



Spring 2021

Nutrition Trends

Top food and nutrition trends for education and health professionals.

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Nutrition and education trends in the context of the current environment—how the COVID-19 pandemic has shaped the environments in which we live, work, play, learn and gather.

The onset of the COVID-19 pandemic upended all aspects of daily life for communities across the country and around the world, impacting social, emotional and physical health. In the United States, it intensified disparities for underserved

populations, as those who already experienced difficulty accessing resources such as food, healthcare and technology found themselves struggling even more.

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About Dairy Council of California

Dairy Council of California and its staff of nutrition education experts are committed to empowering stakeholders, children and families with science-based, personalized programs and resources for the lifelong pursuit of healthy eating habits.

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Dairy Council of California has a Nutrition Trends Task Force which includes 10 staff members, nine of whom are Registered Dietitian Nutritionists. The Task Force meets three times per year to review the trends in nutrition research, education, policy and marketing and communications.

Staff is responsible for tracking a wide variety of publications, both scholarly journals and news media that report on the above topics. This summary outlines the top nutrition and education trends identified at the year-end meeting in early 2021.

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After a year of living with the pandemic, there is opportunity to reflect on the challenges it has raised and look forward to the solutions it may inspire. The pandemic is bringing the issues of mental health, food insecurity, the digital divide, racism and climate change into sharp focus. These are not new issues, and moving forward they must be addressed.

At the same time, the pandemic accelerated the need to find solutions for many societal problems, and these solutions can be built upon as communities begin to recover. For example, advances in telehealth allow clinicians to reach patients who can't leave their homes or who live in rural communities where travel is more difficult. Additionally, while virtual learning in schools has created many challenges, some positive trends may last, such as periodic remote learning, using technology to build career skills in data analysis, and growing the parent-school-community connection. Finally, businesses and organizations have critically reflected on their practices, both internally and externally, to better support diversity, inclusion and equity. The pandemic has created an opportunity to re-evaluate public health infrastructure, systems and policies that were often neglected before COVID-19.

It is through this lens that Dairy Council of California presents the nutrition and education trends in a year unlike any other. The systems and sectors that impact daily life, including health care, education and business, are being placed at the forefront to help solve complex issues. Grassroots activism is growing to levels never before seen. The result is an open environment of sharing voices and experiences and seeking collaboration to find solutions for these unprecedented and interrelated issues.



There is growing focus on overall diet quality, complexities of the food matrix, and acknowledgment of changing nutrition needs throughout the lifespan. The holistic nature of food-based guidelines aims to integrate these important areas.

Guidelines for healthy eating continue to shift from a focus on individual nutrients toward food-based recommendations and optimal dietary patterns. People eat different combinations of foods over time, rather than nutrients in isolation. The synergistic effects of whole foods in supporting optimal health are increasingly addressed in dietary recommendations that focus on consistent patterns of healthy food consumption.

High-quality foods create the foundation for healthy eating patterns. Choosing foods based on overall nutrient density has a greater impact on health than food choices that focus on a single substance such as a vitamin, calories or sugar. A variety of high-quality foods from food groups eaten together have greater impact than the sum of their parts.

The quality of food and a food's matrix, altered by processing and other factors, can fall on a spectrum of how the food impacts health.¹ For example, not all foods containing sugar are equal, and evidence shows that using sugar as an indicator of carbohydrate's impact on health is highly dependent on the food source. Some high-quality food sources that contain carbohydrates and sugar, such as yogurt, flavored milk, fruit, 100% fruit juice and certain breakfast cereals, are shown to be beneficial to health. These foods contain naturally occurring sugars, and although they may contain limited added sugars, they also provide

essential nutrients. Conversely, calorie-equivalent substitutions of low-quality carbohydrate foods with sugar, such as grain-based desserts, show evidence of harm.² This scientific insight supports the focus on food quality and overall dietary patterns rather than food quantity and single nutrients.

