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Sodium Intake of the U.S. Population

What We Eat In America, NHANES 2007-2008

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Highlights

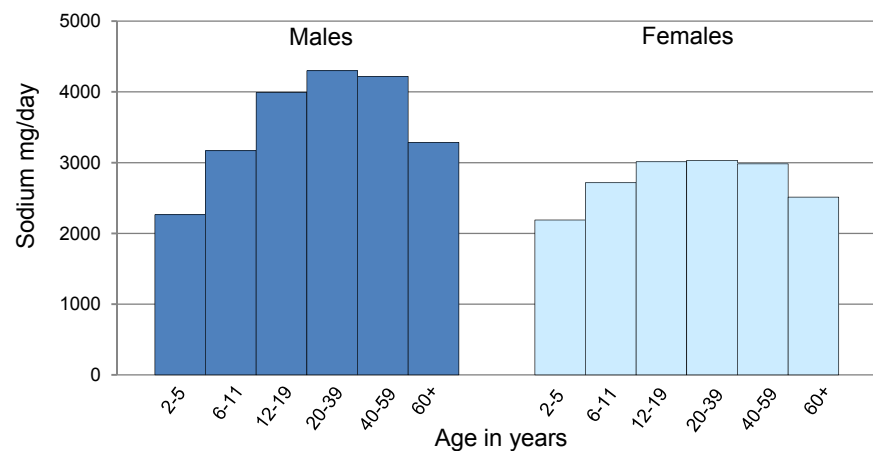
- ▶ In 2007-2008, the average sodium intake of the U.S. population aged two years and older was 3330 mg per day.
- ▶ Sodium intakes have remained relatively unchanged and are comparable to intakes observed in the 1994-1998 survey.
- ▶ Sodium intake is related to calorie intake. As a result of differences in calorie intakes, the sodium intake of males is higher than that of females.
- ▶ The amount of sodium per 1000 kcal is similar between males and females within age categories.
- ▶ On a given day, most individuals consume more sodium than the recommendation of less than 2300 mg per day.
- ▶ Mixed dishes that contain grains, meats, sauces, vegetables, etc. contribute the largest proportion to total sodium intake – 23%. Meat, poultry, fish and eggs contribute 19%, about half of that coming from deli/cured meats.

The scientific literature indicates a strong relationship between increasing levels of sodium intake in adults and risk for hypertension; in children from birth through 18 years, there is moderate evidence that as sodium intake decreases, blood pressure decreases (1). Further, increasing evidence suggests that sodium may have independent, direct harmful effects on stroke risk, cardiovascular disease, renal disease, osteoporosis, and risk for gastric cancer (1, 2). The *2010 Dietary Guidelines for Americans* recommend a sodium intake of less than 2300 mg per day, with further reductions to 1500 mg for certain high risk groups including individuals aged 51 years and older and individuals of any age who are African-American, or have hypertension, diabetes, or chronic kidney disease. Data on the intake of sodium in the United States as reported in *What We Eat In America, NHANES 2007-2008* are presented in this report. The contribution of food categories to total sodium intake is also discussed.

How much sodium is the U.S. population consuming?

In 2007-2008, the average sodium intake of the U.S. population aged two years and older was 3330 mg per day. As Figure 1 illustrates, intake of males overall was higher than females ($p < 0.001$). Teens have higher intakes than younger children, and adults through 59 years have higher intakes than adults 60 and older ($p < 0.001$). These intakes have remained stable since the continuous NHANES survey was begun in 1999 and are also comparable to intakes in the 1994-1998 Continuing Survey of Food Intakes by Individuals (data not shown).

Figure 1. Sodium intake by age and gender, 2007-2008



SOURCE: What We Eat in America, NHANES 2007-2008, Day 1 dietary intake data, weighted.



