Contributions of Dairy Foods to Healthy Eating Patterns

Overview

Dairy foods (i.e., milk, cheese and yogurt) are recommended as a foundational food group for healthy eating patterns at every life stage by leading medical and health authorities, including the Dietary Guidelines for Americans (DGA). Dairy foods across a range of fat levels contribute a uniquely affordable and accessible bundle of important nutrients to the American diet, such as high-quality protein and key micronutrients like calcium, vitamin D, potassium, iodine, vitamin B12 and riboflavin. Children and adults are less likely to fall below recommended intakes of calcium, vitamin D, iodine, folate, vitamin B12 and vitamin B6 when they consume the recommended daily servings of dairy foods. Beyond their nutrient package, milk, cheese and yogurt each have a unique food matrix that delivers a broad array of bioactive compounds linked to health benefits. This rich combination of nutrients and bioactive components within the dairy food matrix may help explain the decades of research linking dairy foods with positive health outcomes across the lifespan. Most Americans could improve their overall diet quality by meeting recommendations for daily dairy food group servings. Increasing dairy consumption to meet guidelines could help close key nutrient gaps and support healthy eating patterns across the lifespan.

Defining the Dairy Food Group

The DGA defines the dairy food group as: “Whole, reduced-fat, low-fat, or nonfat dairy products, including fluid, dry, or evaporated milk; yogurt; and cheeses. Lactose-free and lactose-reduced products, as well as fortified dairy alternatives, are also options.” Serving size examples of nutrient-dense dairy foods are 1 cup of milk, 3/4 cup of yogurt or 1 oz of cheese.

Based on the DGA, starting at six months of age, full-fat yogurt and cheese are recommended as nutrient-dense

options during the complementary feeding period. As children grow, recommended dairy intake increases based on age and overall calorie needs. Young children with lower calorie needs are advised to consume 2 servings of dairy per day, while older children, adolescents and adults are recommended to consume 2 1/2–3 servings per day. Most individuals following eating patterns of 1,600 calories or more are advised to consume 3 daily servings of dairy foods.[1]

Dairy Recommendations by Calorie Level

Daily Calories[a]	Daily Dairy Servings
1,000 – 1,199	2
1,200 – 1,599	2 1/2
1,600 – 3,200	3

a. Dairy servings are based on the "Daily Servings by Calorie Level" guide from the 2025–2030 Dietary Guidelines for Americans, Reference Amount Customarily Consumed (RACC).[1]

Dairy foods contribute nutrients and bioactive components to healthy eating patterns across the lifespan

The importance of dairy foods (i.e., milk, cheese and yogurt) as components of healthy eating patterns has been highlighted since the first iteration of the DGA over 40 years ago.[2] The health benefits of dairy foods are backed by decades of peer-reviewed literature that supports their role in healthy eating patterns and reduced risk of cardiovascular disease, type 2 diabetes, obesity and certain types of cancer.[3-14] Additionally, dairy foods play an important role in bone and muscle health[15-23] and provide nutrients that support immune and gut health.[24,25]

Dairy foods provide a unique profile of essential nutrients to the American diet. Consuming the recommended daily servings of dairy foods across calorie levels contributes substantially to nutrient intakes within an overall healthy eating pattern.[30] Among infants 12-23 months old, the dairy food group is estimated to provide 77-80% of calcium, 73-76% of vitamin D, 27-30% of potassium, 57-63% of vitamin B12, 52-55% of riboflavin (vitamin B2), 54-55% of phosphorus, 38-43% of vitamin A, 36-39% of zinc, 28-30% of choline, 24-25% of magnesium and 17-18% of vitamin B6.[30] Among individuals 2 years and older, modeling data indicate recommended consumption of the dairy food group provides 60-78% of calcium, 55-74% of vitamin D, 15-28% of potassium, 41-61% of vitamin B12, 30-50% of riboflavin (vitamin B2), 30-50% of phosphorus, 23-39% of vitamin A, 21-39% of zinc, 17-32% of choline, 14-27% of magnesium and 10-19% of vitamin B6.[30] Dairy foods also deliver high-quality protein within healthy eating patterns, providing 23-41% of total protein intake.[30]

