

## Nutrient Composition of Preserved Fodder Grasses of Nagaland Used for Feeding of Mithun (*Bos frontalis*)

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### Abstract

Due to the prevailing practice of burning forest for shifting cultivation in the mithun habitated areas, feeding of mithun during winter months was observed to be a major constraint. To alleviate this problem, the conservation of farm-grown fodder crops like Napier, Jowar, Para grass and natural grass of the area through making hay and silage was attempted. The hay and silage prepared from these grasses were stored for three months and then their proximate composition was estimated. It was observed that the hay prepared from Napier contained 6.78±1.20% crude protein (highest) and NFE was highest in Jowar (62.11±4.91%). The addition of soluble carbohydrates in the form of molasses resulted into overall increase in NFE content while added to 1% or 1.5% or 2% (w/w) level. This study further envisaged a detailed metabolic trial on the effect of inclusion of conserved fodders in the feeding regime of mithun.

**Key words :** Fodder, preservation, feeding, mithun, proximate composition, hay, silage

### Introduction

Mithun (*Bos frontalis*) is a semi-domesticated bovine species of northeastern hills (NEH) region of India, where the feeding of these animals during winter months poses a serious threat due to local practice of burning the forest area for shifting cultivation<sup>2</sup>. The conservation of the cultivated fodders was thought of for remedy to the problem. Therefore, on pilot basis, a preliminary study was conducted to evaluate the nutritive value of the hay and silage prepared from the farm-grown fodders so that future feeding strategy could be outlined.

### Materials and Methods

The present study was conducted in the Medziphema Mithun Farm, National Research Centre on Mithun, Jharnapani, Nagaland, India (25°45'43"N and 93°53'04"E) having subtropical humid climate. The annual rainfall averaged 2152.5 mm with maximum of it received during July-August every year. The fodder cultivation was totally rainfed and the late cut Napier, Para grass, Jowar and natural grasses were conserved

for a period of three months by making hay as well as silage. While ensiling, varying proportions of soluble carbohydrates (in the form of molasses @ 1%, 1.5% and 2%, w/w) were added to the fodder. Six samples of each hay and silage were analyzed for their proximate composition as well as their calcium and phosphorus content following the standard methods<sup>1</sup>. The collected data were subjected to suitable statistical analysis<sup>3</sup>.

### Results and Discussion

The best hay in respect of crude protein content was found to be the Napier hay with its crude protein content of 6.78±1.20% (Table 1), followed by natural grass (6.58±1.23%). However, the calcium content was reported in Para grass hay (0.55±0.02%), the ash per cent being the highest in natural grass of the area (9.36±1.75%). The highest crude protein content was found to be in natural grass silage (9.02±1.36%), followed by Napier and Jowar (Table 1). As the nutrient content differed with the soil composition and status, the present findings could not be compared due to lack of earlier results on the aspect.

TABLE 1. Mean ( $\pm$ SE) of nutrient composition (%) of hay and silage prepared from farm grown fodders (n=6)

Nutrients	Napier		Jowar		Para grass		Natural grass	
	Hay	Silage	Hay	Silage	Hay	Silage	Hay	Silage
i) DM	51.02 $\pm$ 3.94	30.66 $\pm$ 1.96	44.89 $\pm$ 2.83	34.26 $\pm$ 2.34	53.73 $\pm$ 3.63	35.36 $\pm$ 2.85	59.83 $\pm$ 3.86	34.78 $\pm$ 2.56
ii) OM	45.01 $\pm$ 2.39	22.93 $\pm$ 1.52	40.11 $\pm$ 2.10	28.67 $\pm$ 1.55	46.83 $\pm$ 2.94	26.97 $\pm$ 2.12	50.47 $\pm$ 3.62	24.27 $\pm$ 2.87
iii) CP	6.78 $\pm$ 1.20	6.13 $\pm$ 1.01	4.42 $\pm$ 1.10	5.99 $\pm$ 1.11	5.78 $\pm$ 1.12	4.75 $\pm$ 1.00	6.58 $\pm$ 1.23	9.02 $\pm$ 1.36
iv) Total Ash	6.01 $\pm$ 1.31	7.73 $\pm$ 1.16	4.78 $\pm$ 0.95	5.59 $\pm$ 0.70	6.90 $\pm$ 1.72	8.39 $\pm$ 1.05	9.36 $\pm$ 1.75	10.51 $\pm$ 1.98
v) EE	0.92 $\pm$ 0.03	1.22 $\pm$ 0.10	1.49 $\pm$ 0.32	2.56 $\pm$ 0.81	1.07 $\pm$ 0.49	1.93 $\pm$ 0.19	2.23 $\pm$ 0.80	1.95 $\pm$ 0.22
vi) CF	32.11 $\pm$ 1.41	31.14 $\pm$ 1.97	27.25 $\pm$ 1.64	28.33 $\pm$ 1.93	33.37 $\pm$ 1.78	34.97 $\pm$ 2.14	29.42 $\pm$ 2.93	30.13 $\pm$ 2.12
vii) NFE	54.19 $\pm$ 3.61	51.78 $\pm$ 3.02	62.11 $\pm$ 4.91	57.23 $\pm$ 3.25	52.95 $\pm$ 3.15	50.02 $\pm$ 2.86	52.43 $\pm$ 3.79	48.17 $\pm$ 2.57
viii) Calcium	0.25 $\pm$ 0.01	0.22 $\pm$ 0.01	0.29 $\pm$ 0.00	0.25 $\pm$ 0.02	0.55 $\pm$ 0.02	0.51 $\pm$ 0.01	0.44 $\pm$ 0.01	0.40 $\pm$ 0.02
ix) Phosphorus	0.21 $\pm$ 0.00	0.24 $\pm$ 0.00	0.25 $\pm$ 0.01	0.29 $\pm$ 0.01	0.26 $\pm$ 0.03	0.30 $\pm$ 0.06	0.27 $\pm$ 0.01	0.35 $\pm$ 0.00