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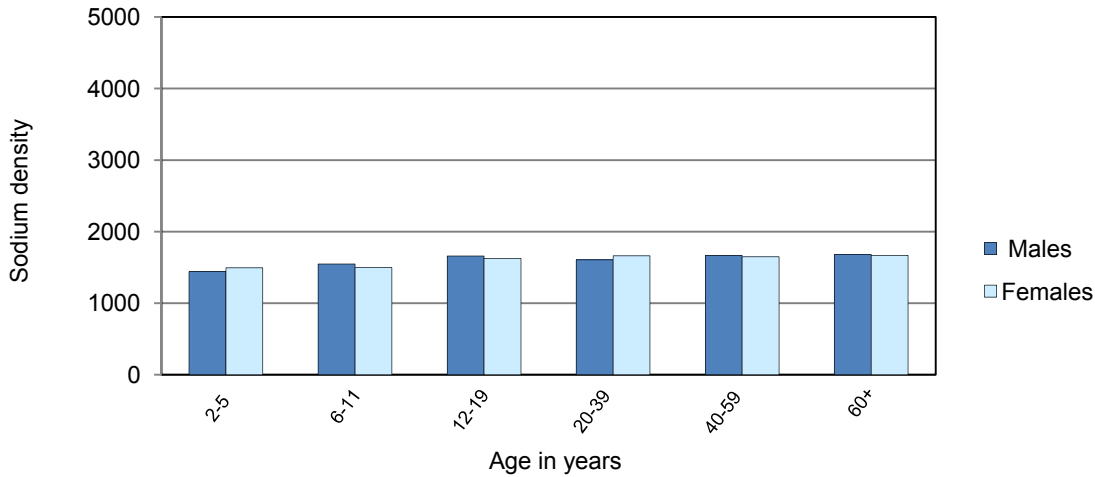
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Sodium intake is related to calorie intake.

The differences in total sodium intake across age and gender groups are related to different energy intakes. When the amount of sodium per 1000 kilocalories (kcal), or sodium density (*see definition on page 4*) is considered, there are no significant differences in sodium intake between males and females within age groups, as illustrated in Figure 2. For the whole population over two years of age, the sodium density of the diet was 1631 mg per 1000 kcal. The dietary intakes of children through 11 years have a lower sodium density compared to teens and all adults ($p < 0.001$). In contrast, to meet the sodium recommendation of less than 2300 mg per day or 1500 mg per day (depending on the population subgroup) based on a 2000 kcal diet, the sodium density would need to be 1150 mg per 1000 kcal, or 750 mg per 1000 kcal.

Figure 2. Sodium intake per 1000 kilocalories by age and gender, 2007-2008



SOURCE: What We Eat in America, NHANES 2007-2008, Day 1 dietary intake data, weighted.

Most individuals consume more sodium than is recommended on a given day.

Table 1 shows the mean and distribution of sodium intake for children and adults on a given day. As the table indicates, mean sodium intakes of all individuals except children 2-5 years were above the recommended level of 2300 mg. Further, on the reporting day, over 75% of adult males and over 50% of adolescents and adult females consumed more than 2300 mg. Reduction of sodium intake to 1500 mg per day is indicated for approximately half of the population, and data show that less than 10% met this recommendation on the reporting day.

Table 1. Mean and distribution of daily sodium intake, 2007-2008

	N	Mean (mg)	SE	Distribution of daily sodium intake				
				Percentiles				
				10 th	25 th	50 th	75 th	90 th
Males and females 2-5 years	832	2230	45.1	1079	1546	2124	2768	3433
Males and females 6-11 years	1121	2933	71.4	1540	1986	2714	3503	4537
Males and females 12-19 years	1156	3505	100.9	1508	2164	2942	4320	6062
Males 20+ years	2662	4043	80.3	1904	2635	3724	4997	6470
Females 20+ years	2758	2884	40.1	1264	1861	2676	3562	4690

SOURCE: What We Eat in America, NHANES 2007-2008, Day 1 dietary intake data, weighted.

What foods contribute to sodium intake?