In addition to dairy foods' important nutrient contributions to the diet, milk, cheese and yogurt each have a unique food matrix – a dynamic profile of nutrients and bioactive compounds within a dairy food's physical structure.[31] An emerging body of research indicates that these components may work together to impact digestion and absorption, ultimately influencing their overall health impact.[32,33] This 'food matrix effect' may help explain the link between dairy foods across a range of fat levels with beneficial to neutral outcomes for health and well-being, such as reduced risk of cardiovascular disease and type 2 diabetes as well as bone, immune and gut health benefits.[34]

Dairy foods make important contributions to nutrient adequacy in the U.S.

Regularly consuming dairy foods (i.e., milk, cheese and yogurt) is a practical food-first approach for supporting nutritionally adequate diets.[49-57] However, nearly 90% of the U.S. population does not meet the recommendations for daily servings.[58] In fact, data indicate Americans two years and older consume only 1.56 daily servings of dairy foods, with consumption being the lowest among non-Hispanic Black and Asian children and adults.[59] Even at the current consumption level, dairy foods provide Americans two years and older 52% of their calcium, 51% of their vitamin D, 14% of their potassium, 17% of their protein and at least 25% of their vitamin A, vitamin B12 and phosphorus.[60] According to nationally representative data (2015-2018 NHANES), milk is a top contributor of both vitamin D and potassium, while cheese is a top contributor of calcium among adults. Similarly, milk is the top contributor of calcium, vitamin D, potassium, energy and saturated fat in children 2-5 years old (2011-2014 NHANES).[61]

Dairy Recommendations by Age and Life Stage

Age	Stage[a]	Daily Energy Needs[b]	Daily Dairy Servings[c,d]	Recommended Dairy Foods[e]
6-12 months	Infancy / Baby	600 – 750	Introduce (up to 1 ⅔)	Cheese and plain (unsweetened), full-fat yogurt
1-3 years	Toddlers	800 – 1,200	1 ¾ – 2 ½	Cheese and plain (unsweetened), full-fat milk and yogurt
3-5 years	Preschool	1100 – 1,400	2 – 2 ½	Milk, cheese and yogurt (choice of fat level; unsweetened)
5-12 years	Gradeschool	1,250 – 2,700	2 ½ - 3	Milk, cheese and yogurt (choice of fat level)
12-18 years	Teenager	2,000 – 3,750	3	Milk, cheese and yogurt (choice of fat level)
19-30 years	Adults	2,150 – 3,500	3	
31-50 years	Adults	2,100 – 3,500	3	
51-70 years	Adults	1,950 – 3,250	3	
>70 years	Adults	1,750 – 2,900	3	

a. Life stages for children are based on the American Academy of Pediatrics (AAP) "Ages & Stages" framework.[26]
b. Daily energy needs are based on NASEM Estimated Energy Requirements (EERs) for the U.S. population using median length/height, weight, and physical activity by age, and reflect the range from female inactive to male very active, rounded to the nearest 50 kcal. Child energy values are based on the upper bound of each age year (e.g., 3.0–4.99 years, 5.0–11.99 years).[27]
c. For dietary patterns below 1,000 kcal/day, dairy servings are based on American Academy of Pediatrics (AAP) food group recommendations for toddlers ages 12–23 months, cup-equivalents.[28]
d. For dietary patterns at or above 1,000 kcal/day, dairy servings are based on the "Daily Servings by Calorie Level" guide from the 2025–2030 Dietary Guidelines for Americans, Reference Amount Customarily Consumed (RACC).[1]
e. Dairy milk is not recommended before 12 months. The 2025-2030 DGA recommends no added sugars through age 10, followed by limiting added sugars using FDA "healthy" criteria as a guide (<2.5 g per ⅔ cup equivalent). The AAP does not recommend flavored milk for children ages 0–5; however, it cites flavored milk as an example of balancing limits on added sugars with nutrient-rich foods and has distinguished it from sugary drinks in school beverage guidance.[1,29]

