



Nitrates and Nitrites



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Background on Nitrates

Nitrate is a water soluble molecule made of nitrogen and oxygen. It is formed when nitrogen from ammonia or another source combines with oxygenated water. Nitrate is naturally found in plants and many foods, and is tasteless and odorless. Since it does not evaporate or bind well to soil, it is used by plants or stays in the water. Nitrate reactions can cause oxygen depletion in water, which may cause fish kills. Most adults take in 20-70 mg of nitrate per day from vegetables according to the World Health Organization. It is not thought to be harmful if part of a balanced diet as humans can readily absorb and excrete nitrates in urine.

Background on Nitrites

Nitrite is a salt or ester of nitrous acid. It can be reduced to nitrate, nitric oxide, or ammonia by many species of bacteria. Nitrites can produce nitrosamines under certain conditions such as acid in human stomachs, which can lead to gastric problems after long exposure.

Sources of Nitrates & Nitrites

- Fertilizers, animal waste, human sewage, decaying plant debris, and industrial waste
- Sodium nitrite is used for the “curing of meat” because it prevents bacterial growth and gives a dark red color

Acknowledgements

Minnesota Department of Agriculture
Minnesota Department of Health
US Environmental Protection Agency

Health Concerns

- Causes “blue baby syndrome” or methemoglobinemia as nitrate changes to nitrite in their stomachs
- Pregnant women should not drink if contaminated; more susceptible to methemoglobinemia
- People with heart or lung disease, inherited enzyme defects, or cancer are more sensitive
- Boiling water for more than 10 minutes can make nitrate more concentrated (freezing or letting stand does not eliminate nitrates either)
- Causes “brown blood disease” in fish

Remedies

Federal maximum contaminant level (MCL) for nitrate in drinking water is 10 mg/L. Nitrite MCL is 1 mg/L or (part per million).

- Short term solution: buy bottled water
- Long term solutions: reverse osmosis
distillation
ion exchange unit
repair your well casing
have a deeper well made

(in-line filters and softeners **do not** remove nitrates)

Why Test for Nitrates and Nitrites

- If you have a shallow well, dug well, or have a damaged or leaking casing
- If there is a pregnant or nursing woman in the home
- If you have children, ruminant animals, horses, or infant animals
- If you have a fish tank or pond
- If you live near a livestock lot or heavily fertilized area



For more information please contact RMB Environmental Laboratories, Inc.