



WHOLE CHILD

Fueling Development for Learning and Life

January 2026

NUTRITION ENVIRONMENT: Evidence-Informed Practice Brief



This brief is part of our series of evidence-informed practices supporting the whole child. We organize the series using the ten domains of the [Whole School, Whole Community, Whole Child \(WSCC\)](#) model. In this brief, we introduce the **Nutrition Environment** domain.

WHAT DO WE MEAN?

The *Nutrition Environment and Services* domain of the WSCC model focuses on developing students' abilities to make healthy nutritional decisions.¹ Students eat up to two meals a day at school, making schools an ideal setting for providing access to nutritious foods and nutrition education.^{2,3} In 2024, 29.7 million children ate school lunches, with 72.5% receiving free or reduced-price meals.⁴ Research has found that the food students consume at school has higher nutritional quality than the food they consume from any other source.⁵ Healthy school meals can help students develop lifelong healthy eating habits.^{6,7}

A strong school nutrition environment supports student health by providing nutritious food and beverage choices, nutrition education, and positive messages about the importance of nutrition throughout the school. The meals and snacks provided by school nutrition services are required to meet federal nutrition standards established by the United States Department of Agriculture (USDA).⁸ In addition to the food offerings in the cafeteria, it is important to attend to the food choices available through vending machines, school stores, concession stands, classroom rewards, classroom parties, school celebrations, and fundraisers.¹ For schools participating in the federal food programs, all foods and beverages sold outside of the cafeteria must meet the Smart Snacks in Schools Nutrition Standards.⁹ Student access to free drinking water in the cafeteria during lunch is required by federal law, and it is a best practice to provide students with access to free water throughout the day.^{2,10}

School personnel can positively influence student nutritional decisions by encouraging participation in federal school meal programs; collaborating with the food service staff on nutrition education;¹¹ incorporating agriculture and local food systems into the curriculum;¹² and serving as role models for healthy eating.^{1,13,14} By fostering healthy nutrition habits, schools can help students learn in the classroom, maintain their overall health, and facilitate healthy food access.



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WHY IS IT RELEVANT TO CHILD OUTCOMES?

Physical Health Outcomes

Prior research has documented a relationship between nutrition and physical health. Children and adolescents need essential nutrients to support development and daily functioning.¹⁵ Experiencing limited access to food, consuming too few or too many calories, or lack of essential nutrients can negatively impact a child's physical health and development.^{16,17} Ultra-processed foods are food products that have undergone extensive industrial processing. They often contain multiple ingredients, additives, and preservatives; these make them convenient, palatable and appealing. Recent research suggests that two thirds of the calories in American children's diets are from ultra-processed foods, and consumption of these foods is associated with negative health consequences in children.^{18,19}

Social, Emotional, and Behavioral Outcomes

Research has also documented a potential link between nutrition and student mental health outcomes. Although few studies have focused on the link between mental health and nutrition in children, preliminary studies have suggested that children who consume inadequate vitamins and nutrients have a higher likelihood of developing social, emotional, or behavioral problems. Further, numerous studies have found an association between mental health and nutrition in adults.^{20,21,22} In addition, vitamin deficiencies, which can result from inadequate consumption of nutritious foods, are associated with a higher likelihood of experiencing symptoms of psychological distress.^{22,23}

Academic Outcomes

Child and adolescent nutrition is associated with cognitive ability, including thinking, reasoning, and problem-solving. Eating breakfast at school, for example, is associated with increased student cognitive performance, as well as improved attendance rates, test scores, and attention.^{24,25,26} In addition, relationships exist between vitamin deficiencies, lower academic achievement, and decreased cognitive functioning.^{7,27} Further, inadequate consumption of fruits, vegetables, and dairy products is associated with lower levels of academic achievement.^{28,29} Proper hydration can also support efficient cognitive functioning in adolescents,³⁰ further emphasizing the importance of providing access to free, clean drinking water throughout the school day.