Research supports the important role of dairy foods in helping meet the recommended amounts of nutrients essential for health and wellness in children and adults.[49-57] Based on 2001-2018 NHANES data, analyses among individuals 2 years and older have reported that higher consumption of dairy foods, specifically higher consumption of milk and yogurt, was positively associated with folate, vitamin B6 and vitamin B12 status.[55] Authors hypothesized that the nutrient contributions from dairy foods, as well as foods consumed with dairy foods such as fortified cereals, may help explain these results. Dietary intake analyses from 2001-2010 NHANES data also indicate a link between milk consumption and higher vitamin D levels among both children and adults ages 2 years and older.[56] In 2020, Hess et al.[49] reported children ages 2-18 meeting recommended consumption of dairy foods were less likely to fall below recommendations for calcium, magnesium, phosphorus, riboflavin, vitamin A, vitamin B12, vitamin D and zinc when compared to children who do not meet dairy consumption recommendations (2013-2016 NHANES data). Additional dietary intake data for children ages 2-18 (2001-2018 NHANES collection) reported that dairy food consumption was associated with a lower risk of being iodine-deficient and was positively associated with iodine status.[50] Among pregnant and lactating women, a 2025 systematic review and meta-analysis of over 50 studies found that higher consumption of dairy foods, specifically milk, was associated with better iodine status and a reduced risk of iodine deficiency.[57] Evidence also indicates dairy consumption can benefit overall dietary quality, with several prospective observational studies among children ages 2-18 reporting that dairy food consumption, particularly higher yogurt consumption, was significantly associated with better diet quality as measured by the Healthy Eating Index* or Diet Quality Index.[51-54]

This evidence suggests that increasing dairy food consumption to meet daily recommendations could be linked with improved nutrient adequacy for Americans across the lifespan.

*HEI scores are based on the 2020–2025 Dietary Guidelines for Americans (DGA) and have not yet been updated to reflect the 2025–2030 DGA. Results should be interpreted within the context of the 2020-2025 DGA.

Essential Nutrients Provided by Dairy Foods

Nutrient	Milk	Yogurt	Cheese	Nutrient Function
Macronutrients				
Protein*	▼	●	▼	Helps build and maintain lean muscle and provides amino acids needed to maintain intestinal tissue integrity, supporting gut health.[35,36]
Vitamins				
Vitamin A*	▼			Supports vision, immune function and growth.[37]
Vitamin D*	▼			Helps the body absorb calcium and supports bone health and immune function.[38]
Vitamin B12*	●	●	▼	Helps with normal blood function and keeps the nervous system healthy.[39]
Riboflavin*	●	●	▼	Helps convert food into energy and enzymes function normally.[40]
Pantothenic Acid	●	▼		Helps convert food into energy and regulate metabolism.[41]
Niacin	▼		▼	Helps convert food into energy.[42]
Minerals				
Calcium*	●	●	▼	Builds and maintains strong bones and teeth; supports nerve and muscle function; contributes to normal enzyme function.[43]
Selenium	▼	●	▼	Protects healthy cells from damage and supports metabolism.[44]
Iodine	●	●	▼	Necessary for proper bone and brain development and metabolic regulation.[45]
Phosphorus*	●	▼	▼	Helps form bones and teeth and supports energy metabolism.[46]
Potassium*	▼			Maintains fluid balance and supports healthy blood pressure and muscle function.[47]
Zinc*	▼	▼		Supports immune function, wound healing and growth.[48]

●Dairy is an excellent source, providing 20% or more of the Daily Value for that nutrient per RACC.

▼Dairy is a good source, providing 10-19% of the Daily Value for that nutrient per RACC.

* Nutrients identified by American Academy of Pediatrics as essential for neurocognitive development.

