

Fattening sheep in a warm shed to compensate for energy deficiency in winter in north-west China

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Introduction Grasslands in north-west of China can experience extremely cold weather conditions which can restrict forage quality and quantity. This leads to a situation of low sheep growth rates and poor body condition. The main reason for low sheep growth rates is the additional energy requirements required to resist cold not being met by forage supply. In theory, improving energy intake can have the same effect as increasing shed temperature. FACS is a kind of by-pass rumen fat and energy additive, and research has shown that feeding it can improve ruminant ADG (Lai, 2002; Zhao, 2001). In this experiment, we added FACS to a sheep diet so as to test the effect on fattening sheep in both a warm and ordinary shed.

Table 1 Experimental design.

Shed type (A)	Intake of FACS(g/sheep· day)		
	B ₁ (0g)	B ₂ (30g)	B ₃ (60g)
A ₁ (ordinary shed)	A ₁ B ₁ (10 sheep)	A ₁ B ₂ (5 sheep)	A ₁ B ₃ (5 sheep)
A ₂ (warm shed)	A ₂ B ₁ (10 sheep)	A ₂ B ₂ (5 sheep)	A ₂ B ₃ (5 sheep)

Materials and methods This experiment was arranged in Huajia biotechnical corporation in Lintao County, China, where the altitude was 1915m, average annual temperature is 10.1 °C, and January being the coldest month. An experiment from Nov 20th to Jan 15th involved 40 healthy 5 month old STHS ewes weighing on average 23 kg body weight. The experimental design is given in Table 1. The nutritious level of basal diet accorded with the daily nutrient requirements of Xinjiang fine wool sheep (expected daily gain was 200 g).

Results and discussion The results (Table 2) showed that in an ordinary shed, the ADG of 30g FACS trait and 60g FACS trait were 13.3% and 33.2% higher than the control treatment (A₁B₁), and ADG of 60g FACS trait (A₁B₃) was 17.6% higher than 30g FACS trait (A₁B₂) (P<0.05). In a warm shed, ADG and average feed intake (AFI) among three traits was similar (P>0.05), indicating that the effect of adding FACS was correlated to feed condition. The ADG and feed conversion efficiency of fattening sheep in a warm shed (A₂B₁) was improved by 9.4% and 4.4% compared that that of an ordinary shed (A₁B₁). The highest profit was obtained for treatment A₂B₁ (¥22.23), where no FACS was added to daily sheep intake in a warm shed. At higher levels of FACS intake, profit declines due to the high price of FACS not being offset by larger gains in ADG.

Table 2 Fattening sheep effect of adding FACS into dietary in both shed.

Trait	ADG (g/day)	Average feed intake(kg)				Feed conversion efficiency	Profit (Yuan)	
		Concentrate	Alfalfa	Silage without ears	Total			
A ₁	B ₁	143.08±33.64	0.65±0.00	0.17±0.01	0.21±0.04	1.04±0.04	13.79±3.01	18.03±16.95
	B ₂	162.14±20.64	0.67±0.01	0.17±0.00	0.18±0.02	1.02±0.03	15.88±2.11	17.42±10.80
	B ₃	190.63±37.21	0.70±0.01	0.17±0.00	0.19±0.07	1.06±0.08	17.80±2.73	18.65±17.56
A ₂	B ₁	156.47±21.93	0.65±0.01	0.18±0.00	0.24±0.03	1.07±0.06	14.39±1.89	22.23±10.37
	B ₂	157.85±35.48	0.66±0.03	0.18±0.00	0.23±0.03	1.07±0.07	14.86±3.80	13.58±19.27
	B ₃	158.21±15.02	0.70±0.02	0.17±0.01	0.19±0.05	1.07±0.05	14.85±1.01	1.150±6.11

Conclusions In this experiment the impact of combinations of adding FACS to daily sheep intake in both ordinary and warm sheds were evaluated. Maximum profit was obtained with a warm shed with no FACS. Adding FACS to sheep diets in a warm shed reduced profit whereas in an ordinary shed there was a slight positive effect for 60g/day FACS in an ordinary shed.

References

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