

Animal Nutrition Survey in Tribal Area of Dang District

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ABSTRACT

A comprehensive Animal Nutrition Survey was carried out in the tribal area of Dang district during different seasons in the year 1976-77 to study the feeding practices followed by tribal people, the types of feeds available and their proximate and trace element composition. The animals in Dang are mainly maintained on grazing in Dang forest. About 90%, 40% and 87% fodder samples, were deficient in zinc, manganese and copper during summer season respectively. Whereas about 72% and 50% of fodder samples were deficient in zinc and copper respectively during monsoon season. These values for winter season were 70% and 35%.

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INTRODUCTION

A comprehensive animal nutrition survey was conducted in the tribal area of Dang district. The feedstuffs available in forest and hilly tract are quite different. Dang district has an area of 1983 sq.km. and lies between 20°-33'-44" to 21°-5'-10" north latitude and 73°-27'-58" to 73°-56'-36" east longitude. In summer, environmental temperature is as high as 44° C, while the temperature in winter is as low as 4° C. The annual rainfall is 200-250 cm. beginning from middle of June. The tract is mostly hilly and densely covered with forest. The district is divided by four rivers viz., Gira, Purna, Khapri and Ambica. Main types of soil found in this district are black cotton soil in valley and low lying area while red porous in hilly area. Out of total area of 1,78,500 ha, 57,000 ha. are under cultivation. The total population of livestock was 79,919 according to 1966 census. Cows and

bullocks contribute the major portion (65,996).

Problem of malnutrition amongst the cattle in tribal area of Dang district was reported to this department by the Directorate of Animal Husbandry, Gujarat State and hence this work was taken up.

MATERIALS AND METHODS

The feeds and fodder samples collected during survey were analysed for proximate analysis as per A.O.A.C. (1970). Calcium was determined as per I.S.I. (1975) and phosphorus was determined quantitatively by photo-electric colorimeter. Trace elements viz., zinc, manganese, copper and iron were determined using wet digestion technique (Atomic absorption spectrophotometer).

RESULTS AND DISCUSSION

Proximate composition:

The results for chemical composition of straw and *gotar* are presented in Table 1.

TABLE 1

Proximate composition of straws and *gotar* samples collected during different seasons in Dang district (% on D.M. basis).

Name of sample		C Protein	E Ext.	C Fibre	N.F.E.	Ash	Silica	P	Ca
STRAWS									
(Banti with seeds)	(1)	5.75	3.45	20.59	56.79	13.42	8.85	0.22	0.47
<i>Echinochloa frumentacea</i>									
(Bhadla plant with seed)	(1)	7.70	2.87	15.82	63.92	9.69	5.02	0.24	0.27
<i>Setaria glauca</i> Beauv									
(Bhadla)	(3)	5.94	2.49	27.22	53.61	10.74	5.15	0.14	0.48
<i>Setaria glauca</i> Beauv.		±0.86	±0.35	± 1.07	± 0.99	± 0.68	± 0.67	± 0.02	±0.01
(Kodra)	(5)	3.90	2.33	35.38	45.07	13.32	7.24	0.20	0.47
<i>Paspalum serobiacutatum</i> .		±0.38	± 0.25	± 2.44	± 2.06	± 0.73	± 0.48	± 0.02	±0.09
Linn									
(Nagali) (<i>Eleusine</i>	(11)	3.36	2.36	27.04	56.64	10.60	3.25	0.27	1.12
<i>coracana</i> . Gaertn.)		±0.25	± 0.16	± 1.39	± 1.66	± 0.47	± 0.27	± 0.03	±0.06
(Nagali Kutar)	(5)	5.60	2.41	23.97	57.33	10.69	5.05	0.24	0.73
(<i>Eleusine coracana</i> . Gaertn.)		±0.44	± 0.30	± 0.93	± 0.97	± 1.25	± 0.85	± 0.03	±0.06
(Rajagira)	(2)	10.51	2.53	27.75	42.36	16.85	0.30	0.28	1.45
<i>Amaranthus hybridus</i> , L									
(Samo)	(5)	4.37	2.32	33.92	47.12	12.27	5.85	0.13	0.45
<i>Paspalidium flavidum</i>		±0.42	± 0.18	± 1.55	± 1.45	± 1.09	± 0.42	± 0.02	±0.04
(Sava or banti)	(5)	4.82	2.42	28.64	52.00	12.12	6.33	0.18	0.41
<i>Echinochloa frumentacea</i>		±0.07	±0.14	±0.99	±0.95	±0.67	±0.55	±0.02	±0.01
(Varai)	(10)	4.13	2.11	33.23	50.28	10.25	4.76	0.11	0.32
<i>Panicum miliaceum</i> , Linn		±0.22	±0.29	±1.16	±1.47	±0.50	±0.27	±0.01	±0.02
GOTARS									
(G.N. <i>gotar</i>)	(7)	8.23	2.41	41.04	38.13	10.19	1.54	0.16	1.00
<i>Arachis hypogaea</i> , Linn		±0.84	±0.33	±2.55	±1.70	±0.65	±0.31	±0.03	±0.15
(Kudid <i>gotar</i>)	(9)	6.52	2.68	41.95	42.15	6.70	1.90	0.14	0.96
<i>Dolichos biflorus</i> , Roxb.		±0.93	±0.18	±2.15	±1.20	±0.45	±0.30	±0.01	±0.07
(Tur <i>gotar</i>)	(9)	12.06	4.07	28.65	47.42	7.80	1.70	0.17	1.02
<i>Cajanus cajan</i>		±0.88	±0.52	±1.38	±1.41	±0.45	±0.23	±0.02	±0.04
(Niger <i>gotar</i>)	(1)	4.46	3.65	30.07	51.47	10.35	0.89	0.28	1.51
<i>Guizotia abyssinica</i>									
(Udid <i>gotar</i>)	(12)	8.65	2.20	39.67	39.38	10.10	1.81	0.18	1.17
<i>Phaseolus mungo</i>		±0.69	±0.15	±2.02	±0.87	±0.60	±0.33	±0.01	±0.10

