

Water Analyte Concentrations Drinking Water for Dairy Cattle

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Measurement	Average ^a	Expected ^b	Possible problems ^c
pH for cows	7.0	6.8-7.5	Under 5.1 or over 9.0
pH for veal calves		6.0-6.4	
---parts per million (ppm, or mg/liter)---			
Nitrate as NO ₃ ^d	34	0-44	Over 100
Calcium	60	0-43	Over 500
Magnesium	14	0-29	Over 125
Potassium	9.1	0-20	
Copper	0.1	0-0.6	Over 0.6 to 1.0
Iron	0.8	0-0.3	Over 0.3 (taste, veal)
Zinc		0-5	Over 25
Sodium	22	0-3	Over 20 for veal calves
Manganese	0.3	0-0.05	Over 0.05 (taste)
Chloride*	20	0-250	
Sulfate	36	0-250	Over 2,000
Total dissolved solids	368	500 or less	Over 3,000
Total hardness	208	0-180	
Total bacteria/100 ml	336,300	Under 200	Over 1 million
Total coliform/100 ml	933	Less than 1	Over 1 for calves; over 15-20 for cows

^aFor most measurements, averages are from about 350 samples; most samples are taken from water supplies in farms with suspected animal health or production problems.

^bBased primarily on criteria for water acceptable for human consumption.

^cBased primarily on research literature and field experiences.

^dShould not be consumed by human infants if over 44 ppm NO₃ or 10 ppm NO₃-N.

^eIf pollution is from human waste, fecal coliform should exceed fecal streptococcus by several times. If pollution is from an animal source, strep should exceed coliform in refrigerated samples analyzed soon after sampling.

*Free or residual chlorine concentrations up to 0.5 to 1.0 ppm have not affected ruminants adversely. Municipal water supplies with 0.2 to 0.5 ppm have been used successfully. Swimming pool water with 1.0 ppm, or 3 to 5 ppm chlorine in farm systems with short contact time have caused no apparent problems for cattle.

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