

Sodium and the Diet

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Food and Nutrition Series | Health

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What is Sodium?

Sodium is an important mineral and electrolyte necessary for many functions in the body. It has an important role in maintaining water balance within cells, and is involved in proper functioning of both nerve impulses and muscles within the body. Along with potassium, sodium also plays a crucial role in blood pressure regulation. Sodium is only needed in small quantities, and the kidneys are responsible for excreting extra sodium from the body.

Sources of Sodium

Sodium in Food—A small amount of sodium is naturally present in most foods, but most dietary sodium is found in processed foods in the form of salt. Salt may be added for flavor enhancement and to extend the shelf life of certain foods. Salt is added to most canned foods, some frozen vegetables, fast foods, smoked and cured meats, and pickled foods (Table 1). It is used in most cheeses, sauces, soups, salad dressings and many breakfast cereals. It is also found in many other ingredients used in food processing. Many commercially prepared condiments and seasonings are also high in sodium. The food industry is working to decrease sodium content in these food items.

Sodium in Salt—Sodium is a component of salt. Table salt, also known as sodium chloride, is 40% sodium and 60% chloride. The sodium portion of salt is associated with high blood pressure.

How much Sodium is Required?

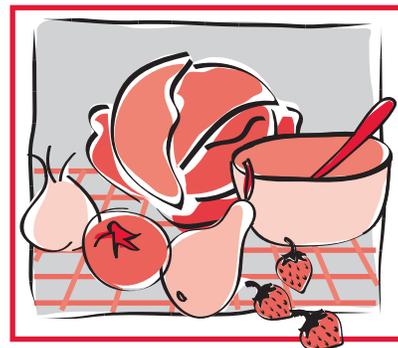
The Adequate Intake (AI) for sodium is 1,500 milligrams daily for males and females ages 9-50. This value is less than 1 teaspoon of table salt per day. The maximum recommended level of sodium intake is 2,300 milligrams daily. On average, more than 85% of American men and women consume sodium in amounts that far exceed the maximum recommended level of intake.

Sodium Deficiency

Sodium deficiency is extremely rare, as most Americans over-consume sodium. Deficiency usually only occurs with prolonged bouts of fluid loss due to diarrhea, vomiting, or perspiration. Those who have kidney problems may also be more likely to develop a sodium deficiency. Symptoms of deficiency include nausea, dizziness, and muscle cramps.

Special Considerations:

For athletes and those strenuously active for more than 1 hour in duration—Those exposed to conditions promoting sweat loss for extended periods may be at risk for low blood sodium levels, or hyponatremia. For those who are well hydrated and active for more than four hours, it is important to replenish sodium stores in the body. Usually, sodium losses can be easily replaced during the next meal. However, in endurance exercise longer than 4 hours, sodium stores should be replaced during exercise with food or sports drink. For more information on nutrition and exercise, see fact sheet [Nutrition for the Athlete](#).



Quick Facts

- A diet high in sodium may be one factor in the development of high blood pressure.
- Sodium is a component of salt: table salt is 40% sodium and 60% chloride.
- Processed and preserved food items such as canned foods, fast foods, cheese, and condiments usually have high sodium content, and are the main source of dietary sodium for Americans.
- Several food industries are discovering methods to decrease sodium in their products.
- The Dietary Guidelines for Americans recommended reducing sodium intake to no more than 2,300 milligrams per day. However, those with hypertension, over the age of 51, or who are African American, should consume no more than 1,500 milligrams of sodium per day. This recommendation includes over half of all Americans.

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Salt-Sodium Conversions

1/4 teaspoon of salt = 500 milligrams of sodium

1/2 teaspoon of salt = 1,000 milligrams of sodium

3/4 teaspoon of salt = 1,500 milligrams of sodium

1 teaspoon of salt = 2,000 milligrams of sodium

Too much Sodium?

Most Americans consume too much sodium. The Tolerable Upper Limit Level (UL) for sodium is 2,300 milligrams daily for teens and adults. This value does not apply to those with high blood pressure, as this value may be set too high. In healthy individuals, excess sodium is usually excreted by the kidneys. However, chronic consumption of excess sodium may also lead to edema or water retention.

Special Conditions for a Low Sodium Diet—In addition to those who are African American or over the age of 51, groups with the following conditions should limit sodium intake to 1,500 milligrams daily:

Kidney Disease: Those with kidney disease may have trouble excreting sodium and other minerals, leading to water retention and swelling.

Congestive Heart Failure: Those with heart failure experience swelling and fluid retention in the lungs and throughout the body. Since sodium promotes fluid retention, a low sodium diet may be helpful in relieving fluid accumulation.