() Figure in the parenthesis indicates number of sample analysed.

Some of the common straws available in this district are of *Setaria glauca* Beauv (*bhadla*), *Paspalum serobiacutatum* Linn (*kodra*), *Eleusine coracana*, Gaertn (*nagali*), *Paspalidium flavidum* (*samo*) *Panicum miliaceum*. Linn (*vari*), *Oryza sativa*,

Linn (*paddy*), *Amaranthus hybridus* L. (*rajagira*), *Echinochloa frumentacea* (*sava* or *banti*) *Zea mays* (*maize*), *Sorghum vulgare* (*sorghum*) etc. They are having usual range of proximate composition with c. protein content ranging from 2.22 to

those collected during summer season. From the foregoing results it is seen that some of the straws and *gotars* in particular are nutritious. Patel *et al.* (1958 & 1963), Patel and Shah (1957 & 1959), Shukla *et al.* (1980, 1982) have reported some-what similar composition of straws and *gotar*. The values reported by Sen and Ray (1971) and Ranjhan (1977) for some common straws and *gotars* are quite comparable with present results.

The proximate composition of forest grasses are given in Table 2. Number of

Proximate composition of grass samples, collected during different seasons in Dang District (% on D. M. basis).

[illegible]

1	2	3	4	5	7	8	9	10
(<i>Kolava</i>) (1)	8.55	2.16	33.55	43.75	11.99	5.17	0.20	0.34
<i>Eragrostis tenella</i> , Beauv.								
(<i>Sikaria</i> green) (8)	6.70	2.78	34.73	46.57	9.22	3.50	0.28	0.30
<i>Chloris dolichostachya</i> , Lagas	±0.55	0.34	±0.93	±1.73	±0.70	±0.28	±0.03	±0.01
(<i>Thararu</i> green) (3)	8.99	4.36	32.57	40.43	13.64	7.06	0.40	0.43
<i>Spodiopogon rhizophorus</i> pilg.	±0.90	±0.18	±1.55	±0.72	±0.64	±0.64	±0.02	±0.04
(<i>Zira</i> green) (2)	7.93	2.33	33.32	43.56	12.86	6.01	0.25	0.44
<i>Leptochloa chinesis</i> , Nees.								
Mix grasses (10)	6.05	2.30	36.42	43.75	11.48	6.36	0.22	0.42
	± 0.70	± 0.22	± 1.24	± 0.98	± 0.37	± 0.46	± 0.02	± 0.03

