

Changing farm livestock and grassland management to improve profitability and sustainability in Sunan county ,Gansu province ,China

Z .F .Ma¹ ,J .P .Wu¹ ,R .Jones² ,D .Michalk² ,D .Kemp³ ,T .Takahashi³

¹Faculty of Animal Science and Technology ,Gansu Agricultural University ,Lanzhou 730070 ,China ,E-mail : wujp@gsau .edu .cn .²NSW Department of Primary Industries ,Orange NSW 2800 ,Australia .³Charles Sturt University ,Orange NSW 2800 Australia .

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Introduction Sunan County is a Yugur Minority Autonomous County in Zhangye Prefecture of Gansu Province .It consists of four separate geographic areas all of which have a significant population of the Yugur Nationality .Farming Gansu alpine fine wool sheep is the principal agricultural system .Sunan is an extremely mountainous region with altitudes ranging between 1 ,327 and 5 ,564 metres and an average annual temperature of 3 .6°C .Sheep are conventionally grazed on winter and spring pastures over the period 20 October to 20 May .The high stocking rates adopted by herders leads to significant grazing pressure ,resulting in pasture degradation ,a loss of desirable species and soil erosion .Ewes usually lamb in April .This is a time when there is a large gap between the nutritional requirements of livestock and what can be supplied by pasture .The use of a greenhouse shed could overcome many of the management and climatic problems in Sunan by reducing the effect of cold winds and the associated loss in body weight to improve lamb survival .

Materials and methods One hundred and eighty adult Gansu alpine fine wool ewes (24 to 36 months of age) ,38 maiden Gansu alpine fine wool ewes (19 months of age) and 40 Gansu alpine fine wool lambs (7 months of age) were used in a 151 day grazing and greenhouse pen feeding experiment .The sheep were randomly divided into two balanced groups .The control group was conventionally grazed ,and the experimental group was pen fed in a greenhouse shed with improved feeding (Bowman & Stowell ,1997) .Animal measurements were taken monthly and the data analyzed using a *t*-test assuming equal variance in each group .

Results and discussion Wool production and body weight change of the experimental group was higher ($p < 0 .01$) than the control group .Once feed ,labour and pen depreciation costs were included ,the average cost of experimental group was 0 .63 RMB sheep⁻¹ day⁻¹ ; the control group was 0 .16 RMB sheep⁻¹ day⁻¹ .After accounting for lamb survival ,body weight change and wool production ,the average net profit of the experimental group was 58 .50 RMB sheep⁻¹ and the control group was 39 .64 RMB sheep⁻¹ .

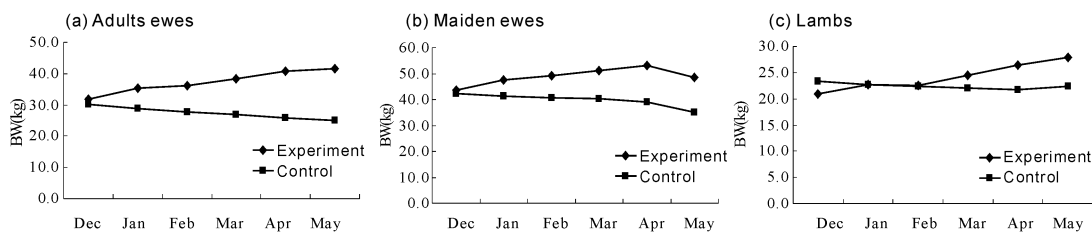


Figure 1 Body weight trends during the 15 day trial .

Table 1 Wool production and reproduction performance .

Group	Wool productivity (kg)			Reproduction performance (%)						
	Adult ewes	Maiden ewes	Lambs	Lamb	Dead	Abortion	Survive	Survive rate	Weaning rate	Dead ewes
Experiment	5 .24±0 .97	4 .56±0 .68	3 .79±0 .49	87	0	0	87	100%	94 .9%	0
Control	3 .27±0 .63	2 .63±0 .31	2 .53±0 .51	77	5	6	72	94 .68%	78 .07%	4

Conclusions Introducing a greenhouse shed for pen feeding Gansu alpine fine wool sheep during cold seasons both improved livestock productivity and farmers' income .Furthermore ,this lead to a reduction of grazing pressure upon pastures and lead to a more sustainable use of the grassland resource .

Reference

Bowman J .G .P . , Sowell B .F . ,1997 .Delivery method and supplement consumption by grazing ruminants : a review .*J .Animal Science* 75 :543-550 .