



**MASTER**

*Water Conditioning Corp.*

www.masterwater.com

## Sodium Facts and Soft Water

### Calculating the sodium addition to soft water during the water softener process

By reviewing the ion exchange sheet we realize that the minerals of hardness, iron and manganese are removed and replaced with the mineral sodium.

Follow the equations below:

Compensated Hardness as (gpg) x 17.1 = Compensated Hardness as (ppm or mg/L)

Compensated Hardness (ppm or mg/L) x 0.46 = Sodium as (mg/L)

Example \_\_\_\_\_ x 17.1 = \_\_\_\_\_  
\_\_\_\_\_ x 0.46 = \_\_\_\_\_

Compensated Hardness	Sodium Added by Softening
1.0 gpg	7.87 mg/L
5.0 gpg	39.33 mg/L
10.0 gpg	78.66 mg/L
15.0 gpg	117.99 mg/L
20.0 gpg	157.32 mg/L
25.0 gpg	196.65 mg/L
30.0 gpg	235.98 mg/L
35.0 gpg	275.31 mg/L
40.0 gpg	314.64 mg/L

### Food and Drug Administration's definition for Sodium in a 6 ounce serving of drinking water (source: Salt Institute)

Sodium-free ..... up to 28 mg/L per 6 ounces

Very low sodium ..... up to 197 mg/L per 6 ounces

Low sodium..... up to 789 mg/L per 6 ounces

## SODIUM IN COMMON FOODS AND BEVERAGES

The data in the following table demonstrates the usual range of sodium in common foods. Despite the care with which the table was prepared, it cannot be totally accurate. Variations in sodium content may be even greater than indicated. However, the table does show an important principle: The amount of sodium almost invariably increases with the degree of preparation.

Fresh raw fruits and vegetables generally have little sodium. When frozen, they are higher in sodium. When canned, they are higher still. Similarly, fresh meats have significantly less sodium than those which have been smoked, koshered, pickled, or converted to sausage. Thus, the use of raw or fresh foods is of considerable assistance in maintaining a low sodium intake.

Use care in the method of preparing food

and in the additives used in cooking. Some seasonings contain large amounts of sodium, even in the small amounts used. In addition, some foods absorb considerable sodium from the cooking water – if it has a high sodium concentration. All these factors must be considered when the food is prepared.

### REFERENCES:

Sodium-Restricted Diets; National Academy of Sciences – National Research Council, Washington, D. C., Publication 325 (1954).

The New Good Housekeeping Cookbook; Dorothy B. Marsh, Good Housekeeping Institute; Harcourt, Brace and World, Inc. (1963).

Family Fare – Food Management and Recipes; U.S. Department of Agriculture, Home and Garden Bulletin No. 1 (1960).

### TYPICAL SODIUM CONTENTS OF SOME COMMON FOODS

Food	*Degree of Prep.	mg. Sodium per Serving	Serving or Measure	Weight Basis
Apples	R	0.5-3.5	1 medium	3 per lb.
Apricots, fresh	R	0.9	2 medium	10 per lb.
Asparagus, spears	R	3.5	½ cup	2 cups cooked per lb.
Asparagus, spears, canned	O	560	½ cup	1½ cup/14.5 oz.
Asparagus, frozen	O	1.3-12	½ cup	2 cups/10 oz.
Bacon, raw	O	103	1 slice	30 slices per lb.
Baking Powder, Phosphate	O	243	1 teasp.	1 teasp./2.7 g
Bananas	R	0.6-6	1 medium	3 per lb.
Beans, baked Navy and Pork	O	950	¾ cup	1½ cup/14 oz.
Beans, canned, baked	O	1130	¾ cup	2 cups/18 oz.
Beans, w/tomato sauce	O	796	¾ cup	1½ cups/14 oz.
Beans, green	R	0.1-2.3	½ cup	3 cups cooked per lb.
Beans, green, canned	O	465	½ cup	2 cups/lb.
Beans, green, frozen	O	1.0-1.5	½ cup	3 cups/lb.
Beans, lima	R	0.2	½ cup	3 cups/lb.
Beans, lima, canned	O	235	½ cup	3 cups/lb.
Beans, lima, frozen	O	114-235	½ cup	3 cups/lb.
Beef, corned	O	1850	5 oz.	-----
Beef, hash, corned, canned	O	610	½ cup	2 cups/lb.
Beef, dried	O	1220	1 oz.	-----
Beef, lean	R	72-92	5 oz.	-----
Beef, lean, Koshered	R	2270	5 oz.	-----
Beef, steak	R	98	5 oz.	-----
Beef, stew, canned	D	22	1 cup	2 cups/lb.
Beets	R	32-124	½ cup	2 cups/lb.
Beets, canned	O	41	½ cup	2 cups/lb.

