



Food Surveys Research Group
 Dietary Data Brief No. 10
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Potassium Intake of the U.S. Population

What We Eat in America, NHANES 2009-2010

Mary K. Hoy, EdD, RD and Joseph D. Goldman, MA

Highlights

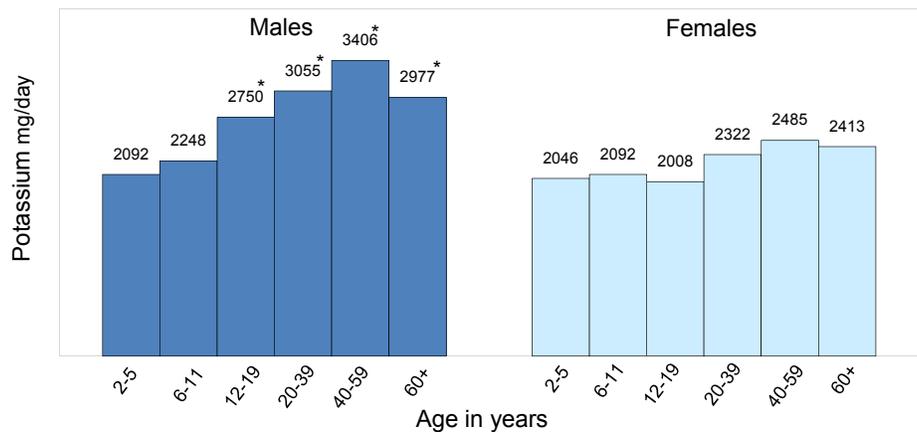
- ▶ The average potassium intake of the U.S. population 2 years and older was 2640 mg per day and intake of the U.S. population has remained relatively unchanged since the mid-1990s. The Institute of Medicine recommendation for Adequate Intake of potassium is 4700 mg per day.
- ▶ The potassium intake of males was significantly higher than females, but overall, the diets of females had a significantly higher potassium density compared to the diet of males.
- ▶ Non-Hispanic black males 20+ years had significantly lower intakes of potassium than Non-Hispanic white and Hispanic adult males. Non-Hispanic black females 20+ years had significantly lower intakes than Non-Hispanic white adult females.
- ▶ The highest contributors to potassium intake were Vegetables and Fruits (20%), Milk and Milk Drinks (11%), Meats and Poultry (10%) and Grain-based Mixed Dishes (10%).

Potassium is identified in the 2010 Dietary Guidelines for Americans as a nutrient to be increased in the diet (1), and the Institute of Medicine (IOM) recommendation for Adequate Intake of potassium is 4700 mg per day (2). Current evidence suggests that an increased intake of potassium lowers blood pressure (1, 3, 4). A low intake may be one factor that contributes to the development of high blood pressure, especially when sodium intake is high (1, 5). Some research suggests that a higher intake of potassium may reduce the adverse effects of a high sodium intake on blood pressure (2, 3). Blacks and those with hypertension may especially benefit from an increased intake of potassium (1). In addition to its effects on blood pressure, a higher potassium intake may reduce the risk of developing kidney stones (2), and might decrease bone loss (2). Data on the intake of potassium in the United States as reported in *What We Eat In America, NHANES 2009-2010* are presented in this report. The contribution of food categories to total potassium intake is also discussed.

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

In 2009-2010, the average dietary potassium intake of the U.S. population aged two years and older was 2640 mg per day. Intake of males overall was higher than females ($p < 0.001$), although gender differences between those 2-5 years and 6-11 years were not significant. As shown in Figure 1, potassium intake of males increased through adulthood, with a decrease for those aged 60+ years. Increases in intakes of females were substantially smaller compared to males. These intakes have remained relatively unchanged since the mid-1990s, and are comparable to intakes observed in the 1994-1998 Continuing Survey of Food Intakes by Individuals (data not shown).

Figure 1. Potassium intake by age and gender, 2009-2010



* Intake of males significantly different than female counterparts, $p < 0.001$

SOURCE: What We Eat in America, NHANES 2009-2010, Day 1 dietary intake data, weighted, excluding breastfed infants.