NUTRITION ENVIRONMENT: EVIDENCE IN ACTION

The strategies provided here summarize a review of available evidence and best practice recommendations in this domain. Strategies are grouped by anticipated resource demand (e.g., funding, time, space, training, materials).*

Level 1: Low resource demand

Ensure adequate time to eat with limited interruptions

- Students are more likely to eat—and less likely to waste—fruits and vegetables when they are provided with adequate time for lunch.³¹
- According to CDC recommendations, students should be allowed appropriate seat time for eating (i.e., at least 10 minutes for breakfast and 20 minutes for lunch).³²

Engage more school personnel in promoting a healthy nutrition environment

- School personnel involvement in the school nutrition environment is associated with positive changes in fruit and vegetable consumption, nutrition knowledge, dietary behaviors, and body mass index.^{6,12,33}
- Schools can involve personnel in strategies such as incorporating nutrition instruction and activities into classes, modeling healthy nutrition habits, creating an inviting eating environment, verbal encouragement and praise for eating fruits and vegetables, and encouraging nutritional awareness.³³
- School personnel can offer non-food rewards, such as individual recognition in front of peers, extra recess, free choice time, homework passes, and other incentives (see “Healthy Non-Food Rewards” in *Additional Resources*).

Level 2: Moderate resource demand

Incorporate student choice and hands-on learning activities

- Adding hands-on learning experiences within nutrition education is associated with increases in students’ healthy food consumption and general nutrition knowledge.^{6,34,35}
- Schools can offer opportunities for youth involvement (e.g., surveys, advisory boards, choosing new dishes for the cafeteria) and hands-on activities, such as creating promotional materials about locally procured foods and cooking classes. These activities are associated with increased healthy fruit and vegetable consumption and overall improved food-related preferences, attitudes, and behaviors.^{36,37}

Collaborate with families and community organizations

- Family involvement in school nutrition activities can support students’ nutrition knowledge and dietary behaviors.^{6,33} Schools can support family involvement by providing newsletters, recipes, activities, and workshops that support healthy eating at home.^{6,33}
- Hands-on learning experiences such as food preparation activities, taste tests, and school garden maintenance) can help students bring nutrition knowledge from the classroom to their homes to share with their families.^{6,34}
- Schools should engage with community partners (e.g., farms, food banks) and families to foster a healthy nutrition environment that incorporates student preferences and healthy foods familiar to students.¹²

Target multiple health behaviors when addressing nutrition

- School-based nutrition interventions have demonstrated greater effectiveness on overall health when multiple behaviors are addressed together, including support for daily physical activity.^{33,38,39}
- Interventions can be designed to coordinate initiatives across health domains, such as incorporating physical education into nutrition education curriculum.^{33,39}

Level 3: High resource demand

Improve the school nutrition environment by investing in scratch cooking and water access

- Develop strong and comprehensive school-wide food environment policies that align with best practices.^{40,41}
- Invest in increasing the amount of scratch-cooking in the meal programs. This may include improving kitchen facilities in each school building and developing culinary skills among food service staff.^{42,43,44}
- Invest in water filling stations throughout the school to increase water consumption and discourage sugary drink consumption.^{45,46}

Build farm to school activities in the cafeteria, classroom, and community

- The USDA and many states provide funding to support purchasing local foods for schools. Food and Nutrition Service provides funding to promote nutritious, local foods in schools through implementation, planning, and training grants. The USDA also provides incentive programs and Farm to School contacts for each state.⁴⁷
- Partner with local farms, extension programs, and community organizations to develop a Farm to School program that increases access to local food and nutrition education.⁴⁸

**For more information about the systematic review process we used to identify evidence-based practices, please refer to our [overview brief](#).*



ADDITIONAL RESOURCES

Note: The [WellSAT WSCC](#) allows users to evaluate district policy alignment with 'best practices' in policy associated with Nutrition Environment and other WSCC model domains.

Action for Healthy Kids

Healthy Non-Food Rewards

This document includes ideas for providing elementary, middle, and high school students with rewards that are not food-based.

CDC

Comprehensive Framework for Addressing the School Nutrition Environment and Services

This guide provides resources and information to help schools develop nutrition environments and services to support healthy eating habits.

School Nutrition

This webpage provides resources and information for enhancing each aspect of the school nutrition environment.

Institute of Child Nutrition

Main Website

This website provides resources and trainings for child nutrition programs.

National Farm to School Network

Main Website

This organization is a networking hub for communities working to bring local food sourcing and food and agriculture education into school systems.

The Lunchbox

Why Scratch Cooking?

An online resource for scratch cooking in schools.

