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Calcium intake of the U.S. population

What We Eat in America, NHANES 2009-2010

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Highlights

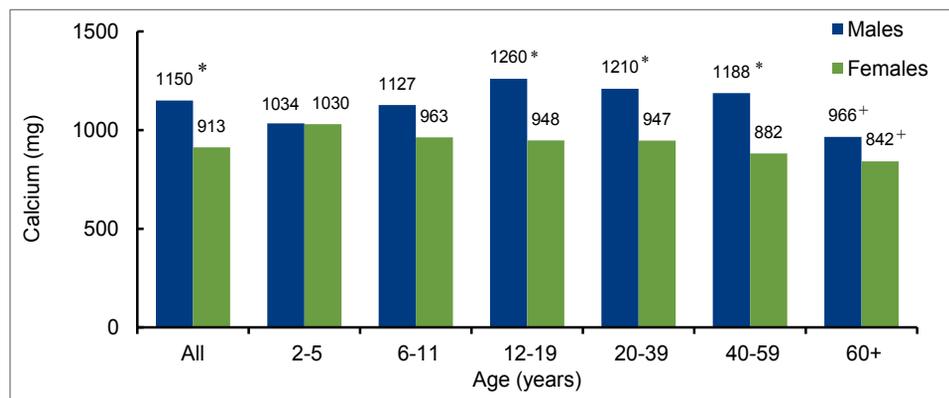
- The average daily dietary calcium intake is 1029 mg.
- The diets of females have a higher calcium density compared to males.
- A quarter of Americans report taking a dietary supplement containing calcium.
- Dietary calcium intake of the population has shown an increasing trend from the mid-90s, increasing approximately 85 to 190 mg across age groups.
- The top three WWEIA Food Categories that contribute to calcium intake are Milk and dairy, Mixed dishes, and Grains

Calcium, the most abundant mineral in the body, is required for many important functions. About 99% of the body's calcium is found in bones and teeth, where it is essential for formation and maintenance of strong bones and teeth. The remaining 1% of calcium is found in the blood, muscle and other tissues, and has important roles in blood clotting, muscle function, nerve transmission, and blood pressure. Calcium has been identified as a nutrient of concern in the 2010 Dietary Guidelines for Americans (1). Data from What We Eat In America, NHANES 2009-2010 indicated that 42% of Americans did not meet their Estimated Average Requirements for calcium as recommended by the Institute of Medicine (2). This report presents data on the dietary and supplemental calcium intake of the U.S. population as reported in What We Eat In America, NHANES 2009-2010 and the contribution of foods and beverages to calcium intake.

What is the calcium intake of the U.S. population?

The mean daily intake of dietary calcium for individuals 2 years and older was 1029 mg. As Figure 1 shows, intake of males was significantly higher than females for teens and adults up to 60 years of age. For those older adults, intake was significantly lower than all others combined within gender.

Figure 1. Calcium intake of U.S. population, WWEIA, NHANES 2009-2010



*Significantly different from females ($p < 0.001$)

+ Within gender, significantly different than other age groups combined ($P < 0.001$)

SOURCE: What We Eat in America, NHANES 2009-2010, day 1, individuals 2+ years



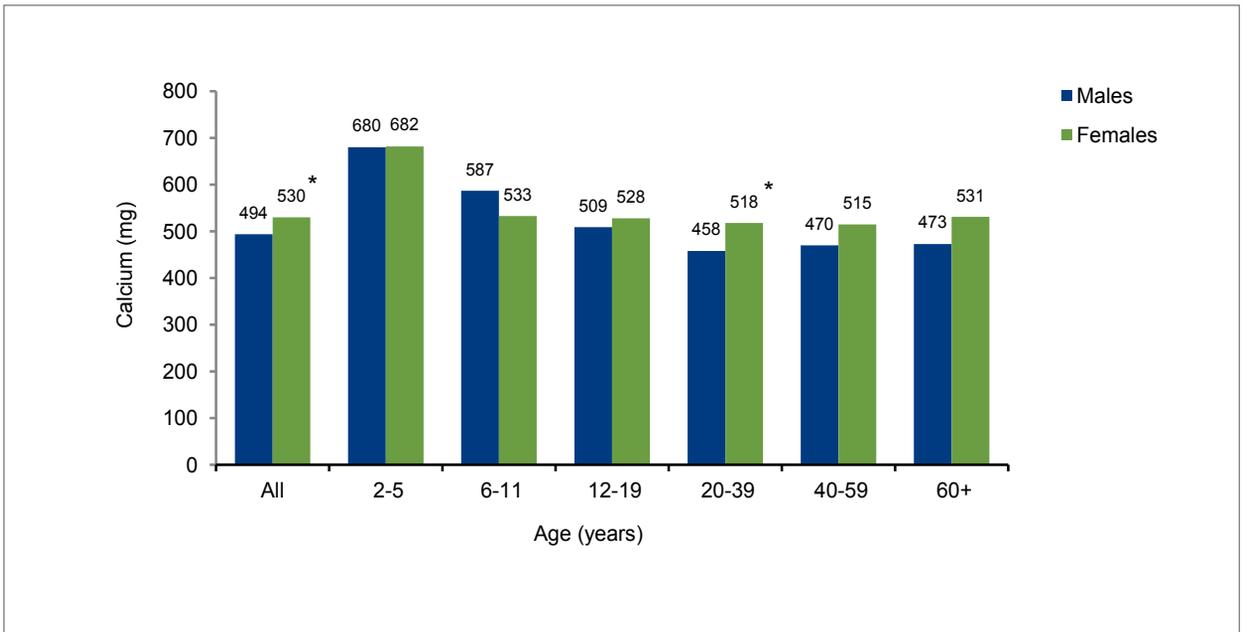
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Calcium intake is influenced by energy intake.

