



a new  
conversation  
about

# Salt and Sodium

Sodium chloride, more commonly known as salt, plays an integral role in our body's fluid volume and electrolyte balance. Salt is also necessary to maintain the quality and safety of the food supply. Salt and sodium are often used interchangeably, however, salt is actually 40 percent sodium and 60 percent chloride.

While being mindful of the amount of sodium one consumes is important, the rationale for why sodium should be limited is controversial. The "salt hypothesis" proposes that higher levels of salt in the diet will lead to higher blood pressure; therefore, increasing the risk of heart disease.<sup>1</sup> Other scientists and research propose only some individuals are affected by the amount of salt in the diet and experience increased blood pressure levels when consuming a diet higher in sodium.<sup>2,3</sup>



## Discussion of Research on Salt-Sensitivity

About 31% of adults in the U.S. have hypertension which is a risk factor for heart disease, stroke and kidney disease.<sup>4</sup> African Americans have the highest rate of hypertension at about 40%; Hispanics and Caucasians have a 29% and 27% rate of hypertension, respectively.<sup>5</sup>

Despite previous emphasis being placed on reducing sodium intake for improved blood pressure or to decrease the risk of developing hypertension, salt and sodium do not affect blood pressure levels of individuals the same. Research suggests some individuals have a more pronounced response to salt increases and decreases.<sup>2,3</sup> These “salt-sensitive” individuals experience a greater change in blood pressure levels as dietary sodium changes. Currently there is not a standardized testing method to determine salt-sensitivity; therefore, sodium recommendations have been made population-wide even though only 26% of Americans with normal blood pressure and 58% of those with hypertension are estimated to be salt-sensitive.<sup>5</sup>

Some people have an increased prevalence of salt-sensitivity including: those with hypertension, diabetes, chronic kidney disease, African Americans, older people, and those with a family member with hypertension.<sup>5</sup> The good news is even if an individual is salt-sensitive, there are diet and lifestyle modifications that can be made to decrease blood pressure.

## Impact of Other Nutrients on Decreasing Hypertension and Salt-Sensitivity

While decreasing sodium intake is the most common prescribed dietary change to control blood pressure, strong scientific evidence indicates that increasing the intake of other nutrients, including potassium, calcium and magnesium, may counteract the effects of sodium on blood pressure levels for both salt-sensitive and non salt-sensitive individuals.<sup>6,7</sup>

A significant portion of research has been done on potassium and other minerals and their effects on blood pressure. Increasing potassium has been shown to reduce blood pressure for individuals regardless of salt sensitivity and even when salt intake remains the same.<sup>8</sup> In addition, a diet rich in calcium, magnesium and potassium is associated with lower blood pressure level.<sup>7</sup> By consuming adequate amounts of these minerals, blood pressure is

lowered because the body expels additional sodium and therefore fluid.<sup>9,10,11</sup> Blood volume is decreased and less pressure is put on veins and arteries; therefore blood pressure is decreased. This effect also works the opposite way, and when individuals do not consume enough potassium or calcium in their diets, the negative effect sodium has on their blood pressure is increased.<sup>8</sup>

On average Americans currently consume only about half of the recommended level of 4,700 mg potassium/day and less than half of the recommended 1,000 mg/day of calcium.<sup>12,13</sup> The 2005 Dietary Guidelines for Americans encourages people to consume more potassium-rich foods, such as fruits and vegetables and low-fat or fat free dairy which is calcium-rich.



## Beyond Hypertension

Individuals whose kidneys do not function properly should also be mindful of sodium intake. The kidneys regulate the sodium level in the body, using what the body needs and ridding itself of the extra. But when the kidneys don't work properly, sodium is not excreted and may result in swelling in the face, legs, and feet.

## Current Recommendations

The 2005 Dietary Guidelines for Americans and the American Heart Association recommend consuming less than 2,300 mg sodium per day and the National Institutes of Health recommends consuming less than 2,400 mg per day. That's about one teaspoon of salt.

However, a study published in the American Journal of Medicine debated universal sodium limitations for the public versus limitations for salt-sensitive people.<sup>14</sup> According to Dr. Hillel Cohen lead author of the study from the Albert Einstein College of Medicine in New York, “Some people may very well benefit from eating a low-salt diet, but there is little clinical evidence supporting a blanket recommendation that everyone needs to eat this way.”



# Sodium and the American Diet

The average American consumes nearly double the daily recommendations for sodium intake.<sup>12</sup> That's about 4,600 mg and the primary source of sodium in the diet comes from bread and cheese.<sup>15</sup> Other higher sodium foods that contribute to the US sodium consumption include processed meats, condiments, cakes, ready to eat cereals and milk.

