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## Older Americans Act Title III-C Nutrition Services Program: **Key Food Sources of Sodium, Saturated Fat, Empty Calories, and Refined Grains in the Diets of Program Participants**

### BACKGROUND

#### Purpose

The purpose of this issue brief is to identify key food sources of sodium, saturated fat, empty calories, and refined grains in the diets of congregate and home-delivered meal participants, and to examine differences between participants and nonparticipants in these key food sources.

Following a healthy eating pattern is an important factor in reducing risks of developing chronic health conditions such as cardiovascular disease, hypertension, diabetes, osteoporosis, and certain types of cancer. The *Dietary Guidelines for Americans* defines a healthy eating pattern as one that emphasizes fruits, vegetables, whole grains, low-fat or fat-free dairy, and lean meats and seafood, and limits sodium, saturated fat, refined grains, and empty calories (U.S. Department of Health and Human Services [DHHS], and U.S. Department of Agriculture [USDA] 2010). For many older adults, following a healthy eating pattern can be challenging. For example, aging can cause a loss of appetite, changes in taste and smell, and difficulty chewing and swallowing, which can affect a person's food choices or overall dietary intake (Institute of Medicine 2010). Older adults may also experience mobility constraints that can make it difficult to shop for and prepare foods.

The Older Americans Act (OAA) Title III-C Nutrition Services Program (NSP)—administered by the Administration on Aging (AoA) within the Administration for Community Living of DHHS—plays an important role in the health of older adults that participate in the program. Specifically, the purposes of the NSP are to (1) reduce hunger and food insecurity; (2) promote socialization of older individuals; and (3) promote the health and well-being of older individuals by helping them access services that encourage proper nutrition, prevent disease, and promote health. The program provides meals, nutrition education, nutrition-risk screening, and nutrition counseling to older adults. Services are provided in congregate meal sites located in a variety of settings, including senior centers, senior cafes, schools, churches, farmers markets, and other community settings. In addition, the NSP provides home-delivered meals and services to homebound older adults. Congregate and home-delivered meals must adhere to the current *Dietary Guidelines for Americans* and provide a minimum of one-third of the Dietary Reference Intakes (Administration for Community Living 2017).

Previous research has shown that meals provided through the NSP make substantial contributions to older adults' diets (Mabli et al. 2017). On average, older adults who

**Empty calories** are provided by foods that contain solid fats and added sugars. Solid fats mainly come from animal foods but also from vegetable oils that are processed.

Grains are either refined or whole. **Refined grains** have been processed to remove the bran and germ, which removes dietary fiber, iron, and other important nutrients.

participated in the NSP obtained about 40 percent of their daily intakes of calories, as well as 35 to 47 percent of daily intakes of nutrients, from a program meal. In addition, the program had positive effects on the nutrient intakes and overall quality of participants' diets, particularly among congregate meal participants. However, when the quality of participants' diets was assessed using the Healthy Eating Index-2010, their diets (like the diets of most Americans) were not fully consistent with the 2010 *Dietary Guidelines for Americans* recommendations for a healthy diet (Mabli et al. 2017). Most notably, participants' diets exceeded recommended limits for sodium, saturated fat, empty calories, and refined grains.

This issue brief identifies the key food sources of sodium, saturated fat, empty calories, and refined grains in the diets of congregate and home-delivered meal participants. It also examines differences between participants and nonparticipants in these key food sources. These findings can help target nutrition education efforts to promote healthier food choices among participants and reduce intakes of these dietary components.

## METHODS

The data used in the analysis were collected as part of the Title III-C NSP Evaluation, which Mathematica Policy Research conducted under contract to the AoA. The evaluation consisted of a process evaluation of program administration and service delivery (Mabli et al. 2015); a cost analysis (Ziegler et al. 2015); and an evaluation of the effect of the program on participants' outcomes, including food security, socialization, and diet quality (Mabli et al. 2017). To estimate the effect of receiving a congregate or home-delivered meal on these outcomes, the study team compared outcomes for participants and a matched comparison group of program-eligible nonparticipants. The purpose of the matched comparison group of eligible nonparticipants was to represent what would happen to participants in the absence of the program. In constructing the matched comparison groups for congregate meal participants and home-delivered meal

participants, the study team used statistical methods to control for differences in the characteristics of participants and their respective group of nonparticipants that could affect both outcomes and program participation decisions.

Trained interviewers conducted 24-hour dietary recalls with both participants and nonparticipants. Interviewers used the Automated Self-Administered 24-hour dietary recall system ([ASA24] National Cancer Institute 2014) to collect detailed information about all foods and beverages consumed during a midnight-to-midnight recall period. The 24-hour dietary recall data provide amounts of calories, nutrients, and USDA Food Pattern food group equivalents (for example, ounce equivalents of refined grains and teaspoons of added sugars) for each food consumed.