Dietary guidelines aim to be seen not as prescriptive but rather as flexible and applicable to individual life stages, while focusing on how foods can meet nutritional needs. This shift is notably addressed in the 2020–2025 Dietary Guidelines for Americans. The latest Dietary Guidelines recommends eating patterns for key life stages, including pregnant and lactating women and children from birth to 24 months. It also identifies underconsumed nutrients that pose a public health concern specific to the needs of these populations, such as iodine and choline for pregnant and lactating women, iron for infants and phosphorus for adolescents. Calcium, vitamin D, potassium and dietary fiber remain nutrients of concern for all age groups.³ Although specific nutrients are critical to different life stages, translating how these nutrient needs can be met through foods and healthy eating patterns is a critical purpose of food-based dietary guidance. Applying nutrition guidance to meet needs at each life stage will continue to shape nutrition research, as evidence builds on the understanding of food quality and dietary patterns across the life span.

Implications: While the Dietary Guidelines outlines nutrient requirements for individuals, healthy eating patterns can be tailored to individual taste preferences, budget, culture and food access. Health professionals and educators are critical sources of nutrition education and serve as connectors to resources and community supports that can help families choose nutrient-dense foods and beverages that meet their needs.

A new era of nutrition research focuses on the gut microbiome and functional foods. Evidence is beginning to reveal strong associations supporting the interconnectivity of diet, inflammation, immune function and gut health.

There is a growing understanding of how the unique collection of bacteria that lives in the gut is impacted by dietary intake and how the gut microbiome plays a role in human health. The food people eat directly influence the microbiome, which in turn impacts metabolism and immunity, ultimately affecting health and risk for chronic diseases.

The gut microbiome has been linked to numerous health conditions and diseases, including hypertension, type 2 diabetes and heart disease among many others.⁴ It has become clear that the makeup of gut microorganisms, which is influenced by genetic and environmental factors such as diet, impacts the susceptibility to inflammation and disease. This focus on inflammation and chronic diseases is now intersecting with the urgency of understanding how foods play a role in protecting against acute diseases by improving immune function.

With so many Americans having one or more chronic diseases, often characterized by ongoing low-grade systemic inflammation, attention is on foods and eating patterns that have anti-inflammatory effects. A recent systematic review identified “functional

foods,” including yogurt, whole grain products, green tea and others, that have been shown in studies to have anti-inflammatory properties.⁵ While these have shown anti-inflammatory effects in clinical trials, it is important to note that no single food has a significant impact on inflammation. Rather, including these foods within a healthy, overall eating pattern leads to health benefits that are greater than the sum of their individual parts.

The advancing knowledge of the gut microbiome is also driving science to look beyond the traditional nutrients in foods and examine lesser-understood components like biologically active compounds within a food’s matrix. At the same time, there is emerging interest in foods and their association to infectious diseases like COVID-19. An example is a growing area of research examining the potential role that lactoferrin may have in prevention and

possibly even treatment of infectious diseases. Lactoferrin is a bioactive component found in dairy and other mammalian milk and is known to have antibacterial and antiviral properties; improve neural development and cognition; promote bone growth; prevent cancer; and exert anti-inflammatory and immune-regulating effects.⁶ Specifically, some evidence points to lactoferrin’s ability to counteract infections and inflammation by blocking the entry of a virus and preventing it from attaching to the host’s cells. While the science on lactoferrin and viruses is still too new to draw conclusions, it highlights advances in the understanding of how foods and their components can impact human health, including both acute and chronic disease prevention and treatment.



Source: Luvían-Morales J et al. Crit Rev Food Sci Nutr, 2021.