forest grasses are available for grazing & feeding the animals in Dang district. Some progressive institutions or farmers are also cultivating improved fodder varieties. The forest grasses growing in Dang district are *Themeda triandra* (bhatadi), *Ischaemum indicum* Merrill (belakhada), *Ischaemum rugosum*, Salisb (*dhodhya*), *Arundinella pumila* Steud (*dhuda*), *Iseilema prostratum*, Andress (*gandhadi*), *Heteropogon contortus* (*kasur*), *Eragrostis tenella*, Beauv (*kolava*), *Chloris dolichostachya* Lagas (*sikarya*), *Spodiopogon rhizophorus*, Pilger (*thararu*), *Leptochloa chinensis*, Nees (*zira*) etc. Most of these grasses are available for grazing during monsoon. The grasses available during summer are *bhatadi*, *belkhada*, *dhodhia*, *gandhadi* etc. The grass samples collected during monsoon being green

Concentrates :

Many cattle owners and commercial milk producers of Dang district feed concentrates to the milking buffaloes. The cattle owners offer *Dolichos biflorus*, Roxb. (*kudid*) with some salt to their bullocks after soaking in the water.

The chemical composition of concentrates feed available in Dang area are given in Table 3.

Proximate composition of concentrate samples collected during different seasons in Dang district (% on D.M. basis).

[illegible]

TABLE 3 (contd.)

1	2	3	4	5	6	7	8	9
(<i>Khati Bhindi</i> seeds)	(1)	20.55	24.94	14.33	33.84	6.34	0.64	0.52
<i>Hibiscus cannabinus</i> , Linn								
(<i>Kudid</i> seeds)	(7)	34.74	4.18	4.84	48.31	7.93	1.64	0.54
<i>Dolichos biflorus</i> , Roxb.		± 3.27	± 0.45	± 0.72	± 4.50	± 0.94	± 0.50	± 0.05
(<i>Niger</i> seed)	(3)	21.60	39.69	11.36	20.45	6.90	0.91	0.56
<i>Guizotia abyssinica</i>		± 0.69	± 1.82	± 0.53	± 1.32	± 0.49	± 0.40	± 0.13
(<i>Sadad</i> seeds)	(1)	4.63	2.45	27.71	57.58	7.63	1.05	0.16
<i>Terminalia crenulata</i>								
(<i>Sag</i> seeds)	(6)	6.44	3.94	52.91	29.03	7.68	2.67	0.25
<i>Tectona grandis</i>		± 0.95	± 0.98	± 9.10	± 6.22	± 1.68	± 1.24	± 0.07
(<i>Savar</i> seeds)	(1)	32.81	14.18	14.72	29.70	8.59	0.31	0.80
<i>Bombax ceiba</i>								
(<i>Kudid</i> meal)	(1)	24.53	4.48	3.00	63.06	4.93	0.31	0.41
<i>Dolichos biflorus</i>								
BRAN AND HUSKS								
(<i>Nagali</i> bran)	(1)	9.56	5.49	1.73	64.19	19.03	3.16	0.31
<i>Eleusine coracana</i>								
(<i>Gram</i> husk)	(1)	5.48	2.38	20.95	56.08	15.11	1.94	0.14
<i>Cicer arietinum</i>								
(<i>Nagali</i> husk)	(1)	4.55	3.69	13.21	55.62	22.93	17.45	0.30
<i>Eleusine coracana</i>								
MISCELLANEOUS								
Black Jaggery	(1)	3.21	8.31	0.00	77.87	10.61	0.68	0.26
(<i>Mahuda</i> flower)	(1)	3.82	3.42	2.08	87.48	3.20	0.41	0.15
<i>Madhuca indica</i>								
(<i>Mahuda</i> seed)	(1)	10.24	51.07	10.03	25.92	2.74	0.09	0.24
<i>Madhuca indica</i>								

() Figure in the parenthesis indicates number of samples analysed.

Guizotia abyssinica (*Niger* seed) cake is a very good proteinous feed available in Dang area. As it is an expeller cake it has higher proportion of ether extract (9.7%). *Dolichos biflorus* Roxb. (*kudid*) seeds and *bhardo* (crushed) are usually fed to bullocks and they are also good sources of c. protein. *Eleusine coracana* (*nagali*) bran is mainly available with tribal people as they use *Eleusine coracana* (*nagali*) seed for human consumption. Black Jaggery is commonly used as energy source (71.8% N.F.E.) for feeding milk-stock and also used in calving ration.