\*Note: R – Raw or fresh foods      O – Ordinary commercial production processes

D – Dietetic foods

## TYPICAL SODIUM CONTENTS OF SOME COMMON FOODS

Food	*Degree of Prep.	mg. Sodium per Serving	Serving or Measure	Weight Basis
Beverages, alcoholic				
Beer	O	28	12 fl. oz.	----
Beer, dark	O	15	12 fl. oz.	----
Beer, light	O	56	12 fl. oz.	----
Beer & ale, various	O	3.1-80	12 fl. oz.	----
Brandy	O	0.9	1 fl. oz.	----
Gin	O	.24	1 fl. oz.	----
Rum	O	0.6	1 fl. oz.	----
Whiskey, blended	O	.09	1 fl. oz.	----
Whiskey, bonded	O	.03	1 fl. oz.	----
Wine (average)	O	2.1	1 fl. oz.	----
Wine Port	O	1.2	1 fl. oz.	----
Wine Sauterne	O	3.0	1 fl. oz.	----
Beverages, carbonated*				
Coca-Cola	O	3.5-7.0	12 fl. oz.	----
Crema Soda	O	3.5	12 fl. oz.	----
Dr. Pepper	O	10.5	12 fl. oz.	----
Ginger Ale	O	7-28	12 fl. oz.	----
Canada Dry	O	63	12 fl. oz.	----
Grape Soda	O	42	12 fl. oz.	----
Lemon-Lime Soda	O	24.5	12 fl. oz.	----
Orange Crush	O	7	12 fl. oz.	----
Orange Soda	O	81	12 fl. oz.	----
Pepsi-Cola	O	35-49	12 fl. oz.	----
Root Beer	O	3.5-28	12 fl. oz.	----
Royal Crown Cola	O	17.5	12 fl. oz.	----
Seven-Up	O	3.5	12 fl. oz.	----
Strawberry Soda	O	17.5	12 fl. oz.	----
White Rock	O	3.5	12 fl. oz.	----
Blueberries	R	1	1 cup	1 cup/5 oz.
Bouillon cube, beef	O	908	1 cube	15 cubes/2 oz.
Bread, Rye & Wheat	O	112	1 slice	24 slices/lb.
Bread, White	O	112	1 thin slice	21 slices/lb.
Bread, White	O	129	1 reg. slice	18 slices/lb.
Bread, White enriched	O	161	1 reg. slice	18 slices/lb.
Bread, Whole Wheat	O	152-211	1 slice	20 slices/lb.
Broccoli	R	11-18	¾ cup	8 stalks/lb.
Broccoli, frozen	O	15	¾ cup	2 cups/10 oz.
Brussels Sprouts	R	6.4-8.5	½ cup	2 cups/10 oz.
Brussels Sprouts, frozen	O	6.4-23	½ cup	2 cups/10 oz.
Butter, salted	O	42	1 pat	96 pats or teasp./lb.
Butter, sweet	O	1	1 pat	96 pats or teasp./lb.
Cabbage	R	3.2-14	½ cup shredded R	3½ cups shredded/lb.
Cabbage	O	4.5-19	½ cup cooked	2½ cups cooked/lb.
Candy				
Caramel, soft	D	16	1 pc.	50 pcs./14 oz.
Milk Chocolate	O	18	1 bar-¾ oz.	2½ cups/lb.
Gum Drops	O	36	½ cup	2½ cups/lb.
Bar, Baby Ruth	O	60	1 bar-1¼ oz.	----
Bar, Milky Way	O	78	1 bar-1¼ oz.	----
Carrots	R	68	½ cup	2¼ cups diced or shredded/lb.
Carrots	O	75	½ cup cooked	2 cups cooked/lb.
Carrots, canned	O	318	½ cup	2 cups/lb.
Cashew nuts, roasted in oil, salted	O	226	4 oz.	----

\*Considerable variation may be found between bottling plants, depending upon the sodium content of the local water.

