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The Honorable Sonny Perdue  
Secretary, U.S. Department of Agriculture  
Jamie L. Whitten Building  
1400 Independence Ave., S.W.  
Washington, DC 20250

The Honorable Alex Azar  
Secretary, U.S. Department of Health and Human Services  
Hubert H. Humphrey Building  
200 Independence Ave., S.W.  
Washington, DC 20201

*Re: Scientific Report of the 2020-2025 Dietary Guidelines Advisory Committee*

Dear Secretaries Perdue and Azar:

The Academy of Nutrition and Dietetics (the “Academy”) appreciates the opportunity to submit comments to the 2020 Dietary Guideline Advisory Committee (the “Committee” or the “Advisory Committee”) regarding its conclusions, advice, and recommendations to inform the 2020-2025 *Dietary Guidelines for Americans* (the “*Dietary Guidelines*,” “*Guidelines*,” or *DGAs*). Representing more than 107,000 registered dietitian nutritionists (RDNs); nutrition and dietetic technicians, registered (NDTRs); and advanced-degree nutritionists, the Academy is the largest association of food and nutrition professionals in the world and is committed to accelerating improvements in global health and well-being through food and nutrition. Our members have helped conduct, review, and translate nutrition research for the *Guidelines* since their inception and will work to help consumers, industry, and government programs adopt dietary patterns in accordance with the final recommendations of the U.S. Department of Agriculture and the U.S. Department of Health and Human Services (collectively, the “Departments”).

## **I. TABLE OF CONTENTS**

The Academy’s comments below reflect our considered analysis of the most current literature and the purposes and statutory requirements of the *Dietary Guidelines*.

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## II. OVERVIEW

There are few public health initiatives with as much policy significance and public relevance as the *Guidelines*. We know “[d]iet is directly related to health, and most Americans suffer from health conditions or suboptimal nutritional status that have the potential to be prevented or ameliorated through diet.”<sup>1</sup> The Academy continues to strongly support their underlying purpose and the need to make them strong, evidence-based, and actionable by health care providers and the public. We also strongly support development of a comprehensive plan for the *Dietary Guidelines*’ broad and effective implementation.

With the issuance of the Scientific Report of the 2020 Dietary Guidelines Advisory Committee (the “Scientific Report”),<sup>2</sup> the Committee, after “examining the evidence on specific nutrition and public health topics and scientific questions,”<sup>3</sup> effectively fulfilled its charge to “provide independent, science-based advice and recommendations to be considered by USDA and HHS in the development of the 2020-2025 *Dietary Guidelines for Americans*.”<sup>4</sup>

The Committee is authorized under 42 U.S.C. 217a(2), Section 222 of the Public Health Service Act, as amended, which also specifies the basis for the guidelines: “The information and guidelines contained in each report...shall be based on the preponderance of the scientific and medical knowledge *which is current at the time the report is prepared*.”<sup>5</sup> Thus, the Committee’s statutory mandate is to make recommendations using the best science presently available, which may require updating recommendations from prior iterations of the *Guidelines*. Notably, “[s]ince 1980, the *Dietary Guidelines*, and the science on which they have been based, have been remarkably consistent on the majority of components that make up a healthy diet, but they also have evolved in several substantial ways.”<sup>6</sup>

We continue to support the Scientific Report’s use of food-based recommendations and its focus on meal patterns and we encourage HHS and USDA to adopt these recommendations for healthy eating in the final *Guidelines*. Dietary patterns are a relatively simple way to deliver consumer-friendly guidance by utilizing existing knowledge of health and nutrition. At the same time, the Academy applauds the shift to a life-stages approach as an important step in ensuring the *Dietary Guidelines* are both relevant and accurate. These new 2020-2025 *Guidelines* will be the first to include nutrition guidance tailored for infants and young children and we hope they will provide relevant guidance for the elderly, the 133 million Americans with one or more chronic health conditions, and individuals from various cultural, racial, and ethnic backgrounds. As Committee members noted in public meetings throughout process, **the *Guidelines* must meet people where they are, recognizing the role that socioeconomic status, health, food insecurity, and life-stage plays in determining how to help Americans meet their diverse dietary needs in a culturally competent way.**<sup>7</sup>

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<sup>1</sup> Dietary Guidelines Advisory Committee. 2020. Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC. (the “Scientific Report”) at 96 (of 835).

