Dairy and The Dietary Guidelines for Americans:

Time to Reassess the Evidence

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The 'Got Milk?' campaign raised an entire generation to believe that dairy is an essential part of a healthy diet, but is milk really the wholesome beverage we think it is? This article explores the presumed health benefits of dairy consumption articulated by the Dietary Guidelines for Americans (DGA). Although the DGA asserts that dairy is associated with bone health and other positive health outcomes, existing evidence suggests otherwise. As such, this article advocates for a new evidence review that would assess the association between dairy and negative health outcomes—particularly in relation to bone health, saturated fat content, and chronic disease. The article also identifies problems with the new DGA process, which identifies questions for the Dietary Guidelines for Americans Committee (DGAC) before the DGAC members are selected. Finally, the article addresses the public's relationship with different dairy and non-dairy alternative products and how the California Milk Processor Board is working to influence this relationship. Recommendations for the DGA are provided at the end.

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INTRODUCTION

Every five years, the United States Department of Agriculture (USDA) and the Department of Health and Human Services (HHS) jointly publish the *Dietary Guidelines for Americans* (DGA), a resource that provides diet and nutrition advice. The DGA is not intended for general audiences; rather, the publication serves as a resource to help health experts and policymakers develop nutrition policies and programs like the National School Lunch Program (NSLP), which provides lunches to students at a free or discounted price, and the Supplemental Nutrition Assistance Program (SNAP, formerly known as food stamps). In 2019, USDA's Food and Nutrition Service (FNS) reported that almost 22 million students received free- and reduced-price lunches through the NSLP, and nearly 36 million people and 18 million households received SNAP benefits (FNS 2020a, 2020b). The DGA is one of the most influential factors determining what millions of Americans consume. Incorrect or misleading information in the DGA could jeopardize the health of millions of Americans.

Since the first publication of the DGA in 1980, and every five years since then, the USDA and HHS have assembled a new Dietary Guidelines Advisory Committee (DGAC) for each iteration of the DGA. Each DGAC reviews current scientific evidence to build upon and revise guidance from the previous DGA. The USDA and HHS published the ninth and most recent edition in December 2020, which will be the primary focus of this paper. More specifically, this paper will center on the DGA's recommendation to consume dairy for its nutritional qualities and the extent to which current evidence supports these qualities.

The first section reviews current presumptions regarding the nutritional value of dairy consumption. The second section details recent scientific findings that challenge the rationale for including dairy in the previous DGA. These findings address issues related to bone health, saturated fat, chronic diseases, and the recommendation of yogurt. The third section outlines the roles that the USDA, HHS, DGAC, and the public play in developing the DGA. This section will also describe how the 2020 DGAC selected topics and questions, what the subcommittees of the DGAC examined, how the public participated in the question formulation process, and how this process has changed over the years. The fourth section analyzes the relationship between the general public's consumption of dairy products and dairy industry players—specifically, the California Milk Processor Board. The fourth section also covers dairy trends, plant-based foods trends, and how the dairy industry is reacting to these trends. The paper concludes with recommendations and final thoughts.

CURRENT PRESUMPTIONS ABOUT DAIRY

The primary goal of the 2020-2025 DGA is to "promote health and prevent disease" in the United States via "healthy eating patterns" (HHS and USDA 2020, viii). The DGA describes dairy consumption as one of the Key Recommendations to achieving a healthy eating pattern, which specifically consists of "fat-free or low-fat milk, yogurt, and cheese, and/or lactose-free versions and fortified soy beverages and yogurt as alternatives" (HHS and USDA 2020, 18). Unlike the previous DGA, the 2020-2025 DGA provides recommended dietary allowances (RDAs) for dairy based on age and calorie level of the consumer. Individuals can meet their RDAs by consuming a specified amount of dairy measured by 1 cup-equivalents, including 1 cup of milk, 1½ ounces of

natural cheese, or 2 ounces of processed cheese. As illustrated in **Table 1**, the DGA establishes four calorie levels for toddlers to meet their energy needs and 12 calorie levels for people 2 years and older to meet their energy needs. The DGA recommends children between 12 and 23 months (who no longer receive human milk or instant formula) should have one-and-two-thirds to two-cup-equivalents per day; people ages two and over should have two- to three-cup-equivalents per day (HHS and USDA 2020).

