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Mineral Profile Status of Dairy Animals of S.D.A.U Adopted Villages of Dantiwada Taluka

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Abstract

Ten villages adopted by Sardarkrushinagar Dantiwada Agricultural University were selected for the study of mineral profile in dairy animals. Samples of various feeds and fodders were collected with detail information of feeding practices in area. The requirement of Cu, Mn and Zn for potential production were calculated which were compared with actual availability of the minerals. The outcome of the study revealed significant low level of Cu and Zn in Diet while Mn was in good amount. To overcome deficiency of Cu and Zn, supplementation level were suggested.

Keywords: Feed; Minerals; Production; Supplementation.

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Introduction

Mineral elements are considered to be inevitable for the normal metabolic and physiological processes of animal systems. The under supply of minerals in livestock rations is the most common feature. Especially, marginal deficiencies are expressed as sub-normal growth or low productions that are difficult to diagnose and result in significant economic losses. The deficiency of certain minerals may not affect crops yields but their availability from such forages may be inadequate for requirement of livestock. It is therefore necessary to generate information on mineral status area wise so as to identify deficiencies or toxicities.[1] Area wise mapping of elements in feed and fodder is relatively a rapid, reliable and cost effective method of providing baseline data on the levels of macro and microelements.

Materials and Methods

The survey was conducted in ten villages *viz.* Vaghrol, Nilpur, Lodapa, Fatepura, Dhaneri, Jegol, Dantiwada, Bhadali, Nani Bhakhar, and Moti Bhakhar. Random sampling technique was used to select the respondents. In each village, 10 farmers who own animal/s producing at least 10 kg or more milk per day

Table 1: Average Estimated Levels of Cu, Mn and Zn Supplied to Buffaloes in Comparison to their Calculated Requirement

Village	Mineral intake (mg/day)			Mineral Requirement (mg/day)			Mineral intake (% of Requirement)		
	Cu	Mn	Zn	Cu	Mn	Zn	Cu	Mn	Zn
Vaghrol	150.01	975.55	777.89	172.23	715.58	1417.96	87.10	136.33	54.86
Nilpur	129.60	937.20	732.62	160.56	658.24	1302.45	81.35	142.38	56.25
Lodapa	147.84	952.24	816.34	168.14	704.10	1430.67	88.16	135.24	57.06
Fatepura	131.72	854.24	682.66	148.84	621.36	1250.31	89.00	137.48	54.60
Dhaneri	158.09	963.88	860.98	179.41	742.25	1472.27	88.11	129.86	58.48
Jegol	143.50	882.51	644.23	164.05	667.86	1360.00	87.50	132.14	47.37
Dantiwada	134.48	809.40	705.70	156.84	648.46	1286.37	85.66	124.82	54.86
Bhadali	149.04	887.78	715.07	162.00	679.88	1299.00	92.68	130.58	55.12
Nani Bhakhar	134.30	816.38	838.57	158.36	653.21	1302.33	85.46	124.98	64.39
Moti Bhakhar	131.38	822.71	730.46	151.74	632.37	1275.25	87.33	130.10	57.28
Average	**140.99**	**890.18**	**750.45**	**162.21**	**672.33**	**1333.66**	**87.23**	**132.39**	**56.02**

Table 2: Average Estimated Levels of Cu, Mn and Zn Supplied to Cows in Comparison to their Calculated Requirements

Village	Mineral intake (mg/day)			Mineral Requirement (mg/day)			Mineral intake (% of Requirement)		
	Cu	Mn	Zn	Cu	Mn	Zn	Cu	Mn	Zn
Vaghrol	136.79	846.05	739.24	153.27	613.08	1260.22	89.26	138.00	58.66
Nilpur	124.99	848.26	679.68	146.88	587.52	1207.68	85.10	144.38	56.28
Lodapa	140.31	853.58	758.82	153.08	612.02	1258.00	91.66	139.47	60.32
Fatepura	131.22	776.20	731.68	142.23	568.86	1169.20	92.26	136.45	62.58
Dhaneri	137.91	846.41	763.18	156.42	625.68	1286.12	88.17	135.28	59.34
Jegol	126.58	728.28	589.31	135.54	542.16	1114.44	93.39	134.33	52.88
Dantiwada	120.98	704.89	682.63	137.16	548.64	1227.76	88.21	128.48	55.60
Bhadali	136.02	778.59	786.19	145.26	581.04	1194.36	93.64	134.00	60.74
Nani Bhakhar	126.88	744.66	754.93	147.33	589.32	1211.38	86.12	126.36	62.32
Moti Bhakhar	122.62	720.43	654.75	138.78	555.12	1141.08	88.36	129.78	57.38
Average	**130.43**	**783.82**	**714.41**	**145.53**	**582.34**	**1207.02**	**89.61**	**134.65**	**58.61**

Table 3: Suggested Supplementation of Cu and Zn to Obviate Deficiency in Buffaloes

Village	CuS04 (mg/d)	ZnS04 (g/d)	Mineral Mixture as per BIS Specification
Vaghrol	92.58	1.93	80
Nilpur	129.00	1.72	72
Lodapa	85.25	1.86	76
Fatepura	71.33	1.72	72
Dhaneri	92.54	1.54	64
Jegol	85.62	1.44	60
Dantiwada	93.16	1.93	80
Bhadali	54.00	1.77	73
Nani Bhakhar	100.0	1.40	59
Moti Bhakhar	84.83	1.65	69

Table 4: Suggested Supplementation of Cu and Zn to Obviate Deficiency in Cows

Village	CuS04 (mg/d)	ZnS04 (g/d)	Mineral Mixture as per BIS Specification
Vaghrol	68.48	1.57	65
Nilpur	91.89	1.60	67
Lodapa	53.20	1.51	63
Fatepura	45.87	1.32	55
Dhaneri	77.12	1.58	66
Jegol	37.33	1.59	66
Dantiwada	38.5	1.65	69
Bhadali	85.20	1.23	51
Nani Bhakhar	67.33	1.38	57
Moti Bhakhar	62.10	1.47	61

were selected. Information regarding the amount and types of feeds and fodders being offered to the animals, approximate rate of daily feed intake by individual animal, milk yield 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. Their requirements for Cu and Mn [2] and Zn[3] were worked out. 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.[4]

Results and Discussion

The overall availability of Cu in daily diet of dairy animals was low. In case of buffaloes, 140 mg/day against the requirement of 162 mg/day. In case of cattle, it was 130 mg/day against requirement of 145 mg/day. The availability of Mn was higher than needed one. In case of buffaloes, actual availability was 890 mg/day against the requirement of 672 mg/day and in cattle, 783 mg/day against requirement of 582 mg/day. The availability of Zn was significantly low in dairy animals feeding. In case of buffaloes was 750 mg/day against the requirement of 1333 mg/day. In case of cattle, it was 714 mg/day against requirement of 1207 mg/day. Overall there were deficiency of 12.77% and 43.98% in Cu and Zn supply for buffaloes and which was of 10.38% and 41.39% in case of cattle. To maintain the essential level in daily diet plan supplementation of $CuSO_4$ and $ZnSO_4$ should be given. Suggested level of $CuSO_4$ (24%) in buffaloes were 54 to 129 mg/day while $ZnSO_4$ (33%) 1.40 to 1.93g/day to overcome deficiency. In cattle level of $CuSO_4$ (24%) in was 38 to 91 mg/day while $ZnSO_4$ (33%) 1.23 to 1.60 g/day.

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