<sup>2</sup> *Id.*

<sup>3</sup> *Id.* at 26.

<sup>4</sup> United States Department of Agriculture. Charter for the 2020 Dietary Guidelines Advisory Committee, Section 3:1. <https://www.dietaryguidelines.gov/sites/default/files/2019>.

<sup>5</sup> 42 U.S.C. 217a(2). (Emphasis added.)

<sup>6</sup> Scientific Report at 27.

<sup>7</sup> Schneeman B. 2020 Dietary Guidelines Advisory Committee Public Meeting. [transcript]. March 13, 2020. <https://www.dietaryguidelines.gov/sites/default/files/2020-06/2020DGACMtg5TranscriptDay2FINAL.pdf>. (“Focus on patterns in food intake are especially useful as we think about dietary guidance that can apply across the life span. And that

The Scientific Report describes other changes, including to the Committee’s methodological approach, which “has many similarities to that described in the reports of the 2010 and 2015 Dietary Guidelines Advisory Committees, but has evolved with the fields of nutrition science and systematic review methods to ensure the processes remain state-of-the-art and rigorous.”<sup>8</sup> We appreciate the work of the Committee and the Departments to continually improve upon the iterative *Guidelines* development processes.

**We hope and expect the Departments will draft 2020-2025 *Guidelines* that deliver upon the 2015-2020 *Guidelines*’ promise to translate the best available “science into succinct, food-based guidance that can be relied upon to help Americans choose foods that provide a healthy and enjoyable diet.”<sup>9</sup>**

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can be tailored for various racial/ethnic preferences and socioeconomic levels.”); *Id.* at 199; Mayer-Davis. Available at <https://www.dietaryguidelines.gov/sites/default/files/2020-06/2020DGACMtg5TranscriptDay2FINAL.pdf> (“So, all that to say that I think that, for this to have real public health impact, we do need to find a way and I think the Integration chapter’s a great place for this, to translate that into food, particularly in terms of food relative to food security and accessibility. Thinking about cost and availability of food, again, so that people know how to make choices that will be consistent with the guidelines in a way that is practical and reasonable in a day-to-day life.”).

<sup>8</sup> Scientific Report at 47.

<sup>9</sup> U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015–2020 *Dietary Guidelines for Americans*. 8th Edition. December 2015. <http://health.gov/dietaryguidelines/2015/guidelines/> at 9 (emphasis added).

### III. STATUS OF THE PROCESS

#### A. Recognizing Contributions of the Committee and the Departments

The Academy remains supportive of the USDA’s Nutrition Evidence Systematic Review (NESR) team’s work and recognizes the immense undertaking of developing the *Guidelines* — including, for the first time, *entirely new* guidelines for children for birth to 24 months old (“B-24”) — during more truncated time period than authorized by the Committee’s charter produced amid the disruptive impacts of the lethal global COVID-19 pandemic. Given these unusually restrictive circumstances, the Departments and the Committee should be particularly commended for the work they accomplished.

To accomplish the task of “examining the evidence on [the] specific nutrition and public health topics and scientific questions”<sup>10</sup> assigned by the Departments (after seeking public input, in response to recommendations of the National Academies of Sciences, Engineering, and Medicine (NASEM)),<sup>11</sup> the Departments appointed as Special Government Employees (SGEs) 20 highly qualified individuals to serve on the Advisory Committee without pay. These experts “included a mix of practitioners, epidemiologists, clinical scientists, trialists, and others from every region of the United States.”<sup>12</sup> We are honored that nine RDNs and 10 members of the Academy were selected to serve on this august and experientially diverse body.

The Academy also recognizes the invaluable contributions of the Departments’ staff, including the policy officials, NESR team, data analysis team, peer review teams across federal agencies, and other *Dietary Guidelines* staff for their contributions in creating this essential resource in unusual circumstances, specifically Eve Stoodly, PhD, the Designated Federal Officer and Lead Nutritionist for the *Guidelines*.

The open and largely transparent process initiated by the Departments provided multiple opportunities for public comment, allowed for candid, constructive, and critical discussions among the experts on the Advisory Committee. The Academy appreciates that the Departments and the Committee reviewed and largely addressed concerns raised in the Academy’s six public comments submitted since 2018 to enhance the process and substance of the Committee’s work.