Table 1: Recommended Servings of Dairy per Day Based on Cup-Equivalents

Ages 12-23 Months				
Calorie Level	700	800	900	1,000
Cup/Day	1 2/3	1 3/4	2	2

Ages 2 Years and Over												
Calorie Level	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
Cup/ Day	2	2 1/2	2 1/2	3	3	3	3	3	3	3	3	3

Source: Author's visualization; DGA data (2020)

The DGA distinguishes the Dairy Group from other nutritional groups for its nutrient content, particularly calcium, and to a lesser extent, vitamins A and D (HHS and USDA 2020). According to the USDA (n.d.), adequate calcium intake has been linked to improved bone health and may reduce risk of osteoporosis. Additionally, the USDA says vitamin D has been demonstrated to help the body maintain adequate levels of calcium, thereby contributing to bone health (USDA n.d.). Indeed, human bones are constantly "remodeling," a lifelong phenomenon through which our bodies repair any micro damage to the bones and replace aging bone tissues by taking minerals—including calcium—from our bones and then replacing the minerals at a later time (Myneni and Mezey 2017). This process suggests that maintaining sufficient levels of calcium and vitamin D preserves bone density.

According to the USDA, dairy remains the primary source of calcium in the American diet (USDA n.d.). However, the DGA acknowledges that not all dairy products are equally beneficial; the Dairy Group excludes foods that are made from milk but have little or no calcium, such as cream, sour cream, and cream cheese (HHS and USDA 2020). The 2020-2025 DGA recommends fat-free and low-fat dairy because these are nutrient-dense foods and beverages, meaning they contain "health-promoting components" with little added sugar, saturated fat, and sodium (HHS and USDA 2020, ix). Although the 2015-2020 DGA recommended limiting cheese consumption because cheese contains more saturated fat and sodium than other dairy products (HHS and USDA 2015), the 2020-2025 DGA only recommends limiting consumption of full-fat cheese options (HHS and USDA 2020).

EXISTING EVIDENCE DISPUTING PRESUMPTIONS

Despite the purported benefits of dairy, certain evidence undermines the validity of these claims, with some even going so far as to suggest that dairy might be detrimental to human health.

Both existing and emerging research refutes long-held presumptions about dairy, especially as it relates to bone health, saturated fat, chronic diseases, and the relative benefit of consuming yogurt.

BONE HEALTH

Some studies indicate dairy has little to no impact on bone health. A 2005 meta-analysis examined literature on the impact of dairy and calcium on bone health in children and young adults (Lanou et al. 2005). The researchers assessed whether or not sufficient evidence supported two different claims: first, whether or not the calcium intake levels recommended by the DGA at the time were appropriate; and second, whether or not dairy promotes bone health more so than other food sources or supplements that contain calcium. The team scrutinized 58 studies and identified numerous deficiencies in them, such as the exclusion of important explanatory variables like weight, pubertal status, and exercise. Moreover, some of the studies examined the effects of calcium supplements on health instead of the effects of calcium derived naturally from food. Vitamin D intake also confounded some of the findings about calcium. These inconsistencies prompted the researchers to conclude that very little evidence supported the idea that increased dairy and increased calcium consumption improve bone health (Lanou et al. 2005).

A few years later, a different team of researchers examined the dairy and calcium intake, exercise regimens, and stress fracture rates of 6,712 girls aged 9 to 15 years old. The team followed up with this cohort for seven years to identify any associations between calcium, vitamin D, and dairy intakes with stress fracture risk (Sonneville et al. 2012). They found that while vitamin D intake was associated with lower stress fracture risk, neither calcium intake nor dairy intake was associated with stress fracture risk. They also added that vitamin D deficiency is common among adolescents. Despite the results of their study, they acknowledged that further research should be conducted on the role of vitamin D in supporting bone health (Sonneville et al. 2012).

While some studies suggest that dairy has little to no impact on bone health, some nutrition experts go so far as to say that dairy is *detrimental* to bone health. Plant-based diet researcher Dr. T. Colin Campbell has long promoted a whole-food, plant-based diet, and has warned of the dangers of dairy in much of his research. He asserts that the traditional links between dairy, calcium, and bone health are all the result of the "reductionist" philosophy embedded within the Western nutrition paradigm that does not consider the whole context of body health and nutrition (Campbell 2013). According to Campbell, foods with high amounts of animal protein (i.e., dairy) may cause your body a net calcium loss as a result of acidosis, a phenomenon that occurs when calcium is taken from the bones and excreted through urine, rendering the bones more fragile (Campbell 2016).