Madhuca indica (*mahuda*) flowers which are commonly available in forest area are also used for feeding to animals by tribal people. The present findings are in genral agreement with the findings reported by Anon (1952-1973), Sen and Ray (1971) and Desai *et al.* (1979).

Trace element contents

The feeds and fodders samples collected from Dang district were analysed for trace element content by wet digestion technique using atomic absorption spectrophotometer and the results are given in Table 4.

TABLE 4

Trace elements content of fodder and feed samples collected during survey in Dang district.

Name of Sample		Zn ppm	Mn ppm	Cu ppm	Fe mg%
STRAW					
(Banti) <i>Echinochloa frumentacea</i>	(1)	54.91	121.20	7.50	64.65
(Bhadla) <i>Setaria glauca</i> , Beauv	(1)	79.13	123.73	12.50	164.70
(Kodra) <i>Paspalum serobiaculatum</i> , Linn	(3)	55.18	146.45	8.75	34.37
		± 14.49	± 73.59	± 2.60	± 12.05
(Nagali) <i>Eleusine coracana</i> , Gaertn	(6)	64.06	114.43	7.56	26.93
		± 2.80	± 9.23	± 1.64	± 2.39
(Rajagira) <i>Amaranthus hybridus</i> , L.	(1)	40.37	25.25	11.25	43.80
(Samo) <i>Paspalidium flavidum</i>	(1)	60.56	95.95	11.00	41.70
(Varai) <i>Panicum miliaceum</i> , Linn	(4)	52.08	80.80	7.19	18.18
		± 8.09	± 9.83	± 2.19	± 2.17
GOTARS					
(G. nut gotar) <i>Arachis hypogaea</i> , Linn	(6)	31.92	130.43	14.79	244.12
		± 2.77	± 54.05	± 2.36	± 49.50
(G.nut plant) <i>Arachis hypogae</i> , Linn	(1)	40.38	148.97	27.50	314.85
(Kudid gotar) <i>Dolichos biflorus</i> , Roxb.	(7)	29.76	36.76	8.14	65.53
		± 3.50	± 7.39	± 1.00	± 19.16
(Niger gotar) <i>Guizotia abyssinica</i>	(1)	19.38	25.25	13.75	11.45
(Tur gotar) <i>Cajanus cajan</i>	(6)	34.99	40.82	10.00	116.58
		± 6.25	± 5.96	± 1.41	± 17.33
(Udid gotar) <i>Phaseolus mungo</i>	(10)	35.45	57.32	13.43	123.04
		± 3.12	± 9.07	± 1.21	± 22.16
GRASSES					
(Baroo green) <i>Sorghum halepense</i> , (L.) pers	(1)	58.95	22.73	11.25	12.90
(Belakheda) <i>Ischaemum indicum</i> , merril	(5)	58.19	87.37	8.75	31.55
		± 8.17	± 9.32	± 1.25	± 5.19
(Bhatadi) <i>Themeda triandra</i>	(22)	33.73	68.57	5.73	22.12
		± 2.43	± 4.51	± 0.56	± 5.51
(Daya green) <i>Alysicarpus</i> , Spp.	(3)	27.99	63.19	13.25	31.43
		± 6.33	± 17.68	± 5.37	± 7.32
(Dharo green) <i>Cynodon dactylon</i>	(2)	52.09	35.35	11.88	12.00
(Dhodhiya) <i>Ischaemum rugosum</i> , Selisb	(10)	59.84	53.78	6.48	28.20
		± 10.59	± 8.20	± 0.65	± 5.19
(Dhuda) <i>Arundinella pumila</i> , Stend	(1)	41.18	479.75	8.00	116.75
(Gandhadi) <i>Ireilema prostratum</i> , Anderss	(9)	42.74	38.04	6.42	33.63
		± 4.10	± 7.55	± 0.90	± 14.92
(Kasur) <i>Heteropogon contortus</i>	(2)	23.42	37.88	4.63	19.30
(Shikaria green) <i>Chloris dolichostacha</i> Lagas	(2)	39.97	40.40	10.00	30.23
(Thararu green) <i>Spadiopogon rhizophorus</i> , Pilg	(1)	58.14	53.03	10.00	13.55
(Zira green) <i>Leptochloa chinensis</i> , Nees	(1)	47.64	164.13	10.00	40.65
	(7)	41.07	69.98	7.39	34.55
Mix grasses		± 3.94	± 6.83	± 0.73	± 5.31

TABLE 4 (contd.)

