

Macro and Micro-Mineral Status of Feeds and Fodders in Sardarkhrushinagar Dantiwada Agricultural University Adopted Villages of Dantiwada Taluka

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Abstract

A survey was carried out in ten villages of Dantiwada taluka of the Banaskantha district which are adopted by Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar to identify the macro and micro-minerals status in feeds and fodders by samples at random. The samples were analysed for macro minerals, calcium and phosphorus with micro minerals copper, manganese and zinc. The concentrate samples were analysed individuals and combination with other ingredients both, as per as their practically implementation to dairy animals. The results of analysis were compared with the critical level for particular micro minerals level and percentages of samples which contain micro minerals below critical level were calculated.

Keywords: Macro and Micro minerals; Survey; Feeds; Fodders.

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Introduction

Mineral imbalances are of common occurrences in livestock throughout the world in affecting them in a number of ways (McDowell *et al.*, 1983). A numbers of researches in the world have reported a high incidence of forage samples below critical levels for different mineral elements, especially copper, zinc, phosphorus, magnesium and calcium (Miles and McDowell, 1983; Underwood and Suttle, 1999). It is obligatory to assess feeds and fodders for minerals, which are dietary essentials, with the objective to recommend quantities needed extra in the ration. At the same time, it is advisable not to recommend excess, so as to avoid the problem of animal waste and toxicity (Garget *al.*, 2003).

The study was undertaken to assess the macro and micro-nutrients status in feeds and fodders.

Materials and methods

The survey was conducted in Sardarkhrushinagar Dantiwada Agricultural University adopted villages in Dantiwada Taluka. The names of villages are Vaghrol, Nilpur, Lodapa, Fatepura, Dhaneri, Jegol, Dantiwada, Bhadali, NaniBhakhar, and MotiBhakhar. Random sampling technique was used to select the respondents. In each village, 10 farmers who own dairy cattle producing at least 10 kg or more milk per day were selected. Information regarding the

Table 1: Mineral content in of feeds and fodders samples
(Figure in parathion denote the number of sample analysed)

Name of the sample	P	Ca	Cu	Mn	Zn
	%		ppm		
Concentrates					
Banasdan + CSC (25)	0.81	0.96	9.01	65.68	67.26
Banasdan + CSC + Bajri (26)	0.78	1.03	6.85	51.30	84.70
CSC + Wheat bhardo+ Guar bhardo (21)	0.73	1.17	8.21	60.43	64.50
Banasdan + Bajri + Isabgullali(19)	1.01	0.56	11.24	71.58	84.89
Banasdan + CSC+ Tuarchunni (16)	0.53	1.05	12.86	87.43	70.12
Banasdan+ Wheat bhardo + CSC + Isabgullali (10)	0.82	1.24	11.36	79.57	68.57
Guar bhardo (12)	0.33±0.01	0.19±0.02	5.89±1.18	16.37±1.26	39.87±2.87
Wheat bhardo (18)	0.34±0.01	0.15±0.01	5.66±1.02	31.48±1.44	36.75±3.39
Bajri (14)	0.44±0.01	0.19±0.01	3.56±0.24	15.24±1.27	19.27±2.34
Jowar (22)	0.37±0.01	0.15±0.02	3.14±0.31	14.85±1.02	22.76± 2.41
Banasdan (30)	1.12±0.11	1.27±0.13	24.10±0.63	86.65±3.32	100.26±3.58
IsabgulGola (15)	0.37±0.01	0.56±0.07	14.00±0.47	50.68±2.26	48.87±.2.13
Cotton Seed Cake(15)	0.43±0.04	0.39±0.03	8.06±0.45	34.68±1.75	34.00±1.53
Green Roughages					
Jowar green (32)	0.32±0.10	0.56±0.05	7.56±0.20	72.01±2.35	29.33±5.22
RajkaBajri (35)	0.36±0.04	0.94±0.06	9.25±1.43	64.56±3.42	39.67±2.29
Chickory leaves (28)	0.70±0.05	0.78±0.03	8.69±1.04	60.24±4.26	28.14±2.03
Lucerne (28)	0.78±0.08	1.37±0.05	7.21±0.34	36.24±1.86	27.46±1.46
Local mixed grass (25)	0.35±0.01	0.78±0.02	9.57±0.54	59.74±2.52	26.64±1.63
Dry Roughages					
Bajra straw (35)	0.16±0.05	0.61±0.04	3.76±0.41	40.36±1.87	19.79±1.34
Wheat straw (32)	0.14±0.03	0.32±0.04	4.38±1.30	46.65±2.14	14.29±1.15
Jowar straw (35)	0.32±0.04	0.48±0.04	6.46±0.34	56.83±1.13	17.40±2.16
Ground nut straw (30)	0.23±0.02	0.42±0.03	8.56±0.28	22.76±1.56	18.25±0.56
Wheat bhoosa (25)	0.16±0.02	0.37±0.04	5.65±0.30	50.15±2.88	16.93±1.67

