

Submitted via Regulations.gov

April 14, 2023

School Meals Policy Division Food and Nutrition Service P.O. Box 9233 Reston, Virginia 20195

Re: Comments from the American Spice Trade Association Regarding USDA's Proposed Revisions to Child Nutrition Programs: Meal Patterns Consistent with the 2020 Dietary Guidelines for American (Docket No. FNS-2022-0043)

To Whom it May Concern,

The American Spice Trade Association (ASTA) appreciates the opportunity to submit comments regarding the U.S. Department of Agriculture's (USDA) proposed rule "Child Nutrition Programs: Revisions to Meal Patterns Consistent With the 2020 Dietary Guidelines for Americans," which was published on February 7, 2023 (88 Fed. Reg. 8050).

ASTA was established in 1907 and is the voice of the U.S. spice industry in the global market. Our members include companies involved in all aspects of the spice trade – importing, growing, processing, and marketing at the wholesale and retail levels. We represent our members' U.S. interests by supporting regulatory compliance and maintaining relationships with U.S. agencies.

ASTA shares USDA's commitment to align school meal nutrition standards with the goals outlined by the Dietary Guidelines for Americans (DGA), namely the promotion of healthy dietary patterns; the customization of nutrient-dense food and beverage choices to reflect personal preferences, cultural traditions, and budgetary considerations; the focus on meeting food group needs while staying within calorie limits; and the limitation of foods and beverages higher in added sugars, saturated fat, and sodium. We are submitting this letter to highlight the importance of spices and herbs in achieving these goals. Spices and herbs are healthful ingredients that promote healthy, diverse eating patterns, play a vital role in the celebration of cultural heritage, and are shown through a growing body of research to have a strong potential to improve health [1-4].

As discussed in more detail in the comments that follow:



- Spices and herbs are recognized by the U.S. DGA and numerous other governmental and nutrition authorities for their ability to improve adherence to healthy dietary patterns.
- Studies show that spices improve the palatability of nutrient-dense foods and reduce the intake of added sugars, saturated fat, and sodium. Moreover, the use of spices and herbs has also been shown to increase the consumption of foods recommended by the DGA such as vegetables, fruits, and healthy grains.
- Spices and herbs are predominantly grown overseas, which may limit their ability to be incorporated into school meals due to the proposed 5% cap on non-domestic products under the Buy American provision.

Therefore, we respectfully request that USDA more explicitly consider the potential for spices and herbs to promote alignment with the goals outlined in the 2020-2025 DGA.

Spices and herbs have been recognized by the U.S. DGA and numerous other governmental authorities for their ability to improve the palatability of nutrient-dense foods and reduce the intake of added sugars, saturated fat, and sodium while also celebrating cultural heritage.

Since 2010, the DGA have consistently recommended the use of spices as a strategy to help consumers meet food group and nutrient intake recommendations. Using spices may help consumers adhere to diets lower in sodium, added sugars, and saturated fat while also increasing the consumption of foods such as fruits, vegetables, and healthy grains by making them more appealing and better tasting. In particular, the 2020-2025 DGA states that "spices and herbs can help flavor foods when reducing added sugars, saturated fat, and sodium, and they also can add to the enjoyment of nutrient-dense foods, dishes, and meals that reflect specific cultures" [5]. As the proposed changes aim to align with the current DGA, herbs and spices should be utilized in school lunches due to their ability to promote the four DGA goals highlighted by USDA.

Furthermore, several government agencies, including FDA, have publicly recognized that herbs and spices support health and wellbeing through reducing salt intake, improving blood pressure, increasing taste and palatability, supporting cultural preference, providing antioxidant protection, and supporting complementary and alternative medicine strategies. Examples of government references are provided in Appendix A. Furthermore, leading public heath nutrition groups recognize the benefits of herbs and spices, such as reducing the intake of nutrients to limit, supporting healthy aging, and encouraging plant-based eating patterns. Examples of public health nutrition group references are provided in Appendix B.

The role of spices, herbs, and taste in establishing heathy and equitable dietary patterns.