TABLE 4 (contd.)		2	3	4	5
1					
OIL CAKE					
(Niger seed cake) <i>Guizotia abyssinica</i>	(8)	97.10 ± 14.76	59.97 ± 10.71	17.25 ± 2.23	127.17 ± 16.10
SEEDS					
(<i>Kudid</i>) <i>Dolichos biflorus</i> , Roxb.	(5)	52.97 ± 4.53	45.96 ± 7.67	19.25 ± 2.15	120.08 ± 27.52
(<i>Nagali</i>) <i>Eleusine coracana</i> , Gaertn	(2)	25.84	26.85	5.00	32.38
(<i>Sadal</i>) <i>Terminalia crenulata</i>	(1)	17.76	17.68	8.75	12.30
(<i>Savar</i>) <i>Bombax ceiba</i>	(1)	58.14	20.20	28.75	83.50
MEAL AND KUSKI					
(<i>Kudid</i> meal) <i>Dolichos biflorus</i> , Roxb.	(1)	38.76	40.40	15.00	38.60
(<i>Tur chuni</i>) <i>Cajanus Cajan</i>	(1)	39.57	20.20	11.25	41.70
(<i>Rice kuski</i>) <i>Oryza sativa</i> , Linn.	(3)	53.02 ± 10.28	88.38 ± 25.63	12.92 ± 3.56	112.58 ± 13.03
HUSKS					
(Cotton seed husk) <i>Gossypium herbaceum</i> , L.	(2)	17.77	15.15	8.13	28.15
(<i>Nagli</i> husk) <i>Eleusine coracana</i> , Gaertn	(1)	73.48	29.79	33.75	346.10

() Figure in the paranthesis indicates number of sample analysed.

The trace element content like zinc, manganese, copper (ppm) and iron (mg%) in the straw ranged from 40.37-79.13, 25.25-146.45, 7.19-12.50 and 18.18-146.70 respectively. Straws of *Echinochloa frumentacea* (Banti), *Eleusine coracana* Gaertn (Nagali) and *Panicum miliaceum* Linn (vari) which are common to Dang district are low in copper content. The ranges of zinc, manganese, copper (ppm) and iron (mg%) in the *gotar* are 19.38-40.38, 25.25-148.47, 7.37-27.50 and 11.45-314.85 respectively. The values of zinc and copper contents are low in common *gotar* *Dolichos biflorus*, *Guizotia abyssinica* available in Dang district. The grass samples have Zn, Mn, Cu (ppm) and Fe (mg%) from 23.42-74.70, 22.73-479.74, 4.38-13.25 and 6.25-116.75. With regard to concentrates, the trace element content are grazing from 17.77-97.10, 15.15-88.38, 5.0-33.75 and 12.30-346.10. The concentrate samples have comparatively higher trace element content than fodder

samples. The present ranges of trace element contents are in general agreement with those reported for some of the similar or other types of roughages and concentrates feed of India by Patel *et al.* (1966), Sawhney and Bedi (1972), Sawhney *et al.* (1973, 1977) and Ranjhan (1977).

The results of percentage of samples either adequate or deficient in trace element (zinc, manganese, copper and iron) during different seasons are given in Table 5. These values were calculated on the basis of Underwood (1971).

Perusal of results in Table 5 revealed that zinc and copper are deficient to a greater extent in all the seasons in case of roughages. The roughage samples are relatively more deficient in trace element (zinc, manganese and copper) during summer than in other seasons. Concentrates are relatively less deficient in zinc and copper than roughage samples.

TABLE 5

Percentage of samples adequate or deficient in trace elements during different seasons

Constituents		Zinc	Manganese	Copper	Iron
Season		Roughages			
Summer	Adequate	10.5	59.5	13.5	100.0
	Deficient	89.5	40.5	86.5	00.0
Monsoon	Adequate	28.1	90.7	50.0	100.0
	Deficient	71.9	9.3	50.0	0.0
Winter	Adequate	30.0	100.00	65.0	100.0
	Deficient	70.0	0.0	35.0	0.0
		Concentrates			
Summer	Adequate	56.3	75.0	75.0	100.0
	Deficient	43.7	25.0	25.0	0.0
Monsoon	Adequate	50.0	75.0	75.0	100.0
	Deficient	50.0	25.0	25.0	0.0
Winter	Adequate	62.5	62.5	87.5	100.0
	Deficient	37.5	37.5	12.5	0.0

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