As part of a prior analysis, the study team classified foods reported in the dietary recalls into a set of major food groups and subgroups. The food groups were based on those developed by the USDA for analyzing dietary recall data collected in *What We Eat in America*, the dietary interview component of the National Health and Nutrition Examination Survey (USDA, Agricultural Research Service 2016). Each food was assigned to one of nine major food groups: milk and dairy; fruits; vegetables; protein foods; mixed dishes; grains; snacks and sweets; beverages other than milk and 100% juice; and added fats, oils, condiments, and sauces. Foods in each major food group were then assigned to one of 61 mutually exclusive subgroups based on specific characteristics of the food. Foods that included more than one component (for example, sandwiches, entree salads, or pasta or rice dishes with meat and vegetables) were counted as a single food.

To identify key sources of sodium, saturated fat, empty calories, and refined grains, the study team examined each food subgroup's contribution to the total intake of each dietary component at the level of the population (Bachman et al. 2008; Subar et al. 1998). The team then computed each food group's contribution to the intake of a dietary component as a percentage of that dietary component. We determined the percentage contributed by summing the amount of the dietary component provided by a particular food group for all individuals and dividing that number by the total amount of the dietary component

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consumed from all foods for all individuals. For example, to estimate the contribution of sandwiches to individuals' total daily intake of sodium, we used the following formula:

$$\text{Sum of sodium consumed from sandwiches} \div \text{sum of sodium consumed from all foods}$$

For each dietary component included in the analysis, the study team estimated the percentage contribution separately for congregate meal participants (n = 468) and nonparticipants (n = 619) and for home-delivered meal participants (n = 433) and nonparticipants (n = 514). Differences between participants and nonparticipants were tested for statistical significance at the 0.05 level.

## FINDINGS

### SODIUM

For congregate meal participants, the top five sources of sodium were sandwiches (13 percent of the total sodium consumed), mixed dishes with meat, poultry, and seafood (including meatloaf, chicken pot pie, chili, chicken parmigiana, or Salisbury steak; 9 percent); soups (7 percent); sweet bakery products (such as cakes, pies, cookies, brownies, sweet rolls, and pastries; 5 percent); and cured meats and poultry (5 percent). Relative to nonparticipants, congregate meal participants obtained significantly larger proportions of their total sodium intakes from mixed dishes with meat, poultry, and seafood (9 percent versus 5 percent), and sweet bakery products (5 percent versus 3 percent).

The leading food sources of sodium among home-delivered meal participants were similar to congregate meal participants, and included sandwiches (12 percent); cured meats and poultry (7 percent); mixed dishes with meat, poultry, or seafood (6 percent); soups (6 percent); and mashed potatoes (5 percent). Home-delivered meal participants obtained a significantly smaller share of their total sodium intakes from sandwiches compared with nonparticipants (12 percent versus 16 percent). Conversely, they obtained a significantly larger share of their total sodium intakes from mashed potatoes than nonparticipants (5 percent versus 2 percent).

### SATURATED FAT

The top five food sources of saturated fat for congregate meal participants were sandwiches (12 percent); added fats and oils (10 percent); sweet bakery products (9 percent); milk (9 percent); and mixed dishes with meat, poultry, or seafood (8 percent). Compared with nonparticipants, congregate meal participants obtained a significantly larger percentage of their saturated fat intakes from sweet bakery products (9 versus 6 percent), milk (9 versus 7 percent) and mixed dishes with meat, poultry, or seafood (8 versus 4 percent).

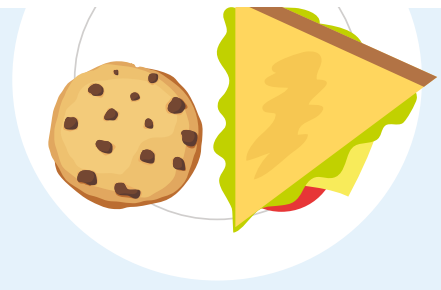
Among home-delivered meal participants, leading sources of saturated fat were sandwiches (12 percent), milk (11 percent), added fats and oils (10 percent), sweet bakery products (8 percent), and meats (6 percent). Compared to nonparticipants, home-delivered meal participants obtained a significantly larger proportion of their saturated fat intakes from milk (11 percent versus 7 percent).

### EMPTY CALORIES

For congregate meal participants, sweet bakery products were the leading source of empty calories (contributing 21 percent of the total calories consumed). Other top source of empty calories included sandwiches (8 percent); frozen dairy desserts, pudding, and gelatin (8 percent); added fats and oils (6 percent); and milk (from fat in whole, reduced, and low-fat milks; 5 percent). Compared to nonparticipants, congregate meal participants obtained a significantly higher proportion of their empty calories from sweet bakery products (21 versus 13 percent) and milk (5 percent versus 4 percent).