#### B. Timely Importance of the 2020-2025 *Dietary Guidelines*

For 35 years, the *Dietary Guidelines* have provided the best available scientific advice to consumers seeking to prevent or reduce their risk of diet-related diseases. As the 2015-2020 *Dietary Guidelines* made clear, its “recommendations are ultimately intended to help individuals improve and maintain overall health and reduce the risk of chronic disease — its focus is disease prevention.”<sup>13</sup> There has *never* been a more relevant or important time for the federal government to provide guidance and programmatic assistance to help Americans improve their health by improving their diets. The Scientific Report makes this point clearly:

“As the 2020 Committee submits its report and the 2020-2025 *Dietary Guidelines for Americans* are prepared, we are in the midst of the COVID-

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<sup>10</sup> Scientific Report at 26.

<sup>11</sup> National Academies of Sciences, Engineering, and Medicine. 2017. *Redesigning the process for establishing the Dietary Guidelines for Americans*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24883> (hereafter “NASEM Report”).

<sup>12</sup> Scientific Report at 52.

<sup>13</sup> Introduction to U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015–2020 *Dietary Guidelines for Americans*. 8th Edition. December 2015. <http://health.gov/dietaryguidelines/2015/guidelines/>.

19 epidemic. As more is learned about infection by SARS-CoV-2 and the development of COVID-19, it is clear that it has significant nutritional implications. ***These parallel epidemics, one noninfectious (obesity and diet-related chronic diseases) and one infectious (COVID-19), appear to be synergistic. Those at most risk for the most serious outcomes of COVID-19, including hospitalization and death, are people afflicted by diet-related chronic diseases (obesity, type 2 diabetes, and cardiovascular disease).*** Finally, throughout the world, the consequences of physical isolation and financial disruption by the threat of COVID-19 infection has led to significant increases in food insecurity and hunger, further increasing susceptibility to both infectious and diet-related chronic diseases. Thus, ***these interrelationships between chronic diseases, COVID-19, and social determinants of health, emphasize the critical importance of improving dietary patterns.***<sup>14</sup>

The pandemic has disproportionately impacted certain minority and at-risk communities — specifically African American, Latino, and low socioeconomic status (“low SES”) communities, in addition to the majority of Americans either with or at-risk of developing nutrition-related chronic conditions, such as overweight and obesity,<sup>15</sup> diabetes and prediabetes,<sup>16</sup> high blood pressure and other risk factors of cardiovascular disease,<sup>17</sup> and compromised immunity.<sup>18</sup> The disparate impact of the parallel epidemics underscores the need for final *Dietary Guidelines* that are applicable to most Americans (*i.e.*, the ‘general public’). Accordingly, we emphasize the Committee’s repeated admonition that studies underpinning the Scientific Report’s recommendations “may not be completely generalizable to the U.S. population as the result of differing participant characteristics,”<sup>19</sup> because of studies not adjusted for “key confounders, such as race/ethnicity.”<sup>20</sup>

The Academy urges the Departments to seize the opportunity to draft *Guidelines* that will do as much as possible to ameliorate “[t]hese parallel epidemics [that] demonstrate the central role of nutrition and healthy dietary patterns in susceptibility to both infections and diet-related chronic diseases and these relationships should be further examined in future dietary guidelines.”<sup>21</sup> The Academy welcomes the opportunity to engage our registered dietitian nutritionists and nutrition and dietetics technicians, registered to translate the *Guidelines* into actionable change to accelerate improvements in global health and well-being through food and nutrition.

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<sup>14</sup> Scientific Report at 5 (emphasis added).

<sup>15</sup> Fryar CD, Carroll MD, Ogden CL. Prevalence of overweight, obesity, and severe obesity among adults aged 20 and over: United States, 1960–1962 through 2015–2016. *National Center for Health Statistics*. 2019 November. [https://www.cdc.gov/nchs/data/hestat/obesity\\_adult\\_15\\_16/obesity\\_adult\\_15\\_16.pdf?fbclid=IwAR21UAAe-O8HkKPv-GDcoa4-sikpSZanba2LXX5uz1QgbeodwX5NADxSEI8](https://www.cdc.gov/nchs/data/hestat/obesity_adult_15_16/obesity_adult_15_16.pdf?fbclid=IwAR21UAAe-O8HkKPv-GDcoa4-sikpSZanba2LXX5uz1QgbeodwX5NADxSEI8). Accessed August 13, 2020.