Additionally, a Sellmeyer et al. (2001) study observed a correlation between animal protein and renal net acid excretion, noting that a higher animal food intake and lower vegetable food intake together result in a net acid load that disturbs the calcium balance and worsens with age (118). To "restore acid-base balance," calcium and other minerals are taken from the bone and wasted in the urine, which ultimately damages the bone mineral mass and content (118). Sellmeyer's team compared two groups of white women over the age of 65. The first group of women consumed a high ratio of animal-to-vegetable protein intake and the second group of women consumed a lower ratio. The researchers found that the women with the higher ratio

experienced a significantly higher rate of femoral neck bone loss than the women with the lower ratio. The researchers also found that the relative risk of hip fracture was significantly higher among the high ratio women than among the low ratio women, though the risk slightly decreased when the model was adjusted for bone mineral density.

SATURATED FAT

Despite the DGA's recommendation to consume low-fat and non-fat dairy options instead of higher-fat options, most Americans still consume more than the recommended amount of saturated fat (HHS and USDA 2020). Not surprisingly, the 2020 DGA indicates that cheese, pizza, and higher-fat milk and yogurt account for a combined total of 15 percent of the total source of saturated fat in the American diet (HHS and USDA 2020). Although the 2015 DGA indicates that dairy alone accounts for 13 percent of the total source of saturated fat in the American diet (HHS and USDA 2015), the 2020 DGA does not address what percentage of the American diet is composed of dairy.

Although some scholars argue that saturated fat may not be as bad for human health as we think it is (Kris-Etherton and Krauss 2020), the DGA encourages limited consumption of saturated fat. While the 2015-2020 DGA explains that the recommendation is "based on evidence that replacing saturated fats with unsaturated fats is associated with reduced risk of cardiovascular disease (CVD)" (HHS and USDA 2015, 15), it does not specifically explain the reasoning for this recommendation other than stating that a healthy eating pattern does not permit "much room" for added sugars, saturated fat, and sodium (HHS and USDA 2020, 18).

Interestingly, recent research suggests that animal fat may be more dangerous than vegetable fat (Chen et al. 2016). A 2016 study evaluated the relationship between dairy fat and risk of CVD in three large cohorts comprising a total of 222,234 US adults: 43,652 men in the Health Professionals Follow-Up Study (1986-2010); 87,907 women in the Nurses' Health Study (1980-2012); and 90,675 women in the Nurses' Health Study II (1991-2011). The researchers estimated the effects of exchanging different fat sources and found that replacing five percent of energy intake from dairy fat with five percent of energy intake from polyunsaturated fatty acid (PUFA) or vegetable fat was associated with a 24 percent and 10 percent reduced risk of CVD, respectively. Additionally, replacing five percent of energy intake from dairy fat with five percent of energy intake from animal fat was associated with a six percent increased risk of CVD. Ultimately the researchers recommended replacing animal fats—including dairy fats—with PUFAs and fats from vegetable sources to prevent CVD risk (Chen et al. 2016).

CHRONIC DISEASES

In addition to concerns over bone health and saturated fat intake, newer studies are investigating the correlation between dairy and chronic diseases, such as cardiovascular disease. According to researchers Willett and Ludwig (2020), the general evidence does not support the "primary justification" for including dairy in the DGA (i.e., that dairy reduces risk of fracture). They add, "total dairy consumption has not been clearly related to weight control or to risks of diabetes and cardiovascular disease. High consumption of dairy foods is likely to increase the risks

of prostate cancer and possibly endometrial cancer but reduce the risk of colorectal cancer" (Willett and Ludwig 2020, 650). Additionally, they claim that reported health outcomes of dairy consumption rely on which foods dairy is associated with. For example, dairy often appears to be the more nutritionally beneficial alternative when compared with processed meat or sugar-sweetened beverages but appears to be the less nutritionally beneficial alternative when compared with plant-protein sources like nuts. Finally, Willett and Ludwig point out that the beneficial nutrients found in cow's milk can be found in sufficient quantities in other food sources and that "no clear benefit of consuming reduced-fat dairy over whole dairy products has been established" (2020, 650). All of these findings contradict existing DGA guidelines and should prompt the next DGAC to demand a new and more comprehensive evidence review.

RELATIVE BENEFITS OF YOGURT

Finally, although the probiotics found in yogurts may provide some health benefits (Nagpal, et al., 2012), low-fat and fat-free yogurts may respectively contain 1.5 and 1.7 times the amount of sugar than their whole-fat counterpart (Nguyen et al. 2016). Moreover, many yogurt brands in the US contain artificially added sugars that are not advertised on the front of the product. For instance, Yoplait's Banana Cream Pie, Boston Cream Pie, and Very Vanilla Light Singles each contain four grams of added sugars, comprising nine percent of the total amount of sugars in each serving (Yoplait n.d.). While consumers may choose these non-fat yogurts based on DGA guidance, they would also be neglecting one of the other DGA Key Recommendations to limit added sugar intake. While further research on the health benefits of yogurt should be conducted, the DGA should clearly warn about the added sugar content of fat-free and low-fat yogurt options so that consumers do not unwittingly consume more sugar than they should.