Osteoporosis: Women who consume excess sodium may be at higher risk for developing osteoporosis even if calcium intake is adequate. Some evidence suggests that for each teaspoon of salt (2,000 milligrams of sodium) consumed, considerable calcium is excreted in the urine.

High Blood Pressure or Hypertension: High sodium consumption is one factor involved in the development of high blood pressure, or hypertension. Hypertension tends to develop

as people age, and can lead to cardiovascular disease. Some individuals are "salt sensitive," so reducing intake of sodium helps to reduce blood pressure levels. A high intake of sodium early in life might weaken genetic defenses against developing high blood pressure. Experts recommend reducing sodium intake while blood pressure is still normal, which may decrease the risk for hypertension later in life.

For those with hypertension or any other special condition, following an overall eating plan known as DASH (Dietary Approaches to Stop Hypertension) and restricting sodium intake to 1,500 milligrams per day, may be useful for lowering blood pressure. Increasing potassium intake has also been shown to have beneficial effects for lowering blood pressure. For more information about the DASH eating plan or diet and hypertension, see fact sheet [Diet and Hypertension](#) and [DASHing to Lower Blood Pressure](#). For more information on potassium and the diet, see fact sheet [Potassium and the Diet](#).

Sodium Labeling

Health Claims

Specific health claims can be made about sodium for food products that meet certain requirements. For example, "A diet low in sodium may reduce the risk of high blood pressure, a disease associated with many factors." In order to make a health claim about sodium and hypertension (high blood pressure), the food must be low or very low in sodium. The following terms describe health claims from products that may help to reduce sodium intake:

- **Sodium free:** Less than 5 milligrams of sodium per serving.
- **Very low sodium:** 35 milligrams of sodium or less per serving.
- **Low sodium:** 140 milligrams of sodium or less per serving.
- **Reduced sodium or Less sodium:** At least 25% less sodium per serving than the reference food.

- **Light in sodium:** At least 50% less sodium per serving than the reference food.
- **Unsalted or No salt added:** No sodium has been added to the product, but the product still contains small amounts of naturally occurring sodium.

Steps to Reduce Sodium

An important recommendation from the Dietary Guidelines for Americans is to reduce consumption of sodium. The following suggestions are starting points to reduce dietary sodium:

- Use more fresh fruit, vegetables and meat. Processed foods usually contain more sodium (Table 1).
- When cooking use canola oil or olive oil, which contain less sodium, instead of butter or margarine.
- Check food labels for the words salt or sodium. Salt often is used as a preservative or flavoring agent. Any ingredient that has sodium, salt or soda as part of its name (monosodium glutamate (MSG), baking soda, and seasoned salt) contains sodium. For more information on food labels, see fact sheet [Understanding the Food Label](#). Purchase foods low in sodium (Table 2).
- Do not use salt substitutes, especially those that contain potassium, without first talking to a medical professional.
- Remove the salt shaker from the table and season foods with herbs and spices rather than salt (Table 3).
- Try products such as low or reduced sodium to curb sodium intake.
- Plan meals that contain less sodium. Try new recipes that use less salt and sodium-containing ingredients and seasonings. Adjust your own recipes by reducing such ingredients a little at a time. Make homemade condiments, dressings and sauces that are low in sodium.
- Taste food before it is salted. If using canned food, rinse in water to remove some of the salt before preparing or serving.

Table 1. Sodium Comparisons—As sodium content increases, so does the level of processing.¹

Food Item (1 serving)	Least Processed Low Sodium < 100 milligrams (mg) per serving	Moderately Processed Elevated Sodium 100-350 milligrams (mg) per serving	Most Processed High Sodium >350 milligrams (mg) per serving
Apple	Raw apple, 2 mg	Apple pie (frozen), 208 mg	Apple pie (fast food), 400 mg
Bread	Low sodium bread, 7 mg	White Bread, 114 mg	Plain Bagel, 561mg
Cooking fats	Vegetable oil, 0 mg Butter(unsalted), 2 mg	Butter (salted), 116 mg Margarine, 140 mg	
Chicken	Chicken, 69 mg	Chicken salad, 290 mg	Chicken pie (frozen), 907 mg Chicken noodle soup, 1,107 mg Chicken dinner (fast food), 2,243 mg
Corn	Fresh corn, 1 mg Frozen corn,7 mg	Corn flakes, 256 mg	Canned corn, 384 mg
Cucumber	Raw Cucumber, 2 mg	Sweet pickle, 128 mg	Dill pickle, 928 mg
Flavorings and Marinades	Lemon, 1 mg	Ketchup, 156 mg	Soy sauce, 1,029 mg
Seasonings	Herbs, 1 mg	Mayonnaise, 103 mg	Salt, 1tsp-1,938 mg
Potatoes	Potato, 5 mg	Potato chips, 200 mg	Mashed potatoes (instant), 485 mg Potato salad, 625 mg
Dairy	Plain yogurt, 105 mg	Milk, 122 mg Buttermilk, 257 mg	Choc. Pudding (instant), 470 mg
Red Meat	Steak, 55 mg	Ham (uncooked), 220mg	Corned beef, 802 mg Jumbo burger (fast food), 990 mg Lunch Meat (beef, pork), 540 mg
Tomatoes	Raw Tomato, 14 mg	Salsa, 200mg	Tomato sauce, 1,498 mg
Fish	Fresh Tuna, 50 mg	Tuna, canned, 384 mg	Tuna pot pie (frozen),715 mg Fish sandwich (fast food), 882 mg
Nuts	Peanuts, unsalted, 8mg Peanut butter, 81 mg	Peanut brittle, 145 mg	Dry roasted peanuts, salted, 986 mg
Cheese	Low sodium cheddar, 6 mg	Cheddar cheese, 176 mg Cottage cheese, 257 mg	American cheese, 406 mg