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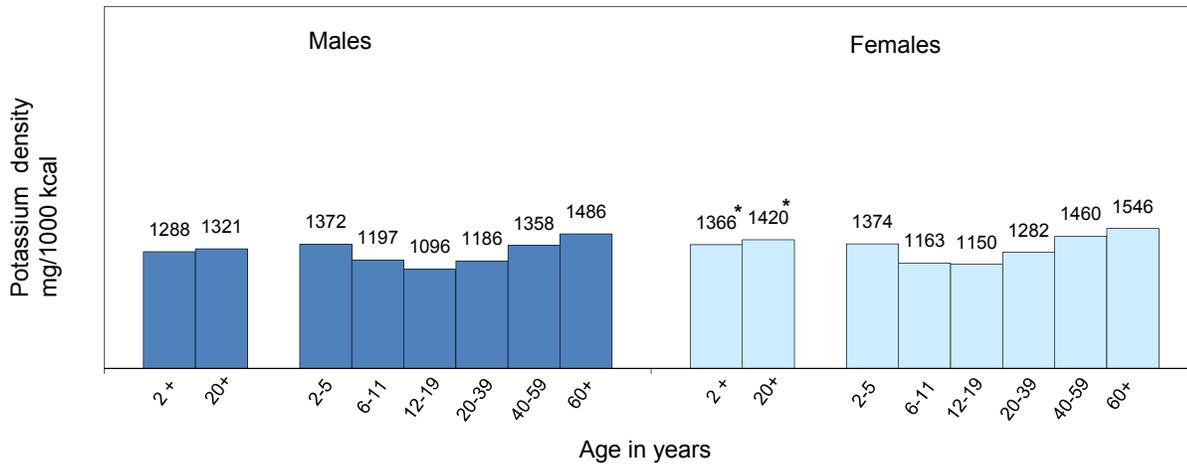
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Potassium intake is influenced by energy intake and food choice.

Dietary potassium intake is related to energy intake, and the higher intake of males may be explained by their higher energy intakes. When potassium intake is examined after adjusting for energy intake, potassium density of the diets of all females 2+ years, as well as those 20+ years is significantly higher than those of their male counterparts ($p < 0.001$). However, when adults are examined by age groups, there are no differences between males and females. Gender differences in potassium density may be related to food choices.

Figure 2. Comparison of potassium intake per 1000 kilocalories by gender, 2009-2010



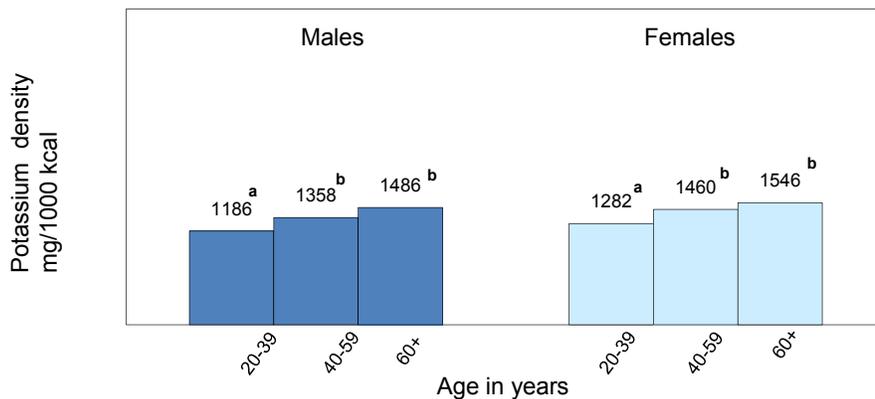
* Potassium density of females 2+ years and of adult females 20+ years significantly higher than males 2+ years and males 20+ years, respectively, $p < 0.001$

SOURCE: What We Eat in America, NHANES 2009-2010, Day 1 dietary intake data, weighted, excluding breastfed infants.

Diets of older adults have higher potassium density than the diets of younger adults.

Figure 3 shows that the diets of adult males and females 20-39 years have a significantly lower potassium density than the diets of corresponding counterparts 40 years and older ($p < 0.001$). Total potassium intakes between these age categories are not significantly different (Figure 1), thus differences per 1000 kcal of energy are most likely explained by differences in food choices.

Figure 3. Comparison of potassium intake per 1000 kilocalories by age, 2009-2010



^{a, b} Within gender, means with different superscript letters are significantly different, $p < 0.001$

SOURCE: What We Eat in America, NHANES 2009-2010, Day 1 dietary intake data, weighted, excluding breastfed infants.

Distribution of potassium intake by selected percentiles on the reporting day.