ROLES OF THE USDA, HHS, DGAC, AND PUBLIC IN THE DGA

Despite the burgeoning evidence described above, the 2020 DGAC did not address important questions about the health benefits of dairy. The following section reviews the process of developing the 2020-2025 DGA, such as how the USDA and HHS developed the topics and research questions, what those topics and research questions investigated, and how the public reacted to this process. It also discusses the general trajectory of question formulation from the previous 2015-2020 DGA to the 2020-2025 DGA.

SETTING THE AGENDA FOR THE DGAC

Each edition of the DGA builds upon the previous edition. The DGAC conducts research, reported in their *Scientific Report*, that is ultimately used by the USDA and HHS to develop the new DGA. Ordinarily, under preliminary guidance provided by the USDA and HHS, the DGAC selects topics and questions to examine once the committee is established. However, this process changed for the 2020-2025 DGA. The 2020-2025 DGA was the first in which the USDA and HHS selected the topics and questions to be examined by the DGAC *before* establishing the DGAC (HHS and USDA 2020). The two departments made this change to "promote a deliberate and transparent process, [and] better define the expertise needed on the Committee," among other reasons (HHS and USDA 2020, 8). The 2020-2025 DGA also cites the Agricultural Act of 2014

as reason for this procedural change, since the Act required the 2020-2025 DGA to specify nutrition and dietary recommendations for infants, toddlers, and pregnant women. USDA Acting Deputy Under Secretary of Food, Nutrition, and Consumer Services, Brandon Lipps, and HHS Assistant Secretary for Health, Admiral Brett Giroir, vetted the topics and questions while considering input from several federal agency representatives (DGA n.d.[a]). These representatives included nutritionists, scientists, and programmatic experts from the USDA, HHS, Department of Veterans Affairs, Environmental Protection Agency, and the Agency for International Development.

Next, the USDA and HHS proposed and posted initial topics and questions for public comment from February 28 to March 30, 2018 (DGA n.d.[a]). Based on public and agency input submitted during this time, the USDA and HHS revised the original topics and questions, posting the final topics and questions along with the call for nominations for DGAC members. From September 6 to October 6, 2018, the USDA and HHS encouraged the public to nominate qualified individuals for the DGAC, and then announced the selected members in February 2019. In March 2019, the DGAC began reviewing current scientific evidence related to diet and nutrition, ending its review when it submitted the *Scientific Report of the 2020 Dietary Guidelines Advisory Committee* to the Secretaries of USDA and HHS in June 2020. Throughout this time, the DGAC discussed the ongoing research at meetings that were open to the public, inviting the public to submit comments to the DGAC regarding the topics and research questions (FNS 2020c).

While many people contributed to the topic and question formulation process, the exclusion of the DGAC members raises concerns. The USDA and HHS explicitly stated that they formulated the topics and questions first so that members with the proper expertise could be selected for the committee (HHS and USDA 2020). Be that as it may, selecting questions that do not address notable concerns with dairy consumption hampers exploration of the role of dairy as it pertains particularly to osteoporosis, cancers, and other diseases. Furthermore, one of the USDA's primary responsibilities is to regulate and advocate for the dairy industry, which leaves open to speculation the possibility that this conflict of interest influenced the DGA process.

DGAC SUBCOMMITTEES IGNORE DAIRY

The 2020 DGAC consisted of six subcommittees (Dietary Patterns; Pregnancy and Lactation; Birth to 24 Months; Beverages and Added Sugars; Dietary Fats and Seafood; and Frequency of Eating) and one cross-cutting working group, the Data Analysis and Food Panel Modeling group (HHS and USDA 2020). None of the final research questions considered by the committees pertained explicitly to a link between dairy consumption and negative health outcomes (FNS n.d.). For instance, although the Dietary Patterns Subcommittee examined the associated risk of certain cancers, CVD, neurocognitive health, and mortality with alcohol, the subcommittee did not examine these health outcomes with any other beverage (FNS n.d.). The subcommittee focused on a broader relationship between dietary patterns—including a vegetarian/vegan diet—and bone health (Schneeman et al. 2020). The only substantial investigation that involved dairy consumption examined whether the consumption of different beverages—including cow's milk—helped consumers meet the nutrient and food group recommendations and whether these beverages were associated with any risk of overweight or obesity (FNS n.d.). Meanwhile, the Dietary Fats and Seafood Subcommittee researched dietary fats—including saturated fat—and their relation to

neurocognitive development and health, risk of CVD, risk of certain cancers, and mortality (FNS n.d.). While these investigations addressed general health topics, they did not address how dairy in particular impacts bone health, and how dairy correlates with saturated fat or any chronic conditions other than adiposity.

