

## NUTRITIONAL EVALUATION OF SOME SELECTED RANGE GRASSES

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### Summary

Grass samples of *Bothriochloa pertusa*, *Cenchrus ciliaris*, *Chrysopogon* spp., *Dicanthium annulatum*, *Hybrid bajra*, *Panicum* spp; *Pennisetum orientale*, *Sorghum alnum* and *Themeda anthera*, experimentally grown in Range Management Farm at Jamrud, were collected and analysed for fibers, carbohydrate, fat and protein content. The nutritive ratios of all the grasses were also determined. The results obtained were compared with those of common grasses of Cholistan, Kalachitta area and Thal already supporting large herds of cattle. They compared favourably well to justify their propagation as a cattle feed on pilot scale.

### Introduction

Grasses constitute an important part of forage available to range live stock in Pakistan. Due to their protein, carbohydrate, fat, fiber and mineral contents, they play an important role in animal nutrition. *Cynodon dactylon*, *phagnitis karka*, *cenchrus ciliaris* and *Sacharum spontanium* are the main grasses in Peshawar, Chharrapani, Pirawala and Campbelpur respectively (8). Grasses contribute carbohydrates and fats which are important sources of energy for the metabolic activities of the animal cells. Besides grasses also contribute a significant amount of protein, which are essentially required in the building of tissue, growing up of wool, production of milk, and for reproduction (6).

Crude protein, fats, carbohydrates and fibers have been reported by a number of workers in various grasses (6, 7, 8, 9, 10, 11). Malik and Khan determined the chemical composition of grasses of Cholistan, Kalachitta and Thal areas, (9, 10, 11) and found it to vary significantly depending upon the soil and climatic conditions of the region (4). Since the chemical constituents of the grasses give an indication of their nutritional value it was decided to conduct experiments on the locally grown grasses with the objective of assessing their nutritive value. The project was taken up to determine the nutritive composition of grasses experimentally grown at the Range Management Farm at Jamrud and to find out their technical feasibility for further propagation as cattle feeding stuff on large scale.

### Material and Methods

Exotic and indigenous samples of grasses were collected from Jamrud Range

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Management Farm of Pakistan Forest Institute, Peshawar in the month of Oct. 1985. The samples were dried in shade for a month. The dried grass samples were ground to fine powder with the help of a grinding mill. They were sieved through 80-100 mesh sieve. Moisture and ash contents were determined using standard methods, prescribed by Griffin (5) and Jacobs (7). Crude fats, crude fibers and crude protein were determined following the standard methods given in A.O.A.C.(2). Fats, carbohydrate and proteins were converted into digestible components following methods given by Bolten and Revis (3). The nutritive ratios were determined following the method outlined by Aiyer (1).

## Results and Discussion

The nutritive components as determined, of the grasses collected from Range Management Farm at Jamrud are given in Table 1.

Table 1

### Basic Chemical Composition of Grasses

Botanical name	Moisture %	Total ash %	Crude fat %	Crude fiber %	Crude protein %	Carbohydrate %
1. <i>Bothriichloa pertusa</i>	11.00	13.70	2.34	25.00	6.00	42.00
2. <i>Cenchrus ciliaris</i>	9.16	9.52	1.73	32.33	7.17	40.00
3. <i>Chrysopogon aucheri</i>	8.70	9.20	2.45	30.00	6.20	43.45
4. <i>Chrysopogon montanus</i>	8.60	10.20	2.44	27.62	6.00	45.14
5. <i>Dicanthium annulatum</i>	10.60	7.02	3.00	34.50	7.40	37.48
6. <i>Hybrid bajra</i>	9.90	10.00	4.10	31.50	8.00	36.50
7. <i>Panicum antidotale</i>	11.48	12.04	2.19	35.03	6.84	32.52
8. <i>Panicum colaratum</i>	9.90	10.12	2.01	41.09	7.01	30.87
9. <i>Panicum turgidum</i>	9.30	12.16	2.20	37.44	6.51	32.39
10. <i>Pennisetum oriental</i>	9.40	11.72	3.10	30.80	6.50	38.48
11. <i>Sorghum almum</i>	10.70	8.52	2.39	28.80	8.60	40.99
12. <i>Themeda anethera</i>	9.16	9.36	2.47	33.25	8.35	36.91

It was observed that the nutritive values of grass samples under analysis fall in the following range:- Total ash, 7.02—13.70%; fat, 1.73—3.10%; fiber, 25.62—41.09%; protein, 6.0—8.60% and carbohydrate, 30.87—45.14%.

Though chemical composition by itself, does not indicate the nutritive value of a forage, it at least hints at the potential value. These values combined with information on palatability and digestibility, give a fair estimate of the utility of grasses as a forage.

The various nutritive components of grasses thus obtained are given in Table 2 as against those of Cholistan, Kalachitta and Thal.

Table 2  
Range of nutritive components of Grasses

Component	Range % of grass components			
	Grasses studied	Cholistan	Kalachitta	Thal
Ash	7.02-13.70	6.4-24.0	5.4 -17.5	4.9-12.0
Fats	1.73- 3.10	0.037-0.33	1.7 - 4.7	0.6- 1.7
Proteins	6.0 - 8.60	5.3-14.2	4.2 -24.3	6.0-8.7
Carbohydrates	30.87-45.14	22.5-61.5	32.00-47.8	30.4-45.8
Fiber	25.62-41.09	15.2 -50.7	22.00-39.9	29.9-42.2

It was observed that total ash, fats, carbohydrates and fibers content determined of the grasses compared favourably well with those of grasses from Cholistan, Kalachitta and Thal. Though protein content is low yet it falls in the agreeable range as compared to those of grasses reported in literature (9, 10, 11).

The digestible components and nutritive ratios of the grasses studied are presented in Table 3.

Table 3  
Digestible components and their nutritive ratio

Botanical name	Digestible components			Nutritive ratio
	Proteins %	Carbohyd- rates %	Fats %	
1. <i>Bothrichloa pertusa</i>	3.42	26.88	1.29	1: 8.70
2. <i>Cenchrus ciliaris</i>	4.09	25.66	0.92	1: 6.71
3. <i>Chrysopogon aucheri</i>	3.53	27.81	1.30	1: 8.70
4. <i>Chrysopogon montanus</i>	3.42	28.90	1.29	1: 9.29
5. <i>Dicanthium annulatum</i>	4.22	23.99	1.59	1: 6.53
6. <i>Hybrid bajra</i>	4.56	23.36	2.17	1: 6.19
7. <i>Panicum antidotale</i>	3.90	20.81	1.16	1: 6.00
8. <i>Panicum colaratum</i>	4.00	19.36	1.06	1: 5.53
9. <i>Panicum turgidum</i>	3.71	21.37	1.17	1: 6.46
10. <i>Pennisetum oriental</i>	3.71	24.63	1.64	1: 7.63
11. <i>Sorghum almun</i>	4.90	25.23	1.47	1: 6.2
12. <i>Themeda anethera</i>	4.76	23.62	1.32	1: 5.57

It was observed that the nutritive ratios obtained were in the agreeable range as compared to those of standard values reported by Aiyer(1).

### Conclusion

The chemical composition and the nutritive ratio of grasses of Range Management Farm at Jamrud compare favourably well with those of grasses from Cholistan, Kalachitta and Thal. Thus these grasses could be used as feeding stuff for cows in milk, horses, dairy breed and beef breed.

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