Sodium and Chloride in Drinking Water

Many people use the word “salt” when they intend to refer to sodium or to sodium chloride. When a salt such as sodium chloride dissolves in water it breaks up into positively- and negatively-charged ions. Sodium chloride breaks up into sodium and chloride ions in water. Every water supply contains some sodium and chloride.

Occurrence of Sodium and Chloride

Typical background levels of sodium and chloride are less than 20 milligrams per liter (mg/L) and 30 mg/L, respectively. A milligram per liter is the same as a part per million (ppm). In the immediate seacoast area, elevated levels of sodium and chloride occur naturally due to the proximity to sea water and wind-blown sea spray. Concentrations in groundwater in the seacoast area typically range up to 75 mg/L sodium and 150 mg/L chloride, respectively. Substantially higher levels of sodium and chloride tend to imply contamination by human activities, including road salt storage, use of road salt, discharges from water softeners, human or animal waste disposal, leachate from landfills, and other activities.

Use of Salt for Road Deicing

The application of deicing salts is an important component of maintaining road safety. The environmental impact of deicing salts can be minimized by use of best management practices.

Health Implications

At present there are no health-based standards for sodium or chloride under the Federal Safe Drinking Water Act. In the mid-1980s, USEPA had listed sodium in a group of contaminants called the Drinking Water Priority List, for which official maximum contaminant levels (MCLs) would be developed. MCLs are health-based standards that must be met by public water systems. A subsequent review of scientific evidence by EPA showed that the vast majority of sodium ingestion was from food rather than drinking water, and that the linkage between sodium and hypertension (high blood pressure) was still not well documented. Consequently in 1988, EPA removed sodium from the Drinking Water Priority List. In March 1998, EPA reissued the list, now known as the Drinking Water Contaminant Candidate List (DWCCL). That list included sodium. In September 2009, the final version of the third edition of the list was published, and sodium was again off the list. Visit the EPA website at www.epa.gov/ogwdw000/ccl/index.html for details.

When considering the health importance of sodium and chloride, EPA assumed that water users consume two liters of water per day, and found that 10 percent or less of a person’s daily sodium intake comes from drinking water. The rest is usually from food. Persons on a sodium-restricted diet should evaluate all sources of sodium when attempting to reduce overall sodium intake. It is often much easier, and less expensive, to make a dietary change than to excessively purify drinking water.

EPA has recommended that sodium levels not exceed 20 mg/L for those persons on a physician-prescribed “no salt diet.” This is the same level recommended by the American Heart Association. This is a very stringent level. For comparison purposes, regular milk has a sodium concentration of approximately 500 mg/L. The sodium levels of certain other major foods are listed below.

Food	Sodium mg
Tomato Sauce 1 cup	1,482
Ham, 2 oz.	810
Bacon, 3 slices	303
Cottage cheese, 1 cup	851
Red or white wine, 3.5 oz.	5
Club soda, 12 oz.	75
Frozen pizza	450-1200
soup	700-1260
Salad dressing	110-505
Bread	95-210
Frozen vegetables	2-160

Sodium and chloride are generally not major contaminants in the water served by community public water systems in Massachusetts. Such systems typically have concentrations of sodium and chloride that are less than 75 mg/L each in almost all cases. Rowley has an average of 100mg/l of sodium in the drinking water.

Secondary (Aesthetic) Drinking Water Standards
EPA has identified 250 mg/L as a concentration at which chloride can be expected to cause a salty taste in drinking water. Water users typically notice the presence of high chloride before an equal amount of sodium. The secondary level of 250 mg/L is based on aesthetic concerns, and is only advisory in the Federal Safe Drinking Water program.

Normally, the best method to control sodium and chloride in drinking water is to better manage those activities that add salt in the recharge area of the water supply source(s). The following are the most common sources of salt in water supply recharge areas.

- **Application of road deicing salts.** For more information, see the “Road Salt and Water Quality” fact sheet referenced above.
- **Water softeners**. Sodium is added to drinking water directly during the softening process, and indirectly by the discharge of waste brine (salt dissolved in water) into subsurface disposal systems.

For more information on sodium contact the Rowley Water Department at 978-948-2640.