## Food sources of sodium among US adults

(from 1994 to 1996 Continuing Survey of Food intake by Individuals)<sup>15</sup>

FOOD GROUP	RANKING	% TOTAL
Other foods*	1	25.4
Yeast bread	2	10.7
Cheese	3	5.5
Ham	4	3.4
Salad dressings/mayonnaise	5	3.2
Cakes/cookies quick-breads/doughnuts	6	3.1
Beef	7	3.0
Milk	8	2.6
Cold cuts (excluding ham)	9	2.6
Ready-to-eat Cereal	10	2.5
Condiments/other sauces	11	2.4
Sausages	12	2.3

\*Includes salt (from disaggregated food mixtures), monosodium glutamate, spices, herbs, plain gelatin, gums, seaweed, grain-based beverages, and cocoa powder.



**Chip Myth:** *Despite their salty taste, chips are no higher in sodium than many other foods, such as many breads and cereals.*

- A chip tastes saltier because the salt is on the chip's surface. In other foods, they mix in and bake the salt which hides its taste.
- In fact, Frito-Lay snacks account for only about 1% of the sodium consumption in US.
  - More than 70% of Frito-Lay products contribute less than 10% of the suggested daily value (240 mg sodium/oz)
  - And 12% of Frito-Lay products contribute less than 5% of the DV (120 mg sodium/oz).

## SODIUM COMPARISONS OF FRITO-LAY PRODUCTS AND COMMONLY CONSUMED FOODS AND SNACKS



LEADING FRITO-LAY PRODUCTS	AVERAGE SERVING OF COMMON FOODS*	AVERAGE SERVING OF COMMON SNACKS*
<i>Tostitos</i> Restaurant Style Tortilla Chips (120mg/oz)	Fruit yogurt (140 mg/cup)	Trail mix (170mg/1/2 cup)
<i>SunChips</i> Multigrain Snacks Original (120 mg/oz)	Whole wheat English muffin (155mg/half)	Microwave popcorn (120mg/3 cups)
<i>Ruffles</i> Potato Chips (160 mg/oz)	White bread (170 mg/slice)	Graham crackers (190mg/2 sheets)
<i>Fritos</i> Corn Chips (160 mg/oz)	Angel food cake (210mg/piece)	Wheat crackers (225 mg/oz)
<i>Lay's</i> Classic Potato Chips (180 mg/oz)	Ready-to-eat corn flakes cereal (265 mg/cup)	Goldfish-shaped cheese-flavored crackers (240mg/oz)
<i>Doritos</i> Nacho Cheese Tortilla Chips (180 mg/oz)	Plain bagel (380 mg/3oz)	Snack mix [pretzels, rye chips, mini breadsticks, wheat crisps] (380mg/ 2/3 cup)
<i>Cheetos</i> Crunchy Cheese Flavored Snacks (290 mg/oz)	Cottage cheese (460 mg/4oz)	Pretzel sticks (560mg/oz)

\* The overall nutritional profile of each food should be considered when making choices. Data from USDA Nutrient Database

One 10 oz bag of *Tostitos* Restaurant Style Tortilla Chips contains:

- 6 ½ ears of corn
- 4 ½ tbsp corn oil
- And ½ tsp salt

## Hurdles for Salt Reduction and/or Replacement

For a food to be labeled “healthy,” it must meet a specific set of criteria established by the Food and Drug Administration. The sodium requirement in the definition is 480 mg sodium or less per 50 grams of food. However, the American Medication Association recently recommended that the FDA revoke salt’s “safe to consume” status and recommended that processed food, fast food and restaurant food reduce sodium levels by at least 50% within the next decade (by 2016). There are many hurdles to reducing or replacing sodium in the food supply.

- ▶ At present, there is no totally acceptable salt substitute available.
  - Potassium chloride, a potential salt substitute, can be harmful to people with certain medical conditions such as kidney disease or some types of heart disease.<sup>16</sup>
- ▶ Reducing sodium below a certain threshold typically compromises the taste and flavor of a product; salt alternatives may introduce an undesirable taste in the product.
  - Some reduced sodium products introduced by food manufacturers have not been well accepted by the public, forcing many to discontinue products.<sup>17</sup>
- ▶ Replacing the function and purpose salt plays in a product brings forward a new set of challenges, including the potential to require alternative or additional preservatives, reducing texture quality, weakening gluten and affecting fermentation often necessary for the desired final product.

## Putting Sodium Into Perspective

In order for us to be healthy, our bodies need sodium daily for basic life processes. Certain groups of people are more prone to salt sensitivity and should be mindful of their sodium intake and check with a health professional to understand their risk of hypertension. However not all people are sensitive to salt and would benefit from reducing their sodium intake significantly.

A “salty” taste doesn’t necessarily mean that a food is high in sodium; inversely, foods that do not taste salty may in fact contain significant amounts of sodium. Reading food labels is important when gauging how much sodium a food contains.



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