¹Notice that most “elevated” to “high” level sodium foods are processed, meaning they are more likely to contain added ingredients such as preservatives- which means more salt.

Table 2. High sodium seasonings, sauces, condiments, and common recipe ingredients.

Seasoning	Sauces	Recipe Ingredients	Condiments
Onion salt Celery salt Garlic salt Seasoned salt Meat tenderizer Bouillon	Soy sauce Steak sauce Barbeque sauce Worcestershire sauce	Baking soda Monosodium glutamate (msg) Baking powder	Mustard Salad dressings Pickles Chili sauce Relish Ketchup

Table 3. Season foods with herbs and spices instead of salt.

Appetizers	
Hors d'oeuvres	Chervil, oregano, paprika, parsley
Cheese dips and spreads	Basil, chervil, dill weed, marjoram, oregano, sage, parsley, summer savory, tarragon
Deviled or stuffed eggs	Curry powder, dill weed, summer savory, tarragon
Dips	Curry powder, oregano, chervil, parsley
Mushrooms	Oregano, marjoram
Seafood cocktails and spreads	Basil, dill weed, thyme, bay leaves, tarragon
Vegetables	
Asparagus	Lemon peel, thyme
Broccoli	Lemon juice, onion
Brussels sprouts	Lemon juice, mustard
Cabbage	Dill weed, caraway seeds, oregano, lemon juice, vinegar, onion, mustard, marjoram
Carrots	Marjoram, ginger, mint, mace, parsley, nutmeg, sage, unsalted butter, lemon peel, orange peel, thyme, cinnamon
Cauliflower	Rosemary, nutmeg, tarragon, mace
Celery	Dill weed, tarragon
Cucumber	Rosemary, onion
Green beans	Basil, dill weed, thyme, curry powder, lemon juice, vinegar
Peas	Mint, onion, parsley, basil, chervil, marjoram, sage, rosemary
Potatoes	Bay leaves, chervil, dill weed, mint, parsley, rosemary, paprika, tarragon, mace, nutmeg, unsalted butter, chives
Spinach	Chervil, marjoram, mint, rosemary, mace, nutmeg, lemon, tarragon
Squash	Basil, saffron, ginger, mace, nutmeg, orange peel
Tomatoes	Basil, bay leaves, chervil, tarragon, curry powder, oregano, parsley, sage, cloves
Zucchini	Marjoram, mint, saffron, thyme
Entrees	
Eggs and cheese	Curry powder, marjoram, mace, parsley flakes, turmeric, basil, oregano, rosemary, garlic, mustard, mace, ginger, curry powder, allspice, lemon juice, pepper
Fish and shellfish	Basil, bay leaves, chervil, marjoram, oregano, parsley, rosemary, sage, tarragon, thyme, lemon peel, celery seed, cumin, saffron, savory, dry mustard
Poultry	Basil, saffron, bay leaves, sage, dill weed, savory, marjoram, tarragon, oregano, thyme, rosemary, paprika, curry powder, orange peel, cranberries, mushrooms
Pork	Cloves, garlic, ginger, mustard, nutmeg, paprika, sage, rosemary, savory, thyme, curry powder, oregano, apples
Desserts and baked items containing fruit	
Apples	Allspice, cardamom, ginger, cinnamon, cloves, nutmeg
Bananas	Allspice, ginger, cinnamon, nutmeg
Oranges	Allspice, cinnamon, anise, nutmeg, cloves, ginger, mace, rosemary
Pears	Allspice, cinnamon, nutmeg, anise, mint
Puddings	Arrowroot, cinnamon, cloves, lemon peel, vanilla bean, ginger, mace, nutmeg, orange peel

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