## TYPICAL SODIUM CONTENTS OF SOME COMMON FOODS

Food	*Degree of Prep.	mg. Sodium per Serving	Serving or Measure	Weight Basis
Catsup, tomato	O	204	1 tablespoon	-----
Celery	R	172-259	1 cup raw diced	2½ cups/lb.
Celery flakes, dehyd.	O	34.5	1 tablespoon	-----
Celery Salt	O	672	1 teaspoon	-----
Celery Seed	O	3	1 teaspoon	-----
Cereals				
Bran, all-bran	O	340-395	1 oz.	1 pkg./1 oz.
Cornflakes	O	186	1 cup-1 oz.	1 cup/oz.
Oats, Oatmeal	R	0.2	¼ cup uncooked	5½ cups/lb.
Rice, Puffed	O	.13	½ oz.-1 cup	2 cups/oz.
Wheat Flakes	O	367	1 cup-1 oz.	1 cup/oz.
Grape Nuts	O	186	¼ cup-1 oz.	¼ cup/oz.
Muffets	O	1.5	2 biscuits	24 biscuits/lb.
Puffed Wheat	O	.56	½ oz.-1 cup	2 cups/oz.
Shredded Wheat	O	0.5	2 biscuits	19 biscuits/lb.
Cheese, Am. Swiss	O	201	1 slice	16 slices/lb.
Cheese, Cheddar	O	173-198	1 slice	16 slices/lb.
Cheese, Cottage	O	330	½ cup	16 fl. oz./lb.
Cheese, Cream, Phila.	O	212	3 oz. pkg.	-----
Cheese, Parmesan powd.	O	14.3	1 teasp.	-----
Cheese, Velveeta Cheese	O	910	1"x1¼"x2"	-----
Cherries	R	4.5	1 cup	3 cups/lb.
Cherries, sweet, dark canned	D	1.2	½ cup	16 fl. oz./1 lb. 1 oz.
Chicken	R	106	5 oz.	-----
Chicken, light meat	R	77	5 oz.	-----
Chicken, light meat breast	R	111	5 oz.	-----
Chicken, dark meat	R	114	5 oz.	-----
Chicken, leg meat	R	156	5 oz.	-----
Chocolate syrup, Hershey	O	10.6	1 tablespoon	13 fl. oz./lb.
Cloves, whole	O	1.4	10 whole	-----
Coffee, instant, Nescafe, dry	O	.84	1 teaspoon	-----
Coffee, reg. roasted dry	O	0.2	2 tablespoons	-----
Corn, sweet	R	.15-.7	½ cup	-----
Corn, sweet, frozen	R	65-80	½ cup	3 cups/lb.
Corn, sweet yellow, canned	O	252	½ cup	2 cups/lb.
Crackers, Graham	O	100	1 dbl. cracker	32 dbl. crackers/lb.
Crackers, Rye, Ry-Krisp	O	95	1 triple cracker	36 triple crackers/8 oz.
Crackers, Soda	O	138	1-4 pc. cracker	36x4 crackers/lb.
Cucumber, pickle, dill	O	318	1 pickle ½" dia. x 2½"	-----
Duck, breast	R	97	5 oz.	-----
Duck, leg	R	136	5 oz.	-----
Eggs, whole	R	36-62	1 med.	10 avg. eggs w/out shell/lb.
Frankfurters	O	610	1 med.	8/lb.
Fruit cocktail, canned in syrup	O	10	½ cup	2 cups/lb.
Goose, breast	R	108	5 oz.	-----
Goose, leg	R	136	5 oz.	-----
Ham, cured	O	1560	5 oz.	-----
Ice Cream	O	43-68	¼ pt.	1 pt/9.5 oz.
Lamb (Lean)	R	128	5 oz.	-----
Lamb chop	R	129-139	5 oz.	-----
Lamb leg	R	111	5 oz.	-----
Liver, beef	R	75-492	5 oz.	-----
Liver, calf	R	156	5 oz.	-----
Liver, chicken	R	119	5 oz.	-----
Margarine	O	52	1 pat	96 pats or teasp./lb.