Fermented foods and the probiotics they contain, which play a positive role in a healthy gut microbiome, have drawn the attention of scientists, health professionals, the food industry and consumers. Recognizing this, the International Scientific Association for Probiotics and Prebiotics (ISAPP) recently convened an expert panel that defined fermented foods and beverages as “foods made through desired microbial growth and enzymatic conversions of food components.” This definition clarifies that microorganisms are required for fermentation. Traditionally, fermented foods have played a role in preventing food spoilage and extending shelf-life. In addition, the ISAPP consensus statement differentiates fermented foods from probiotics, which are present in most fermented foods, but not all.⁷ As the knowledge around fermented foods and their health effects on the microbiome, immunity and inflammation continues to advance, there may be momentum to include fermented foods as a key component of dietary recommendations in the future.

Implications: The advancing knowledge of the gut microbiome and its role in health is another step forward in the evolution of nutrition science. A deepening understanding of how food and beverages feed the microbes in the gut, which in turn exhibit health-promoting effects, such as regulating immunity and reducing inflammation, can be applied in nutrition education and guidance. Interest in foods with functional benefits, such as yogurt and other fermented dairy foods, provides opportunities for health professionals and educators to help individuals incorporate high-quality, nutrient dense foods into their diets to promote overall health and well-being.

The importance of engaging individuals through their own personal life experiences is acknowledged as a vital component in achieving meaningful, equitable community change.

Conditions in the places where people live, learn, work, play and gather affect a wide range of health and quality-of-life risks and outcomes. These social and environmental conditions are referred to as social determinants of health.⁸ Examples of these social determinants include housing and transportation, racism and discrimination, and socioeconomic factors such as income. Social determinants largely explain the differences seen between and within communities in the ability for people to achieve their full health potential. Reducing the barriers that create health disparities requires solutions at the individual, systems and policy levels. Healthy People 2030, a government initiative that establishes a decade of measurable public health objectives, provides a framework that outlines five key areas: health care access and quality, education access and quality, social and community context, economic stability, and neighborhoods and built environments.⁹ Creating effective change in any of these areas relies on the understanding and inclusion of the experiences, knowledge and diverse perspectives of those within a community.

More attention is being directed to educators, health experts and policy makers to identify the “experiences” of individuals faced with overcoming common health barriers such as access to nutritious food, health care providers, or even safe and

nurturing school environments. The pandemic has brought these issues to the forefront, highlighting the racial, social and geographical gaps in achieving health equity. What's more, resource gaps directly impact children and families, especially people of color. Nourish California recently conducted statewide research illustrating the experiences of individuals and families across California, particularly in light of the pandemic. Its key findings show that more than three in five survey respondents have worried about running out of food in the past 12 months. Black (69%) and Latinx (75%) Californians were more likely to experience this concern than respondents of other races and ethnicities. Households with children were also more likely to face this concern (74%) compared to those without children (56%).¹⁰ Another research study found that white students were provided more options to choose in-person schooling while a majority of Black and Latinx students lived in school districts where online learning was the only option. The barrier to quality virtual education is even more significant with 17 million students nationwide lacking internet access at home and more than a third of rural America having poor or no internet access.¹¹ But just knowing the data and providing resources are not enough to address these issues. Reducing barriers to health equity requires acting on the perspectives, knowledge and ideas of the people who navigate these challenges every day.

Sub Trend: Solutions such as nutrition education to advance health equity, aim to foster greater trust and authenticity, celebrate diversity and center on a collaborative approach.

Empathy, compassion, authenticity and trust are often the touchstones of successfully engaging patients and clients in making healthy lifestyle

changes. With rates of obesity and associated chronic diseases remaining high among children and adults,¹² health professionals and educators may tend to focus on disease outcomes as being individually controlled versus resulting from a systemic problem. The latter helps reframe these important public health issues in a way that is empathetic to those experiencing negative health outcomes as a result of their environment.