Sources: USDA FoodData Central online at http://fdc.nal.usda.gov/. Mean values calculated from database entries across all fat levels of plain vitamin D-fortified fluid milk in Legacy, Foundation, and Survey (FNDDS) data sources (n=12).; U.S. Department of Agriculture, Agricultural Research Service. 2016. USDA National Nutrient Database for Standard Reference, Release 28. Nutrient Data Laboratory Home Page, https://www.ars.usda.gov/nutrientdata; low moisture, part skim mozzarella (#01029).; U.S. Department of Agriculture, Agricultural Research Service. 2016. USDA National Nutrient Database for Standard Reference, Release 28. Nutrient Data Laboratory Home Page, http://www.ars.usda.gov/nutrientdata; Low-fat vanilla yogurt (#01119).

Dairy foods provide affordable nutrition in the U.S. diet that is hard to replace with non-dairy foods

Dairy foods provide a unique, bioavailable package of nutrients that can help close many nutrient gaps for Americans at an affordable price and for a reasonable amount of calories.[62-64] Dairy milk is a nutrient-dense source of 13 essential nutrients, providing high-quality protein, calcium, vitamin D, potassium, iodine and vitamin B12,[63,65] within a relatively modest amount of calories. On average, a serving of regular dairy milk costs $0.22 per 8-oz

serving (based on the average price of a gallon of milk) and lactose-free dairy milk can be purchased for $0.55 per 8-oz serving (based on the average price of a half-gallon of milk).[66]

A modeling study using data from the 2011-2014 NHANES collection period indicates that dairy foods are the lowest cost sources of dietary calcium and vitamin D and among the lowest cost sources for other nutrients such as potassium, magnesium, vitamin A, vitamin B2 and vitamin B12 among both children and adults.[63] Another modeling study from the same NHANES dataset suggests that replacing the nutrient contributions provided by dairy foods, either at the current consumption levels or levels recommended by the DGA, would require substantially greater quantities of non-dairy foods and could increase food costs by 0.5 to nearly 6 times, depending on the non-dairy foods selected.[62] Similarly, a 2025 analysis by Drewnowski[64] suggests dairy foods (i.e., milk, cheese and yogurt) offer high-quality protein at an economical price, with fat-free and whole-milk dairy foods among the most affordable foods to meet daily protein needs. Additional evidence from a modeling study investigated how to avoid nutrient deficiencies when replacing dairy foods with soy-based alternatives in omnivorous, pescatarian and vegetarian diets. Results indicated that an adequate intake of calcium, as well as vitamin B12 in the case of a vegetarian diet, could only be achieved within these diets if additional and significant dietary changes are made, such as higher consumption of calcium-rich vegetables.[67]

These findings suggest that increasing dairy food consumption to meet DGA recommendations can help improve intake of several important nutrients in a cost-effective way. Conversely, reducing dairy food consumption may potentially lead to unintended economic- and health-related consequences.[68]

Study Spotlight: Plant-based beverages are not a simple swap for dairy milk

Consumers are increasingly looking for attributes in foods and beverages beyond nutrition, such as taste, alignment with personal beliefs and presence/absence of allergens. For these reasons and more, consumers may turn to plant-based beverages as a replacement or addition to dairy milk, not realizing they are not simple nutritional swaps.

In a 2025 study, Johnson et al.[69] analyzed 219 plant-based beverages (21 brands), looking at 175 different nutrients, food components and nutritional metrics in products derived from almond, oat, soy, coconut, hemp, rice, pea, flax, cashew, hazelnut, walnut and blends.

- Only three soy-based products were found to meet all the nutritional standards for dairy milk. Within and across the plant-based beverages assessed, there was a wide range of variability in the content of protein, vitamins and minerals.
- Vitamin B12 levels varied the most among vitamins, while calcium levels showed the biggest differences between mineral content in the products evaluated.
- There was a wide range in the content of added sugars found in plant-based alternatives. While the average added sugar content was about 10% DV, a total of 84 (38%) products did not contain added sugars, while a total of 42 (19%) products were high in added sugars with >20% DV provided per serving.

The findings of this study underscore the important nutrient contributions of dairy foods like milk and the role nutrition professionals play in educating patients, clients and consumers on the nutritional differences between dairy milk and plant-based alternatives. In fact, authoritative statements by at least eleven medical and nutrition groups[1,70-73] have provided expert perspectives on this topic, indicating the potential for unintended public health consequences of substituting plant-based alternatives for dairy foods.

