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Physical-chemical quality of drinking water for ruminants: a preliminary study

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Abstract

Water quality is a very important factor to improvement ruminant production. The aim of this study was to determine the physical-chemical quality of drinking water for cattle and sheep in Zona da Mata Alagoana. This research was conducted in three cattle farms and one sheep farm located in Viçosa and Chã Preta. The trial was carried out from November 2016 to January 2017. On all farms the animals fed on pasture with water always available in the trough, excepted for one cattle farm that animals drank in water reservoir. Only one sample was collected on each farm on days that did not rain. The samples were identified as follows: Sample 1 = Dairy cow farm (trough), Sample 2 = Meat sheep farm (trough), Sample 3 = Beef cattle farm (water reservoir) and Sample 4 = Dairy cow farm (trough). The water samples were collected in bottles of mineral water and immediately after they were identified and sent to Central Analítica laboratory in Maceió – AL to analyze the physical – chemical parameters according to Standard Methods. The following analyzes were performed: pH, turbidity, total hardness, eletric conductivity, sulfate, nitrate, nitrite, sodium, chlorides, total iron, calcium. The physical – chemical properties data were presented by a descriptive statistical analysis. The results are shown in the Table 1. All parameters are within the allowed limits, except for turbidity and total iron. The turbidity values were higher for samples 3 and 4 (10,1 NTU; 12,0 NTU respectively) than the maximum limit (Maximum 5,0). The total iron was much higher for the sample 3 (8,193 mg Fe/L) than the limit value and the others samples (Table 1). Probably because sample 3 is coming from water reservoir. In conclusion, the quality of the water is good and safe for the consumption of the animals.

Table 1 - Physical-chemical properties of drinking water for cattle and sheep

Item	Sa* 1	Sa* 2	Sa* 3	Sa* 4	Limits
pH	7,34	8,12	8,15	7,98	6,0 – 9,0
Turbidity (NTU)	3,2	1,8	10,1	12,0	Max. 5
Total hardness (mg $CaCO_3$/L)	256,0	262,0	120,0	50,0	Max. 500
Electric conductivity (µS/cm)	575,0	612,0	366,0	228,0	-
Sulfate (mg SO_4/L)	141,79	163,28	83,84	48,33	Max. 250
Nitrate (mg/L)	0,11	0,57	1,17	0,49	Max. 10
Nitrite (mg/L)	<0,01	<0,01	0,01	0,00	Max. 1
Sodium (mg Na/L)	11,1	16,8	25,3	28,1	Max. 200
Chlorides (ppm Cl)	82,17	85,21	72,02	40,58	Max. 250
Total iron (mg Fe/L)	0,122	0,097	8,193	1,010	Max. 0,3
Calcium (mg Ca/L)	43,98	48,86	12,22	4,07	-

Note: *Sa = Sample