IJSES

Volume 6, Issue 7, pp. 36-38, 2022.

International Journal of Scientific Engineering and Science
ISSN (Online): 2456-7361

Feeding Value of the Different Re-growths of Tiger grass (*Phragmites vulgaris*) from Different Habitats

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Abstract— *Analyses of the feeding value of Tiger grass "Phragmites vulgaris" unravel the potential of this grass as roughage for ruminants. The depth of information arising from this study, which can be used to improve ruminant nutrition and productivity, is unprecedented. Nutritional benefits of Tiger grass based on proximate analysis don not vary statistically with the different habitat sources studied; Upland, Lowland and Riverbank, as well as the nutritive value of the samples of the different stages of re-growths-30, 45 and 60 days (P>.05). The ability to thrive in different habitats ensures the steady supply of this grass throughout the year. The crop is hardy and can easily adapt to different environments and could possibly withstand the seemingly unavoidable environmental challenge being posted by climate change.*

Keywords— *Feeding value, roughage, ruminant, Phragmites vulgaris, Tiger grass.*

I. Introduction

Local feed resources are significant for ruminant feeding especially in the tropics and sub-tropic regions. They can be developed and utilized as on-farm feed resources. Growth stage of grasses has been shown to affect effective degradability as organic matter (Wanapat, 2012). Tiger grass like all other hay grasses decreases palatability with age especially after heading (Cullison & Lowrey, 1987); thus, it is a non-conventional feed resource. PCCARD (2007), defined the non-conventional feed resources as feeds that have not been traditionally used in animal feeding and not normally used in commercially produced ration for livestock. Tiger grass, belongs to non-conventional feeds because of its under-utilization as animal feed in the Philippines.

Even the Tiger grass seems unpopular as feed for ruminants, study shows its good potential as soilage or hay because of their fairly good nutritive value (Cullison & Lowrey, 1985). The crude protein content of Phragmites and in vitro dry-matter digestibility (IVD) decreased and the crude fiber increased with ageing. There was a significant negative correlation between the CP and CF content. There was a significant positive correlation between IVD and crude protein content, but with a significant negative correlation with the fiber content.

Tiger grass is very important as a source of cellulose and energy. The use of Common Reed or Tiger grass as a potential source of roughage in ruminant nutrition is interesting. It is a reach source of nitrogen substances. From mineral composition point of view, Common Reed has a relatively high magnesium content (2.65 g/kg), potassium (10.9 g/kg) and manganese (97.0 mg/kg). The dry matter degradability value of common reed is comparable with the dry matter digestibility of wheat straw (41. 8%) These results indicate a possibility of using common reed (especially as a source of nitrogen, magnesium, potassium and manganese) as a partial replacement of roughage for ruminants (Baran & Varadyova, 2004). In order to understand the value of the Tiger grass as possible feed for ruminants, their re-growths based on habitat are put into test in terms of nutrient content

II. Materials and Method

The study used a two-factor experiment in Completely Randomized Design (CRBD) with 4 replicates.

Factor A –Stages of Re-growth:
- 30 days re-growth
- 45 days re-growth
- 60 days re-growth

Factor B –Habitat where Tiger grass was taken:
- Upland habitat
- Lowland habitat (marshland habitat)
- Riverbank habitat

The treatment combinations are coded as:
T1 = 30 days re-growth from Upland habitat
T2 = 45 days re-growth from Upland habitat
T3 = 60 days re-growth from Upland habitat
T4 = 30 days re-growth from Lowland habitat
T5 = 45 days re-growth from Lowland habitat
T6 = 60 days re-growth from Lowland habitat
T7 = 30 days re-growth from River bank habitat
T8 = 45 days re-growth from River bank habitat
T9 = 60 days re-growth from River bank habitat

Fig. 1. Experimental Layout

III. Results and Discussion

Nutrient Composition of Tiger grass

Crude Protein. Crude Protein is the gross amount of protein in a given sample. Protein is very important for the repair and maintenance of body tissues. Based from the result of the proximate analysis the mean crude protein ranges from 15.000% observed in 30 days re-growth from riverbank habitat to 16.173% observed in 60 days re-growth from lowland habitat. Analysis of variance shows that the differences in re-growth as well as in habitat were comparable at 5% level of significance (Table 1).

This result means that all re-growth of Tiger grass from 30-60 days and from all the habitats studied have comparable feeding value in terms of Crude Protein. This result is not in consonance with the report of Zamora and Baguio (1984), that each cutting has a unique nutrient content, as well as characteristic physical properties. This is due to the fact that the cutting dates made in the study are close that close that the crude protein of samples studied are comparable.