The higher calcium intake of males is related to their higher energy intakes. When calcium intake is adjusted by energy intake, the diets of females have a higher calcium density (mg calcium/1000 kcal) than males, as shown in Figure 2. When all females are considered together, this difference is significant, although differences between males and females by age group were only significant for those 20-39 years. Difference in calcium density may be related to food choice.

Figure 2. Calcium density (mg/1000 kcal) of U.S. population, WWEIA, NHANES 2009-2010



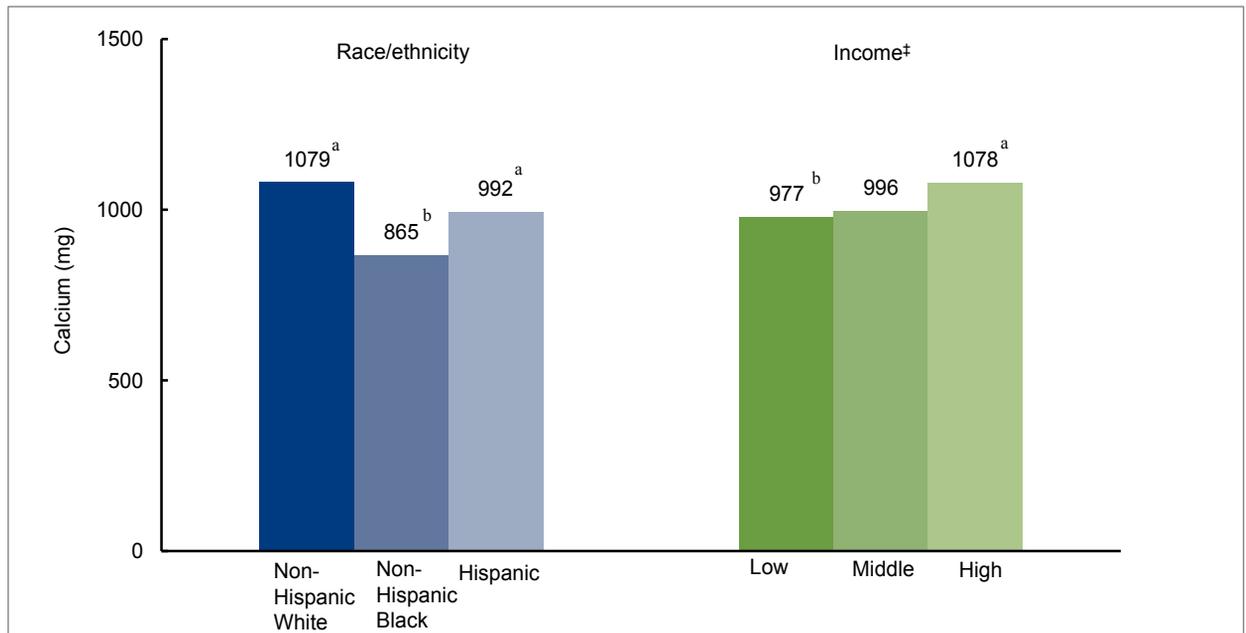
*Significantly different from males (p<0.001)

SOURCE: What We Eat in America, NHANES 2009-2010, day 1, individuals 2+ years

Does calcium intake differ by race/ethnicity and income status?

Yes. There are some differences in calcium intakes by race/ethnicity and income status. As Figure 3 shows, mean intake of Non-Hispanic blacks was lower than Non-Hispanic whites and Hispanics. Figure 3 also shows that when considered by income status, those from lower income households had lower intakes compared with those from the highest income households. Differences in calcium density by race/ethnicity and income status are similar to those for intake.

