and standard errors (s.e.) of body weight (kg) and body dimensions (cm) of the control (C) and restricted (R_2) groups at the start of restriction, at the end of restriction and at the end of experiment ($P < 0.05$).*

Measure	Groups	Start of restriction		End of restriction		End of experiment	
LW	C	19.00	1.28	22.81^{a}	1.12	34.31^{a}	0.67
	A	19.02	1.45	17.14^{b}	1.27	33.58^{a}	0.71
	R_2	19.20	1.49	15.98^{b}	0.87	32.38^{ab}	0.74
TL	C	54.85	3.06	56.08^{a}	3.02	59.00^{a}	3.05
	A	54.48	3.12	54.35^{b}	3.11	58.48^{a}	3.04
	R_2	54.60	2.64	54.13^{bc}	2.65	58.33^{ab}	2.62
WH	C	57.58	4.30	58.48^{a}	4.38	60.23^{a}	4.10
	A	57.40	4.40	57.05^{b}	4.36	60.38^{a}	4.07
	R_2	57.35	4.38	56.45^{c}	4.35	59.68^{a}	3.95
CG	C	67.60	2.70	68.55^{a}	2.71	78.05^{a}	2.48
	A	67.78	2.66	66.65^{b}	2.60	78.05^{a}	2.72
	R_2	67.63	2.90	64.65^{c}	2.92	77.88^{a}	2.69

Conclusions Ujumuqin lambs, after feed restriction below their daily maintenance nutrition requirement, can achieve similar compensatory growth similar to their non-retarded counterparts. The difference of the total intake between the C and R_2 mainly resulted from the differences in the intake time and the bite rate.