In its proposed rule, USDA notes the importance of taste and consumer preferences in achieving the National School Lunch Program's transitional sodium limits. USDA recommends a five-year, phased limitation timeline so that menus may be adjusted without compromising the enjoyability of school meals. Further, USDA notes in its proposed rule that "to shift taste preferences is a key potential



outcome of this proposed rule," as taste preferences formed in early life may influence later food choices.

Studies demonstrate that spices and herbs have the potential to compensate for loss of flavor in nutrient-dense foods lower in added sugars, saturated fat, and sodium, improving students' liking of low-fat, reduced sugar, and low-sodium alternatives [6-10]. For example, one study in adults found that sodium intake decreased by 957 mg/day following a behavioral intervention that emphasized the role of spices and herbs on the maintenance of sodium intake at the recommended intake level of 1500 mg/day [11].

In a study of underserved high schools in Baltimore, a school-based nutrition education program focusing on flavor enhancement through spices ("Spice MyPlate") was introduced [12]. The intervention focused on the use of spices and herbs to eat a diet that aligned with the USDA MyPlate guidelines, with an emphasis on spices that were accessible in terms of their cultural acceptability, relative affordability, health benefits, and cooking versatility. Participating students noted that health was not a motivating goal for food selection and that flavor enhancement was important to overcome unpalatable taste barriers to consuming vegetables. The study found that the Spice MyPlate nutrition education intervention improved diet quality and attitudes towards healthy eating more effectively than standard nutrition education.

Therefore, the inclusion of spices and herbs has the potential to shift taste preferences to improve liking of low-fat, reduced sugar, and low-sodium alternatives, consistent with USDA's desired outcomes. ASTA encourages USDA to consider the use of spices and herbs as a tool to achieve its transitional limits, as well as to improve nutrition and dietary patterns to advance healthy equity.

The use of spices and herbs has been shown to increase vegetable consumption in school aged children.

The 2020-2025 DGA state that the majority of the U.S. population (~90%) does not meet the recommended dietary intake of vegetables and 80% fail to meet the recommended dietary intake of fruit. In the proposed rule, the USDA encourages school authorities to offer a variety of vegetable subgroups, including non-starchy vegetables which may not be as palatable to children. However, flavor enhancement through the addition of spices and herbs has been demonstrated to increase vegetable consumption across various age groups.

For example, one study examined vegetable consumption by high school students located in an economically underserved urban area [13]. Prior to the study, participating students reported consuming just 20% of the 2.5 cup-equivalent (c-eq) vegetable intake recommended by the Dietary Guidelines for Americans. The researchers reported that vegetable intake during lunch time increased by 18.2% (8.22 grams/day, p < 0.0001) when spices and herbs were added during the preparation of the vegetables. Vegetable consumption increases as high as 115% (p < 0.0001) for carrots and 81.7%



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(p<0.0001) for mixed broccoli, carrots, and cauliflower were reported when seasoned with spices and herbs.

Another study evaluated the consumption of a variety of raw vegetables by pre-school aged children (aged 3-5 years) [14]. The researchers found that the intake of raw vegetables significantly increased when they were served along with a reduced-fat dip flavored with spices and herbs compared to the raw vegetable alone or when served with a plain dip. Further, preschoolers' liking of vegetables significantly increased when paired with the herb dip.

Therefore, the use of spices and herbs helps children and youths maintain healthy dietary patterns by both promoting the consumption of nutritious foods such as vegetables, as well as reducing the intake of added sugars, saturated fat, and sodium.

There is a growing body of evidence regarding the role of spices and herbs in health promotion and disease prevention.

Additionally, spices and herbs have been used for thousands of years for both culinary and health purposes. Herbs and spices contain a wide variety of phytochemicals, including polyphenolic compounds with antioxidant and inflammatory properties that are suspected to contribute to their health-promoting properties [15]. A growing body of research shows that culinary spices and herbs may have beneficial effects in areas such as heart health, cognition, metabolic health, cancer prevention, gut health, and weight management as well as improving diet quality by making healthier foods more acceptable to consumers [16-17].

USDA's proposed 5% ceiling on the non-domestic foods a school authority may purchase per school year may practically limit schools' ability to leverage herbs and spices as sodium, fat, and sugar alternatives.