Project Bread

Getting Started with Scratch Cooking

A resource for school nutrition professionals interested incorporating more scratch cooking into school meal programs.

USDA Food and Nutrition Service

MyPlate

This webpage includes activities, lessons, posters, and other resources for children, caregivers, and educators to enhance student nutrition education.

Procuring Local Foods for Child Nutrition Programs Guide

This guide provides information and resources for districts interested in providing locally sourced food in school cafeterias.

Meals for School and Child Care

This webpage includes information about the federal school meal programs, which aim to help provide healthy food to students by reimbursing schools and other organizations.

USDA's Team Nutrition

This webpage provides training and resources for children, educators, caregivers, and community members to help enhance student nutrition education.

University of Connecticut

UConn Rudd Center for Food Policy & Health

This website contains information and resources about food policy in schools, along with a database of resources and legislation on topics such as school meals, food marketing, and obesity prevention.

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SOURCES

- ¹ Association for Supervision and Curriculum Development & Centers for Disease Control and Prevention. (2014). *Whole school, whole community, whole child: a collaborative approach to learning and health*.
http://www.ascd.org/ASCD/pdf/siteASCD/publications/w_holechild/wsc-a-collaborative-approach.pdf
- ² Centers for Disease Control and Prevention. (2021a). *School nutrition*.
<https://www.cdc.gov/healthyschools/nutrition/schoolnutrition.htm>
- ³ Cullen, K. W., & Chen, T. A. (2017). The contribution of the USDA school breakfast and lunch program meals to student daily dietary intake. *Preventive Medicine Reports*, 5, 82-85.
- ⁴ U.S. Department of Agriculture, Food and Nutrition Service. (2025). *Child nutrition tables*.
<https://www.fns.usda.gov/pd/child-nutrition-tables>
- ⁵ Liu J, Micha R, Li Y, Mozaffarian D. Trends in Food Sources and Diet Quality Among US Children and Adults, 2003-2018. *JAMA Netw Open*. 2021;4(4):e215262.
doi:10.1001/jamanetworkopen.2021.5262
- ⁶ Wang, D., & Stewart, D. (2013). The implementation and effectiveness of school-based nutrition promotion programmes using a health-promoting schools approach: a systematic review. *Public Health Nutrition*, 16, 1082-1100.
- ⁷ World Health Organization. (2005). *Nutrition in adolescence: Issues and challenges for the health sector: Issues in adolescent health and development*.
http://apps.who.int/iris/bitstream/handle/10665/43342/9241593660_eng.pdf?sequence=1
- ⁸ U.S. Department of Agriculture, Food and Nutrition Service. (2025). *Nutrition standards for school meals*.
<https://www.fns.usda.gov/schoolmeals/nutrition-standards>
- ⁹ U.S. Department of Agriculture, Food and Nutrition Service. (2024). *Smart snacks in schools*.
<https://www.fns.usda.gov/school-meals/nutrition-standards/smartsnacks>
- ¹⁰ Centers for Disease Control and Prevention. (2024). *Water access in schools*. <https://www.cdc.gov/school-nutrition/water-access/index.html>
- ¹¹ Hayes, D., Contento, I. R., & Weekly, C. (2018). Position of the Academy of Nutrition and Dietetics, Society for Nutrition Education and Behavior, and School Nutrition Association: Comprehensive nutrition programs and services in schools. *Journal of Nutrition Education and Behavior*, 50(5), 433-439.
<https://doi.org/10.1016/j.jneb.2018.03.001>
- ¹² Resource library. The Edible Schoolyard Project. (n.d.). <https://edibleschoolyard.org/resource-search>
- ¹³ Andrade, J., Lotton, J., & Andrade, J. (2018). Systematic Review: Frameworks Used in School-Based Interventions, the Impact on Hispanic Children's Obesity-Related Outcomes. *Journal of School Health*, 88(11), 847-858.
- ¹⁴ Centers for Disease Control and Prevention. (n.d.). *Tips for teachers: Promoting healthy eating and physical activity in the classroom*.
<https://www.cdc.gov/physical-activity-education/media/pdfs/tips-for-teachers.pdf>
- ¹⁵ American Academy of Pediatrics. (2016). *A teenager's nutritional needs*.
<https://www.healthychildren.org/English/ages-stages/teen/nutrition/Pages/A-Teenagers-Nutritional-Needs.aspx>
- ¹⁶ Dietary Guidelines Advisory Committee. (2020). *Scientific report of the 2020 Dietary Guidelines Advisory Committee: Advisory report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service.
<https://www.dietaryguidelines.gov/2020-advisorycommittee-report>
- ¹⁷ U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025 (9th ed.)*. U.S. Department of Agriculture and U.S. Department of Health and Human Services.
https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf
- ¹⁸ Wang, L., Martínez Steele, E., Du, M., Pomeranz, J. L., O'Connor, L. E., Herrick, K. A., Luo, H., Zhang, X., Mozaffarian, D., & Zhang, F. F. (2021). Trends in consumption of ultraprocessed foods among US youths aged 2-19 years, 1999-2018. *JAMA*, 326(6), 519-530.
<https://doi.org/10.1001/jama.2021.10238>
- ¹⁹ Khoury, N., Martínez, M. Á., Garcidueñas-Fimbres, T. E., et al. (2024). Ultraprocessed food consumption and cardiometabolic risk factors in children. *JAMA Network Open*, 7(5), e2411852.
<https://doi.org/10.1001/jamanetworkopen.2024.11852>
- ²⁰ Kaplan, B. J., Rucklidge, J. J., Romijn, A., & McLeod, K. (2015). The emerging field of nutritional mental health: inflammation, the microbiome, oxidative stress, and mitochondrial function. *Clinical Psychological Science*, 3, 964-980.
- ²¹ McMartin, S. E., Jacka, F. N., & Colman, I. (2013). The association between fruit and vegetable consumption and mental health disorders: evidence from five waves of a national survey of Canadians. *Preventive Medicine*, 56, 225-230.
- ²² Rao, T. S., Asha, M. R., Ramesh, B. N., & Rao, K. J. (2008). Understanding nutrition, depression and mental illnesses. *Indian Journal of Psychiatry*, 50, 77-82.
- ²³ Ganji, V., Milone, C., Cody, M. M., McCarty, F., & Wang, Y. T. (2010). Serum vitamin D concentrations are related to depression in young adult US population: The Third National Health and Nutrition Examination Survey. *International Archives of Medicine*, 3, 1-8.
- ²⁴ Adolphus, K., Lawton, C. L., & Dye, L. (2013). The effects of breakfast on behavior and academic