In contrast to the questions formulated for the 2015 DGAC, the questions for the 2020 DGAC do not directly probe the health outcomes of dairy consumption. For instance, the 2015 DGAC examined how much vitamin D would need to come from fortified dairy for a healthy diet (Millen et al. 2015). Another question the 2015 DGAC researched had multiple parts: "What would be the impact on the adequacy of the [eating] patterns if (1) no dairy foods were consumed, (2) if calcium was obtained from non-dairy sources (including fortified foods), and (3) if the proportions of milk and yogurt to cheese were modified? What is the relationship between changes in types of beverages consumed (milk compared with sugar-sweetened beverages) and diet quality?" (Millen et al. 2015, 49). Although the 2015 DGAC ultimately included dairy as an essential component of good health, the committee at least demonstrated an effort to analyze the correlations between dairy, adequate intake of certain nutrients typically associated with dairy (calcium, vitamin D, etc.), and overall health benefits.

PUBLIC INPUT DISMISSED

The dismissal of public input is also disconcerting. Informed citizens submitted over 6,000 comments during the open online comment period, of which more than 600 included the search term "dairy" or "milk" (FNS 2018). (Unfortunately, the *Regulations.gov* database does not permit use of Boolean operators, so the author could not verify how many overlaps existed between the two searches such that one comment might include both "dairy" and "milk.") Over 60 percent of the last 330 "dairy" commenters expressed concerns about including dairy in the DGA, citing the value of vegan, whole-foods, plant-based, and other diets that reduce or eliminate dairy consumption; personal anecdotes about improved health after eliminating dairy from their diets; support for exploring the potential health benefits of non-dairy milks; concerns about the dairy industry influence on the DGA; and anxieties over the impact of dairy production on the environment.

In addition to the online forum, people expressed their apprehension directly to the committee in public hearings. The DGAC met five times to review its progress, and although all of the meetings were open to public attendance, only two of them permitted public participation (DGA n.d.[b]). Eighty-one participants (DGA n.d.[c]) were scheduled to comment at the second meeting, each representing various industries and interests, including nearly three dozen individuals who promoted more consumption of fruits, vegetables, pulses, whole grains, and plant-based diets (Hitt Nichols 2019). Seven of these speakers implored the committee to reconsider presumptions about dairy specifically (DGA n.d.[d; Hitt Nichols 2019). Four speakers at the fourth meeting echoed these sentiments (Hitt Nichols 2020). Despite this input, the 2020 DGAC did not research dairy in a meaningful way that addressed issues raised by the public.

FUTURE CONSIDERATIONS

Due to public concern over dairy, the 2020 DGAC should have continued probing the food group and asked more questions about its presumed health benefits, not fewer. Listed below are potential questions that the DGAC should have explored in the 2020 deliberations and that merit attention before the 2025 DGAC is scheduled to meet.

First, the next DGAC should reexamine the presumptions that calcium is the sole or primary defender of bone health. Citing previous research, Willet and Ludwig illustrate that countries exhibiting the lowest rates of milk and calcium consumption—like China and Indonesia—often exhibit the lowest rates of hip fracture, though the association may be confounded by vitamin D intake, ethnicity, or other factors (2020). The 2025 DGAC could ask if factors beyond dietary habits—like exposure to sunshine and exercise—have an equal, lesser, or greater impact on bone health than the bioavailability and absorption of calcium and other nutrients from each of the major food groups.

Second, the DGAC should explore the role of calcium and other nutrients in supporting bone health and whether the current amounts of calcium recommended are reasonable. For example, the researchers could examine a line of questioning such as: if the absorption of calcium is augmented when consumed with vitamin D as some studies suggest (Boonen et al. 2007; Weaver et al. 2015), then is the daily recommended amount of calcium appropriate? Could an individual safely consume less calcium? Does vitamin K improve calcium regulation and bone formation, as research has indicated (Palermo et al. 2017)? The committee should directly address these questions by conducting more comprehensive meta-analyses and if necessary, additional studies.