The top food sources of empty calories among home-delivered meal participants were similar to those of congregate meal participants and included sweet bakery products (which contributed 17 percent); sandwiches (8 percent); sweetened beverages (8 percent); milk (7 percent); and added fats and oils (6 percent). Home-delivered meal participants consumed a significantly higher proportion of their empty calories from milk compared to nonparticipants (7 versus 5 percent).

# Top 5 Sources of . . .



## Sodium

### Congregate meal participants

- Sandwiches
- Mixed dishes with meat, poultry, or seafood
- Soups
- Sweet bakery products
- Cured meats and poultry

### Home-delivered meal participants

- Sandwiches
- Cured meats and poultry
- Mixed dishes with meat, poultry, or seafood
- Soups
- Mashed potatoes

## Saturated fat

### Congregate meal participants

- Sandwiches
- Fats and oils
- Sweet bakery products
- Milk
- Mixed dishes with meat, poultry, or seafood

### Home-delivered meal participants

- Sandwiches
- Milk
- Fats and oils
- Sweet bakery products
- Meats

## Empty calories

### Congregate meal participants

- Sweet bakery products
- Sandwiches
- Frozen dairy desserts, pudding, and gelatin
- Fats and oils
- Milk

### Home-delivered meal participants

- Sweet bakery products
- Sandwiches
- Sweetened beverages
- Milk
- Fats and oils

## Refined grains

### Congregate meal participants

- Sweet bakery products
- Sandwiches
- Bread, rolls, and tortillas
- Grain-based mixed dishes
- Quick breads and bread

### Home-delivered meal participants

- Sandwiches
- Sweet bakery products
- Bread, rolls, and tortillas
- Grain-based mixed dishes
- Quick breads and bread

## REFINED GRAINS

Congregate meal participants obtained more than half of the refined grains they consumed from sweet bakery products (21 percent); sandwiches (18 percent); and breads, rolls, and tortillas (18 percent). Grain-based mixed dishes (such as pasta or rice, dumplings, turnovers, and macaroni and cheese) and quick breads (such as biscuits and muffins) were also among the top five sources of refined grains (each contributing 7 percent to the total amount consumed). Congregate meal participants obtained almost twice as much of their refined grains from sweet bakery products than nonparticipants did (21 versus 11 percent).

The top five sources of refined grains among home-delivered meal participants were the same as those reported for congregare meal participants—sandwiches (20 percent); sweet bakery products (17 percent); breads, rolls, and tortillas (17 percent); grain-based mixed dishes (7 percent); and quick breads (6 percent).

## DISCUSSION

These findings provide useful information on the types of foods that contributed to participants' excessive intakes of sodium, saturated fat, empty calories, and refined grains. Participants consumed these dietary components from a

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variety of food sources; however, the top five sources accounted for almost 50 percent of participants' total intakes of sodium, saturated fat, empty calories, and refined grains.

Focusing nutrition education efforts with program staff that plan and prepare congregate and home-delivered meals could help improve participants' diets, given that program meals make such substantial contributions to participants' dietary intakes. For example on average, a program meal contributed to 39 to 41 percent of congregate and home-delivered meal participants' daily intake of saturated fat, and nearly half of the daily sodium consumed by participants was contributed by program meals (46 to 47 percent; Mabli et al 2017). Reducing or modifying these specific foods in program meals and targeting them through nutrition education efforts with participants is another strategy that can help improve the quality of older adults' diets.

It is important that nutrition education focus on healthier alternatives, rather than just eliminating specific types of foods from the diet. For example, the *Dietary Guidelines for Americans* recommend replacing saturated fats with unsaturated fats; refined grains with whole grains; red meat with leaner meats, poultry, and seafood; and higher-fat dairy with fat-free or low-fat varieties. For both congregate and home-delivered meal participants, sandwiches were a leading contributor to all four dietary components included in this analysis. Sandwiches with meat (ham, roast beef, and pork) were the most common type of sandwich consumed by participants (Gearan and Niland forthcoming). This fact suggests that modifying sandwich ingredients could help lower intakes of sodium, saturated fat, empty calories, and refined grains—for example, by including leaner meats and seafood, lower-sodium meats and cheeses, and whole grain breads.

Similarly, sweet bakery products were among the top five contributors to sodium, saturated fat, empty calories, and refined grains for both groups of participants. Over the course of a day, 61 percent of congregate meal participants and 48 percent of home-delivered meal participants consumed at least one sweet bakery product (mostly cookies, brownies, cakes, and pies).

Encouraging older adults to limit these types of foods or opt for lower-fat, lower-sodium, or whole-grain varieties of these types of foods in their daily diets could help reduce intakes of sodium, saturated fat, empty calories, and refined grains.