Per the National School Lunch Act (NSLA, 42 U.S.C. 1760(n)) and program regulations at 7 CFR 210.21(d)(2)(i) and 220.16(d)(2)(i), school food authorities are required to purchase domestic commodities or products "to the maximum extent practicable" (the "Buy American provision"). Exceptions to the Buy American provision are granted if:

- a) The product is not produced or manufactured in the U.S. in sufficient and reasonably available quantities of a satisfactory quality; or
- b) Competitive bids reveal the costs of a U.S. product are significantly higher than the non-domestic product.

USDA has proposed to institute a 5% ceiling on the non-domestic commercial foods a school authority may purchase per school year. ASTA supports USDA's goals to support American farmers and ranchers while simultaneously recognizing that the purchase of domestic products is not always practicable for schools. However, ASTA is concerned that the establishment of a ceiling will practically limit the quantity



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of spices and herbs purchased by school authorities, thus inhibiting the schools' ability to alter recipes in compliance with sodium and added sugar reduction targets.

The vast majority of spices and herbs are grown outside of the U.S., including staple ingredients such as vanilla beans, black and white pepper, cinnamon, and oregano. Although some spices are grown in the U.S., such as dried chili peppers, dehydrated onion, and dehydrated garlic, the majority of spice and herb commodities require tropical or subtropical climates which cannot be found in the U.S. Furthermore, USDA proposes codifying a definition which states that 51% of the product must consist of agricultural commodities grown domestically to be considered under the Buy American provision. This may pose a challenge to pre-packaged seasoning blends, which contain both domestic and non-domestic ingredients in varying ratios. Without clear quantification of the portion of non-domestic spices and herbs on the product label, school authorities may be unclear whether a certain seasoning blend is compliant with the provision. As such, we request that USDA consider an exemption for herbs and spices in its "Buy American" provision.

Conclusion

In summary, ASTA supports USDA's efforts to promote healthy diets and harmonize child nutrition programs with the 2020-2025 DGA. Based on the consensus among nutrition authorities, as well as a growing body of scientific evidence, spices and herbs should be included in USDA's roadmap to achieve the four goals outlined in the DGA. As noted, spices have been recognized by numerous government and health authorities to promote healthy eating patterns and reduce the intake of sodium, saturated fat, and added sugar without compromising flavor or enjoyment. Therefore, we request that USDA more explicitly cite the importance of herbs and spices in its policies on the creation of meal patterns for children consistent with the 2020-2025 DGA and the USDA consider an exemption for herbs and spices in its "Buy American" provision.

Thank you for the opportunity to provide these comments. Please feel free to contact ASTA with any questions or if we can be of assistance to the agency on this or other matters.