TABLE 1. Effect of age of re-growth and habits on crude protein of Tiger grass (%)

	Re-growth			
Habitat	**30 days**	**45 days**	**60 days**	**Mean**
Upland	16	16.002	16.158	16.053
Lowland	15.523	114.783	16.173	15.493
Riverbank	15	15.373	15.633	15.335
Mean	15.508	15.286	15.988	

Source	*F Value*	*P Value*
Habitat	0.95	0.3978
Re-growth	0.68	0.5165
Habitat*Re-growth	0.32	0.8603
CV=8.569%		

Crude Fiber. Crude fiber is very important to the normal functioning of the ruminant stomach as it is the main bulk of a ruminant diet. The structure of the ruminant stomach – having 4 compartments makes them an efficient converter of fiber into volatile fatty acids.

The mean crude fiber content of Tiger grass ranged from 24.087% observed from 45 days re-growth, taken from upland habitat to 27.660% observed from 45 days re-growth taken from riverbank habitat. But the differences among treatments were comparable (P> 0.05) (Table 2).

This result may be attributed to the very close age difference of the re-growths used and the crude fiber content of the samples is within the same range, that when cut young, grasses could give higher advantage in terms of feeding quality to ruminants.

TABLE 2. Effect of age of re-growth and habits on crude fiber content of Tiger grass (%)

	Re-growth			
Habitat	**30 days**	**45 days**	**60 days**	**Mean**
Upland	24.805	24.087	27.49	25.461
Lowland	26.2473	26.037	25.737	26.016
Riverbank	26.630	27.660	26.192	26.827
Mean	25.903	25.928	26.473	

Source	*F Value*	*P Value*
Habitat	1.74	0.1953
Re-growth	0.38	0.6866
Habitat*Re-growth	2.02	0.1193
CV=6.595%		

Crude Fat. Fat is a very important biochemical in animal body because aside from being a source of energy which is 2.25 times that of carbohydrates, it is the storage of fat-soluble vitamins and a component of the cell membrane.

The crude fat content of Tiger grass ranged from as low as 0.893%, the mean observed from 60 days re-growth taken from upland habitat to as high as 1.287% observed from 30 days re-growth taken from lowland habitat, but differences among re-growths as well as among habitats were comparable as shown by the analysis of variance (P>0.05) (Table 3).

This result shows that the Tiger grass at 30-60 days re-growths from upland, lowland and riverbank habitats have no differences in feeding value in terms of Crude Fat content.

TABLE 3. Effect of age of re-growth and habits on crude fat content of Tiger grass (%)

	Re-growth			
Habitat	**30 days**	**45 days**	**60 days**	**Mean**
Upland	1.13	1.26	0.893	1.094
Lowland	1.287	0.938	1.037	1.087
Riverbank	1.000	1.020	1.050	1.023
Mean	1.139	1.073	0.993	

Source	*F Value*	*P Value*
Habitat	0.23	0.7943
Re-growth	0.81	0.4574
Habitat*Re-growth	0.31	0.2912
CV=8.569%		

Ash. Ash constitutes the mineral component of the samples. Macrominerals as well as microminerals are important components of body structures. Calcium and Phosphorus function in bone formation, sulphur is a structural component of amino acid cysteine and methionine, and Cobalt a component of viatamin B12 to name a few.

Insignificant difference (P> 0.05) was observed among the mean ash contents of the samples of the different re-growths from all the habitats studied. The mean ash contents of the samples ranged from 13.730% observed in 45 days re-growth taken from riverbank habitat to 15.875% at 30 days re-growth taken from Upland habitat. Analysis of variance shows that all re-growths as well all habitats are comparable in terms of ash content (Table 4).

This means that with regards to the ash or mineral content, all re-growths of Tiger grass from 30 -60 days taken from the three different habitats have the same feeding value.

TABLE 4. Effect of age of re-growth and habits on ash content of Tiger grass (%)

	Re-growth			
Habitat	**30 days**	**45 days**	**60 days**	**Mean**
Upland	15.875	15.293	14.387	15.185
Lowland	14.287	14.992	14.967	14.749
Riverbank	14.767	13.73	14.563	14.353
Mean	14.976	14.672	14.639	

Source	*F Value*	*P Value*
Habitat	0.68	0.5128
Re-growth	0.14	0.8727
	0.6	0.6673
Habitat*Re-growth		
CV=8.569%		

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Volume 6, Issue 7, pp. 36-38, 2022. ISSN (Online): 2456-7361

IV. CONCLUSION

Feeding value of Tiger grass do not vary statistically in terms of habitat. The Tiger grass from different sources can be utilized as feed for ruminants.

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