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Babita Bohra

*International Centre for Integrated Mountain Development, Nepal*

Vir Singh

R. D. Gaur

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## Chemical composition of range plants of vital fodder value for livestock-based economy in Uttarakhand Himalaya , India

Babita Bohra<sup>1</sup> , Vir Singh<sup>2</sup> and RD Gaur<sup>2</sup>

<sup>2</sup> Professor , <sup>1</sup> Regional Rangeland Consultant , ICIMOD , P .O . Box 3226 , Kathmandu , Nepal

E-mail : babitabohra@rediffmail .com , bbohra@icimod .org , babitabohra@gmail .com

**Key words :** Chemical composition , nutritive value , range plants , tree fodder

**Introduction** India's 219 million cattle , 94 million buffalo and 123 .50 million goats account for about 16 , 57 and 17 percent of the world's total dairy animal population , respectively . India's Himalayan State of Uttarakhand is especially rich in its livestock resources with overwhelming dependence on range plants . This paper provides the nutritive values of the range plants of fodder value and compares them with crop residues and concentrate feeds .

**Materials and methods** Samples for chemical analysis included tree fodder ( *Grewia opiva* , *Celtis australis* , *Vitis parkeri* , *Ougenia delbaegioides* , *Ficus clavata* , *Ficus roxburghii* , *Ficus palmata* , *Machilus duthiei* , *Quercus leucotricophora* , *Ficus nemoralis* , *Ficus cunia* , *Bauhinia vahlii* , and *Pyrunus cerariades* ) , grasses ( *Themeda anathera* green , mixed green grass , and *Themeda anathera* hay ) , crop residues (rice straw and finger millet straw ) , and concentrate feeds (complete feed block , urea-molasses-mineral blocks , and home-produced concentrate) . The samples were collected from 60 families in three mountain villages in the Almora district of Uttarakhand Himalaya , India . They were analysed for their proximate analysis using the standard methods of AOAC (1995) . Neutral Detergent Fibre (NDF) and Acid Detergent Fibre (ADF) were determined according to Goering and Van Soest (1970) . Digestibility was determined by using nylon bag technique following Mehrez and Ørskov (1977) . Statistical analysis was done by using CRD (Snedecor and Cochran , 1968) .

**Results and discussion** Chemical composition and dry matter digestibility (DMD) values showed a wide variation amongst the types of feeds and fodders available for livestock in the study area . There was significant difference ( $p < 0 .01$ ) between DM , CP , CF , NDF , ADF and DMD percentage in different groups (Table 1) . Chemical composition of a feed or fodder naturally depends upon its source and , within the source , it varies with environmental factors such as soil , climate , etc . This was the reason for differences in the nutritive values of feeds and fodders .

**Table 1** Average nutritive values (percent) of tree fodder , grasses , crop residues and concentrate feed .

Parameters	Tree fodder	Grasses	Crop residues	Concentrate feed
Dry matter**	36 .07± 2 .880	36 .24±12 .443	89 .30±0 .599	87 .13±3 .622
Crude protein**	16 .64±1 .034	6 .32±0 .437	3 .14±0 .185	18 .32±1 .912
Ether extract	1 .89±0 .248	2 .13±0 .229	1 .50±0 .549	3 .06±1 .506
Crude fibre**	17 .58±1 .008	29 .30±1 .448	47 .24±0 .164	10 .57±5 .557
Total ash	12 .79±1 .214	9 .29±1 .194	10 .31±0 .039	14 .14±5 .639
Acid insoluble ash	2 .74±0 .616	4 .72±0 .632	5 .330±0 .730	5 .13±2 .103
Neutral detergent fibre**	54 .03±0 .868	55 .83±1 .317	68 .57±1 .550	31 .11±13 .500
Acid detergent fibre**	37 .55±1 .500	39 .98±2 .770	43 .46±0 .609	18 .67±7 .961
Digestibility**	56 .76±2 .353	47 .40±2 .694	52 .00±0 .000	81 .00±6 .658
Nitrogen free extract	51 .15±1 .96	52 .94±0 .774	37 .25±1 .844	53 .98±8 .509
Organic matter	87 .20±1 .21	90 .70±1 .194	89 .69±3 .624	85 .85±5 .639

Values bearing superscripts in a row differ significantly ; \*\*  $P < 0 .01$

**Conclusions** Nutritive value of fodder trees is comparable even with concentrate feeds . Rangeland plants , thus , offer the most important input for the sustenance and potential development of livestock-based economy of mountain areas .

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