TABLE 2. Changes in nutrient content of fodders (n=6) due to addition of different levels of soluble carbohydrate

Fodder + level of molasses*	Nutrients (%)						
	DM	OM	CP	EE	CF	Total Ash	NFE
J+1%	34.50±1.50	28.75±1.29	5.56±1.06	2.23±0.80	26.88±2.13	5.75±1.75	59.88±3.54
J+1.5%	32.67±1.54	26.77±1.61	5.49±1.09	2.82±0.56	27.75±2.58	5.90±1.39	58.97±3.24
J+2%	31.66±1.23	25.44±1.25	4.95±1.02	2.11±0.72	27.95±2.67	6.22±1.27	59.43±3.18
P+1%	35.75±1.85	26.77±2.10	5.37±1.03	2.01±0.61	32.23±3.17	8.98±1.58	51.76±3.51
P+1.5%	32.80±1.65	25.09±1.72	4.90±1.00	1.35±0.01	37.35±3.28	7.71±1.48	49.39±2.96
P+2%	39.60±1.57	30.80±2.80	5.24±0.01	1.76±0.02	32.77±3.59	8.80±1.39	51.83±3.10
N+1%	29.90±1.66	22.94±1.62	9.69±1.21	1.55±0.05	33.32±3.25	6.96±1.71	49.28±3.56
N+1.5%	28.00±1.12	20.68±1.28	7.53±1.24	2.02±0.03	31.10±3.46	7.32±1.07	52.03±3.75
N+2%	29.55±1.01	22.42±1.31	5.75±1.08	1.66±0.01	38.59±3.87	7.13±1.25	47.14±2.77
Ng+1%	36.82±2.89	27.71±3.05	5.66±1.10	2.15±0.21	27.11±2.50	9.11±2.75	55.97±3.17
Ng+1.5%	37.91±2.25	26.98±2.53	10.33±1.14	1.77±0.02	28.99±2.38	10.91±2.19	49.38±3.00
Ng+2%	36.76±2.38	25.85±2.58	10.60±1.17	1.64±0.06	28.06±2.51	10.93±2.23	49.95±3.15

J= Jowar; P= Para grass; N= Napier; Ng= Natural grass.

The addition of soluble carbohydrate (molasses) was done and the crude protein content was highest in the natural grass silage added with 2% molasses ( $10.60 \pm 1.17\%$ ), the Napier silage enriched with 1% molasses had crude protein content of  $9.69 \pm 1.21\%$  (Table 2). The total ash content was also highest in the natural grass silage ensiled with 2% molasses ( $10.93 \pm 2.23\%$ ). The total organic matter ( $30.80 \pm 2.80\%$ ) was highest in Para grass silage added with 2% molasses. The ether extract content was recorded as the highest ( $2.82 \pm 0.56\%$ ) in Jowar silage enriched with 1.5% molasses. The nitrogen free extract content was the highest ( $59.88 \pm 3.54\%$ ) in Jowar silage ensiled with 1% molasses which were comparable to earlier reports (Dhali *et al.*, 2007).

The present study revealed that the hay prepared from Napier and Natural grasses as well as Napier and Jowar silage could well be stored for a period of three months before they are fed to mithun. The fodders, so conserved, retained their nutritive value and may be incorporated in the mithun feeding regime. Further research on the nutrient utilization pattern of mithun when fed with the conserved fodders is also envisaged through the present findings.

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