

## Nitrates in Our Water

Nitrates are an unwelcome pollutant into Iowa's rivers and streams. As is typical every spring, heavy spring rains wash the nitrates off the farm fields, into field tile, and then into creeks, streams, rivers, and lakes. Snowmelt can also flush nitrates off farm fields into water bodies.

Nitrate is formed from commercial fertilizers and manure. The cycle begins when plants do not absorb all of the fertilizer and manure that was applied to the land, both farmland and urban lawns. Because 95% of Iowa's land is farmed<sup>1</sup>, the largest contributor to the nitrate problem is farmland. That fertilizer and manure stays in the soil over the winter and forms a chemical called nitrate.

### Health effects of exposure to nitrates

Nitrates can cause Blue Baby Syndrome in infants by reducing the blood's capacity to carry oxygen, which can cause death or serious health issues. Nitrates have also been implicated in miscarriages. Additionally nitrates may be implicated in cancer, including brain tumors, leukemia, and nose and throat cancers<sup>2</sup> and colorectal cancers<sup>3</sup>. Nitrates are endocrine disruptors, which means that they act like a hormone in the human body.<sup>4</sup>



Photo credit: Charlie Rahm, USDA NRCS

Because of the health problems caused by nitrates, the Environmental Protection Agency has set a limit of 10 milligrams of nitrate per liter of water. A higher level of nitrates causes health problems to those who drink the water. However in two studies published in 2018 indicate that 10 milligrams of nitrate per liter of water may be too high to protect the public health and even suggest that the level should be set at half its current level<sup>5</sup>.

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<sup>1</sup> Perry Beeman, "Nitrates in rivers hit record levels," *The Des Moines Register*, May 10, 2013

<sup>2</sup> "Nitrates and Nitrites," Environmental Protection Agency, May 22, 2007

<sup>3</sup> Aarhus University. "Nitrate in drinking water increases the risk of colorectal cancer, study finds." *Science Daily*, February 20, 2018. [www.sciencedaily.com/releases/2018/02/180220095019.htm](http://www.sciencedaily.com/releases/2018/02/180220095019.htm);

Jörg Schullehner, Birgitte Hansen, Malene Thygesen, Carsten B. Pedersen, Torben Sigsgaard. "Nitrate in drinking water and colorectal cancer risk: A nationwide population-based cohort study", *International Journal of Cancer*, 2018; DOI: 10.1002/ijc.31306

<sup>4</sup> Fact Sheet – Nitrate Removal Facility, Des Moines Water Works.

<sup>5</sup> Jörg Schullehner, Birgitte Hansen, Malene Thygesen, Carsten B. Pedersen, Torben Sigsgaard. "Nitrate in drinking water and colorectal cancer risk: A nationwide population-based cohort study", *International Journal of Cancer*, 2018; DOI: 10.1002/ijc.31306;

Mary H Ward, Rena R. Jones, Jean D. Brender, Theo M. de Kok, Peter J. Weyer, Bernard T. Nolan B, Christina M. Villanueva, Simone G van Breda, "Drinking Water Nitrate and Human Health: An Updated Review", *International Journal of Environmental Research and Public Health*, July 23, 2018;

## Effects of Nitrates on drinking water

Both private wells and urban drinking water sources can be polluted by manure and commercial fertilizers.

Urban water treatment plants must periodically test the water being delivered to its customers. When drinking water is out of compliance with nitrate levels, then nitrate removal systems and procedures must be installed. Sometimes those procedures involve taking water from another river or from other wells. There is a risk when those alternate sources are also contaminated with nitrates.

Owners of private wells need to have their drinking water tested annually for nitrates and other pollutants. If your well is contaminated, then an alternate source of drinking water must be found. Bottled water is expensive, a cost that is borne by the owner of the well and not by the polluter.

## Solutions

In order to ensure that the drinking water in Iowa remains safe to drink, the Iowa Chapter supports the following policies:

- Restoring wetlands which can hold snow melt and rain water and filter pollutants from it. In key areas, the public should own the wetlands to ensure wetlands are maintained.
- Ensuring that manure is applied to fields in appropriate amounts, with inspections enforcement for those who do not comply.
- Setting numerical standards for all watersheds for the amount of nitrate and nitrogen that can be in the water by non-point agricultural sources, with regular water monitoring and enforcement. The standards should include a timeline for compliance. Although upstream natural processes, land use, chemical use, land management practices all affect non-point pollution in a stream, each watershed should be given a target that reflects clean, non-polluted water.
- Monitoring the water to determine where strategies are not working or where landowners and farmers are not implementing nutrient reduction strategies.
- Ensuring enforcement actions are taken when water quality standards are not met in a watershed.
- Establishing a surcharge on all agriculture land to pay for restoring wetlands in key locations, training farmers on land management practices and farming techniques that will reduce nitrates and nitrogen from leaving the farmland, and creating a grant and loan program for installing techniques on the farms. The solution to safe drinking water is to make the people who pollute it pay to clean it up; today that is not happening. Today the urban residents pay to take the pollutants out of their drinking water, pollutants that were put in the water upstream; pay for storm sewers; and pay to ensure that pollutants have been removed from their wastewater.
- Enhancing the technical support available to farmers and landowners who want assistance in determining techniques and land management practices to use on their land and on the land they lease. Those techniques include installing buffer strips along streams; enrolling erodible ground in the federal Conservation Reserve Program (CRP); installing field contours, prairie strips and grass



*Photo credit: Tim McCabe, USDA NRCS*

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Margaret McCasland, Nancy M. Trautmann, Keith S. Porter, Robert J. Wagenet, "Nitrate: Health Effects in Drinking Water", Cornell Cooperative Extension

waterways; planting cover crops; and testing soil before applying fertilizer. Farmers are paying for fertilizers that are applied to their fields. When the fertilizer washes off the fields and into streams, the crops are not able to use the fertilizer and the farmer wastes money on purchasing the fertilizer.

Droughts and wet periods are part of the weather cycle in Iowa. Farming in Iowa requires the ability to respond to those weather cycles. That response includes holding nitrogen and nitrates on the land where they can be used as fertilizer for the crops and not using the rivers and streams as a garbage can. It is always easy and cheaper to dump pollutants into the environment and not pay to clean them up or to handle them correctly, but it is not acceptable to foul someone's drinking water.

Iowans need to get serious about reducing nitrogen and nitrate pollution in our waters. The Des Moines Water Works has invested in de-nitrification equipment; none of the other cities in Iowa have the equipment. Likewise private well owners do not have de-nitrification equipment and also are not testing their water as frequently as municipal sources. Solutions to keeping the drinking water safe from nitrates are becoming more expensive and more difficult as nitrate levels climb and remain high for extended periods of time.

Yet de-nitrification is simply a bandage. The solution is to reduce the nitrates that enter our water bodies through improved land management and farming techniques. Voluntary efforts have not been successful in reducing the levels of nitrogen and nitrate entering our water bodies and in keeping the levels reduced.

The answer to safe drinking water is to keep the pollution out of it.