performance in children and adolescents. *Frontiers in Human Neuroscience*, 7, 1-16.

²⁵ Rampersaud, G. C., Pereira, M. A., Girard, B. L., Adams, J., & Metz, J. D. (2005). Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *Journal of the American Dietetic Association*, 105, 743-760.

²⁶ Wesnes, K. A., Pincock, C., Richardson, D., Helm, G., & Hails, S. (2003). Breakfast reduces declines in attention and memory over the morning in schoolchildren. *Appetite*, 41, 329-331.

²⁷ Taras, H. (2005). Nutrition and student performance at school. *Journal of School Health*, 75, 199-213.

²⁸ Florence, M. D., Asbridge, M., & Veugelers, P. J. (2008). Diet quality and academic performance. *Journal of School Health*, 78, 209-215.

²⁹ MacLellan, D., Taylor, J., & Wood, K. (2008). Food intake and academic performance among adolescents. *Canadian Journal of Dietetic Practice and Research*, 69, 141-144.

³⁰ Kempton, M. J., Ettinger, U., Foster, R., Williams, S. C., Calvert, G. A., Hampshire, A., ... & Smith, M. S. (2011). Dehydration affects brain structure and function in healthy adolescents. *Human Brain Mapping*, 32, 71-79.

³¹ Burg, X., Metcalfe, J. J., Ellison, B., & Prescott, M. P. (2021). Effects of longer seated lunch time on food consumption and waste in elementary and middle school-age children: A randomized clinical trial. *JAMA Network Open*, 4(6), e2114148.

³² Centers for Disease Control and Prevention. (2021b). *School meals*.

<https://www.cdc.gov/healthyschools/npao/schoolmeals.htm>

³³ Meiklejohn, S., Ryan, L., & Palermo, C. (2016). A systematic review of the impact of multi-strategy nutrition education programs on health and nutrition of adolescents. *Journal of Nutrition Education and Behavior*, 48, 631-646.