Social Determinants of Health Copyright-free Healthy People 2030

Improving the health of those living with the impacts of obesity and chronic diseases is best approached with empathy and respect, acknowledging diversity and culture and consciously moving away from placing blame or stigma.¹³ One approach that is gaining traction is the move toward more holistic and individualized nutrition. Precision nutrition is the practice that goes beyond simply targeting symptoms and instead uses the lens of genetic, biological and environmental, as well

as social and behavioral, determinants of health in its approach.¹⁴ Efforts to better bridge health care delivery with a broader range of support are currently underway. For example, Google Health is analyzing disparities that exist in terms of access and is developing apps that would help doctors better assess patients and connect them to resources in their communities.¹⁵ Advances like these will help the healthcare system improve individual quality of life to support thriving communities.

Implications: Efforts to foster health equity will require a broad range of strategies aimed at the individual, systems and policy levels, while addressing the social determinants of health. Health professionals and educators can play an important part in these solutions, especially in identifying the personal experiences related to everyday barriers of those they support, such as children and families. Empathy and compassion have been a foundation to trusted, individualized care. Additionally, educators can actively gain the unique and important perspectives, experiences and ideas from those within the communities they serve.



Consumer food purchasing and eating behaviors continue to shift amid the pandemic as a result of social and environmental changes, but it remains to be seen what changes will be normalized in the long-term.

Many factors influence consumer behavior, and changes are inevitable, often driven by minor shifts in the broader environment. Some changes occur slowly over time, while others happen quickly, such as those brought on by the COVID-19 pandemic. The sudden and extended closure of restaurants in response to the pandemic is just one of the abrupt changes that occurred in the past year. According to a survey by the International Food Information Council, the pandemic led more than eight in 10 Americans to alter their food habits. These changes include cooking more often at home, snacking more frequently, eating healthier than usual and thinking about food more frequently.¹⁶

A combination of indoor-dining restrictions and stay-at-home orders in early 2020 initially led many people to turn to home cooking, and their enthusiasm hasn't waned. In fact, 55% of consumers are eating from home more often and anticipate doing so even after the pandemic.¹⁷ Many home cooks are seeking out comfort foods or putting a spin on classic dishes. With tens of thousands of restaurants either closed or in need of federal assistance,¹⁸ ghost kitchens with no dining room or street presence—which were trending pre-pandemic—are expected to continue growing in popularity as they offer flexibility to launch food services with minimal investment.

Snacks have solidified their role as a staple in many people's diets, as consumers increasingly consider them to be mini-meals and seek out healthy, nutrient-dense options. More time at home and the stress of the pandemic have consumers "snacking non-stop" and three in five are choosing better-for-you snacks.¹⁹

While price and taste remain the key factors in food purchasing decisions, consumers also value foods that are health-promoting, comforting, accessible and safe. Sustainability continues to be an important consideration, with 65% of consumers wanting their everyday actions to positively affect the environment.²⁰ Consumers want to know where their food comes from, how it was produced and how it was sourced. This desire to impact change through purchases is leading to increased sales of plant-based products. An already growing demand for these products was accelerated by food shortages at the start of the pandemic. Consequently, both investment in and sales of plant-based products continued to grow in the past year.²¹ At the same time, there is growing awareness that plant-based meat alternatives may be highly processed with a long list of ingredients. While environmental factors are an increasing part of food decisions, it is equally important to consider the nutritional impact on human health. Research is currently limited on plant-based meat alternatives and their effect on nutrition, chronic diseases and food safety.²²

Implications: Though permanent post-pandemic changes to consumer behavior are unknown, it is likely that many current behaviors will continue, including cooking at home, increased snacking and shopping based on personal values. These changes create an opportunity to educate consumers on the importance of building healthy and sustainable eating patterns that center on nutrient-dense foods.

The dialogue surrounding sustainable nutrition as part of climate change mitigation efforts has moved to an action phase with research and policy initiatives launched at the international, federal and state levels.