<sup>16</sup> Centers for Disease Control and Prevention. A Snapshot: Diabetes in the United States. 2017 November. <https://www.cdc.gov/diabetes/library/socialMedia/infographics.html>. Accessed August 13, 2020.

<sup>17</sup> Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. *Journal of the American College of Cardiology*. 2018;71(19). doi:10.1016/j.jacc.2017.11.006.

<sup>18</sup> How Many Americans are Immunocompromised? Berman Institute Bioethics Bulletin. <http://bioethicsbulletin.org/archive/how-many-americans-are-immunocompromised>.

<sup>19</sup> Boushey C. 2020 Dietary Guidelines Advisory Committee Public Meeting. [transcript]. March 12, 2020. 176. <https://www.dietaryguidelines.gov/sites/default/files/2020-06/2020DGACMtg5TranscriptDay1FINAL.pdf>.

<sup>20</sup> *Id.* at 140.

<sup>21</sup> Scientific Report at 5.

## C. Themes of the Scientific Report

### 1) *Disconnect between the Guidelines and Consumption Patterns*

One constant since the *Dietary Guidelines* were first published in 1980 is “that average diets of Americans do not conform to dietary recommendations,” as evidenced by the total Healthy Eating Index-2015 score of 59 out of 100.<sup>22</sup> The Scientific Report reiterated that the failure to meet recommendations crosses all ages groups, life stages, and demographics:

- “[A]cross all age groups ages 2 years and older, the intake of fruits and vegetables, dairy products, and whole grains is less than recommended and the balance among protein sources (*i.e.*, plant, seafood, meat, poultry, eggs, and dairy) does not meet recommendations for most groups.”<sup>23</sup>
- “[M]ost Americans have 1 or more chronic diet-related health conditions, including overweight and obesity, heart disease, stroke, type 2 diabetes, hypertension, liver disease, certain types of cancer, dental caries, and/or metabolic syndrome. The Committee’s review of current dietary intakes shows that the American dietary landscape has not changed appreciably over time. Across the lifespan, ***the typical diet Americans consume result in overconsumption of total energy***, saturated fats, sodium, added sugars, and for some consumers, alcoholic beverages. Intakes of fruits, vegetables, and whole grains are lower than current recommendations.”<sup>24</sup>
- “The American dietary landscape has not changed appreciably in recent decades. Across the life course, it is characterized by a *persistent overconsumption of total energy* (*i.e.*, calories), *saturated fats, salt, added sugars, and alcoholic beverages* among a high proportion of those who choose to drink. Whole-grain intakes remain extremely low across most of the population; *whole grains are mainly consumed as part of breakfast foods or in snack foods* (chips, crackers). Intakes of fruits and vegetables are lower than current recommendations, with most Americans consuming less than 1 cup of whole fruit per day. *Less than half of vegetables are consumed “alone” or as a distinct raw or cooked portion, meaning that they are largely being consumed when incorporated into another food type* (*i.e.*, as part of a sandwich or crackers).”<sup>25</sup>

The lack of alignment between what we Americans eat and the *Dietary Guidelines*’ recommendations is a solvable, not an intractable, problem. As detailed below in Sections V(C) and VII(B) *et seq.* related to dietary patterns and implementation of government programs, respectively, there is a bevy of effective, evidence-based nutrition interventions, government programs, and other strategies proven to help Americans adopt healthier dietary patterns. The Academy’s RDN and NDTR members are uniquely qualified to help Americans meet the *Dietary Guidelines for Americans*’ recommendations.

### 2) *New Focus on Transitions to Carry Forward Effective Strategies*

A new and intriguing focus in this Scientific Report is the Committee’s emphasis not only on recommending appropriate nutrition at each life stage, but also the importance of helping Americans consciously transition to healthy dietary patterns between and during their various life stages. The Academy strongly supports the Scientific Report’s finding that “[e]fforts are needed at every life stage to improve typical eating patterns and reinforce the recommended eating patterns for Americans to

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<sup>22</sup> Healthy Eating Index (HEI). USDA. <https://www.fns.usda.gov/resource/healthy-eating-index-hei>.

<sup>23</sup> Scientific Report at 31-32 (emphasis added).

<sup>24</sup> Scientific Report at 14-15 (emphasis added).