³⁴ Dudley, D. A., Cotton, W. G., & Peralta, L. R. (2015). Teaching approaches and strategies that promote healthy eating in primary school children: a systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 12, 1-26.

³⁵ Knai, C., Pomerleau, J., Lock, K., & McKee, M. (2006). Getting children to eat more fruit and vegetables: a systematic review. *Preventive Medicine: An International Journal Devoted to Practice and Theory*, 42, 85-95.

³⁶ Hersch, D., Perdue, L., Ambroz, T., & Boucher, J. L. (2014). Peer reviewed: the impact of cooking classes on food-related preferences, attitudes, and behaviors of school-aged children: A systematic review of the evidence, 2003–2014. *Preventing Chronic Disease*, 11, 1-10.

³⁷ Mumby, S., Leineweber, M., & Andrade, J. (2018). The Impact the Smarter Lunchroom Movement Strategies Have on School Children's Healthy Food

Selection and Consumption: A Systematic Review. *Journal of Child Nutrition & Management*, 42(2).

³⁸ Vasques, C., Magalhães, P., Cortinhas, A., Mota, P., Leitão, J., & Lopes, V. P. (2014). Effects of intervention programs on child and adolescent BMI: A meta-analysis study. *Journal of Physical Activity & Health*, 11, 426-444.

³⁹ Wethington, H. R., Finnie, R. K. C., Buchanan, L. R., Okasako-Schmucker, D. L., Mercer, S. L., Merlo, C., Wang, Y., Pratt, C. A., Ochiai, E., & Glanz, K. (2020). Healthier food and beverage interventions in schools: Four community guide systematic reviews. *American Journal of Preventive Medicine*, 59(1), e15–e26.

⁴⁰ Koriakin, T. A., McKee, S., Schwartz, M., & Chafouleas, S. M. (2020). Development of a Comprehensive Tool for School Health Policy Evaluation: The WellSAT WSCC. *Journal of School Health*, 90(12), 923-939. DOI:10.1111/josh.151

⁴¹ Micha, R., Karageorgou, D., Bakogianni, I., Trichia, E., Whitsel, L. P., Story, M., Peñalvo, J. L., & Mozaffarian, D. (2018). Effectiveness of school food environment policies on children's dietary behaviors: A systematic review and meta-analysis. *PloS One*, 13(3), e0194555.

⁴² See, A. (2024, October 14). *15 benefits of scratch cooking in schools*. Chef Ann Foundation. <https://www.chefannfoundation.org/blog/15-benefits-of-scratch-cooking-in-schools/>

⁴³ Trent, R., Ijaz Ahmed, D., & Koch P. (2019) *Cooking outside the box: How a scratch cooking pilot in the Bronx is reshaping meals in New York City schools*. Laurie M. Tisch Center for Food, Education & Policy, Program in Nutrition, Teachers College, Columbia University. <https://nyhealthfoundation.org/wp-content/uploads/2019/12/Cooking-Outside-the-Box-Full-Report.pdf>

⁴⁴ Falce, R. (2024, June 3). *2024 school nutrition standards: How scratch cooking can help*. Healthy School Recipes. <https://healthyschoolrecipes.com/2024-school-nutrition-standards-how-scratch-cooking-can-help/>

⁴⁵ Pedroza-Tobias, A., Craddock, A. L., Blacker, L., Ritchie, L. D., Schmidt, L. A., McCulloch, C. E., Salomon, J. A., Brindis, C. D., Cabana, M. D., & Patel, A. I. (2024, Online first). Water first school water promotion and access intervention: A cost analysis study. *Journal of the Academy of Nutrition and Dietetics*. <https://doi.org/10.1016/j.jand.2024.10.022>

⁴⁶ An, R., Xue, H., Wang, L., & Wang, Y. (2017). Projecting the impact of a nationwide school plain water access intervention on childhood obesity: A cost-benefit analysis. *Pediatric Obesity*, 13(11), 715–723. <https://doi.org/10.1111/ijpo.12236>

⁴⁷ U.S. Department of Agriculture, Food and Nutrition Service. (2021, July 15). *Farm to School grant program*. Community Food Systems. <https://www.fns.usda.gov/cfs/farm-school-grant-program>.

⁴⁸ *National Farm to School Network*. Farm To School. (n.d.). <https://www.farmtoschool.org/>

