

## Guidance on nitrates in livestock water supply

### Why should I be concerned about nitrates in my water supply?

High nitrate concentrations in water can harm livestock and domestic animals. Horses and ruminants like cattle, sheep, and goats are most susceptible to nitrates. Bacteria in their digestive systems reduce nitrate to nitrite, and the elevated nitrite levels in the blood can interfere with hemoglobin's ability to carry oxygen through the body. Symptoms of nitrate poisoning include labored breathing, a blue muzzle, trembling, lack of coordination, and an inability to stand. The effects can be reversed if nitrates are removed from the animals' diet.

### What about feed?

Animal feeds can also contain nitrates, which can compound on nitrates in water supplies. Additionally, silage or hay cut during a drought can have higher nitrate concentrations.

### How do I determine the level of nitrates in my water supply?

The Minnesota Department of Agriculture has recommendations for testing well water for nitrate levels.

[Minnesota Department of Agriculture's Water Testing for Nitrate page \(https://www.mda.state.mn.us/water-testing-nitrate\)](https://www.mda.state.mn.us/water-testing-nitrate)

### What do I do with the test results?

Lab reports might list nitrate in one of two ways, as  $\text{NO}_3\text{-N}$  or  $\text{NO}_3$ . The following recommendations are from a South Dakota State University study:

#### Recommendations for water usage based on nitrate levels

Levels of nitrate-N ( $\text{NO}_3\text{-N}$ )	Levels of nitrate ( $\text{NO}_3$ )	Recommended action
0-100 ppm	0-440 ppm	Experimental evidence indicates this water should not harm livestock.
100-300 ppm	440-1300 ppm	This water should not by itself harm livestock. If animals are also fed hay, forage, or silage containing high levels of nitrate, consider treatment options or alternate water sources.
>300 ppm	>1300 ppm	This water could cause typical nitrate poisoning in cattle, sheep, or horses, and it is not recommended for any livestock, consider treatment options or alternate water sources.