Sincerely,

Laura Shumow Executive Director

American Spice Trade Association



References

- [1] Huang, Y., Tsai, M-F., Thorat, R.S., Xiao, D., Zhang, X., Sandhu, A.K., Edirisinghe, I., Burton-Freeman, B.M. 2021. Endothelial Function and Postprandial Glucose Control in Response to Test-Meals Containing Herbs and Spices in Adults with Overweight/Obesity. *Frontiers in Nutrition*. 9:811433.
- [2] Petersen, K.S., Davis, K.M., Rogers, C.J., Proctor, D.N., West, S.G., Kris-Etherton, P.M. 2021. Herbs and spices at a relatively high culinary dosage improves 24-hour ambulatory blood pressure in adults at risk of cardiometabolic diseases: a randomized, crossover, controlled-feeding study. *The American Journal of Clinical Nutrition*. 00:1–13.
- [3] Wang, J., Wang, S., Yang, J., Henning, S.M., Ezzat-Zadeh, Z., Woo, S.L., Qin, T., Pan, Y., Tseng, C.H., Heber, D. and Li, Z., 2020. Acute Effects of Cinnamon Spice on Post-prandial Glucose and Insulin in Normal Weight and Overweight/Obese Subjects: A Pilot Study. *Frontiers in nutrition*, 7.
- [4] Azeez, T.B., Lunghar, J. (2021) 6-Antiinflammatory effects of turmeric (*Curcuma longa*) and ginger (*Zingiber officinale*). *Inflammation and Natural Products*, 127-146.
- [5] U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2020-2025. 9th Edition. December 2020. Available at DietaryGuidelines.gov.
- [6] Polsky, S., Beck, J., Stark, R.A., Pan, Z., Hill, J.O., Peters, J.C. (2014) The influence of herbs, spices, and regular sausage and chicken consumption on liking of reduced fat breakfast and lunch items. *Journal of Food Science*. 79(10): S2117-26.
- [7] Ghawi, S.K., Rowland, I., Methven. (2014) Enhancing consumer liking of low salt tomato soup over repeated exposure by herb and spice seasonings. *Appetite*. 81:20-9.
- [8] Peters, J.C., Polsky, S., Stark, R., Zhaoxing, P., Hill, J.O. (2014) The influence of herbs and spices on overall liking of reduced fat food. *Appetite*. 71(1): 183-188.
- [9] Dougkas, A., Vannereuz, M., Giboreau, A. (2019) The impact of herbs and spices on increasing the appreciation and intake of low-salt legume-based meals. *Nutrients*. 11(12): 2901.
- [10] Peters, J.C., Marker, R., Pan, Z., Breen, J.A., Hill, J.O. (2018) The influence of adding spices to reduced sugar foods on overall liking. *Journal of Food Science*. 83(3):814-821.
- [11] Anderson, C., Cobb, L.K., Miller, E.R., Woodword, M., Hottenstein, A., Chang, A.R., Mongraw-Chaffin, M., White, K., Charleston, J., Tanaka, T., Thomas, L., Appel, L.J. 2015. Effects of behavioral intervention that emphasizes spices and herbs on adherence to recommended sodium intakes: results of the SPICE randomized clinical trial. The American Journal of Clinical Nutrition. 102(3):671-9.
- [12] D'Adamo, C., McArdle, P.F., Balick, L., Peisach, E., Ferguson, T., Diehl, A., Bustad, K., Bowden, B., Pierce, B.A., Berman, B.M. (2016) Spice MyPlate: Nutrition Education Focusing Upon Spices and Herbs



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Improved Diet Quality and Attitudes Among Urban High School Students. American Journal of Health Promotion. 30(5):346-56.

- [13] D'Adamo, C.R., Parker, E.A., McArdle, P.F., Trilling, A., Bowden, B., Bahr-Robertson, M.K., Keller, K.L., Berman, B.M. (2021) The addition of spice and herbs to vegetables in the National School Lunch Program increased vegetable intake at an urban, economically-underserved, and predominantly African-American high school. Food Qual Prefer, 88.
- [14] Savage, J.S., Peterson, J., Marini, M., Bordi, P.L., Birch, L.L. (2013) The addition of a plain or herb-flavored reduced-fat dip is associated with improved preschoolers' intake of vegetables. Journal of the Academy of Nutrition and Dietetics. 113(8):1090-5.
- [15] Serafini M, Peluso I. Functional Foods for Health: The Interrelated Antioxidant and Anti-Inflammatory Role of Fruits, Vegetables, Herbs, Spices and Cocoa in Humans. Curr Pharm Des. 2016;22(44):6701-6715.
- [16] Jiang TA. Health Benefits of Culinary Herbs and Spices. J AOAC Int. 2019
- [17] https://www.mccormickscienceinstitute.com/our-research



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APPENDIX A: Selected Statements from U.S. Government Sources Supporting Nutrition Benefits of Spices and Herbs

This appendix includes a non-exhaustive collection of examples of federal governmental resources and references that demonstrate support for the healthfulness of spices and herbs.