## TYPICAL SODIUM CONTENTS OF SOME COMMON FOODS

Food	*Degree of Prep.	mg. Sodium per Serving	Serving or Measure	Weight Basis
Mayonnaise	O	560	½ cup	2½ cups/lb.
Milk, Cows				
Milk, Condensed, sweetened	O	444	1 cup	----
Milk, Evaporated	O	246	1 cup	----
Milk, Whole	R	122-127	1 cup	----
Mushrooms, sliced	R	3-7	¼ cup	1¼ cup/lb.
Mushrooms, canned	O	283	¼ cup	1¼ cup/lb.
Mustard, Prep paste	O	57	1 teasp.	----
Olives, ripe, pickled	O	33	1 medium	8/oz.
Olives, stuffed, pickled	O	70	1 medium	11/oz.
Onion, cooked	O	8-11	½ cup	2 cups/lb.
Onion Soup, cream of canned	D	72	1 cup	----
Parsley flakes	O	4.4	1 tablespoon	----
Parsnips	R	9-11	½ cup	2 cups/lb.
Peanut butter	O	16	1 tablespoon	----
Peanuts, roasted in oil and salted	O	520	¼ lb.	----
Peas	R	1.1-9.1	¼ cup	1 cup/lb.
Peas, frozen	O	27-295	½ cup	1 cup/lb.
Peas, canned, less liquor	O	306	½ cup	2 cups/lb.
Pea, Soup, canned	D	28-69	1 cup	----
Pork, lean	R	82	5 oz.	----
Pork, med. lean	R	97	5 oz.	----
Pork, 10% protein	R	60	5 oz.	----
Potatoes	R	7.5-9.8	1 medium	3/lb.
Potato chips	O	384	¼ lb.	----
Pretzels	O	1925	¼ lb.	----
Raisins, seedless	O	30	1 cup	¾ cups/lb.
Salmon, canned	O	1190	1-7¾ oz. can	----
Sardines, canned, various	O	424-806	1-3¾ oz. can	----
Sauerkraut, canned	O	690	½ cup	2 cups/lb.
Sausage-breakfast	O	1000	¼ lb.	----
Sausage-bologna		370	1 slice	16 slices/lb.
Sausage-pork		840-870	¼ lb. or 4 links	----
Shrimp	R	159	¼ lb.	----
Spinach	R	24-165	½ cup	1½ to 2 cups/lb.
Spinach, frozen	O	30-43	½ cup	3 cups/lb.
Sweet Potatoes	R	13.4	½ cup	2½ cups/lb.
Sweet Potatoes, canned	O	66	½ cup	----
Tomato juice	O	250	½ cup	----
Tomato Soup, canned diluted as served	O	900	1 cup	----
Tongue, beef	R	71-142	5 oz.	----
Tuna, canned	O	1580	7 oz. can	----
Turkey, breast	R	57	5 oz.	----
Turkey, leg meat	R	131	5 oz.	----
Veal, fillet	R	152	5 oz.	----
Veal, lean	R	68	5 oz.	----
Veal, muscle	R	163-278	5 oz.	----
Worcestershire Sauce	O	84	1 teaspoon	----

**Note:** 1 level teaspoon of table salt weighs approx. 7,000 milligrams. This amount of salt would contain approx. 2800 mg. of sodium.

## SOME COMMON QUESTIONS ABOUT SOFT WATER AND YOUR HEALTH

- 1Q. I read somewhere that drinking soft water might be related to heart attacks. Is this true?

There is currently a medical controversy over what effect, if any, drinking hard or soft water may have on heart disease. In some areas with **naturally** soft water, residents seem to suffer more from heart disease. In other areas, there appears to be no difference between drinking hard or soft water. A number of researchers feel that some other constituent of water – not hardness or softness – may be responsible for the variations in heart disease figures in different areas of the country.

- 2Q. Is there any idea what this "other constituent" might be?

Some researchers believe that very small amounts of a "protective" substance may be present in some water supplies and lacking in others. This unknown substance could have a beneficial effect on the heart – in much the same way that minute amounts of fluoride protect the teeth. At the present time, no one knows exactly what this substance may be.