amount and types of feeds and fodders being offered to the animals, approximate rate of daily feed intake by individual animal were collected with the fair degree of precision on a questionnaire from individual farmer using standard sampling procedure, samples of green fodder, dry roughage, individual concentrate ingredients, compound concentrate mixtures and homemade concentrate mixtures were collected from all the respondents. The Ca content was analyzed by the method of Talapatra *et al.* (1940) and the Phosphorus content was analyzed colorimetrically by AOAC (1999) method. The contents of Cu, Mn and Zn were analyzed using Atomic Absorption Spectrophotometer (ECIL, AAS 4141). The data were subjected to statistical analysis using methods of Snedecor and Cochran (1980).

Results and discussion

Most of the dairy animal owners keep the animals stall-fed either at home or at farm within a limited area. Crop residues, predominantly wheat and bajri straw, were

Table 2: Percentage of feed samples containing Cu, Mn and Zn below critical levels in SDAU adopted villages.

Particulars	Cu (<8.0ppm)	Mn (<40.0ppm)	Zn (<30.0ppm)
Concentrates	32.50	25.40	26.80
Green roughages	44.20	16.80	60.50
Dry Roughages	76.40	20.50	100.00

found to be the main source of roughages in the ration of animals in the area. They store dry fodder like straws of bajri, wheat, jowar and groundnut haulms. Most of them grow green fodders like Jowar, 'rajaka-bajari (multicut), Chicory leaves, hybrid Napier and Lucerne. They also feed local mixed grasses. It was found that the dairy animals were fed roughage three times and concentrates offered twice a day at the time of milking. Among the concentrate they feed Banasdan (compound cattle concentrate) manufactured by Banaskantha District Co-operative Milk

Producers' Union Limited (Banas Dairy), commercial concentrate mixtures, maize grain, bajri grain, jowar grain, wheat grain, guar grain, cottonseed cake, Isabgullali etc.

The minerals composition of feeds and fodder collected during the survey is given in Table 1. The data on Ca and P content of the feedstuffs are in agreement with the reports of Anonymous (1983), Desai *et al.* (1984), Desai *et al.* (1985), Garg *et al.* (1999) and Garg *et al.* (2003). The Cu content seemed to be lower in most of the feedstuffs collected. The feeds like Wheat straw, jowar straw, bajri straw, groundnut straw, paddy straw, wheat bhoosa, etc. and green roughage like lucerne, rajaka-bajari, chickory leaves, jowar green, Gajaraj, local mixed grass etc., the quantities were under 16.95 ppm. These findings are in agreement with Garget *et al.* (1999). However, Desai *et al.* (1985) reported slightly higher values of Cu content in these feedstuffs. Most of the homemade concentrate mixtures contained more than 12 ppm and Banasdan contained 24.10±0.63ppm Cu, which might have been achieved by using mineral mixture as per BIS specifications during manufacture of compound concentrate.

Most of the green fodders offered to the animals contained reasonable amount of Mn (36.24±1.86 to 72.01±2.35 ppm). It was apparent that most of the dry roughage was low in Zn content. Jowar straw, groundnut straw, paddy straw, wheat bhoosa etc. showed less than 26.38 ppm Zn. This is in agreement with the findings of Desai *et al.* (1985) and Sanjeev Kumar (2009).

The perusal of data on Cu, Mn and Zn content of feedstuffs collected during the survey showed variation when compared with the values obtained in the surveys of feeds and fodders in North Gujarat and other part of Gujarat. The possible reason for such variations may be that with the introduction of high yielding crop varieties, intensive crop systems and extensive fertilizer application; the mineral profile in soil, plants or animal feedstuffs are rapidly changing, which in turn affect the mineral status of animals (Miller, 1979; Singh and Sangwan, 1987; Vasudevan, 1987; Underwood and Suttle, 1999).

The percentage of the feed samples collected during survey and containing Cu, Mn and Zn below critical levels (Cu < 8ppm, Mn < 40ppm and Zn < 30ppm) has also been worked out for developing a better understanding on the subject and the data is given in Table 2.

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