Food and Drug Administration (FDA)

- Food Safety & Nutrition: What You Need to Know to Keep You and Your Family Heart Healthy (Podcast)¹
 - Dr. Susan Mayne: "When it comes to sodium, we encourage preparing your own fresh foods.
 That way you can season your foods with herbs and spices rather than salt or salt based seasonings."
- FDA Insight: A Closer Look at Nutrition (Podcast)²
 - Dr. Susan Mayne: "So, if consumers want to reduce sodium, you can also look for the words light, low sodium, reduced sodium, or no salt on packaged foods; and of course, read those labels for sodium. You can also flavor foods with herbs and spices and no salt or low salt seasoning blends."
- Sodium In Your Diet (Article)³
 - "Add flavor without adding sodium: Limit the amount of table salt you add to foods when cooking, baking, or at the table. Try no-salt seasoning blends and herbs and spices instead of salt to add flavor to your food."
- Sodium Reduction (Article)⁴
 - This resource includes advice to companies to use herbs and spices in formulation instead of salt/sodium.
- Eating Too Much Salt? Ways to Cut Back Gradually (Article + Video)⁵
 - "Expand your spice horizons. Try no-salt seasoning blends and herbs and spices instead of salt to add flavor to your food."

Centers for Disease Control and Prevention (CDC)

- Cultural Food Preferences in Food Service (Article + Toolkit)⁶
 - o "Spices can be used to infuse a dish with the flavors of a culture."
 - "Spices, herbs, and oils can be used to infuse dishes with the desired cultural flavors."

 $^{^1} https://www.fda.gov/consumers/health-equity-forum-podcast/food-safety-nutrition-what-you-need-know-keep-you-and-your-family-heart-healthy$

² https://www.fda.gov/news-events/fda-insight/fda-insight-closer-look-nutrition

³ https://www.fda.gov/food/nutrition-education-resources-materials/sodium-your-diet

⁴ https://www.fda.gov/food/food-additives-petitions/sodium-reduction

⁵ https://www.fda.gov/consumers/consumer-updates/eating-too-much-salt-ways-cut-backgradually

⁶ https://www.cdc.gov/nutrition/food-service-guidelines/strategize-and-act/cultural-food-preferences.html



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- Sodium Reduction in Food Service (Toolkit/Tip Sheet)⁷
- Healthy Eating Communications Kit (Social Media Kit) 8
 - o Includes social media messages promoting spices and herbs to reduce salt.
- I Have Diabetes and Cancer. What Should I Eat? (Article)⁹
 - "Foods that improve your appetite. You may want to add some spices and herbs to your food to perk up the taste. Their unique flavors may also help reduce the amount of salt you add to your dishes."
- Reducing Sodium in Children's Diets (Article)¹⁰
 - o Includes advice for parents, caregivers and places that sell or serve food to use spices, herbs, and vegetables instead of salt.

National Institutes of Health (NIH) National Cancer Institute (NCI)

- Complementary and Alternative Medicine (Article)¹¹
 - Recognizes herbs and spices such as turmeric or cinnamon as biologically-based complementary and alternative medicine practices.

NIH National Heart, Lung, and Blood Institute (NHLBI)

- Use Herbs and Spices Instead of Salt | NHLBI, NIH (Infographic/fact sheet)¹²
 - "Choosing and preparing foods that are lower in salt and sodium might help prevent or lower high blood pressure."

NIH National Institute on Aging (NIA)

- What's On Your Plate: Smart Food Choices for Healthy Aging (Toolkit)¹³
 - o "Taste and smell are important for healthy appetite and eating. Try adding fresh herbs, spices, or lemon juice to your plate."
 - "Make sure your foods are seasoned well, but not with extra salt. Try using lemon juice, vinegar, or herbs to boost the flavor of your food."
- Overcoming Roadblocks to Healthy Eating (Article)¹⁴

⁷ https://www.cdc.gov/dhdsp/docs/sodium-tip-sheets.pdf

⁸ https://www.cdc.gov/dhdsp/healthy eating kit.htm

⁹ https://www.cdc.gov/diabetes/library/features/diabetes_cancer.html

¹⁰ https://www.cdc.gov/vitalsigns/children-sodium/

¹¹ https://www.cancer.gov/about-cancer/treatment/cam

¹² https://www.nhlbi.nih.gov/resources/use-herbs-and-spices-instead-salt

¹³ https://order.nia.nih.gov/sites/default/files/2019-05/whats-on-your-plate-508.pdf

¹⁴ https://www.nia.nih.gov/health/overcoming-roadblocks-healthy-eating



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 "Growing older, having dental problems, and medication side effects can cause your senses to change. Taste and smell are important for a healthy appetite and eating. Try adding fresh herbs, spices, or lemon juice to your plate."