<sup>25</sup> Scientific Report at 175-176 (emphasis added).

achieve adequate nutrient intakes, avoid excess energy intake, and lower risk of chronic diseases.”<sup>26</sup> The Committee offered additional recommendations to encourage this conscious transition towards adoption of effective strategies:

“One of the most important steps many Americans can take to achieve a dietary pattern associated with health and lowered risk of chronic diseases is to identify the foods that provide energy with little or no recommended nutrients or fiber in their current eating pattern, reduce their intake of these items, and shift their food choices to more healthful foods and beverages to meet energy goals. Such an approach enables individuals to focus on *strategies to improve their dietary pattern that are most relevant at their life stage and can be carried forward to the next stage.*”<sup>27</sup>

We support the Committee’s recognition that “this approach can help individuals understand that it is never too late to start making improvements in their dietary pattern. To use this approach effectively, an individual will need to recognize what food and beverage choices are most important to shift.”<sup>28</sup> The Committee also found:

“Food pattern modeling begins to illustrate some opportunities for engagement with the public in continuing to shift dietary intakes in healthy directions. Identifying subtle changes in intakes and preferences over the life course signals opportunities to help maintain healthy intakes early in life and build on those behaviors over time. It is also possible to identify life stage transition points when the potential for changes are likely to be detrimental or lead to higher risk dietary patterns. If these “at risk” periods are anticipated over the life course, public health strategies can be considered that may help to decrease the adoption of poor dietary habits that may become engrained into lifestyle patterns over the long term.”<sup>29</sup>

We join the Committee in recommending the final *Guidelines* assist Americans in shifting their dietary patterns at discernable inflection points. Our RDN and NDTR members have the training and talent to assist in this endeavor, but we recognize that without a commitment from policymakers, insurers, and other stakeholders, opportunities to assist Americans during these transition points will be inadequate to meet the demonstrated need.

### 3) *Focus on Context of Food Environment and Overall Food System*

The Academy supports efforts to create a sustainable overall food system and urges the Departments to draft *Guidelines* that recognize the intense public interest<sup>30</sup> in “evaluating sustainability of recommended dietary patterns, addressing the social and economic aspects of access to foods that are components of healthy dietary patterns, and considering systemic changes to encourage behavior change consistent with the guidelines.”<sup>31</sup> As the Committee wisely noted, “[t]hese comments point to areas that are important

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<sup>26</sup> Scientific Report at 32 (emphasis added).

<sup>27</sup> Scientific Report at 39 (emphasis added).

<sup>28</sup> Scientific Report at (44/835).

<sup>29</sup> Scientific Report at (762-763/835).

<sup>30</sup> Wood-Wright, Natalie. “New U.S. dietary guidelines ignore broad support for food sustainability.” *Hub*, Johns Hopkins University, Mar 11, 2016, <https://hub.jhu.edu/2016/03/11/dietary-guidelines-sustainability-survey/> (“Nearly three-quarters of adults surveyed believe U.S. Dietary Guidelines should include environmental provisions and support sustainable agriculture practices.”).

<sup>31</sup> Scientific Report at 5.

for USDA and HHS to address through appropriate mechanisms, and their consideration may provide useful approaches for implementing the recommendations in the *Dietary Guidelines for Americans*.<sup>32</sup>

It is critical the 2020-2025 *Guidelines* do not ignore or suppress the existential issues of the food environment and food systems identified in the Scientific Report. We strongly support the report's related findings and its recommendations for the Departments as they finalize the *Guidelines*:

- “Though the Committee did not review questions on topics such as the food environment, the overall food system, or strategies to support behavior change, it emphasized the importance of these topics and strongly encourages the Secretaries of USDA and HHS to examine these topics to support improved dietary intake among Americans.”<sup>33</sup>
- “The Committee’s review and discussion, as well as the public comments submitted during the Committee’s review period, reinforce the ***need to consider the Dietary Guidelines for Americans in the context of the food environment and the overall food system. Such topics include areas such as sustainability of the food supply and food insecurity*** (i.e., the chronic or episodic limited access to safe, nutrient-dense foods to support health), which is experienced by many Americans. Improved understanding also is needed of approaches to encourage behavior change to better meet the recommendations for healthful eating.”<sup>34</sup>

The Academy offers additional, specific recommendations related to sustainability and food systems stewardship for the Departments to incorporate as they finalize the *Guidelines* in Section VI, below.

