

Manuscript Titles and Author Lists: Proceedings from Nourish Now: A science dialogue on improving adolescent health through nutrition
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Call to Action: The future of evidence-based adolescent-focused dietary guidance

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Headline: Adolescents have the greatest demand for nutrients to support rapid growth and development, yet diet quality during this life stage is at its lowest — a situation that is compounded by unique physiological, social, and behavioral challenges. Publications from “*Nourish Now: A Science Dialogue on Improving Adolescent Health through Nutrition*” identified barriers and opportunities to improve nutrition and health during adolescence and issued a call to action to prioritize adolescent-focused research that can inform evidence-based dietary guidelines tailored to this pivotal life stage.

Background:

Research has established that nutrient intake and nutrient adequacy in childhood and adolescence impacts physical growth, development, and academic performance as well as short- and long-term health and chronic disease risk. Yet, there is limited research conducted within this life stage, and dietary guidance may lack specificity for these unique life stage- and growth-specific needs. Public health guidance has noted that nutrient gaps among adolescents are significant—setting the stage for a “constellation of potential nutritional risk factors”¹. To raise awareness and promote opportunities aimed at addressing adolescent life stage nutrition and health, the National Cattlemen’s Beef Association, on behalf of the Beef Checkoff, partnered with the Arkansas Children’s Nutrition Center (ACNC), one of six USDA Agricultural Research Service (ARS) national human nutrition research centers, to convene 50 leading nutrition scientists, physicians, registered dietitians, and public health experts for a science dialogue on improving adolescent health through nutrition. Outcomes of the meeting included published proceedings and a call to action, which are summarized here.

Objective:

The workshop, titled “*Nourish Now: A Science Dialogue on Improving Adolescent Health through Nutrition*,” was convened to address four objectives:

- Demonstrate the need for balanced dietary patterns to address the unique nutritional needs and gaps of adolescents.
- Highlight the nutrition-related health challenges affecting adolescents, as well as the potential public health impact of these issues.
- Identify barriers and challenges for adolescents to consume nutritionally adequate diets.
- Identify research needs and opportunities to better support evidence-based dietary guidance to effectively improve the health and wellbeing of adolescents.

The *Nourish Now* proceedings and call to action reflect the scientific dialogue from the workshop and are intended to summarize priority issues, emerging evidence, and research gaps, with the goal of informing future research directions and evidence-based dietary guidance tailored to this life stage.

Key Takeaways:

Adolescence is a complex life stage of tremendous physical, hormonal, cognitive and social growth, development, and change. Rapid growth marked by increases in height, bone mass, muscle development, and, for girls, the onset of menstruation, all intensify requirements for energy, protein, iron, zinc, calcium, vitamin B12, and other nutrients. Despite these increased needs, U.S. adolescents consistently show the poorest overall diet quality as compared to other life stages. NHANES analyses report that adolescents, on average, underconsume nutrient-dense foods such as fruits, vegetables, dairy, whole grains and high-quality protein foods, like beef. In particular, adolescent girls show the propensity to fall short on their dietary intakes of protein, iron, folate, and vitamin B12, nutrients essential for growth, oxygen transport, energy metabolism and brain health.

The research presented at *Nourish Now* indicates this transitional period of adolescence is a stage where eating patterns become easily disrupted or irregular and are more influenced by factors outside the home. Habits like skipping breakfast, late-night eating, frequent snacking, and high consumption of sugar sweetened beverages and ultra processed foods are common. These behaviors are shaped by school schedules, sleep disruptions, peer influences, and heavy exposures to food marketing through social media. Experts noted that over 90 percent of adolescents use social media, and, further, food and beverage marketing in these spaces tend to promote highly palatable convenience foods that are higher in calories but low in essential nutrients. This creates a significant challenge for adolescents to meet nutrient needs, even when calorie intake is sufficient or excessive. Lifestyle factors including physical activity, sleep, and mental health were also discussed as interconnected issues. Research from CDC indicates that only about 26% of adolescents engage in one hour of physical activity a week while about 46% report spending about 3 hours per day on gaming. Low physical activity, inadequate sleep due to changing sleep cycles, and rising rates of anxiety and/or disordered eating can all further disrupt behavior, appetite regulation, food choices, and nutritional status during this developmental period. Additionally, almost a quarter of teens experience some degree of food insecurity, increasing their risk of nutrient inadequacies and developing poor health habits. Many of these complex factors together directly or indirectly have a negative impact on the nutritional status and health of adolescent-age children.