Table 1 shows the means and values at selected percentiles of potassium intake for children and adults on the reporting day. As the table shows, most individuals are consuming less than 4700 mg on a given day. On the reporting day, less than 25% of males were consuming at least 4700 mg potassium, whereas less than 1% of females were consuming 4700 mg.(data not shown). Given available evidence regarding potassium intake and its relationship to hypertension, kidney stones, and bone health, most individuals would benefit from increasing dietary intake of foods high in potassium.

Table 1. Distribution of daily potassium intake, 2009-2010

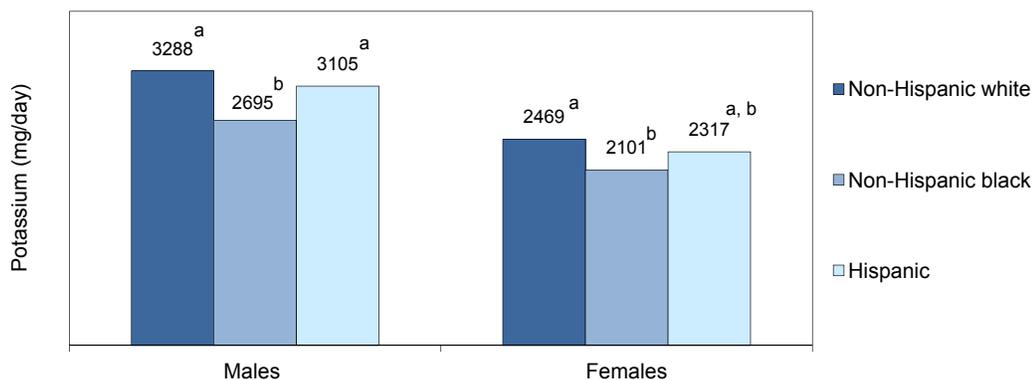
	N	Mean (mg)	SE	Distribution of daily potassium intake Percentiles				
				10 th	25 th	50 th	75 th	90 th
Males and females 2-5 years	861	2071	36	1172	1503	1972	2481	3082
Males and females 6-11 years	1154	2172	40	1208	1566	2050	2641	3281
Males and females 12-19 years	1265	2366	64	1073	1556	2129	2959	3939
Males 20+ years	2789	3172	44	1595	2184	2992	3855	4877
Females 20+ years	2973	2408	22	1226	1696	2296	3049	3629

SOURCE: What We Eat in America, NHANES 2009-2010, Day 1 dietary intake data, weighted, excluding breastfed infants.

Does potassium intake differ by race/ethnicity or income?

When considered by race/ethnicity, potassium intake of Non-Hispanic black males 20+ years was significantly lower compared to Non-Hispanic white and Hispanic adult males ($p < 0.001$), as shown in Figure 4. Non-Hispanic black females 20+ years had significantly lower intake compared to Non-Hispanic white adult females only ($p < 0.001$). Differences between children and adolescents were not significant (data not shown). For all individuals 2+ years, those at income levels greater than 300% of poverty threshold had significantly higher intakes than those whose income levels were 300% or less ($p < 0.001$) (data not shown).

Figure 4. Potassium intake of males and females 20+ years by race/ethnicity



^{a, b} Within gender, means with different superscript letters are significantly different, $p < 0.001$

SOURCE: What We Eat in America, NHANES 2009-2010, Day 1 dietary intake data, weighted, excluding breastfed infants.

What foods contain potassium?

Foods that have a higher potassium content include fruits and vegetables, milk and yogurt, and protein foods including meat and poultry, some fish, and beans and peas. The potassium content of grains and grain products, fats and oils, and sweets is lower. Table 2 shows the potassium content of several representative foods per 100 grams and for common serving sizes. More information about other specific foods can be found using the What's In the Foods You Eat Search Tool (<http://www.ars.usda.gov/Services/docs.htm?docid=17032>).

Table 2. Potassium content of selected foods per 100 grams and for common measures[†]

Food	Potassium (mg) per 100 grams	Common Measure	Potassium (mg) per common measure
Beet greens, cooked	903	½ cup	650
Raisins	749	¼ cup	271
Baked potato, with skin	531	1 medium	919
Black beans, cooked	374	½ cup	322
Banana	358	1 small	362
Salmon, canned	336	3 oz.	286
Carrots, baby, raw	320	10	320
Spinach, cooked from frozen	301	½ cup	309
Broccoli, cooked from fresh	291	½ cup	268
Cantaloupe, raw	267	1 cup	417
Tomato, fresh	237	½ medium	146
Orange	181	1 medium	237
Yogurt, low fat, plain	234	6 oz. container	398
Milk, 1%	150	1 cup	366

[†] Based on the Food and Nutrient Database for Dietary Studies (FNDDS) 5.0 used to process and analyze What We Eat in America, NHANES 2009-2010 dietary intake data (6). Underlying food composition data are from the USDA National Nutrient Database for Standard Reference 24 (7).