A wide variety of foods contribute to sodium intake. Most dietary sodium comes from sodium added during food processing or during cooking in restaurants. Some foods contribute sizable amounts to total intake when consumed because they have a high sodium density per serving (*see definition on page 4*). However, many foods provide less sodium per serving but contribute substantially to total intake because they are frequently consumed. Table 2 shows the contribution of different food categories to total sodium intake.

Table 2. Percent contribution of food categories to sodium intake, 2007-2008

FOOD CATEGORIES [†]	Individuals Reporting [‡] (%)	Contribution to Sodium (%)
Grain- or Meat/Poultry/ Fish-Mixed Dishes		23
Mixed Dishes: meat, poultry, fish w/ sauces, gravies, bread, and/or vegetables	19	5
Pizza: pizza, calzones, pizza rolls	12	5
Pasta/Macaroni Dishes: spaghetti, ravioli, macaroni, lasagna, salads	17	5
Mexican/Latin-type Items: burritos, tacos, tamales, nachos, other mixed dishes	8	3
Indian/Asian-type Items: curries, egg rolls, fried rice, stir-fries, sushi	7	3
Rice/Rice Dishes: plain rice, rice dishes w/ sauces, meat, beans, and/or vegetables	14	2
Meat, Poultry, Fish, Eggs		19
Deli/Cured Meats: ham, luncheon meats, frankfurters, bacon, sausage	35	9
Poultry: fried/baked chicken, patties, nuggets, turkey, duck	28	4
Meats: beef, pork, lamb, game	24	2
Fish/Seafood: finfish and shellfish, cakes, salads	11	2
Eggs/Egg Dishes: scrambled/fried, omelets, quiches, souffles	19	2
Bread/Grain Products		14
Breads/Rolls: yeast breads and rolls, tortillas, bagels, English muffins	65	8
Breakfast Bakery Items/Quick Breads: biscuits, cornbread, muffins, pancakes, waffles, French toast, doughnuts, pastries	16	3
Cereals/Grains: RTE cereals, grits, oatmeal	32	2
Vegetables		7
Vegetables: salads, canned, fresh, frozen, except white potatoes	54	3
White Potatoes: baked, boiled, mashed, fried, salads, except potato chips	31	3
Beans/Legumes: dried and canned, bean dishes	10	1
Dairy		7
Cheese: all cheese and cheese items	39	4
Fluid Milk: flavored and unflavored milks	52	3
Savory Snacks: chips, crackers, popcorn, pretzels	46	5
Salad Dressings/Spreads/Dips: dressings, mayonnaise, butter, margarine, dips	47	4
Condiments/Sauces/Pickled Vegetables: catsup, salsa, soy sauce, barbeque sauce, pickles, sauerkraut	42	4
Soups: canned and home recipe	13	4

[†] Food categories not listed including beverages, ice cream/dairy items, nuts/seeds, fruits, sugar/substitutes, baby foods, other miscellaneous foods each contribute ≤3% of sodium.

[‡] Percentage of individuals reporting the foods in the category at least once on the day.

SOURCE: What We Eat in America, NHANES 2007-2008, Day 1 dietary intake data, weighted.

Definitions

Sodium density: The amount of sodium in a specified amount of a food or diet in order to make comparisons. Comparisons of the sodium density of foods are usually on a per 100 gram basis, and comparisons of the sodium density of the diet is usually on a per 1000 kcal basis.

Data Source

Estimates in this report are based on one day of dietary intake data collected in *What We Eat in America*, the dietary intake interview component of the National Health and Nutrition Examination Survey (NHANES), in 2007-2008. Data on sodium consumption are based on Day 1 dietary intake data of 8529 individuals age 2 years and older with complete and reliable intakes. Data on contribution of food groups to total sodium intake of the population are based on Day 1 dietary intake data of all individuals excluding breastfed children (N=9118). Sample weights were applied in all analyses to produce nationally representative estimates.

References

1. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans, 2010. 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010*
2. He HJ and MacGregor GA. A comprehensive review on salt and health and current experience of Worldwide reduction programmes. *J Hum Hypertens* 2009, 23(6):363-84.

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