#### 4) *Research Methods and National Academies’ Recommendations*

The initiation of the 2020 *Guidelines* were preempted by the congressionally mandated 2017 reports by the National Academies of Sciences, Engineering, and Medicine (NASEM or the “National Academies”), which made a number of recommendations about how to strengthen the *Dietary Guidelines* development process so these *Guidelines* could be made reliable, trustworthy, and relevant to all Americans.<sup>35</sup> We are pleased “USDA and HHS have acted on many of the recommendations in the 2017 [NASEM] report *Redesigning the Process for Establishing the Dietary Guidelines*,”<sup>36</sup> and we understand other recommendations were impracticable to accomplish in the available timeframe, but we reemphasize the rationale for mandating the NASEM reports and the value of these reports’ recommendations.

The Academy appreciates that because “the Departments are committed to supporting a transparent, inclusive, and science-driven process, USDA and HHS added some new steps to the 2020 Committee process in response to recommendations from the National Academies’ recommendations and stakeholder feedback, and also adopted updated best practices of reviewing nutrition science and developing guidance.”<sup>37</sup> We note, *infra*, specific methodological and research limitations impacting the *Dietary Guidelines* development process and again look forward to the opportunity for the Academy to offer our expertise to the Departments as they prepare for the 2025-2030 *Dietary Guidelines*. Of

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<sup>32</sup> Scientific Report at 5.

<sup>33</sup> Scientific Report at 25.

<sup>34</sup> Scientific Report at 40-41 (emphasis added).

<sup>35</sup> National Academies of Sciences, Engineering, and Medicine. *Optimizing the process for establishing the Dietary Guidelines for Americans: The selection process*. Washington, DC: The National Academies Press; 2017. <https://doi.org/10.17226/24637> (“NASEM Report”).

<sup>36</sup> Scientific Report at 41 (internal citations omitted).

<sup>37</sup> Scientific Report at 4.

particular importance are inclusion and exclusion criteria; results tables, risk of bias, and total scores; grading; and other methodological issues.

We look forward to having a robust discussion soon about the Departments' incorporation of the National Academies' recommendations into this guidelines process and how to facilitate the future adoption of recommendations that were not adopted (because of a lack of time or other circumstances) before developing the next iteration of the *Guidelines*. In particular, we support and reiterate the Scientific Report's admonition to adopt the National Academies' recommendation that "[t]he secretaries of USDA and HHS should commission research and evaluate strategies to develop and implement systems approaches into the *DGA*. The selected strategies should then begin to be used to integrate systems mapping and modeling into the *DGA* process."<sup>38</sup>

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<sup>38</sup> Scientific Report at 41.

## IV. MAKING RECOMMENDATIONS FOR “THE GENERAL PUBLIC”

### A. Defining the General Public

The charter for the 2020 Advisory Committee reminds us the National Nutrition Monitoring and Related Research Act of 1990<sup>39</sup> instructs that “[the *Guidelines*] shall contain nutritional and dietary information and guidelines for the *general public*”<sup>40</sup> This creates significant uncertainty and tension when the ‘general public’ has obesity, overweight, or one or more other chronic diseases. The Departments must make clear in the final *Guidelines* if and when its dietary recommendations are appropriate for (1) a general population in which more than two-thirds of the adult population is overweight or instead (2) primary prevention of obesity and other diet-related chronic diseases. The Academy notes and appreciates the extent to which the Committee distinguished its recommendations in this regard in the Scientific Report.

The Academy recognizes the value in directing guidelines at the entities and individuals most able to effect the respective changes on both micro and macro levels, including registered dietitian nutritionists. There is, however, a potentially competing value in the guidelines being written in approachable, concise language that is easy for consumers to apply. **As there are evidence-based dietary recommendations for many diet-related chronic diseases that do not match the *Guidelines*, confusion can develop among professionals and the public about which dietary recommendations to follow if it is unclear whom the *Guidelines* target in terms of nutritional needs.**

To promote greater understanding of the Scientific Report and the subsequent *Guidelines*, we encourage the Departments to reiterate the *Guidelines* will not apply to people with certain health statuses and are not meant to replace medical advice or individualized recommendations based on health assessment and disease status. In addition, recommendations may differ across the lifecycle — particularly for older adults — making the current age-related approach appropriate. **In short, the *Guidelines* should indicate when certain recommendations may differ for or not apply to a certain group of Americans and should also explicitly detail its rationale when making differing or non-generalizable recommendations.**

