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Effects of different drying ways on main nutrition ingredient in different growth stages of Xinjiang small reed

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Key words: Xinjiang small reed, Growth stages, Drying ways, The proportion of stem to leaf, Nutrition ingredient

Introduction Xinjiang small reed (*Phragmites communis*) is extensive distributing. It has strong adaptability to the weather and soil. It is the latent husbandry resource for ruminant animal especially. Although the resource is abundant, utilization is very low so that it causes the most waste. The high quality reed hay has higher nutrition value. Now, the studies reports were few of the using of reed. This studies that effect of different drying ways on nutrition ingredient in different growth stages of Xinjiang small reed.

Materials and methods The experiment was conducted in Urumqi, Xinjiang of China. Four growth stages: heading, blooming, grain-filling and scorch stage. Five different drying ways: shade (SH), sunshine (SU), conditioning shade (CSH), conditioning sunshine (CSU), turned conditioning sunshine (TCS). Analytical index: moisture, the proportion of stem to leaf, dry matter (DM), crude protein (CP), neutral detergent fiber (NDF), acid detergent fiber (ADF).

Table 1 The proportion of stem to leaf in different growth stages of Xinjiang small reed.

Growth stages	Moisture (%)	Fresh : Dry	Stem : leaf
Heading	55.6	2.44 : 1	0.45 : 1
Blooming	49.7	1.65 : 1	0.71 : 1
Grain-filling	44.9	1.46 : 1	0.80 : 1
Scorch	40.3	1.96 : 1	0.89 : 1

Results From heading to scorch stage, the proportion of stem to leaf rises, from heading stage 0.45 : 1 increase to 0.89 : 1 the scorch stage. The moisture content was decreased gradually. The proportion of fresh to dry weight was decreased also. According to table 2, the content of DM had no significant difference ($P > 0.05$), even if used the difference drying ways, but the CP content decreased obviously ($P < 0.05$). Both NDF and ADF rose. Use the different drying way, the CP was the highest of CSU. The content of NDF was the lowest of CSU. The content of ADF had no difference and all about 53.0%.

Table 2 The content of DM, CP, NDF, ADF in different drying ways and growth stages of Xinjiang small reed.

Drying ways		Growth stages				
		SH	CSH	SU	CSU	TCS
DM%	Heading	95.9 ^a	96.3 ^a	96.2 ^a	96.3 ^a	96.0 ^a
	Blooming	96.2 ^a	95.9 ^a	95.5 ^b	96.0 ^a	96.0 ^{ab}
	Grain-filling	95.9 ^a	95.9 ^a	96.2 ^a	96.2 ^a	96.3 ^a
	Scorch	95.5 ^b	95.7 ^a	95.9 ^{ab}	95.0 ^b	95.8 ^b
CP%	Heading	10.1 ^b	10.9 ^a	11.3 ^a	11.4 ^a	11.0 ^a
	Blooming	8.0 ^a	8.1 ^a	8.3 ^b	9.0 ^b	8.3 ^b
	Grain-filling	6.8 ^b	7.0 ^a	7.5 ^b	7.5 ^a	7.2 ^b
	Scorch	4.8 ^c	4.9 ^a	5.0 ^c	5.3 ^b	5.1 ^c
NDF%	Heading	77.6 ^b	75.1 ^b	74.5 ^a	72.0 ^b	74.8 ^b
	Blooming	77.7 ^a	77.2 ^a	76.7 ^b	77.6 ^a	78.1 ^a
	Grain-filling	76.5 ^a	77.9 ^b	76.6 ^a	76.7 ^b	77.3 ^a
	Scorch	85.4 ^b	81.9 ^a	82.9 ^b	84.0 ^a	83.4 ^b
ADF%	Heading	50.0 ^b	51.2 ^a	50.3 ^a	49.9 ^b	49.6 ^c
	Blooming	51.7 ^b	52.1 ^a	51.6 ^a	51.8 ^a	54.5 ^c
	Grain-filling	52.4 ^a	52.1 ^a	52.1 ^a	52.5 ^a	52.6 ^b
	Scorch	57.8 ^a	56.8 ^a	58.4 ^a	58.4 ^a	57.1 ^a

* DM=dry matter, CP=crude protein, NDF=neutral detergent fiber, ADF=acid detergent fiber.

SH=shade, SU=sunshine, CSH=conditioning shade, CSU=conditioning sunshine, TCS=turned conditioning sunshine. CP%, NDF%, ADF% is the dried matter percentage absolutely. ABC: $P < 0.01$ abc: $P < 0.05$

Conclusions Along with the growing of Xinjiang small reed, the proportion of stem to leaf rises so that the CP content decreased obviously. So heading stage's hay was the best. From the average nutrition ingredient and five dry methods analysis shows that the quality of drying method of CSU was the best.

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