Figure 3. Calcium intake of U.S. population, by race/ethnicity and income, WWEIA, NHANES 2009-2010



^{a,b} Within race/ethnicity and income, significantly different ($p < 0.001$)

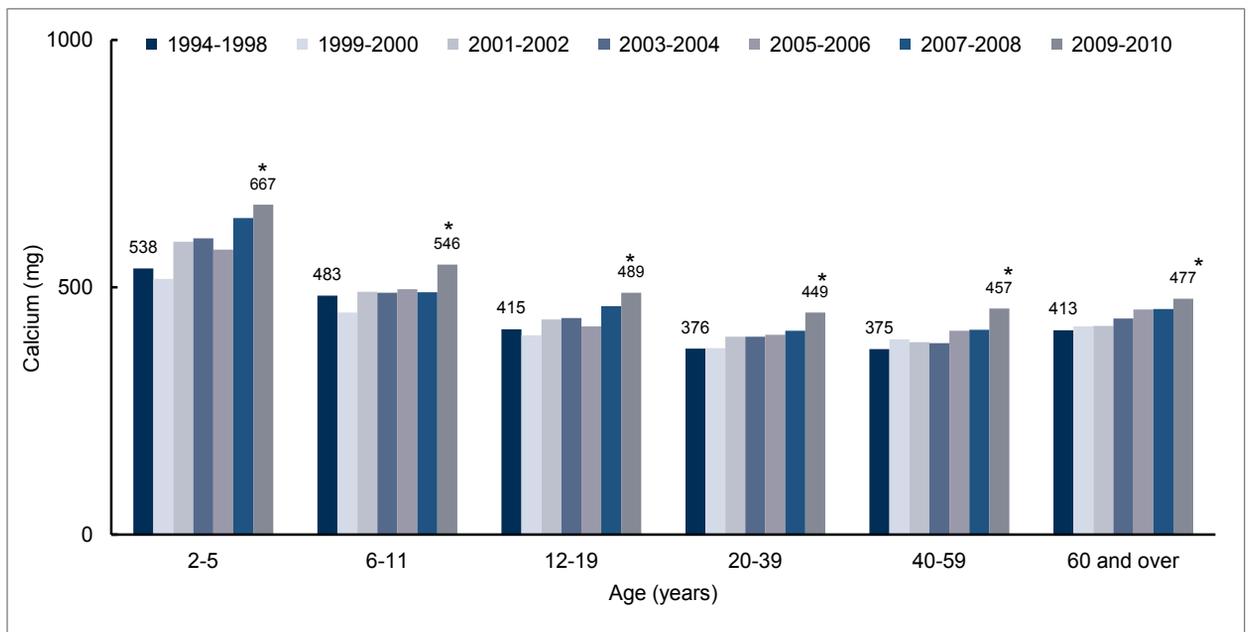
[‡]Income level based on % poverty threshold – Low: 0-130%; Middle: 131-300%; High: >300%

SOURCE: What We Eat in America, NHANES 2009-2010, day 1, individuals 2+ years

Has calcium intake changed over time?

Yes. As Figure 4 illustrates, trends in calcium density, excluding calcium that may be obtained from drinking water, show significant increases since the mid to late 1990s. Across age categories, the increases ranged from around 70 to 130 mg per 1000 kcal. These increases in calcium density resulted in similar trends for total calcium intake, which increased around 85 to 190 mg across age categories (data not shown).

Figure 4. Trends in calcium density between 1994-1998 and 2009-2010



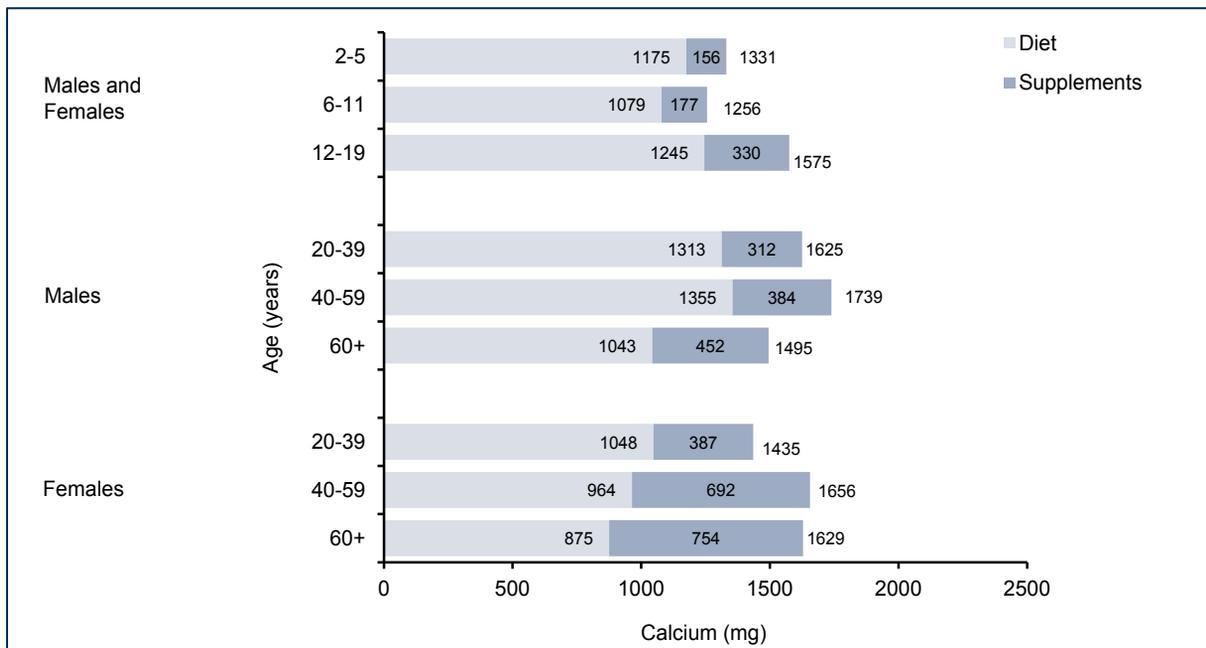
* Significant linear trend for increasing calcium density between 1994-1998 and 2009-2010 P<0.001