Third, the DGAC should explore lactose malabsorption, a phenomenon that occurs when lactose is not absorbed into the small intestine. If this undigested lactose reaches the colon, then bacterial fermentation occurs and gastrointestinal symptoms manifest, such as diarrhea, bloating, flatulence, borborygmi, gut distension, cramps, and abdominal pain (Jansson-Knodell et. al. 2020). In 2017, *Lancet* published a systematic review and meta-analysis that reviewed published studies investigating lactose malabsorption rates around the world—studies that, in total, included 62,910 participants from 450 study populations and 89 countries (Storhaug et al. 2017). The team estimated that as much as 68 percent of the world population cannot absorb lactose, though this estimate varies by region and methodology. For example, the estimate for North America is 42 percent and the estimate for the Middle East is 70 percent. When the researchers assessed the global prevalence rate using only genotyping data, the estimate is 74 percent; when they used only lactose intolerance test data, the estimate is 55 percent; and when they used only hydrogen breath test data, the estimate is 57 percent. Of particular relevance to this paper, the researchers estimated a substantial percentage—36 percent—of the US population cannot absorb lactose (Storhaug et al. 2017). Thus, the DGAC could research to what extent does lactose malabsorption interfere with Americans' ability to adopt the DGA recommendation to consume more dairy? Are there non-dairy foods (other than fortified soy foods and beverages) that could provide adequate calcium, vitamin D, and other nutrients traditionally provided by dairy foods?

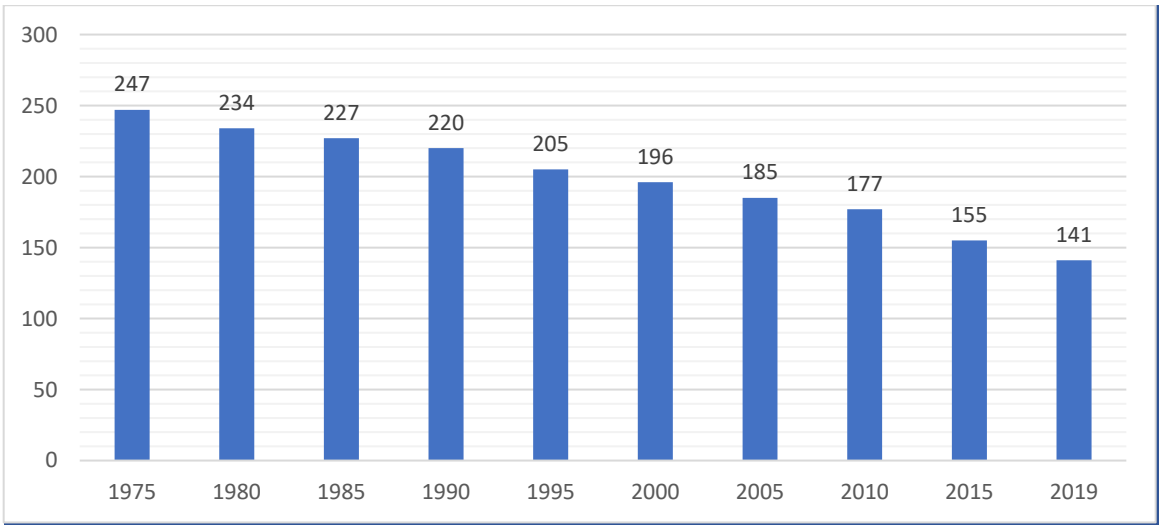
TRENDS IN CONSUMPTION OF DAIRY AND PLANT-BASED ALTERNATIVES

As discussed in the previous section, Americans demonstrated their interest in the role of dairy in nutrition and in the DGA by submitting public comments and attending DGAC meetings. Recent trends in consumption of dairy and plant-based food alternatives also help illustrate the perceptions the American public has about consuming dairy products. Additionally, examining how the dairy industry pushes back against these trends is important to understand why some consumers may not question the health benefits of dairy.

DAIRY TRENDS

Based on sales data collected over the past six decades, the general public appears to be forging a new, perhaps complex, relationship with dairy. Most notably, overall fluid milk consumption has declined steadily for decades, as can be seen in **Figure 1**. According to the USDA's Economic Research Service (ERS), from 1975 to 2019, per capita consumption of fluid milk decreased by 43 percent, butter increased by 32 percent, yogurt increased by 570 percent, and regular (excluding low-fat and non-fat) ice cream decreased by 33.5 percent (ERS 2020).[1] From 1995 to 2019, per capita consumption of American cheese increased from 11.69 pounds to 15.54 pounds, and per capita consumption of other types of cheeses increased from 14.98 pounds to 22.79 pounds (ERS 2019).[2]

Figure 1: Per Capita Consumption of Fluid Milk (lbs. per person)



Source: Author's visualization; ERS data (2020)

[1] Fluid milk includes "whole, reduced fat, low-fat, skim, flavored, buttermilk, eggnog, and miscellaneous" (ERS 2020).