Modifying the types of foods older adults consume can help improve their overall diet quality. Program staff can play an important role in this effort by providing high quality meals and targeted nutrition education to participants. Moreover, staff should evaluate program menus and participants' diets to aim for consistency with the *Dietary Guidelines for Americans*. These efforts will help ensure that the NSP is fulfilling its goal of promoting the health of older adults. While program staff can help participants reduce intakes of sodium, additional policies and strategies at local, state, and national levels in both the private and public sectors are necessary to support these efforts since most of the sodium consumed in the United States comes from salt added during commercial food processing (DHHS and USDA 2015).

## REFERENCES

- Administration for Community Living (ACL). "Nutrition Services: Nutrition Quality Standards." Washington, DC: ACL, 2017. Available at <https://www.acl.gov/programs/health-wellness/nutrition-services>. Accessed August 9, 2018.
- Bachman, J.L., J. Reedy, A.F. Subar, and S.M. Krebs-Smith "Sources of Food Group Intakes Among the US Population, 2001–2002." *Journal of the American Dietetic Association*, vol. 108, no. 5, 2008, pp. 804–814. doi:10.1016/j.jada.2008.02.026.
- Gearan, E., and K. Niland. "Older Americans Act Title III-C Nutrition Services Program for Older Adults: Examining the Types of Foods Consumed from Program Meals and Over 24 Hours." Washington, DC: U.S. Department of Health and Human Services, Administration for Community Living, forthcoming.
- Institute of Medicine (IOM). "Providing Healthy and Safe Foods as We Age: Workshop Summary." Washington, DC: The National Academies Press, 2010.

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- Mabli, J., E. Gearan, R. Cohen, K. Niland, N. Redel, E. Panzarella, and B. Carlson. "Evaluation of the Effect of the Older Americans Act Title III-C Nutrition Services Program on Participants' Food Security, Socialization, and Diet Quality." Washington, DC: U.S. Department of Health and Human Services, Administration for Community Living, April 1, 2017. Available at [https://www.acl.gov/sites/default/files/programs/2017-07/AoA\\_outcomesevaluation\\_final.pdf](https://www.acl.gov/sites/default/files/programs/2017-07/AoA_outcomesevaluation_final.pdf). Accessed August 9, 2019.
- Mabli, J., N. Redel, R. Cohen, E. Panzarella, M. Hu, and B. Carlson. "Process Evaluation of Older Americans Act Title III-C Nutrition Services Program." Washington, DC: U.S. Department of Health and Human Services, Administration for Community Living, September 30, 2015. Available at <https://www.acl.gov/sites/default/files/programs/2017-02/NSP-Process-Evaluation-Report.pdf>. Accessed August 9, 2018.
- National Cancer Institute. "Automated Self-Administered 24-hour (ASA24) Dietary Recall System." 2014. Available at <http://epi.grants.cancer.gov/asa24/>. Accessed August 9, 2018.
- Subar, A.F., S.M. Krebs-Smith, A. Cook, and L.L. Kahle. "Dietary Sources of Nutrients Among US Adults, 1989 to 1991." *Journal of the American Dietetic Association*, vol. 98, no. 5, 1998, pp. 537–547. doi:10.1016/S0002-8223(98)00122-9.
- U.S. Department of Agriculture (USDA), Agricultural Research Service. "What We Eat in America, Food Categories 2013–2014." 2016. Available at <https://www.ars.usda.gov/nea/bhnrc/fsrg>. Accessed August 9, 2018.
- U.S. Department of Health and Human Services (DHHS), and U.S. Department of Agriculture (USDA). "Dietary Guidelines for Americans 2010, 7th edition." Washington, DC: U.S. Government Printing Office, December 2010. Available at <https://health.gov/dietaryguidelines/dga2010/DietaryGuidelines2010.pdf>. Accessed August 9, 2018.
- U.S. Department of Health and Human Services (DHHS), and U.S. Department of Agriculture (USDA). "Dietary Guidelines for Americans 2015–2020, 8th edition." Washington, DC: HHS and USDA, December 2015. Available at <https://health.gov/dietaryguidelines/2015/guidelines/>. Accessed August 9, 2018.
- Ziegler, J., N. Redel, L. Rosenberg, and B. Carlson. "Older Americans Act Nutrition Programs Evaluation: Meal Cost Analysis." Washington, DC: U.S. Department of Health and Human Services, Administration for Community Living, September 25, 2015. Available at [https://www.acl.gov/sites/default/files/programs/2017-05/NSP-Meal-Cost-Analysis\\_v2.pdf](https://www.acl.gov/sites/default/files/programs/2017-05/NSP-Meal-Cost-Analysis_v2.pdf). Accessed August 9, 2018.
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