Other scientists feel that the problem might be caused by other elements, such as **cadmium**, in the drinking water. It is known that this metal can cause high blood pressure when taken in small quantities. Trace amounts of cadmium can be dissolved from galvanized water pipes by the corrosive action of **naturally** soft water.

- 3Q. What's the difference between naturally soft water and the water from my water softener?

There's a great deal of difference! Naturally soft water is generally acidic

and contains very few dissolved minerals. This tends to make the water quite corrosive to pipes and plumbing.

The softened water from your home appliance is more like the raw water from which it is made. It is usually alkaline rather than acidic, and contains moderate amounts of dissolved minerals. Thus softening a hard water in the home does not significantly affect corrosion.

- 4Q. If I have a corrosive water supply, how can I minimize the tendency of the water to dissolve metals, such as cadmium, lead, etc., from the piping system?

If your supply is a naturally soft, acidic water, you can install a neutralizing filter, or feed a neutralizing substance. In other types of corrosive water, you can feed a corrosion inhibiting substance.

- 5Q. Is there any simple way to avoid potentially dangerous metals from the plumbing system in water used for cooking and drinking?

Yes. Most of the metals dissolve from pipes when water stands in them for extended periods, such as overnight. Thus a simple practice is to allow the water to run for a few minutes in the morning to flush out the accumulated dissolved metals before drawing water for cooking or drinking. Further, since hot water tends to be more corrosive than cold water, it is preferable to use cold water for cooking and drinking.

- 6Q. Is there a household water treatment device which will remove the potentially dangerous, health-related metal impurities from water for drinking and cooking?

Yes. Several systems are small enough to be installed under a kitchen sink to supply

a special faucet, ice cubers, etc., with highly purified water for cooking and drinking. These systems operate on well-known water purification principles, such as demineralization and reverse osmosis, and will substantially remove not only the metals, but laxative sulfates, sodium and other minerals from the water.

**7Q. I've heard that a water softener adds sodium to my water supply. Is this true?**

Yes. A household water softener removes the hardness minerals – calcium and magnesium – from water and replaces them with sodium.

**8Q. How much sodium is added to the water by a water softener?**

That depends on the hardness of your raw water. The following table shows the additional amount of sodium consumed by drinking **one quart** of softened water.

**INITIAL WATER HARDNESS**

1.0 grains per gallon  
5.0 grains per gallon  
10.0 grains per gallon  
20.0 grains per gallon  
40.0 grains per gallon

**SODIUM ADDED BY SOFTENING**

7.5 milligrams/quart  
37.5 milligrams/quart  
75.0 milligrams/quart  
150.0 milligrams/quart  
300.0 milligrams/quart

**9Q. Is this additional amount of sodium in my diet harmful?**

For normal, healthy people, the answer is no. The amount of sodium consumed from drinking water is normally only 5-10% of the amount consumed from other food sources. For example, one slice of white bread contains 161 milligrams of sodium; 3/4 cup of canned

baked beans, 1130 milligrams; one tablespoon of catsup, 204 milligrams; one medium frankfurter, 610 milligrams; and one cup of whole milk, 122-127 milligrams. Even a common Alka-Seltzer tablet contains 532 milligrams of sodium.

**However, if you suffer from hypertension or are on a sodium-restricted diet, you should consult your doctor about the proper water for drinking.** Since most hard waters also contain sodium, your doctor may recommend that you drink sodium-free packaged or bottled water, or remove sodium from your water by demineralization or reverse osmosis.

**10Q. How can I determine how much sodium is in my water?**

If you're using a municipal water supply, your Water Department can tell you the amount of sodium. If you have a private well, an independent testing laboratory can determine the sodium content.

**11Q. Since I already have a water softener in my home, is there any way I can have all the benefits of soft water and still drink hard water?**

Yes. In most cases it's relatively simple to install a hard water faucet at the kitchen sink for cooking and drinking purposes. Your local water conditioning equipment dealer can provide you with details and installation costs.

**12Q. Is there any place I can write for additional information on the subject of soft water and health?**

Yes. Write to the **Water Quality Association, 477 East Butterfield Road, Lombard, Illinois 60148** and ask for the Technical Paper on "Naturally Soft Water and Heart Disease."