### B. Health Equity and Cultural Competence

The Academy’s Strategic Plan<sup>41</sup> encourages a shift in focus toward health equity, social determinants of health, and transparent involvement of broader constituencies, which we believe are critical to incorporate and address throughout the *Dietary Guidelines* development process. It is well-established that racial and ethnic minorities experience unique health and wellness challenges and are at a greater risk of having food insecurity as well as obesity.<sup>42 43</sup> The Committee found:

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<sup>39</sup> Section 301 of Public Law 101-445 codified at 7 U.S.C. 5341.

<sup>40</sup> United States Department of Agriculture. Charter for the 2020 Dietary Guidelines Advisory Committee, Section 3:1. <https://www.dietaryguidelines.gov/sites/default/files/2019>.

<sup>41</sup> Academy of Nutrition and Dietetics Strategic Plan. eatrightPRO.org. [https://www.eatrightpro.org/-/media/eatrightpro-files/leadership/bod/strategic-plan/academy-of-nutrition-and-dietetics\\_strategic-plan\\_sep-2017.pdf?la=en&hash=D00E3FE00D1475FB416E20004DECC3C136D5D7E5](https://www.eatrightpro.org/-/media/eatrightpro-files/leadership/bod/strategic-plan/academy-of-nutrition-and-dietetics_strategic-plan_sep-2017.pdf?la=en&hash=D00E3FE00D1475FB416E20004DECC3C136D5D7E5).

<sup>42</sup> Vaccaro JA, Huffman FG. Sex and Race/Ethnic Disparities in Food Security and Chronic Diseases in U.S. Older Adults. *Gerontol Geriatr Med*. 2017(3). doi:10.1177/2333721417718344. Published June 30, 2017. (“Although the national average of household food insecurity is 14%, it is 22.4% for Hispanic households and 26% for African American households as compared with 11% for White non-Hispanics.” (Internal citations omitted.)).

<sup>43</sup> Wang L, Southerland J, Wang K, et al. Ethnic Differences in Risk Factors for Obesity among Adults in California, the United States. *Journal of Obesity*. 2017;2017:10 pages. <https://doi.org/10.1155/2017/2427483>.

“There are disparities in the severity of the prevalence, incidence, or mortality rate of chronic health conditions between groups classified by sex, age, race-ethnicity, income level, and weight status. In general, chronic health conditions have become more prevalent over time and are highest among older populations, different racial and ethnic subgroups, and those with lower income levels.”<sup>44</sup>

In a recent statement, Academy President Linda T. Farr, RDN, CSOWM, LD, FAND, made clear “[t]he **Academy of Nutrition and Dietetics believes American society, leaders and organizations must commit to doing more to address systemic racism and pervasive inequities across all facets of society.**”<sup>45</sup> To do so, it is critical for the Departments to consider the *Guidelines*’ recommendations and the implementation thereof through a health equity lens, recently described as “the examination of who experiences the benefits and burdens of policies and programs as well as the basis for differential experiences.”<sup>46</sup>

The Academy believes the *Guidelines* and the Departments’ other initiatives to improve the nutritional status of Americans, reduce obesity and other diet-related chronic diseases, and increase food security must include coordinated efforts to achieve health equity and reduce health disparities. **We urge the Departments to include in the final *Guidelines* strategies for achieving health equity, including how collaboration across all sectors and levels of government to implement policies can improve public health and provide equitable access to healthy and affordable food, clean water, and effective nutrition care services.**

The Committee also recognized the extent to which the nutrition research it reviewed failed to reflect the diversity of the American population comprising the ‘general public’ and the concomitant need for well-implemented recommendations that address both health disparities and cultural variations in dietary pattern consumption. **The Scientific Report details that the evidence base for many analyses came from studies predominantly on white, upper middle class individuals that often failed to be adjusted for important “potential confounders, such as race/ethnicity [and] socioeconomic status.”**<sup>47</sup> Other Scientific Report conclusions include:

- For example, with regard to dietary patterns before and during pregnancy and GDM, the Scientific Report recognized, “Generalizability of the studies is limited to healthy White women who have access to health care. Women of other races and ethnicities and those of lower socioeconomic status are underrepresented in this body of evidence. A major reason for grading this evidence as “limited” was the lack of adequately powered randomized controlled trials, few cohorts contributing to the observational studies, issues with risk of bias including self-reported exposure and outcome, and limited generalizability.”<sup>48</sup>

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<sup>44</sup> Scientific Report at (103/835).

