

Nutritive Value of Guatemala Grass (*Tripsacum laxum*) as Affected by Method of Conservation

A. Das* and D. De

ICAR Research Complex for NEH Region
Sikkim Centre, Tadong, Gangtok 737 102, Sikkim

(Received 17 August 2000; revised version received 24 October 2000; accepted 10 November 2000)

In Sikkim, animal husbandry occupies an important position among the various professions of socio-economic importance. It plays an important role in upliftment of poorer section of the society. About 80-90% of total 1 lakh household are engaged in animal husbandry. However, the productivity of the animals are far below the national average. One of the major constraints in this regard is acute shortage of feeds and fodders (Balaraman, 1987). This problem become aggravated during lean period (November-February) when farmers feed their livestock with tree fodders, availability of which is inadequate. Guatemala grass (*Tripsacum laxum*) which performs well under the agro-climatic condition of Sikkim with an average yield of 94 t/ha (Singh *et al.*, 1996), can be preserved for feeding during lean period. However, there is no report indicating the nutritive value of conserved Guatemala grass. Hence, this experiment was conducted to study the effect of method of conservation on nutritive value of Guatemala grass.

Guatemala grass was harvested at preflowering stage during the month of November,

1998. After chopping, grasses were conserved either as hay or silage. For preparation of silage, chopped grasses were filled in GI drums. After proper compression, the opening of the drums were closed by putting dry grass on the top, followed by plaster of muds to keep it air-tight. Ensiling was done for a period of 60 days after which the drums were opened. Hay was prepared by sun drying of chopped fodders. For evaluation of feeding value, 4 crossbred, adult bullocks were used. A replicated (with time) 2x2 Cross-Over design was adopted. During the first period of 15 days, the animals (2 per treatment) were randomly allocated to either hay or silage as sole feed. During the second period of 15 days the animals which earlier consumed hay were allocated to silage and the animals which earlier consumed silage were allocated to hay as sole feed. During each period, after a preliminary feeding of 10 days a digestion trial of 5 days collection period was conducted. Fresh and clean drinking water was provided to the animals free of choice. The feed, refusals and faecal samples were analyzed for proximate principles (AOAC, 1984). The data obtained were analyzed statistically (Snedecor and

*Corresponding Author

Table 1. Comparative Feeding Value of Hay and Silage prepared from Guatemala Grass

	Dietary Treatments		
	Hay	Silage	CD
DMI (kg/d)**	4.36	5.25	0.14
Digestibility of Nutrients (%)			
DM*	54.74	60.34	4.60
OM*	56.36	65.56	7.76
EE	58.06	57.22	NS
CP	58.77	58.99	NS
CF*	43.64	51.11	3.36
NFE	65.97	69.42	NS
Nutritive Value (%)			
DCP*	3.87	04.84	0.39
TDN*	52.01	59.14	6.99

* $P < 0.05$; ** $P < 0.01$; NS = Non Significant

Cochran, 1967).

Physical characteristics i.e. aroma, texture and colour were satisfactory for both hay and silage. Dry matter (DM) content was 31.45, 38.00 and 87.00 %; Crude Protein (CP) content was 8.25, 8.14 and 6.43%; Crude fibre (CF) content was 33.17, 33.25 and 36.11%; Ether Extract (EE) content was 1.14, 1.17 and 0.95 %; Nitrogen Free Extract (NFE) content was 48.58, 48.32 and 47.63% : and ash content was 8.85, 9.12 and 8.88 % : in fresh fodder, silage and hay respectively. The chemical composition of silage was similar to fresh fodder. However, considerable loss of nutrients occurred during hay making due to inclement weather condition and leaf shedding (Thakur and Sharma, 1998).

Dry matter intake (DMI) was significantly ($P < 0.01$) higher in bullocks fed on silage in comparison to those fed on hay (Table 1) indicating the palatability of silage. It has been reported that

DMI from silage could be as high as fresh fodder from which it is made (Grewal *et al.*, 1998). On the other hand, DMI from hay of paragrass or water hyacinth was less in comparison to fresh fodder or silage (Chakrabarty *et al.*, 1991).

Digestibility values for DM, OM and CF were significantly ($P > 0.05$) higher in silage fed group in comparison to hay fed group (Table 1). This could be due to breakage of ligno-cellulosic bond during ensiling (Puri and Gupta, 1998) and greater initial solubility of silage inside rumen (Thiago *et al.*, 1992). Consequent upon increase in intake and digestibility of nutrients, digestible crude protein (DCP) and total digestible nutrients were significantly ($P < 0.05$) higher in silage in comparison to hay.

From the results of this experiment it is evident that silage prepared from Guatemala grass was superior to hay. Thus, Guatemala grass can be better preserved as silage.

REFERENCES

- AOAC (1984) *Official Methods of Analysis*, 14th ed., Association of Official Analytical Chemists, Washington, DC.
- Balaraman, N (1987) A critical appraisal on the availability of and fodders available in Sikkim. *Journal of Hill Research* **1** : 54-59.
- Chakrabarty, B., Mandal, L. and Banerjee, G.C. (1991) Effect of feeding water hyacinth in various forms on growth performance of cross-bred calves. *Indian Journal of Animal Nutrition* **8(4)** : 269-273.
- Grewal, R.S., Ahuja, A.K. and Gupta, B.K. (1998) Dry matter intake prediction potential of conserved forages based on silage additives. *Indian Journal of Animal Nutrition* **15(1)** : 30-34.
- Puri, J.P. and Gupta, B.N. (1998) Effect of urea treatment of rice straw on chemical composition and in vitro dry matter digestibility. *Indian Journal of Animal Nutrition* **15(4)** : 287-289.
- Singh, K.A., Yadav, B.P.S and Goswami, S.N. (1996) *Forage Resource Management for Sustainable Agro-Ecosystems*. Bulletin No. 39. ICAR Research Complex for NEH Region, Umiam, pp. 5.
- Snedecor, G.W. and Cochran, W.G. (1967) *Statistical Methods*, 7th edition, Oxford and IBH Publishing Company, Calcutta.
- Thakur, S.S. and Sharma, D.D. (1998) Bacterial and Fatty acid Production rate in Crossbred calves fed chemically preserved maize fodder. *Indian Journal of Animal Nutrition* **16(1)** : 24-29.
- Thiago, L.R.L., Gill, M. and Dhanoa, M.S. (1992) Studies on frequency of feeding and method of conserving grass herbage in cattle. 1. Voluntary feed intake, digestion and rate of passage. *British Journal of Nutrition*. **67** : 305-318.