What foods contribute to potassium intake?

As shown in Table 3, Fruits and Vegetables contributed 20% to total potassium intake, providing 13% and 7% respectively. Of the total contribution by Vegetables, almost half (6%) was from White Potatoes (except chips), and the remaining (7%) was from all Other Vegetables. Of the 7% contribution from Fruits, bananas and apples, the top two reported fruits, provided 2% and 1%, respectively (data not shown). Milk, and Flavored Milk and Milk Drinks accounted for 11% of total potassium intake, which was primarily from fluid milk. Meats and Poultry, including Cured Meats contributed 10% to total intake. Grain-based Mixed Dishes such as pasta dishes, macaroni and cheese, pizza and sandwiches accounted for 10% of total potassium intake. Coffee and Tea provided 7%, of which Coffee provided 5% of total potassium intake, and Fruit/Vegetable juices contributed 5%, about half of which was from orange juice (data not shown). Meat/Poultry Mixed Dishes and Plant-based Protein Foods, primarily beans/peas and Mixed Dishes with beans/peas each provided 4% of potassium, and Savory Snacks such as chips, popcorn and crackers contributed 3%.

Table 3. Percent contribution of food categories to potassium intake, 2009-2010

FOOD CATEGORIES [†]	Individuals Reporting (%) [‡]	Contribution to Potassium (%)
Fruits and Vegetables	81	20
Total Vegetables	67	13
Vegetables: fresh, frozen, canned, salads, mixed dishes, except white potatoes	55	7
White Potatoes: baked, boiled, mashed, French fries, hash browns, potato salad, except potato chips	31	6
Total Fruits: fresh, frozen, canned, salads	48	7
Milk and Milk Drinks	55	11
Milk: whole, reduced fat, low fat, nonfat	48	9
Flavored Milk and Milk Drinks: flavored milk, milk substitutes, milkshakes	12	2
Meats and Poultry	66	10
Cured Meats: ham, luncheon meats, frankfurters, bacon, sausage	34	4
Meats: beef, pork, lamb, game	24	3
Poultry: fried/baked chicken, patties, nuggets, turkey, duck	27	3
Grain-based Mixed Dishes: pasta mixed dishes, macaroni and cheese, rice mixed dishes, pizza, sandwiches, burritos, tacos, tamales	50	10
Coffee and Tea	55	7
Coffee	42	5
Tea	23	2
100% Juices: orange juice and all other 100% fruit /vegetable juices	25	5
Meat/Poultry Mixed Dishes: meat or poultry as main ingredient with grain and/or vegetable, gravies, sauces	18	4
Plant-based Protein Foods: beans/peas and beans/peas mixed dishes, nuts and seeds, soy products	27	4
Savory Snacks: chips, crackers, popcorn, pretzels	45	3

[†] Food categories not listed including Seafood, Breads and Tortillas, Cheese and Yogurt, Cereals, Soups, Sweetened Beverages, Beer and Wine, Sugars and Sweets, and Condiments, Dips, Sauces each contribute <3% of potassium.

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

SOURCE: What We Eat in America, NHANES 2009-2010, Day 1 dietary intake data, weighted, excluding breastfed infants.

Definitions

Adequate Intake: The recommended average daily intake level based on observed or experimentally determined approximations or estimates of nutrient intake by a group (or groups) of apparently healthy people that are assumed to be adequate – used when an Estimated Average Requirement (EAR) cannot be determined. (2)

Potassium density: The amount of potassium in a specified amount of a food or diet in order to make comparisons. Comparisons of the potassium density of foods are usually on a per 100 gram basis, and comparisons of the potassium density of the diet are 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 2009-2010. Data on potassium consumption and contribution of foods to dietary potassium intake are based on Day 1 dietary intake data of 9042 individuals age 2 years and older with complete and reliable intakes, excluding breastfed infants. Sample weights were applied in all analyses to produce nationally representative estimates.

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