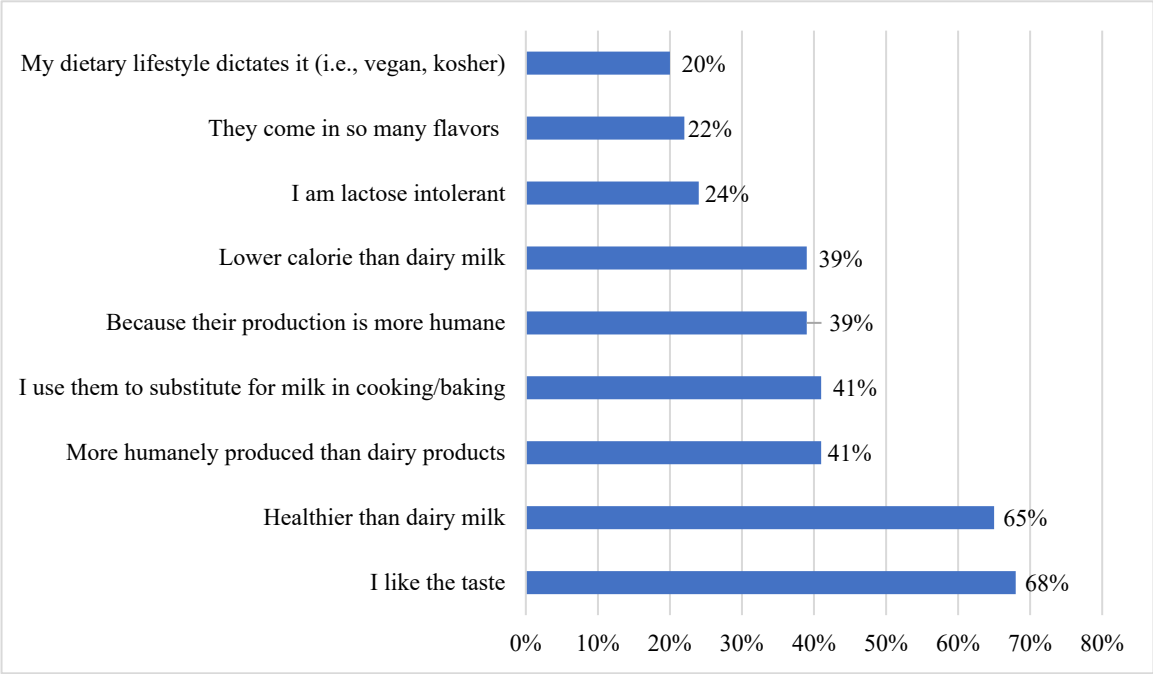
[2] American cheese includes cheddar, Colby, washed curd, stirred curd, Monterey, and Jack. Other types of cheese include Swiss (including Emmenthaler and Gruyere), blue (including Gorgonzola), brick, muenster, cream and Neufchatel, Hispanic, and Italian (mozzarella and non-mozzarella) (ERS 2019).

PLANT-BASED FOODS TRENDS

Meanwhile, consumption of plant-based foods in the United States has increased. In 2018, plant-based milk represented 15 percent of total milk sales (Plant Based Foods Association [PBFA] 2018a). A Nielsen study (commissioned by PBFA) reported that sales growth of plant-based milk alternatives were up nine percent in 2018, compared to just three percent the year prior (PBFA 2018b). The same Nielsen study also found that sales of plant-based cheeses grew by 43 percent, plant-based yogurts by 55 percent, and plant-based creamers by 131 percent (PBFA 2018c).

The reasons behind the increase of plant-based food consumption are not yet clear. Consumers have expressed various motivations for eating more plant-based foods, ranging from health to environmental to ethical concerns (Kateman 2019). Despite a lack of research in this area, some surveys are beginning to investigate these motivations. A 2015 survey conducted by BerryCart, a rebate app that offers cash back on certain foods and beverages, asked 2,500 users in the US why they purchased plant-based milks. As illustrated in **Figure 2**, 68 percent of the respondents answered that their main reason was for taste, 65 percent thought plant-based milks are healthier than dairy milk, 39 percent said plant-based milks have fewer calories than dairy milk, and 24 percent disclosed that they were lactose intolerant (Statista 2019). More research is needed to understand why sales of plant-based dairy alternatives are increasing.