Leading health and wellness organizations recognize the nutrition and health benefits of dairy foods

The DGA and other authoritative health and wellness organizations recognize the contributions nutrient-dense dairy foods like milk, cheese and yogurt make to health and wellness across the lifespan.

Dairy Food Recommendations from Medical and Health Authorities

2025-2030 Dietary Guidelines for Americans[1]

Three servings of dairy foods, including full-fat dairy with no added sugars, as part of a 2,000-calorie dietary pattern are recommended, adjusting as needed based on individual caloric requirements.

American Diabetes Association 2019[74]

Dairy foods are components of a range of recommended eating patterns except vegan diets.

American Heart Association 2021[75]

Low-fat or fat-free dairy foods are recognized components of the DASH diet, an evidence-based eating pattern for cardiometabolic health promotion.

Food and Agriculture Organization of the United Nations 2014[76,77]

Dairy foods are recommended by over 70% of countries that have food-based dietary guidelines.

Food and Drug Administration 2024[78]

The Qualified Health Claim states eating yogurt regularly, at least 2 cups (3 servings) per week, may reduce the risk of type 2 diabetes according to limited scientific evidence.

Healthy Eating Research (A national program of the Robert Wood Johnson Foundation with recommendations from the Academy of Nutrition and Dietetics, American Academy of Pediatric Dentistry, American Academy of Pediatrics and American Heart Association) 2019[71,79]

Low-fat or fat-free dairy foods are recommended as part of a healthy diet for children and adolescents. Specifically, plain pasteurized milk is included in beverage recommendations to support meeting daily hydration and nutrient needs among children and adolescents, with whole milk being recommended until age two.

Joslin Diabetes Center 2018[80]

Milk, cheese and yogurt, whole- and reduced-fat varieties, are recognized as part of healthy eating patterns, within calorie limits.

National Medical Association 2024[81]

Advises meeting national dairy intake recommendations (2 to 2.5 servings/day for young children, 3 serving/day for older children, adolescents, adults and geriatrics) contributes to better nutrition and health outcomes for Black Americans across all life stages.

The Bone Health and Osteoporosis Foundation 2016[18]

Based on good evidence, dairy food consumption is recommended to support nutrient needs for the development of peak bone mass.

Practical strategies to support Americans in meeting dairy food recommendations

There are many affordable and accessible choices in the dairy case across a range of fat levels – from lactose-free and lower lactose options to fermented and high-protein dairy foods and more – providing flexibility for a variety of lifestyle preferences and health needs.

Lactose intolerance

There are many convenient and cost-effective dairy food options that can help keep nutrient-dense dairy foods in the diets of Americans with lactose intolerance (LI).[82-84] This is important, as evidence-based authoritative medical groups have acknowledged that unintended health consequences may occur due to underconsumption of dairy foods among people who experience LI.[85-86]

The National Medical Association published evidence reviews on dairy foods across the lifespan, which include LI management recommendations.[86] These strategies include:

- Consuming fermented dairy foods such as yogurt (which is lower in lactose and also contains live and active cultures that may modulate lactose digestion)
- Consuming small amounts of dairy foods throughout the day
- Consuming milk and other lactose-containing foods with meals which can slow down the absorption of lactose and reduce LI symptoms
- Taking supplements before meals that contain lactase enzyme and/or taking probiotic supplements that contain lactic acid bacteria.

Plus, people can opt for lactose-free dairy milk and other lactose-free or lower-lactose dairy foods such as hard cheeses and yogurt. The majority of grocery and convenience stores now offer their own brand of lactose-free dairy milk, which has the same 13 essential nutrients as regular milk. In fact, as of 2026, 73.5% of U.S. stores carrying food and beverages sell lactose-free dairy milk, making it a widely available and increasingly popular option for those with LI.[87] Empathetic education by health professionals on the availability of cost-effective, convenient and versatile lactose-free and lower-lactose dairy food options can help support continued dairy food consumption among individuals living with LI, helping more Americans meet dairy food and nutrient recommendations.

