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Sandwiches are a major contributor to dietary sodium intake

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Sandwiches Account for One-Fifth of Total Sodium Intake, with Nearly Half of American Adults Consuming Them on Any Given Day, According to New Study Published in the *Journal of the Academy of Nutrition and Dietetics*

Sandwiches make up a substantial part of the American diet and are a significant contributor to daily energy and sodium intake. By closely analyzing data from the federal nationwide dietary intake survey known as "What We Eat in America NHANES 2009-2010," a team of Department of Agriculture (USDA) researchers found that on any given day 49 percent of U.S. adults eat at least one sandwich, and sandwiches account for one-fifth of total daily sodium intake. The study was conducted by USDA Agricultural Research Service (ARS) investigators at the Food Surveys Research Group. ARS is USDA's chief intramural scientific research agency and is partnering with the U.S. Department of Health and Human Services in conducting the survey. The study findings were published in the *Journal of the Academy of Nutrition and Dietetics.*

Sandwiches are a mainstay of American cuisine, but they pose a challenge to survey researchers since they can be comprised of a wide variety of different ingredients. In What We Eat in America NHANES 2009-2010, participants reported everything they ate and drank the previous day. Each food and beverage reported was then assigned one or more food codes so that its nutrient content could be determined.

For most sandwiches, participants reported the various components of

their sandwich (such as bread and fillings) individually. Those components were then coded separately with multiple food codes that were linked to indicate they were eaten together as a sandwich. For instance, a ham and cheese sandwich may have been coded as specific amounts of bread, ham, cheese, lettuce, and mayonnaise. On the other hand, some sandwiches, especially fast-food sandwiches, were coded using a single food code (for instance, "turkey submarine sandwich, with cheese, lettuce, tomato, and spread" or "bacon cheeseburger, ¼ lb meat, with tomato and/or catsup, on bun").

Because previous studies had defined sandwiches as only those that were represented by a single food code, those analyses found that sandwiches only contributed about 4 percent of daily sodium intake. In this innovative study, investigators broadened the sandwich definition by including sandwiches that were coded as multiple ingredients as well as those coded using a single food code. By including sandwiches coded both ways, researchers discovered that sandwiches actually account for one-fifth of total sodium intake and that on any given day nearly half of the adults in America aged 20 years and older eat a sandwich.

"In 2009-2010, only about 20 percent of all sandwiches were represented by a single food code," explains study co-author ARS nutritionist Rhonda Sebastian, MA. "For that reason, previously published estimates of sandwich contributions to sodium intake that were based on only single-code sandwiches are considerably underestimated."

The 2010 Dietary Guidelines for Americans recommend a maximum intake of 2,300 milligrams of sodium per day. For certain groups – adults over 50, African-Americans, and those with certain medical conditions, such as high blood pressure, diabetes, or chronic kidney disease – the recommended amount is reduced to 1,500 milligrams per day. This study revealed that, for adults, sandwiches alone contribute 30 percent of the less restrictive guideline and 46 percent of the stricter

guideline.

Researchers also found that people who ate sandwiches had significantly higher energy intakes than those who did not. Those who consumed a sandwich on the survey day took in, on average, around 300 kilocalories more than those who did not report eating a sandwich. Sandwich reporters also had higher total sodium intakes, averaging around 600 milligrams per day higher than sandwich non-reporters.

"The unanticipated finding that sandwich consumption is associated with higher overall intake of energy underscores the importance of making healthful choices of sandwich ingredients," says co-author ARS nutritionist Cecilia Wilkinson Enns, MS, RD. "Many sandwiches, such as burgers and franks, and common sandwich components, such as yeast breads, cheese, and cured meats, are among the top contributors not only to sodium but also to energy in the diets of adult Americans."

The study found that the higher levels of sodium intake among sandwich reporters were linked to the higher levels of daily energy consumption. "Regardless of sandwich reporting status, sodium density was approximately 1,700-1,800 mg per 1,000 kilocalories, suggesting that the higher sodium levels of sandwich reports are explained by their higher energy intake," states Sebastian.

As Americans search for ways to improve their diets, taking another look at sandwiches may help people make better choices and avoid consuming both too many calories and too much sodium. "Though much national attention is appropriately focused on reducing sodium in the food supply, consumer choices still play a vital role," concludes Wilkinson Enns. "Due to sandwiches' frequent consumption and considerable contributions to sodium intake, substituting lower-sodium for higher-sodium ingredients in sandwiches could significantly impact sodium intakes."

More information: "Sandwiches are a major contributor of sodium in the diets of American adults: Results from What We Eat in America, NHANES 2009-2010," by Rhonda Sebastian, MA; Cecilia Wilkinson Enns, MS, RD; Joseph D Goldman, MA; M. Katherine Hoy, EdD, RD; Alanna J Moshfegh, MS, RD, *Journal of the Academy of Nutrition and Dietetics*, DOI: 10.1016/j.jand.2014.07.034

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