



## RESEARCH ARTICLE

### QUALITY OF HAY MADE FROM GREEN FOLIAGES

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#### Manuscript Info

##### Manuscript History

Received: 10 June 2020

Final Accepted: 14 July 2020

Published: August 2020

##### Key words:-

Hay, Conservation, Hybrid Napier Grass, Cowpea

#### Abstract

Green fodders are considered to be the most important factor for the dairy industry as they play a key role in changing dairy farming into a profitable business. So, there is an urgent need for preservation of nutrients from green forages available during the peak period for feeding livestock during the lean period. Like silage, another way of preserving nutrients is to practice it in the form of hay. The principle of hay making is to preserve the nutritional value of forages by drying it to a level at which the activity of microbial decomposers is inhibited. The moisture content of 10-12% is the optimum level for halting the microbial activity (Balwinder Kumar et al. 2019). To mitigate the problem of animal feed shortage during the lean period, the conservation of forage appears to be the only alternative. Hybrid Napier grass (RBN 9) and Cowpea (EC 4216) resulted in good hay with 76.4% dry matter and 6.4% relative water content (RWC) and 91.8% dry matter and 1.5% relative water content (RWC) respectively when dried in Sun for 6 days.

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#### Introduction:-

India is an agriculture country with a large livestock population making dairy and livestock industry an important subsidiary occupation of farmers. It boosts the economy of the country by providing milk, meat, wool, etc. India has recently emerged as the largest producer of milk in the world though livestock productivity is very low as compared to the developed countries. The low productivity of the animals is chiefly due to an improper supply of nutrients. Poor supply of nutrients to livestock during the scarcity period is a matter of concern. Both quantitatively and qualitatively supply of feed nutrients which is further compounded during the lean and scarcity period (Singh and Mujumdar 1992; Kumar et al. 2014). Inadequate supply of quality fodder has been identified as one of the reasons for poor livestock productivity (Anjum et al 2012; Kumar et al 2016).

Forage conservation plays an important role for productive and efficient livestock farms. Forage conservation provides a good supply of quality feed when forage production is insufficient. Forage conservation also provides farmers with means of preserving forage when production is faster than can be adequately utilized by grazing animals. This prevents lush growth from becoming too mature. Consequently, forage conservation provides continuous high-quality forage for livestock throughout the year. The present communication deals with the hay prepared from Green foliage of hybrid Napier grass and Cowpea.

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### Materials and Method:-

Green fodder of Hybrid Napier grass (*Pennisetum purpureum* Schum cultivar RBN-9) and Cowpea (*Vigna anguiculata* Walp cultivar EC-4216) was used for hay making. The crop was harvested early in the morning at the pre-flowering stage and batches of 1.5kg green forages were dried in different conditions that are in an oven, under the sun or in shade with or without cover with or without turnings.

The batches of green foliage were kept for drying under given conditions in the sun; the weight of the individual batches was recorded at the same time on a subsequent Day till constant weight.

The dry matter content in the foliage was a calculator with the figures obtained for oven-dried samples. To assess water loss from the sample relative water content (RWC) was calculated as described by Harris and Thaine (1975) using the following equation-

$$RWC(\%) = \frac{W_t - W_d}{W_s - W_d} \times 100$$

There  $W_t$  is the sample weight at time  $t$ ,  $W_s$  is the saturation or initial weight and  $W_d$  is dry Weight.

### Results and Discussion:-

The crops selected for this investigation resulted in good hay after drying. Based on colour, it was observed that when the sample was dried in an oven, it gives off its green colour resulting in pale green to grey hay. The sample, which was covered with polythene paper, resulted in a bad product with yellow colour and undesirable odour. This was probably due to the fermentation process which took place under an anaerobic condition created by polythene. The pH of the polythene sample was 4.1 indicating acid fermentation. The paper cover was better than the polythene cover as the sample could retain its colour; however, the rate of drying was poor. The sample, which was dried in shade resulted in green hay particularly when frequent turnover was given the fodder dried in sun made hay in less time but the resulting hay was not as green as that resulted from shade drying.

Table 1 gives an account of the drying rate of fodder species selected for hay making under different conditions. The table gives information on the decrease in weight and relative water content of the fodders under oven, sun, and shade drying. The table also provides information on % dry matter of resulting hay. Green fodder of RBN-9 variety of Hybrid Napier grass and EC-4216 variety of Cowpea resulted in good hay with 76.4% dry matter and 6.4% relative water content (RWC) and 91.8% dry matter and 1.5% relative water content (RWC) respectively when dried in sun for 6 days.

Statistical study shows that there was a maximum average decrease in weight in Hybrid Napier grass (835gm) than in Cowpea (712gm). However, the variation in a decrease in weight was more in Cowpea than in Hybrid Napier grass as indicated by the value of the coefficient of variation (CV).

**Table 1:-** Drying rates of Hybrid Napier grass (RBN-9) and Cowpea (EC 4216) under various conditions  
Duration from 17<sup>th</sup> February 2018 to 23<sup>rd</sup> February 2018.

Crop and Cultivar	Drying period (days)	Method of drying									
		Oven (60°C)		Sun Drying		Turnover		Shade Drying		Turnover	
		Weight(g)	RWC (%)	Weight(g)	RWC (%)	Weight(g)	RWC (%)	Weight(g)	RWC (%)	Weight(g)	RWC (%)
Hybrid Napier grass (RBN-9)	0	1500	100	1500	100	1500	100	1500	100	1500	100
	1	630	29.8	1040	62.9	1010	60.4	1060	60.4	1095	67.3
	2	295	2.8	830	45.9	800	43.5	855	47.9	880	50
	3	260	0	710	36.2	690	34.7	740	38.7	775	41.5
	4			600	27.4	585	26.2	625	29.3	650	31.4

									4		
	5			470	16.9	455	15.7	490	18.5	520	20.9
	6			340	6.4	355	7.6	400	11.2	425	11.8
	% DM of hay	100		76.4		73.2		65		61.1	
	Mean	671		784		766		810		835	
	SD	499.8		361.6		358.4		348.5		341	
	CV (%)	53.8		46		46.7		42.9		40.8	
Cowpe a (EC 4216)	0	1500	100	1500	100	1500	100	1500	100	1500	100
	1	615	30.5	910	53.7	940	56	960	57.6	1010	61.5
	2	250	1.9	700	37.2	715	38.4	730	50.5	750	41.1
	3	225	0	520	23.1	580	27.8	590	28.6	600	29.4
	4			370	11.3	430	16	420	15.2	440	16.8
	5			320	7.4	350	9.8	330	8.2	360	10.5
	6			245	1.5	280	4.3	310	6.6	325	7.8
	% DM of hay	100		91.8		80.3		72.5		69.2	
	Mean	647		652		685		691		712	
	SD	515.7		407.2		393.2		394.1		379.7	
	CV (%)	79.5		62.4		57.3		57		53.2	

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