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Chemical Composition of the Haulms of Different Groundnut Varieties of Gujarat

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ABSTRACT

Groundnut haulms, a byproduct of legume crop was found to be rich in protein and calcium and to some extent in phosphorus. The average chemical composition of groundnut haulm was 8.5% crude protein, 2.2% ether extract, 31.5% crude fibre, 45.1% nitrogen free extract, 12.7% ash, 4% silica, 0.5% phosphorus and 1.5% calcium. The DM, crude protein and calcium yields (kg/hectare) were found to be higher (12674.00, 1083.62 and 176.16 respectively) in SEL 7-95. Out of ten different varieties, SG 84 contained highest crude protein (9.6%) and lowest crude fibre (27.6%).

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INTRODUCTION

Groundnut haulms, leaves and plant constitule good fodder when green or can be used as dry fodder. Because of the shortage of fodder and periodical droughts at regular intervals, groundnut haulms can used as a source of dietary fibre to the animals.

MATERIALS AND METHODS

Haulms of ten groundnut varieties were procured from the Plant Breeding Department of Anand Campus of Gujarat Agricultural University and marked as individual treatment namely T_1 (ICGV 87189), T_2 (ICGV 87191), T_3 (ICGV 86309), T_4 (SG 84), T_5 (SEL 7- 95), T_6 (J-19), T_7 (J-22), T_8 (J-11 NC), T_9 (ICG 44 NC) and T_{10} (GC-2 LC). Quadruplicate samples of the haulms of each groundnut variety were analysed for moisture, crude protein, ether extract, crude fibre, Ash and silica following AOAC (1975) and the phosphorus and calcium by ISI (1975) method. Statistical analysis of the data was carriedout as per procedures of Snedecor and Cochran (1968).

RESULTS AND DISCUSSION

Chemical composition

The average values of various constituents have been presented in Table 1. The average crude protein content of the haulms of different groundnut varieties were ranging from 7.49% (J-19) to 9.58% (SG 84) ($P < 0.05$). These results are in close agreement with the values reported by Krishnamohan *et al.* (1985); while higher values of crude protein levels have been reported by Rao and Mathur (1971).

The haulms of different varieties of groundnut contained 1.67% (GC-2 LC) to 2.69% (J-11 NC) ether extract. The treatment differences were observed to be

TABLE 1

Average chemical composition of haulms of different groundnut varieties (g per 100 g DM).

Constituents	*Groundnut varieties*										
	ICGV 87189	*ICGV 87191*	*ICGV 86309*	*SG 84*	*SEL 7-95*	*J 19*	*J 22*	*J-11 NC*	*JCG-44 NC*	*GC-2 LC*	*Average*
C. protein	8.86 ± 0.36	8.40 ± 0.25	8.04 ± 0.25	9.58 ± 0.67	8.55 ± 0.40	7.49 ± 0.36	7.70 ± 0.22	8.34 ± 0,23	9.34 ± 0.47	8.86 ± 0.24	8.50 ± 0.20
E. extract	2.54 ± 0.19	2.20 ± 0.08	2.43 ± 0.11	2.42 ± 0.22	1.92 ± 0.16	2.16 ± 0.19	2.14 ± 0.22	2.69 ± 0.18	2.29 ± 0.17	1.67 ± 0.18	2.24 ± 0.08
C. Fibre	29.51 ± 1.18	31.02 ± 0.94	31.34 ± 1.30	27.56 ± 0.55	31.23 ± 1.11	32.98 ± 0.96	31.73 ± 1.27	33.66 ± 1.26	30.92 ± 0.95	35.01 ± 0.43	31.49 ± 0.63
NFE	46.15 ± 1.50	44.83 ± 0.70	46.22 ± 1.33	47.33 ± 0.51	43.71 ± 1.53	45.71 ± 0.78	46.63 ± 1.32	43.72 ± 1.00	44.17 ± 1.40	42.99 ± 1.27	45.09 ± 0.42
Ash	12.94 ± 0.88	13.55 ± 1.37	11.97 ± 0.52	13.11 ± 0.59	14.59 ± 2.31	11.66 ± 0.65	11.80 ± 0.44	11.59 ± 1.01	13.28 ± 0.53	11.47 ± 0.97	12.68 ± 0.30
Silica	4.61 ± 0.99	5.17 ± 1.40	3.18 ± 0.30	4.91 ± 0.32	5.82 ± 2.10	2.67 ± 0.27	3.67 ± 0.72	2.52 ± 0.53	3.84 ± 0.60	2.98 ± 0.74	3.94 ± 0.24
P	0.46 ± 0.99	0.41 ± 0.02	0.45 ± 0.05	0.35 ± 0.01	0.42 ± 0.04	0.67 ± 0.05	0.61 ± 0.02	0.51 ± 0.02	0.46 ± 0.01	0.55 ± 0.05	0.49 ± 0.29
Ca	1.38 ± 0.02	1.45 ± 0.05	1.62 ± 0.12	1.40 ± 0.09	1.39 ± 0.06	1.68 ± 0.14	1.60 ± 0.04	1.62 ± 0.03	1.51 ± 0.04	1.47 ± 0.04	1.51 ± 0.03

TABLE 2

DM and nutrient yield from haulms of different groundnut varieties (kg/ha).