Figure 2: *Reasons for Buying Plant-Based Milks among Consumers in the United States as of Q4 2015*



Source: Author's visualization; Statista (2019)

THE DAIRY INDUSTRY PUSHES BACK

Perhaps to combat the growth in sales of plant-based foods, producers and other big players in the dairy industry continue to push questionable information and guidance through pervasive marketing campaigns. Anyone around in the 1990s and early 2000s likely remembers the enormous *Got Milk?* campaign that received seemingly endless endorsements from celebrities and athletes alike. The California Milk Processor Board (CMPB) deployed the campaign in 1993 and still advertises that milk contains vast amounts of calcium and is therefore good for bone health (n.d.[a]). More recently its campaign has adapted a new image centered on deriding various conspiracy theories. For example, the website includes a picture of what looks like a lizard person with a caption that states, "The world is run by reptilian shapeshifters! They want to enslave the human race!" (CMPB n.d.[b]). Alongside this image and caption is another image comprising a flying creature with an udder and a caption that states, "Milk is 'unnatural'! even though it comes straight from nature!" (CMPB n.d.[b]). The entire campaign combats the notion that milk is "bad for you" (CMPB n.d.[b]). It is worth noting, however, that the Dairy Council of California (DCC)—a state government agency funded by dairy farmers and milk processors and administered by the California Department of Food and Agriculture—published all of the references cited on the CMPB campaign's website. Although some of the sources appear credible, the DCC's funding marks a clear conflict of interest that should be considered by individual consumers when choosing to incorporate dairy in their diet.

RECOMMENDATIONS & CONCLUSION

Based on a review of the often inconsistent evidence regarding the health benefits of dairy, four recommendations warrant consideration. This paper makes these recommendations under the assumption that the next DGAC will meet in 2025, but the urgency of the issues discussed in this paper justify moving up the date.

First, the 2025 DGAC should conduct a new evidence review of the health merits associated with dairy consumption. Failing to acknowledge the inconsistencies in the existing literature and the emerging evidence against long-held presumptions is not acceptable. Specifically, the committee should research the most recent findings on the correlation between dairy and bone health as well as the correlation between dairy and saturated fat. Some additional questions may include:

- Do we actually absorb and use the same amount of calcium that we consume? If not, should we reduce the RDA for calcium?
- What other factors inhibit absorption and bioavailability?
- Are other nutrients more strongly associated with bone health, such as vitamin K or protein?
- Do other factors beyond nutrition have a greater impact on bone health, such as exercise or exposure to sunlight?

Researchers should investigate the correlation between dairy and weight control, diabetes, cardiovascular disease, and certain cancers. Given the recent increase in plant-based food consumption, the DGA may also benefit from studying the nutritional differences between dairy and corresponding plant-based alternatives, such as oat milk and soy cheese.

Second, the 2025 DGAC members should be engaged in selecting the topics and questions. Questions and topics should not be formulated exclusively by the USDA due to a potential conflict of interest with its work to safeguard the dairy industry. The DGAC should also be required to address public comments in a meaningful way. For instance, the USDA and HHS could require the DGAC to provide an explanation as to why a certain topic is not explored if a given number of comments related to that topic are submitted by the public.

Third, the USDA should examine plant-based dietary trends more closely. Despite a lack of research on the nutritional quality of plant-based diets, Americans have been consuming plant-based foods and beverages more frequently in recent years and it appears the trend will continue. If people who rely on federal food and nutrition programs are also consuming more plant-based foods and beverages, then they may not be optimizing their participation in these programs if the programs do not allow benefits to go toward plant-based foods. The next DGA should account for these changes so participants can maximize program benefits while maintaining a healthy diet.

Finally, in regard to "milk myths," federal and state governments should educate and instruct the public on how to assess information for accuracy, especially when it comes to nutrition, so that consumers can make more informed decisions about their diets. To start, perhaps the USDA and HHS can publish a centralized list of all the sources considered by the DGAC that support its recommendations. The agencies can also summarize and explain the findings of these studies in a way that someone without an econometric or nutrition background could readily understand. The list can be published online and include tips for honing analytical skills. For instance, the website could encourage its audience to consider appropriate operational variables, source credibility and conflicts of interest, and sample size and generalizability. Finally, the site should emphasize that correlation does not equal causation and readers should maintain an appropriate level of skepticism when dissecting data.

The processes by which DGA topics and research questions are designed and how DGAC members are selected are flawed and should be revised. Despite existing and emerging evidence that challenges the long-presumed nutritional benefits of dairy, the 2020 DGAC did not fundamentally investigate these inconsistencies, potentially undermining the validity of the DGA. This topic is critical because the DGA informs policies that affect the health of millions of people relying on programs like the NSLP and SNAP. This paper provides four recommendations and highlights three issues that merit attention from the DGAC and suggests the committee should reconvene before 2025 due to the urgency of this topic.

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