

## 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<sub>1</sub>) , 15% weight loss (R<sub>2</sub>) and 20% weight loss (R<sub>3</sub>) ( results reported here for C , A and R<sub>2</sub>) . 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<sub>2</sub> 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<sub>2</sub> group . We found that the R<sub>2</sub> 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<sub>2</sub> group .

**Table 1** Means and standard errors (s.e.) of body weight (kg) and body dimensions (cm) of the control (C) and restricted (R<sub>2</sub>) 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 <sup>a</sup>	1.12	34.31 <sup>a</sup>	0.67
	A	19.02	1.45	17.14 <sup>b</sup>	1.27	33.58 <sup>a</sup>	0.71
	R <sub>2</sub>	19.20	1.49	15.98 <sup>b</sup>	0.87	32.38 <sup>ab</sup>	0.74
TL	C	54.85	3.06	56.08 <sup>a</sup>	3.02	59.00 <sup>a</sup>	3.05
	A	54.48	3.12	54.35 <sup>b</sup>	3.11	58.48 <sup>a</sup>	3.04
	R <sub>2</sub>	54.60	2.64	54.13 <sup>bc</sup>	2.65	58.33 <sup>ab</sup>	2.62
WH	C	57.58	4.30	58.48 <sup>a</sup>	4.38	60.23 <sup>a</sup>	4.10
	A	57.40	4.40	57.05 <sup>b</sup>	4.36	60.38 <sup>a</sup>	4.07
	R <sub>2</sub>	57.35	4.38	56.45 <sup>c</sup>	4.35	59.68 <sup>a</sup>	3.95
CG	C	67.60	2.70	68.55 <sup>a</sup>	2.71	78.05 <sup>a</sup>	2.48
	A	67.78	2.66	66.65 <sup>b</sup>	2.60	78.05 <sup>a</sup>	2.72
	R <sub>2</sub>	67.63	2.90	64.65 <sup>c</sup>	2.92	77.88 <sup>a</sup>	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<sub>2</sub> mainly resulted from the differences in the intake time and the bite rate .