

FACTS



Nitrate and Nitrite in Drinking Water

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WHAT ARE NITRATE AND NITRITE?

Nitrate and nitrite are related nitrogen compounds that occur naturally in soil, water, plants, and food. They are formed when microorganisms in the environment break down organic materials, such as plants, animal manure, and sewage.

Nitrate can also be found in chemical fertilizers.

Nitrite is used as a curing agent for meat. Nitrate is more commonly found in water than nitrite.

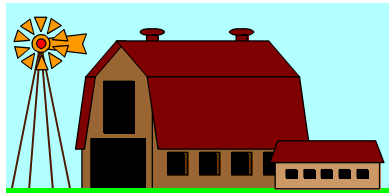


HOW CAN THESE CHEMICALS GET INTO YOUR DRINKING WATER?



Nitrate can get into your drinking water from runoff or seepage into ground water from farms, golf courses, home lawns and gardens. Other sources of nitrate and nitrite in water include landfills, poorly managed animal feedlots,

and faulty septic systems. If you have a private well, nitrate may get into the water more easily if your well is poorly constructed or improperly located.



HOW CAN YOU FIND OUT IF THESE CHEMICALS ARE IN YOUR DRINKING WATER?

Under U.S. Environmental Protection Agency (USEPA) regulations, all public water supplies using ground water must be monitored for nitrate and nitrite. To obtain the test results for your drinking water system, contact your water company or the New Jersey Department of Environmental Protection (NJDEP), Bureau of Safe Drinking Water. If you have a private well, you can get your water tested by a private laboratory listed in the telephone directory. Call the NJDEP, Office of Quality Assurance, to make sure that the laboratory is certified to test for these contaminants in your drinking water.

High levels of nitrate from the following sources may indicate the presence of other contaminants in your well water:

If you have high levels of nitrate or nitrite in your well, you should contact your local health department or cooperative extension office for advice on additional testing for microbial or pesticide contamination.

- **Faulty septic tank or nearby animal feedlot:** Nitrate contamination in well water from human or animal waste may mean that microbial contaminants are also present.
- **Agricultural or residential fertilizer use.** Wells with nitrate contamination from fertilizers may also contain pesticides.

DO THESE CHEMICALS PRODUCE HARMFUL HEALTH EFFECTS?

Under certain conditions, the body changes nitrate to nitrite. Methemoglobinemia, a form of anemia, can result from the reaction of nitrite with hemoglobin in the blood. When this occurs, the ability of the blood to carry oxygen to the body's tissues is decreased.

Consult your physician or local hospital emergency room if you suspect that an infant is ill because of drinking water contamination.

In infants, this condition is called "blue baby" syndrome. Infants are especially susceptible for four reasons: (1) their fluid intake per body weight is greater than that of adults;

(2) their stomach acidity can be lower than adults, thus allowing the growth of stomach bacteria that change nitrate to nitrite; (3) they have a form of hemoglobin that is more likely to form methemoglobin; and (4) they are less able to change methemoglobin back to normal hemoglobin.



Pregnant women are also more susceptible to nitrate/nitrite-induced methemoglobinemia since they have higher than normal levels of methemoglobin. The level of methemoglobinemia peaks around the 30th week of pregnancy and declines to a normal level after delivery.

Nitrite can form a variety of N-nitroso compounds by reacting with proteins in the stomach. Some of these compounds have been found to cause cancer in animals. However, according to the USEPA, the data is inadequate to determine whether exposure to nitrate and nitrite in drinking water can result in human cancer.

IS THERE A MEDICAL TEST FOR METHEMOGLOBINEMIA?



For methemoglobinemia, a laboratory test can tell you how much methemoglobin is in your blood.

In case of a health emergency, contact your physician, the New Jersey Poison Control Center (800-962-1253) or your hospital emergency room.

IS THERE A SAFE LEVEL OF THESE CHEMICALS IN YOUR DRINKING WATER?

In order to prevent or reduce the chances of health effects occurring due to contaminants in drinking water, "Maximum Contaminant Levels" (MCLs) have been established by the USEPA and the NJDEP. MCLs are set at levels that are below those known to cause harmful effects. MCLs are legal limits that public water systems must meet.