Constituent	Groundnut varieties									
	ICGV 87189	*ICGV 87191*	*ICGV 86309*	*SG 84*	*SEL 7-95*	*J-19*	*J-22*	*J-11 NC*	*ICG-44 NC*	*GC-2 LC*
Dry matter	10417.50 ± 896.59	10417.50 ± 400.96	12501.00 ± 567.05	7118.00 ± 593.00	12674.00 ± 1147.40	10938.25 ± 593.07	10417.25 ± 283.52	10591.00 ± 521.00	10590.75 ± 715.98	11285.50 ± 593.00
C. protein	922.99 ± 53.31	875.07 ± 35.63	1008.08 ± 39.59	681.90 ± 106.69	1083.62 ± 286.50	819.26 ± 63.74	802.12 ± 24.47	883.28 ± 42.78	987.17 ± 55.20	999.89 ± 63.93
E. extract	264.60 ± 31.10	229.19 ± 15.96	303.17 ± 18.06	172.25 ± 25.55	243.34 ± 35.51	236.26 ± 21.03	222.92 ± 28.93	284.89 ± 24.28	242.52 ± 18.11	188.46 ± 26.13
C. fibre	3074.20 ± 364.90	3231.50 ± 155.24	3917.81 ± 283.77	1961.72 ± 139.65	3958.09 ± 425.51	3607.43 ± 275.37	3305.39 ± 245.07	3564.93 ± 250.37	3274.65 ± 262.67	3951.05 ± 233.03
NFE	4807.67 ± 359.67	4670.16 ± 86.32	5777.96 ± 302.55	3368.94 ± 254.88	4539.80 ± 532.27	4999.87 ± 211.47	4857.56 ± 68.47	4630.38 ± 201.31	4677.93 ± 424.07	4851.63 ± 169.93
Ash	1348.02 ± 195.98	1411.57 ± 206.49	1496.36 ± 121.19	933.16 ± 39.32	1849.13 ± 306.14	1275.39 ± 102.49	1229.25 ± 91.40	1227.49 ± 161.65	1406.45 ± 51.93	1294.44 ± 145.47
P	47.92 ± 5.40	42.71 ± 3.62	56.25 ± 10.30	24.91 ± 4.40	53.23 ± 5.50	73.28 ± 7.07	63.54 ± 1.38	54.01 ± 5.26	48.71 ± 2.14	62.07 ± 4.42
Ca	143.76 ± 9.40	151.05 ±	202.51 ± 22.52	99.45 ± 14.71	176.16 ± 23.50	183.76 ± 12.70	166.67 ± 4.15	171.57 ± 10.80	159.12 ± 11.29	165.87 ± 5.56

...nificant (P < 0.05). The present results are in agreement with that of Hussain and Ahmed (1970) and Durgaprasad *et al.* (1986). The crude fibre content in the haulms of different groundnut varieties ranged between 27.56% (SG 84) and 35.01% (GC-2 LC) (P < 0.05). Similar results have been reported by Rao and Mathur (1971) and NFE content of the haulms ranged from 42.99% (GC-2 LC) to 47.33% (SG 84). The values of NFE are in agreement with the values given by Shukla *et al.* (1985), however, Krishnamohan *et al.* (1985) reported lower values for NFE in the groundnut haulms. The percentage of ash in haulms of different varieties of groundnut ranged from 11.47% (GC-2 LC) to 14.59% (SEL 7-95). The results are in agreement with the values given by Rao and Mathur (1971). The silica content in groundnut haulms were ranged between 2.52% (J-11NC) and 5.82% (SRL 7-95). Treatment differences were found nonsignificant. The phosphorus and calcium content in groundnut haulms were of the order of 0.35% (SG 84) to 0.67% (J-19) and 1.38% (ICGV 87189) to 1.68% (J-19), respectively.

Nutrient yields

The average yield of drymatter and different nutrients per hectare from different varieties of groundnut haulms have been presented in Table 2. The varietal differences for crude protein and ash were nonsignificant while highly significant treatment differences were observed for DM and rest of the nutrients. Among the different varieties of groundnut, variety SEL 7-95 yielded highest DM, crude protein and calcium (12674.00, 1083.62 and 176.16 kg/ha, respectively) as compared to other varieties.

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