

## Acknowledgement:

This Fact Sheet is one of a series developed by an Interagency Committee with representatives from Saskatchewan Health, Health Regions, Saskatchewan Watershed Authority, Saskatchewan Environment, Saskatchewan Agriculture and Food, Agriculture and Agri-Food Canada – PFRA and Health Canada.

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Government of  
Saskatchewan

# Nitrite

(For Private Water and Health Regulated Public Water Supplies)

## What Is Nitrite?

Nitrites are composed of nitrogen and oxygen with the nitrite ion found in salts having the chemical formula  $\text{NO}_2^-$ . Nitrites are part of the nitrogen cycle, that is the transformations of nitrogen and nitrogen containing compounds in nature. While nitrites alone do not signify a pollution problem, their presence in combination with ammonia and nitrate may indicate environmental contamination.

## How Does Nitrite Get Into The Water?

In water the most commonly found forms of nitrogen are nitrate, nitrite, ammonia and organic nitrogen (such as might be found in plant matter). Nitrite can be formed by the oxidation of ammonia or the reduction of nitrate. Generally nitrates are found in much higher concentrations than nitrites in water since nitrates are the more stable, with the ratio of the two dependent on factors such as acidity and temperature.

Nitrites can enter water through the use of corrosion inhibitors in industrial process water, or through the conversion from ammonia or nitrates. Nitrates can be introduced into water through the breakdown of human or animal sewage by bacteria in the environment, or by runoff from fertilized land.

## How Do Nitrites Affect My Health?

Nitrites consumed directly, or formed after the conversion of nitrates to nitrites in the stomach, react with iron compounds in human blood reducing the ability of those iron compounds to bind oxygen. Babies under 6 months of age are particularly susceptible, resulting in symptoms such as shortness of breath and a blue colour around the mouth referred to as blue baby syndrome (methemoglobinemia).

Long-term exposure to high levels of nitrites in adults can result in increased urine production since nitrites are a diuretic, while nitrites have also been used as laxatives. In extreme cases nitrites can also increase the risk of hemorrhaging in the spleen.

## Other Considerations?

Nitrites are extensively used in the process to cure meats, so the total exposure to nitrites should take into account both water and meat consumption.

Nitrites in acidic solutions (such as found in a stomach) can form nitrous acid that can react with products of amino acids (e.g. from proteins) to produce nitrosamines that are known carcinogens.

## How Can Nitrites Be Removed From My Drinking Water?

Nitrites can be removed from drinking water by distillation, while reverse osmosis treatment will also significantly reduce nitrite levels, as will some specific ion exchange processes. Boiling water will not remove nitrites.

## What Is The Standard For Nitrite In Drinking Water?

The Health Canada Guidelines for Canadian Drinking Water Quality and the Saskatchewan Environment's Drinking Water Quality Standards establish a maximum acceptable concentration for nitrites of 3.2 mg/L. This is sometimes expressed in terms of nitrogen as nitrite, in which case this same concentration converts to 1 mg/L as nitrite-nitrogen.

## How Can I Find Out If My Water Has A High Concentration Of Nitrite?

Most water quality testing laboratories can determine nitrites in a water supply. Due to the interconversion that is possible between nitrate and nitrite it is not uncommon for the analysis of the total nitrate and nitrite levels to be performed, with the measured value converted to an effective single nitrate concentration due to the likelihood for the conversion of nitrite to the more stable nitrate. Containers are available from the Saskatchewan Disease Control Laboratory, local health region office or rural municipality office. For more information on sampling instructions and containers you should contact an accredited laboratory.

## Need More Information?

### Health Regulated Public Water Supply

For more information on this Fact Sheet and/or other water quality issues relating to Health Regulated Public Water Supplies contact your local Health Region Public Health Inspector.