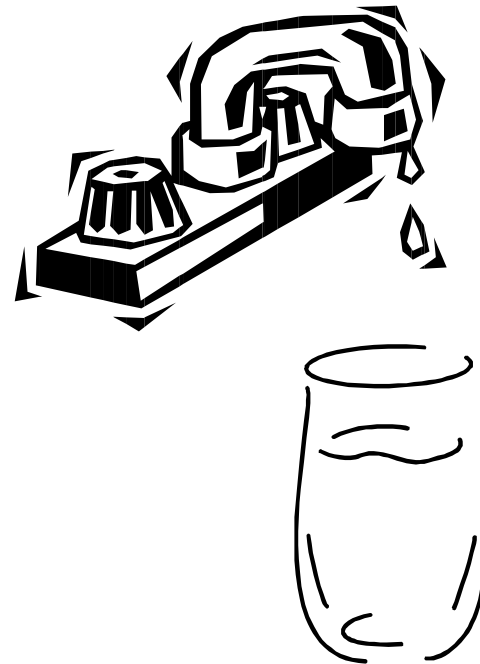
In 1962, the U.S. Public Health Service recommended a permissible level equal to 10 parts per million (ppm) or 10 milligrams of nitrate-nitrogen in 1 liter of drinking water (mg/l). Since this standard takes available health effects information into account, infants are

unlikely to have methemoglobinemia caused by drinking water that contains nitrate at or below this level. This level is the same as the federal MCL for drinking water as listed in the following table:

Maximum Contaminant Levels (MCLs)

Chemical	MCL ¹
Nitrate	10 ppm
Nitrite	1 ppm
Nitrate/nitrite (combined)	10 ppm
¹ measured as nitrogen in milligrams per liter (ppm)	

- If you are on a public water system and your water exceeds the MCLs, the water company, by state law, must take action to bring the water below these limits.
- If you have a private well, you should report any test results that exceed MCLs to your local health department. They will be able to investigate the source of the contamination and see if other wells around you are also contaminated.



If your water exceeds one of these MCLs, it does not necessarily mean that the water will make you sick. Because of the uncertainty, however, it is important that steps be taken to reduce the levels of these chemicals in drinking water.

SHOULD YOU CONTINUE TO USE YOUR DRINKING WATER IF THESE CHEMICALS ARE FOUND?

Whether you receive public water or have a private well, you should follow the advice of your local health department. Their advice will be based on the amount of the contaminant found in your water and whether infants are exposed to the water. For example, they may recommend that pregnant women and infants use an alternate source of drinking water, such as bottled water, until the problem is resolved. **Boiling water is not recommended as this will increase the concentration of nitrate due to evaporation of the water.**



WHAT CAN YOU DO TO REMOVE THESE CHEMICALS FROM YOUR DRINKING WATER?

The USEPA has identified the Best Available Technologies (BATs) that are capable of removing regulated contaminants from your drinking water. The BATs for both nitrate and nitrite are anion exchange and reverse osmosis. If you have a private well, repair of the well casing or a deeper well may be the solution. For more information on home water treatment devices, contact the NJDEP, Bureau of Safe Drinking Water, the USEPA, Safe Drinking Water Hotline, or NSF International.

FOR MORE INFORMATION...



- ◆ **Local Health Department**
Local telephone directory
Local water issues, private well testing guidance, and health effects of nitrate and nitrite in drinking water

- ◆ **New Jersey Department of Health and Senior Services
Consumer and Environmental Health Services**
PO Box 369
Trenton, NJ 08625-0369
(609) 588-3120
Health effects of nitrate and nitrite in drinking water

- ◆ **New Jersey Department of Environmental Protection
Bureau of Safe Drinking Water**
(609) 292-5550
Federal and State drinking water regulations and public water supply monitoring results

- Office of Quality Assurance**
(609) 292-3950
NJ certified laboratories for nitrate and nitrite in drinking water

- ◆ **United States Environmental Protection Agency
Safe Drinking Water Hotline**
(800) 426-4791
Federal drinking water regulations, health effects of nitrate and nitrite in drinking water, and other water safety issues

- ◆ **NSF International**
(313) 769-8010
(800) NSF-6275
Home water treatment device and bottled water information

- ◆ **Environmental and Occupational Health Clinical Center
University of Medicine and Dentistry/New Jersey**
(732) 445-0123
Physician referral or consultation on health effects of nitrate and nitrite

- ◆ **New Jersey Poison Control Center**
(800) 962-1263

OTHER AVAILABLE MATERIALS...



- FACTS: Lead in Drinking Water*
- FACTS: Mercury in Drinking Water*
- FACTS: Microorganisms in Drinking Water*
- FACTS: Pesticides in Drinking Water*
- FACTS: Volatile Organic Compounds in Drinking Water*
- Parasites and New Jersey Drinking Water: Information on Giardia and Cryptosporidium*
- Contacts and Information: Drinking Water Issues*
- Don't Drink Lead (11" x 17" poster)*
- Don't Drink Lead (8½" x 11" flyer)*
- Keep Your Baby Safe From Lead (11" x 17" poster)*
- Keep Your Baby Safe From Lead (8½" x 11" flyer)*

Name _____

Address _____

Town _____ State _____ Zip _____

Please send this order form to:

New Jersey Department of Health and Senior Services
Consumer and Environmental Health Services
PO Box 369
Trenton, NJ 08625-0369



Division of Environmental and Occupational Health Services
Consumer and Environmental Health Services
PO Box 369
Trenton, NJ 08625-0369