U.S. Department of Agriculture (USDA) Agricultural Research Service (ARS)

- Herbs Can Spice Up Your Antioxidant Protection (Article)¹⁵
 - o "Ounce for ounce, many herbs used to flavor our foods have more antioxidant power than berries, fruits and vegetables, according to a recent Agricultural Research Service study."

USDA Supplemental Nutrition Assistance Program Education (SNAP-Ed)

- Herbs | SNAP-Ed (usda.gov) (Recipes)¹⁶
 - "Herbs and spices are a great way to add flavor to your recipes and dishes without added sodium and sugar. Try growing your own fresh herbs to save money and give your meals a flavor boost! If you don't have an herb garden, dried herbs work just as well in almost all recipes."

¹⁵ https://www.ars.usda.gov/news-events/news/research-news/2002/herbs-can-spice-up-your-antioxidant-protection/

¹⁶ https://snaped.fns.usda.gov/seasonal-produce-guide/herbs



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APPENDIX B: Public Health Nutrition Groups Supporting Nutrition Benefits of Spices & Herbs

This appendix includes a non-exhaustive collection of examples of references and resources from academic and public health organizations that demonstrate support for the healthfulness of spices and herbs.

Academy of Nutrition and Dietetics

- Get to Know Your Spice Rack (Article)¹⁷
 - "But, when it comes to lightening up recipes, it is important to understand how to keep flavor when reducing fat, sugar or sodium. One way is through the addition of spices, herbs or other flavorings such as citrus juice, vinegars, dried fruits and cheeses."

American Cancer Society

- Cut Calories and Fat, Not Flavor (Article)¹⁸
 - o "To replace some moisture and flavor loss when fat is reduced, make up the difference with broth, non-fat milk, fruit juice, and extra herbs, spices, and vegetables."
- Nutrition for the Person with Cancer During Treatment (Booklet/Flyer)¹⁹
 - "Cancer and its treatments can change your senses of taste and smell. These changes can affect
 your appetite and are often described as a bitter or metallic taste, food tasting too salty or
 sweet, or food not having much taste. If you're having these problems, try foods, marinades,
 spices, drinks, and ways of preparing foods that are different from those you usually use."
- Nutrition for People with Cancer (Booklet/Flyer)²⁰
 - "Mix diced or flaked cooked meat with sour cream and spices to make dip."

American Diabetes Association

- DIY Spice Blends (Article/Resource Hub)²¹
 - O "Looking to cut back on sodium? Make your own spice blends to add more flavor to your dishes, cut back on salt, and give your heart-healthy, diabetes-friendly recipes a personal touch."
- Grocery Shopping Game Plan (Article)²²
 - "While you should try and stick to your list, challenge yourself to get one experimental ingredient each week, whether it's a spice you haven't tried before or a new piece of produce. Once you get it home, look up recipes that feature it and try to use it that week in a dish."

 $^{^{17}\} https://www.eatright.org/food/food-preparation/herbs-and-spices/get-to-know-your-spice-rack$

 $^{^{18}\} https://www.cancer.org/healthy/eat-healthy-get-active/take-control-your-weight/cut-calories-and-fat-not-flavor.html$

¹⁹ https://www.cancer.org/content/dam/cancer-org/cancer-control/en/booklets-flyers/nutrition-for-the-patient-with-cancer-during-treatment.pdf

²⁰ https://www.cancer.org/content/dam/CRC/PDF/Public/6711.00.pdf

²¹ https://www.diabetesfoodhub.org/articles/diy-spice-blends.html

²² https://diabetes.org/healthy-living/recipes-nutrition/grocery-shopping-game-plan



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- Go Heart Healthy (Article) ²³
 - o "Try using herbs and spices for flavor instead of salt, butter, lard, or other unhealthy fats."