Fat flexibility

The 2025-2030 DGA recommends the inclusion of nutrient-dense dairy foods like milk, cheese, yogurt and lactose-free dairy milk across a range of fat levels as a part of a healthy eating pattern, while maintaining guidance that saturated fat intake should remain below 10% of total daily calories.[1] This is an opportunity for healthcare professionals to help patients incorporate dairy foods based on their preferences, a strategy sometimes referred to as *fat flexibility.* This flexibility may address barriers to meeting daily dairy food recommendations, including personal taste preferences. Consumer research suggests that Americans may have a preference for reduced-fat and whole-milk, with whole-milk commonly used in culinary applications.[88]

Allowing flexibility across dairy fat levels may support adherence to dairy food recommendations while maintaining overall balanced and calorie-appropriate eating patterns. This guidance is already being applied in practice by many healthcare professionals, with survey data indicating that over 80% of providers, including registered dietitians, report recommending fat flexibility and believe there is room for this approach in healthy diets.89 In addition, dietary modeling research indicates that one of the three recommended servings of dairy foods can be a whole milk (3.25%) or reduced-fat (2%) option within healthy eating patterns for Americans 9 years and older while staying within the current DGA recommendations for saturated fat, calories and sodium intake.90 Therefore, providing flexibility in dairy food guidance may allow individuals to incorporate dairy foods that align with their preferences.

Conclusion

The well-established nutrition and health benefits of nutrient-dense dairy foods (i.e., milk, lactose-free dairy milk, cheese and yogurt) within healthy eating patterns are recognized by the DGA and dietary guidance from leading health and wellness authorities. Dairy foods are affordable and accessible sources of an array of nutritional and bioactive components delivered as part of a unique food matrix that sets dairy foods apart from other food groups. The body of evidence suggests dairy foods provide practical nutrition that is hard to replace with non-dairy foods, and meeting the recommended daily servings of dairy foods can help support nutrient adequate diets for children and adults. Overall, it is important that dietary choices be tailored to meet individual health needs, personal preferences and other lifestyle factors. There are a variety of dairy food options, from non-fat to whole varieties, lactose-free and lower lactose, and fermented and high-protein, offering versatility for a variety of lifestyle preferences and modern health and wellness needs.

Key Takeaways for Health & Wellness Professionals

- **Dairy foods deliver a powerful nutrient package in every serving.** Milk, yogurt and cheese provide up to 13 essential nutrients that can help support bone, muscle, heart, immune, gut and brain health.[8-24,30]
- **Most Americans aren't eating enough nutrient-dense dairy foods – and that may mean missing out on key nutrition and health benefits.** Nearly nine out of 10 Americans fall short of daily dairy recommendations. Meeting the recommended 3* servings per day from options like milk, lactose-free dairy milk, yogurt, kefir or cheese can help close common nutrient gaps, especially for calcium, vitamin D and potassium.[49,55,56,58]
- **Dairy foods are an affordable, practical way to nourish your family.** Dairy foods like milk, cheese and yogurt are among the most cost-effective sources of calcium, vitamin D (commonly in fortified milk) and high-quality protein in the American diet – delivering more nutrition per dollar compared to many alternatives.[62-64,66]
- **Plant based beverages are not a simple swap for dairy milk.** Researchers at the University of Minnesota analyzed over 200 plant-based alternative beverages (including almond, oat, soy and pea) and they found nearly 80% of them contained less calcium, less vitamin D and less protein compared to dairy milk. They concluded that, with the exception of fortified soy beverage, plant-based alternative milks are not nutritionally equivalent to dairy milk.[65]
- **There is a dairy option for almost everyone.** Lactose-free milk has the same nutrients as regular milk, just without the lactose, and lower-lactose options like cheese and yogurt are often well tolerated.[82-86]
- **Dairy foods across a range of fat levels can fit into a healthy eating pattern.** Whether you choose fat-free, low-fat, reduced-fat or whole-milk options, dairy foods provide important nutrients in a balanced diet.[88-90]

*The Dietary Guidelines for Americans provide daily dairy serving recommendations based on calorie intake. Three servings of dairy are recommended for diets of 1,600 calories or more per day.

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