SOURCE: What We Eat in America, NHANES 2009-2010, day 1, individuals 2+ years

What is the contribution of supplements to calcium intake?

Approximately one-quarter (26%) of individuals 2 years and older (excluding pregnant and/or lactating women, and breast-fed children) reported taking a multi- or single ingredient supplement containing calcium on a given day (3). Compared to males, a higher percentage of females over 20 years and older reported supplement intake (26% versus 37%) (3). The average intake of calcium from multi- or single ingredient supplements was 521 mg (3). As Figure 5 illustrates, females taking supplements containing calcium consume higher amounts of supplemental calcium compared to their male counterparts, and males and females 60 years and older who take supplements containing calcium consume more supplemental calcium than younger individuals

Figure 5. Contribution of diet and supplements to total calcium intake of those who report taking a supplement on a given day, WWEIA, NHANES 2009-2010



SOURCE: What We Eat in America, NHANES 2009-2010, day 1, individuals 2+ years
Reporters of calcium-containing supplements only (n=1,883)

What foods contribute to calcium intake of the population?

Table 1 shows the contribution of WWEIA food categories to calcium intake of the population. Milk and dairy products contributed over one-third (37%) to total calcium intake, of which about half (19%) was from plain milk. This included milk consumed as a beverage, added to cereal, or added to another beverage. About one-third of the contribution from milk and dairy was from cheese. Mixed dishes accounted for 17% of calcium intake, which included cheese in pizza, sandwiches (primarily from fast food) and mixed ingredient items such as tacos, burritos, pasta dishes, and macaroni and cheese. Grains, primarily grain products, provided 12% of calcium, over half of which was from breads, rolls and tortillas (7%).

Table 1. Contribution of What We Eat In America Food Categories to calcium intake of U.S. population, WWEIA, NHANES, 2009-2010.

Food Category [†]	Individuals Reporting (%) [‡]	Contribution to calcium intake (%)
Milk and dairy	73	37
Milk: whole, reduced, low and non-fat milk	48	19
Flavored milk: chocolate and other flavored milk	7	3
Cheese: cheese and cottage/ricotta cheese	39	13
Yogurt: plain and flavored yogurt	8	2
Mixed dishes	68	17
Grain-based: pasta dishes, macaroni and cheese, burritos, tacos, tamales, fried rice	33	6
Pizza: fast food/restaurant and frozen pizza	14	5
Grains	85	12
Breads, rolls, tortillas: yeast breads/rolls, flour and corn tortillas, bagels, English muffins	66	7
Non-alcoholic beverages, excluding plain and flavored milk	90	8
100% juice: citrus juice, other fruit and vegetable juices	25	4
Snacks and sweets: ice cream, frozen dairy products, candy containing chocolate, cakes and pies, tortilla/corn chips	80	7
Protein foods: meats, poultry, seafood, cured meats, plant-based protein foods	82	5
Vegetables: potatoes, dark green vegetables, lettuce and salads, other vegetables	67	4

[†]Food categories not listed contribute 3% or less to calcium intake of the population, including Fruit, Fats and oils, Condiments and sauces, Sugars, and Alcoholic beverages.

[‡]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, individuals 2+ years

Definitions

Estimated Average Requirement (EAR) : the nutrient intake value that is estimated to meet the requirement defined by a specified indicator of adequacy in 50 percent of the individuals in a life stage and gender group (4).

calcium density: The amount of calcium in a specified amount of a food or diet in order to make comparisons. Comparisons of the calcium density of foods are usually on a per 100 gram basis, and comparisons of the calcium 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 calcium consumption and contribution of foods to dietary calcium 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.

References

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