Study on Drying Characteristic and Hay Quality of Alfalfa in Different Hay Making Methods

Shiming Xue
Yunnan Beef Cattle and Pasture Research Center, China

Guilian Shan
Chinese Academy of Agricultural Sciences, China

The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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XUE Shiming[1] *,SHAN Guilian*[2]
[1] *Yunnan Beef Cattle and Pasture Research Center , Kunming , Yunnan 650212 ,P .R .of China ;*[1] *E-mail :xsmkm64@sina . com*[2] *Grassland Research Institute of Chinese Academy of Agricultural Science , Hohhot , Inner Mongolia 010010 , P .R .of China .*

Key words : hay making method , alfalfa , drying characteristics , hay quality , grey correlative degree analysis

Introduction Alfalfa hay has high nutrition , can provide animal with better nutrition . However , the nutrition of alfalfa is easily lost in the drying process (Gao , et al , 1997) . So it is very important to select feasible hay making methods to speed up the drying rate and decrease the nutrition loss of alfalfa . In this experiment , we study on six hay making methods , discuss the effect of hay making methods on drying characteristic and hay quality of alfalfa . The purpose is to select feasible hay making methods which are fit for the special weather in winter and spring in Yunnan , to improve the animal husbandry development and relieve the extrusive forage and livestock incompatibility . Through the experiment , it is expected to provide both in theory basis and technical guidance for alfalfa hay production .

Materials and methods The experiment was conducted in Yunnan Agriculture University , where the elevation is 1850m , mean temperature is 14 .5℃ , mean precipitation is 838 .6-997 .1mm , centralizes in summer and autumn . The material was *Medicago sativa .cv .Milennium* , harvested when it was 60cm at vegetative stage , then used six drying methods (Table 1) . We measured the drying rate during the drying process . When sufficiently dried , the sample was crushed for the test of nutritional components and in vitro digestibility . We calculated dry matter intake and relative feed value .

Results 65℃ drying in lab was the best one with the shortest drying time and was significantly different ($P < 0.01$) from the other methods (data not shown) . The content of CP , NDF and ADF were different in different treatments . The content of IVDMD , DMI and RFV were also different because of the difference of drying time and nutritional components . Through Grey Correlative Degree Analysis , it was shown that 65°C drying in lab was the best (Table 1) .

Table1 *Hay quality of alfalfa and grey correlative degrees between tested making methods and standard making method .*

hay making method	CP	NDF	ADF	IVDMD	IVOMD	DMI	RFV	Corr . degree	sequence
65℃ drying in lab	20 .38^{a}	35 .79^{d}	30 .57^{d}	73 .02^{a}	71 .13^{a}	3 .35^{a}	169 .17^{a}	0 .8637	1
insolating under sunshine	18 .36^{d}	39 .23^{a}	33 .60^{a}	67 .62^{c}	65 .40^{d}	3 .06^{c}	148 .74^{c}	0 .6279	6
drying in shade	18 .83^{c}	38 .70^{b}	32 .64^{b}	68 .54^{bc}	66 .43^{c}	3 .10^{c}	152 .57^{c}	0 .6874	4
Pressing stems	18 .86^{c}	38 .45^{b}	32 .57^{b}	69 .13^{bc}	66 .56^{c}	3 .12^{c}	153 .70^{c}	0 .6634	5
spraying K_2CO_3	19 .97^{b}	37 .34^{c}	31 .64^{c}	71 .99^{a}	68 .81^{b}	3 .21^{b}	160 .07^{b}	0 .7238	2
pressing stems + K_2CO_3	19 .75^{b}	37 .53^{c}	31 .72^{c}	71 .06^{a}	68 .47^{b}	3 .20^{b}	159 .10^{b}	0 .7037	3

$^{a-d}$ Means in the same column with different letters are significantly different at $P < 0.05$.

Conclusions The drying rate of alfalfa was different in different hay making methods . 65℃drying in lab was the best one with the shortest drying time . 65℃ drying in lab , pressing stems +K_2CO_3 and spraying K_2CO_3 could reduce the nutrition loss and increase the hay quality . Through Grey Correlative Degree Analysis of the six making methods , it was showed that 65°C drying in lab was the best one , followed by pressing stems + K_2CO_3 and spraying K_2CO_3 , The latter two methods were easy operations and low cost , thus recommending for use in hay production in Yunnan .

Reference

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