Stakeholders in the global food system are being asked to collaborate in meeting international health and sustainability targets. The targets are already challenged by the growing population and transition toward diets with more calories and ultra-processed foods. Recently, significant actions were undertaken to address these challenges. On a global scale, the United Nations Committee on World Food Security approved its Voluntary Guidelines on Food Systems and Nutrition to support countries in their efforts to eradicate all forms of hunger and malnutrition through a comprehensive food systems approach.²³ These guidelines will contribute to the process of achieving sustainable food systems and improved nutrition and will ensure that foods needed for adequate nutrition are accessible, affordable, safe and of sufficient quality and quantity. They will also serve as a blueprint for potential policy documents leading up to the 2021 Food Systems Summit, a multi-sector convening to launch new actions to achieve global sustainability and health targets.²⁴ Actions are also being taken within the United States and here in California. Just days into his administration, President Joe Biden signed an executive order to rejoin the Paris Agreement, within the United Nations Framework Convention on Climate Change. This move signals a renewed focus on strategies to address the consequences of climate change, including the

impacts on the global food system. In California, Governor Gavin Newsom launched the California Climate Action Corps and signed an executive order to fight climate change in 2020.²⁵

The food industry has been an active and valued partner in combatting climate change. As an example, a collaborative of food industry leaders announced its Farm Powered Strategic Alliance, an initiative to repurpose unavoidable food waste from manufacturing and supply chain operations into carbon-negative, farm-derived renewable natural gas.²⁸ In another example, dairy industry leaders are responding to consumer demands to support farms that use less water and fertilizer, reduce greenhouse gas emissions and use more natural techniques to maintain soil quality.²⁹ The US dairy industry has a Net Zero Initiative that specifically outlines plans for the sector to become carbon neutral, optimize water usage and improve water quality by 2050. Currently the dairy industry contributes less than 2% of US greenhouse gas emissions.³⁰ Overall, concerted efforts to decrease environmental footprints are being enacted in a wide range of agricultural and food processing sectors.

Consumer awareness of the connection between food choices and climate impacts is growing. The Consumer Environmental Trends Report 2020 found that over 78% of the world's consumers are concerned about the environment.³¹ In fact, the International Food Information Council's 2020 Food and Health Survey revealed that 34% of consumers consider environmental sustainability when shopping.¹⁶ Individual actions to reduce food waste and eat a healthy diet can make a significant difference. Food waste remains a critical challenge, as Americans waste 30-40% of the nation's food supply, with more than 31% of that waste occurring at the retail and consumer levels.³²

Supporting people with high-quality, healthy dietary patterns and protecting finite environmental resources continues to be a priority. While many point to animal-sourced foods as being a major contributor to the environmental footprint, other dietary factors play a role as well. Excessive intake of calories contributes to greenhouse gases, while fruits, vegetables and some nuts are water-intensive crops. In fact, shifting consumption patterns to align with the Dietary Guidelines for Americans recommendations would increase water use by 16% while greenhouse gases emissions would remain relatively the same.³³ Therefore, trade-offs are likely to be considered among other climate change solutions. Simplistic strategies such as elimination of entire food groups or categories are likely to have unintended consequences. For example, research conducted at Virginia Tech confirmed that removal of dairy cows would have minimal impact on greenhouse gas emissions; however, such a move would reduce the availability of essential micronutrients such as alpha-linolenic acid; calcium; vitamins A, D, B12 and choline.³⁴ An overall focus on diet quality and healthy eating patterns remains the foundation of sustainable nutrition.

Implications: Researchers, government officials and those working in the agricultural and food industries continue to work toward a consistent and balanced definition of sustainability from a holistic point of view that considers environmental, nutritional, economic, social and cultural factors. Sustainable food systems adopted globally must benefit the health and well-being of individual consumers in addition to supporting the economic stability and health of local communities. Public-private partnerships will be instrumental in developing and operationalizing innovative technologies that allow all sectors along the food supply chain to decrease their environmental footprint while still providing nutrient-dense foods that are readily available and affordable.

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Solutions such as nutrition education to advance health equity, aim to foster greater trust and authenticity, celebrate diversity and center on a collaborative approach.

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