Sodium & Chloride in Well Water:

Health Considerations

Environmental & Occupational Health Assessment Program • August 2015

Introduction

Sodium and chloride are elements that are not highly toxic and comprise the basic components of common table salt. However, they can create concerns when they appear at elevated levels in drinking water. This fact sheet describes the potential sources, health risks and target levels of sodium and chloride in drinking water.

There are no enforceable federal or state standards for the level of sodium in drinking water. However there is a CT DPH guidance level of 100 mg/L for sodium that reflects current scientific and medical opinion on sodium dietary restrictions in those at risk for high blood pressure. The amount of sodium in a normal diet is 10 to 20 times higher than this guidance level. Adhering to this level ensures that drinking water does not become a substantial source of daily sodium, even for those on a sodium-restricted diet.

The Connecticut Maximum Contaminant Level (MCL) for chloride in public water system and private wells is 250 milligrams per liter (mg/L). Aside from the potential health concerns with sodium and high blood pressure, these sodium and chloride limits are intended to keep the water from tasting salty and from having a corrosive effect on plumbing.

How Does Sodium & Chloride Get Into Wells?

Sodium and chloride are elements that are very common in nature and in the human diet. They occur naturally in groundwater, typically at low concentration. However, sources such as road salt, both its storage and application to roads in winter, can be a significant source to groundwater. Other potential sources include industrial waste, sewage, fertilizers, water softener discharge, and living in coastal areas where sea water can influence the quality of groundwater.

In certain cases, the elevated sodium may come from a water softener as most softeners allow some sodium to enter the filtered water. The CT DPH guidance level of 100 mg/L applies to that case and any other reasons why sodium becomes high in a water supply well. Some water softeners use potassium chloride as the exchange agent to remove water hardness instead of sodium chloride. If this is the case, it is also important to monitor for potassium in tap water and inform your physician of the result.

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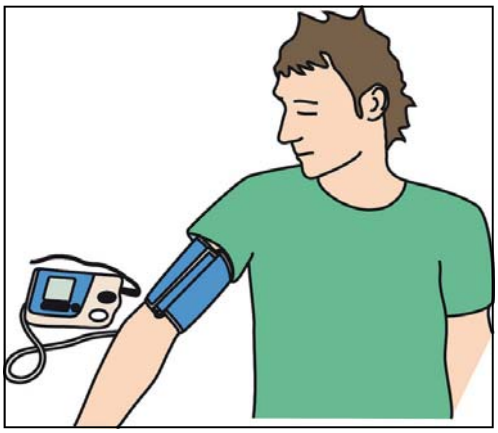
What Health Effects Are Caused by Drinking Sodium & Chloride Every Day in Tap Water?

There have been many studies on the potential effect of dietary sodium on blood pressure. Epidemiology studies show that in some cases lowering sodium intake to the official American Heart Association goal of 1500 mg per day can have a beneficial effect on blood pressure. In many cases the typical diet delivers greater amounts of sodium than this goal. For most people sodium in a water supply well does not present a substantial or unique health risk because the level obtained from water is much less than from the diet. However, certain individuals may be placed on low sodium diets (<1500 mg/d) due to heart, kidney or blood pressure conditions. Such individuals should test their water for sodium to make sure that it doesn't make a substantial contribution to the overall intake level. They should notify their physician if it is above 100 mg/L. This guidance value is primarily for private wells. For public supplies, CT DPH has a notification level of 28 mg/L that requires supplies to notify their customers at that and higher levels. However, that value is dated and the new 100 mg/L target can be used in discussion with your doctor regarding sodium levels in your drinking water.



As noted above, adults at risk for high blood pressure and related conditions are the sensitive group. We have no evidence that exposures to children at a school or day care center would lead to a health risk. Further, workplace exposures may tend to be of less concern than sodium in a residential supply given that most people consume more tap water at home than at work.

Chloride has a state MCL of 250 mg/L due to increasing conductivity, corrosivity and saline taste of the water at this and higher concentrations. While the chloride MCL does not have a health basis it is often elevated in concert with sodium.

Elevated levels of sodium and chloride can also impart a salty taste, interfere with the watering of certain plants, and increase the corrosivity of water, which in turn can affect household plumbing.

Testing for Sodium Chloride in Well Water

To determine if sodium and/or chloride are present in your well water, arrange to test your water with a state certified laboratory. Follow the laboratory's instructions carefully to avoid contamination and to obtain a good sample. Take precaution to not cross contaminate the samples during collection and consider proper transportation and handling of the samples once they've been collected. Home test kits may not provide accurate results.

Corrective Action

If chloride is present in well water at concentrations above the state MCL of 250 mg/L, it is advisable to stop drinking the water and take steps to find out and eliminate the source. The same is true for sodium concentrations in well water above the state guideline of 100 mg/L. However, it's important to keep in mind that for most people this is a small amount of sodium compared to what is ingested from the diet and so the sodium guideline pertains primarily to those who have a medical reason to restrict sodium from their diet. The local health department and the state Department of Energy and Environmental Protection (DEEP) can help you determine where the sodium or chloride contamination may be coming from.

If the source cannot be identified or cannot be resolved, you may need to consider using bottled water, installation of treatment, connecting to a public water system, if available, or drilling a new well over the long term. If using bottle water, read the label to determine the water's sodium content.

Treatment methods for sodium and chloride include reverse osmosis and distillation. If sodium levels in your well water are moderately high (over 100 mg/L) small distillation or reverse osmosis treatment units are available that will produce three to ten gallons of water per day (enough for drinking and cooking needs for a household).

Protecting Your Private Well Water

You can protect your well by paying careful attention to the land use activities that occur in the area near your well. Regular testing and adopting practices to prevent contamination can help ensure that your well supplies you with good quality water.

For More Information:

Treatment Questions:
Public Water Wells: CT DPH Drinking Water Section: 860-509-7333
Private Wells: CT DPH, Private Well Program, 860-509-7296.

Health Questions:
CT DPH, Environmental & Occupational Health Assessment Program, (860) 509-7740

Source Investigation: CT DEEP, contact the District Manager for your region, go to
http://www.ct.gov/deep/cwp/view.asp?a=2715&q=324994&deepNav_GID=1626