### Private Water Supply

For more information on how nitrite impacts on Human Health contact your local Health Region office. For information on how nitrite impacts Agricultural Operations contact Saskatchewan Agriculture through the Agriculture Knowledge Centre at 1-866-457-2377 or on the internet (<http://www.agriculture.gov.sk.ca/AKC/>).

<p><b>Government of Saskatchewan</b> Water Information website <a href="http://www.SaskH2O.ca">www.SaskH2O.ca</a></p>	<p><b>Water Inquiry Line</b> Questions about water? Call 1-866-SASK H2O (1-866-727-5420) to be referred to proper agency.</p>
<p><b>Saskatchewan Ministry of Health</b> <a href="http://www.health.gov.sk.ca/environmental-health">http://www.health.gov.sk.ca/environmental-health</a> <b>Regional Health Offices</b> Saskatoon: Saskatoon (306) 655-4605 Sunrise: Yorkton (306) 786-0600 Kelsey Trail: Melfort (306) 752-6310 Five Hills: Moose Jaw (306) 691-1500 Sun Country: Weyburn (306) 842-8618 Heartland: Rosetown (306) 882-6413 Prairie North: North Battleford (306) 446-6400 Prince Albert Parkland: Prince Albert (306) 765-6600 Cypress: Swift Current (306) 778-5280 Regina Qu'Appelle: Regina (306) 766-7777 Mamawetan Churchill River: La Ronge (306) 425-8512 Keewatin Yatthe: Buffalo Narrows (306) 235-5811 <b>Saskatchewan Ministry of Health</b> <b>Saskatchewan Disease Control Laboratory, Regina</b> General Inquiry 1-866-450-0000 Phone: (306) 798-2125 // Fax (306) 798-0071 Website: <a href="http://www.health.gov.sk.ca/lab">http://www.health.gov.sk.ca/lab</a></p>	<p><b>Saskatchewan Watershed Authority,</b> Head Office, Moose Jaw (306) 694-3900 Website: <a href="http://www.swa.ca">www.swa.ca</a> <i>Regional Offices:</i> <a href="http://www.swa.ca/AboutUs/Contact.asp?type=Offices">http://www.swa.ca/AboutUs/Contact.asp?type=Offices</a></p> <p><b>Sask Water Corporation</b> Head Office, Moose Jaw Customer Service 1-888-230-1111 Website: <a href="http://www.saskwater.com">http://www.saskwater.com</a></p> <p><b>Prairie Farm Rehabilitation Administration (PFRA)</b> - Agriculture and Agri-Food Canada Website <a href="http://www.agr.gc.ca/pfra/water/intro_e.htm">http://www.agr.gc.ca/pfra/water/intro_e.htm</a> <i>Regional Offices:</i> <a href="http://www.agr.gc.ca/pfra/sask_e.htm">http://www.agr.gc.ca/pfra/sask_e.htm</a></p> <p><b>Saskatchewan Ministry of Agriculture</b> General Inquiry 1-866-457-2377 Agricultural Operations Regina (306) 787-4680 Irrigation Development Outlook (306) 867-5500 Website: <a href="http://www.agriculture.gov.sk.ca">www.agriculture.gov.sk.ca</a></p>
<p><b>Health Canada</b> First Nation and Inuit Health Branch, Regina (306) 780-6561 // FAX (306) 780-7733 Website: <a href="http://www.hc-sc.gc.ca">http://www.hc-sc.gc.ca</a></p>	<p><b>Saskatchewan Ministry of Environment</b> Toll-Free 1-800-567-4224 or (306) 953-3750 Spill Emergency Toll-Free 1-800-667-7525 Website: <a href="http://www.environment.gov.sk.ca">http://www.environment.gov.sk.ca</a></p>
<p><b>Government of Saskatchewan</b> Water Information website <a href="http://www.SaskH2O.ca">www.SaskH2O.ca</a></p>	<p><b>Water Inquiry Line</b> Questions about water? Call 1-866-SASK H2O (1-866-727-5420) to be referred to proper agency.</p>