While public health guidance such as the *2020-2025 Dietary Guidelines for Americans* acknowledges nutrient gaps among adolescents, more practical, age-, growth- or milestone-specific, evidence-based guidance on how to help teens meet their nutritional needs in real-world, modern food environments could be beneficial. Discussions at *Nourish Now* emphasized that many adolescents are at greater risk, compared to other age groups, of inadequate intake of key nutrients that can be obtained from a few common food groups, such as fruits and vegetables; legumes; whole grains; and high-quality, animal-source foods (like beef). The importance of healthy

dietary patterns and of meals eaten at home was stressed, noting that adolescent diet quality remains strongly linked to the meals and foods that are available and consumed within the household, even as teens gain independence.

The *Nourish Now* science dialogue culminated with a public health call to action for an increased investment in adolescent focused nutrition research, including more focused monitoring of nutrient status, well-designed intervention studies and a clearer translation of science into practical, life-stage-specific guidance. Furthermore, it calls for an updated understanding of nutrient requirements during this stage of life. For example, dietary protein intake recommendations were set to prevent deficiency, but there is a need to better understand requirements to support the rapid growth and development during adolescence, while also laying a solid foundation for optimal long-term health outcomes. This complex transitional period of adolescence represents both a challenge and a pivotal opportunity to establish healthy dietary patterns that can support lifelong health and should no longer be treated simply as an extension of childhood or adulthood.

Implications:

- Insufficient attention to food choices and diet quality in adolescents does not just impact short-term energy and growth, it may also contribute to nutrient gaps that can affect long-term physical growth, academic performance, and future risk of chronic disease.
- The modern food environment makes it difficult for adolescents to meet their nutritional needs. Greater independence, busy schedules, social media influence and easy access to more highly processed, highly palatable foods means adolescents often prioritize convenience and taste over nutrient density and health. As a result, many teens are not consuming enough whole, nutrient-rich foods or meals that provide key nutrients, including vitamins and minerals. Without intentional guidance and accessible nutritious options, adolescents are at risk of falling short of nutrients their rapidly growing bodies and brains need most.
- There is a compelling, critical need for evidence-based, age- and/or milestone-specific nutrition research to inform dietary guidance and offer practical solutions for the adolescent life stage. The Call-to-Action authors and Nourish Now adolescent researchers agree that current dietary guidance does not adequately address the unique needs of adolescents. More targeted research, clearer messaging, and realistic food- and behavior-based strategies would support adolescents in building healthy eating patterns that can support their health throughout their lives.
- As part of a strategy to help adolescents build and prioritize healthy dietary patterns, beef can be recommended as a practical nutrient-dense food to fill critical nutrient gaps commonly seen in this life stage. Beef's high-quality protein supports optimal growth, and its bioavailable forms of iron, zinc, vitamins B6 and B12, and phosphorus help address the essential nutrients that are commonly low in diets of both female and male adolescents.
- Assessing protein intake and protein requirements during vulnerable life stages like adolescence is an emerging priority, with protein quality playing a role in optimal growth and development. Beef is a complete protein providing a bioavailable form of all essential amino acids, for relatively fewer calories compared to other protein foods.

¹Dietary Guidelines Advisory Committee. 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; 2020. Accessed [date]. <https://www.dietaryguidelines.gov/2020-advisory-committee-report>

Citations:

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