American Heart Association

- Stakeholder Discussion to Reduce Population-Wide Sodium Intake and Decrease Sodium in the Food Supply (Published Article)²⁴
 - "The top products people used to limit sodium intake were seasonings, spices, and herbs."
 - "Sodium reduction techniques can be combined and include gradual reductions, intensification of other flavor notes such as spices or umami, or use of a different salt size particle or crystal form."
- Lowering Sodium in School Lunches_(Infographic)²⁵
 - "Add herbs and spices to rice instead of margarine or salt."
- Common Herbs and Spices: How to Use Them Deliciously (Article)²⁶
 - o Includes a how-to guide on the flavor profiles of several common spices and how to use them.
 - o NOTE: This article is also posted on the American Stroke Association's website.²⁷
- Tis the Seasonings (Article)²⁸
 - o "Herbs and spices are at the heart of most of the world's best cuisines. There's no better way to add excitement and depth to your healthy at-home dishes."
 - o Includes tips for using various herbs and spices and storing them appropriately.

American Institute for Cancer Research

- AICR's Guide to Herbs and Spices (Refrigerator Cards)²⁹
 - "Herbs and spices contain natural substances called phytochemicals. Studies show these plant substances may act to protect against a wide range of cancers."
- Celebrate Summer with Herbs and Spices (Article)³⁰
 - "Research shows that fragrant green herbs and pungent spices boost good health by substituting for salt and adding natural phytochemicals which may protect against cancer."

²³ https://diabetes.org/healthy-living/recipes-nutrition/meal-planning/go-heart-healthy

²⁴ https://www.ahajournals.org/doi/full/10.1161/cir.000000000000001

²⁵ https://www.heart.org/-/media/Files/About-Us/Policy-Research/Fact-Sheets/Access-to-Healthy-Food/INFOGRAPHIC-Lowering-Sodium-in-School-Foods.pdf

²⁶ https://www.heart.org/-/media/Files/About-Us/Policy-Research/Fact-Sheets/Access-to-Healthy-Food/INFOGRAPHIC-Lowering-Sodium-in-School-Foods.pdf

²⁷ https://www.heart.org/en/healthy-living/healthy-eating/cooking-skills/preparing/common-herbs-and-spices-how-to-use-them-deliciously

²⁸ https://www.heart.org/en/healthy-living/healthy-eating/cooking-skills/preparing/tis-the-seasonings

²⁹ https://store.aicr.org/products/herb-and-spice-wheel

³⁰ https://www.aicr.org/resources/blog/celebrate-summer-with-herbs-and-spices/



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Harvard University (The Nutrition Source blog)

- Plate and the Planet (Article)³¹
 - "The term plant-forward is defined as "a style of cooking and eating that emphasizes and celebrates, but is not limited to, foods from plant sources—fruits and vegetables (produce), whole grains, legumes (pulses), nuts and seeds, plant oils, and herbs and spices—and reflects evidence-based principles of health and sustainability."
- Research Roundup (Article featuring published research)³²
 - o Includes a number of studies about the benefits of spices and herbs in reducing or replacing salt.
- Healthy Longevity (Article)³³
 - "Seasoning food more liberally with sodium-free herbs, spices, and vinegars may help to compensate for sensory deficiencies."
- Diet Review: Anti-Inflammatory Diet (Article)³⁴
 - "There is no single anti-inflammatory diet plan. Generally, it emphasizes eating a wide variety of fruits and vegetables, unsaturated fats, minimally refined whole grains, tea, coffee, herbs, spices, and oily fish. The Mediterranean diet³⁵ and DASH diet³⁶ are popular dietary plans that already showcase many anti-inflammatory foods."

³¹ https://www.hsph.harvard.edu/nutritionsource/sustainability/plate-and-planet/

³² https://www.hsph.harvard.edu/nutritionsource/2015/12/18/research-roundup-dec2015/

³³ https://www.hsph.harvard.edu/nutritionsource/healthy-longevity/

³⁴ https://www.hsph.harvard.edu/nutritionsource/healthy-weight/diet-reviews/anti-inflammatory-diet/

³⁵ https://www.hsph.harvard.edu/nutritionsource/healthy-weight/diet-reviews/mediterranean-diet/

³⁶ https://www.hsph.harvard.edu/nutritionsource/healthy-weight/diet-reviews/dash-diet/