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Effects of concentrate supplement on intake and weight gain of grazing lambs

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Key words: grasslands, fattening of grazing lamb, concentrate supplement, dry matter intake of herbage

Introduction Sheep are the most efficient converters of the hundreds of thousands hectares of marginal vegetation into high quality animal protein. Meat production from lambs has remained economically important for centuries in Inner Mongolia. Many lambs in pastoral farming systems in Inner Mongolia cannot become full-grown and ready for slaughter in the same year. This system then becomes uneconomical for the production of livestock for slaughter. This study was designed to explore feeding systems to improve the productive performance of grazing lambs.

Materials and methods This experiment was conducted at the Ortindag Sandy Land in Xilingol steppe in Inner Mongolia from August to October 2006. Sixty ram lambs (4 months) of Germanic Merino (♂) × Mongolian (♀) were divided into three equal groups viz. grazing (control), grazing supplementation (I) and indoor supplementation (II). 40 lambs from the control and group I were put on a grassland plot and left to graze from 08:00 until 18:00 everyday. Group I received daily 300 g/lamb concentrates (corn 65%, soybean meal 15%, cottonseed meal 15%, premix 4.7%, salt 0.3% parts) after pastoral grazing. Group II was confined in a sheepfold, with ad-lib access to grass hay and fed concentrates (same as above). The body weight (BW) of all lambs was recorded at the beginning and end of the experiment. All groups were grazed on the same feed prior to the experiment, each treatment group was gradually introduced over 7 days to the various feed treatments. The experiment lasted 30 days. Acid insoluble ash (AIA) was used as an internal marker to measure dry matter intake (DMI) and dry matter digestibility (DMD) (Bergeroa et al., 2004). All data were expressed as the Mean ± SD and evaluated by ANOVA and Duncan's multiple range test using the SPSS 11.5 software. $P < 0.05$ was considered significantly different.

Results and discussion Herbage DMI ($\text{g/kgW}^{0.75} \cdot \text{d}$) of group I and group II were significantly lower than the control group (Table) ($P < 0.05$) and the DMF and DMD were no different between the three treatment groups. Thus lambs of group I and II consumed less herbage (by 25.44%, 23.35%) than the no supplement treatment group (the control group).

There were no significant differences in initial body weight between the three groups (Table), but after 30 days treatment, the final BW of group I and II showed increasing tendency towards control group ($P = 0.058$, $P = 0.265$). The ADG of lambs was significantly different ($P < 0.01$) between all treatments. Thus the supplement evidently increased the weight gain of grazing lambs. Previous studies have shown lambs fattened on pasture generally have less ADG than sheepfold lambs (Díaz et al., 2002). Pasture grazed lambs generally have greater energy requirements than lambs confined to a sheepfold because of an increased basal metabolism due to the type of herbage offered as well as the increased activity associated with grazing.

Table Comparison of DMI and liveweight performance.

group	DMI($\text{g/kgW}^{0.75} \cdot \text{d}$)	DMF(g)	DMD(%)	Initial BW(kg)	Final BW(kg)	ADG(g/d)
I	136.46 ± 39.24 ^b	429.10 ± 69.45	80.38 ± 1.99	28.05 ± 0.74	34.07 ± 2.28	179.33 ± 0.43 ^B
II	140.29 ± 13.60 ^b	449.17 ± 87.62	80.23 ± 2.31	27.93 ± 0.90	33.83 ± 1.55	196.67 ± 0.32 ^A
control	183.03 ± 56.95 ^a	550.24 ± 85.22	78.97 ± 4.53	27.42 ± 0.93	32.36 ± 2.64	164.67 ± 0.59 ^C
<i>P</i> value	0.030	0.512	0.764	0.894	0.058	0.001

Means with unlike superscript in rows differ significantly; capital letter ($P < 0.01$) and small letter ($P < 0.05$).

Conclusions From above, we concluded that the nutritive value of the feeds could effect the dry matter intake of herbage by grazing lambs. The productive performance of grazing lambs was significantly improved by concentrate supplement treatment. The herbage DMI and DMD of grazing animal measured with AIA were on the high side.

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