<sup>45</sup> A Message from Academy President Linda T. Farr, RDN, CSOWM, LD, FAND. Academy of Nutrition and Dietetics. <https://www.eatrightpro.org/news-center/member-updates/from-our-leaders/a-message-from-academy-president-linda-t-farr>. Accessed June 5, 2020.

<sup>46</sup> Eyler AA, Valko CA, Macchi M, et al. Adjusting the Equity Lens: Gaps in Addressing Health Equity in State Chronic Disease Prevention. *Health Equity*. 2019;3(1):86-91. doi:10.1089/heq.2018.0075. Published March 29, 2019. citing Pertillar T, Pobutsky A, Brandt G, et al. Assessment of funding and other capacity needs for health equity programming. *J Health Dispar Res Pract*. 2017;9(Special Issue):72–94.

<sup>47</sup> Boushey C. 2020 Dietary Guidelines Advisory Committee Public Meeting. [transcript]. March 12, 2020. 176. <https://www.dietaryguidelines.gov/sites/default/files/2020-06/2020DGACMtg5TranscriptDay1FINAL.pdf>.

<sup>48</sup> Scientific Report at 206.

- With regard to gestational weight gain and dietary patterns consumed during pregnancy, the Committee found “[p]eople with lower socioeconomic status (SES), adolescents, and racially and ethnically diverse populations were underrepresented in the body of evidence.”<sup>49</sup>
- Similarly with regard to dietary patterns consumed during pregnancy and hypertension, the report concluded “[l]imited evidence in healthy Caucasian women with access to health care suggests dietary patterns before and during pregnancy higher in vegetables, fruits, whole grains, nuts, legumes, fish, and vegetable oils and lower in meat and refined grains are associated with a reduced risk of hypertensive disorders of pregnancy, including preeclampsia and gestational hypertension.”<sup>50</sup>
- Regarding supplementation during infancy and childhood, “[i]nformation on race and/or ethnicity of the participants was not provided in most of the studies. The countries of study origin were Canada, the United States, and Finland, but without knowing more about the characteristics of the participants, it is difficult to judge the potential risk factors for vitamin D deficiency that may have been present.”<sup>51</sup> Specifically, for vitamin D, the Committee emphasized “[f]uture studies should be appropriately powered, include racially and ethnically diverse samples, and report baseline infant vitamin D status, human milk vitamin D content, and sun exposure.”<sup>52</sup>
- The Committee also found “[e]vidence is insufficient to estimate the association between dietary patterns before and during pregnancy and risk of hypertensive disorders of pregnancy in minority women and those of lower socioeconomic status.”<sup>53</sup>
- The Committee’s finding that “[a] distinct advantage of these structured patterns is the replication and comparability of study findings. On the other hand, these patterns may not represent all cultural or regional variations of dietary intakes.”<sup>54</sup>
- “Understanding the extent to which the entire population and various subgroups (e.g. age, sex, race and ethnic origin, food security status, income) achieve food group and food component intake recommendations is the foundation for tailoring powerful public health communication strategies focusing first on food-based strategies...”<sup>55</sup>

The Academy strongly agrees with Committee member Dr. Stang that the Committee should “think about dietary guidance that can apply across the life span[, a]nd that can be tailored for various racial/ethnic preferences and socioeconomic levels.”<sup>56</sup> The Academy offers additional specific comments in Section VII(B), *infra*, on interventions and programs — when developed and implemented with a health equity lens — that can enhance culturally competent implementation of the guidelines.

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<sup>49</sup> Scientific Report at 210.

<sup>50</sup> Scientific Report at 206.

<sup>51</sup> Scientific Report at 423.

<sup>52</sup> Scientific Report at 423-424.

<sup>53</sup> Scientific Report at 206.

<sup>54</sup> Scientific Report at 476.

<sup>55</sup> Scientific Report at 96.

<sup>56</sup> Schneeman B. 2020 Dietary Guidelines Advisory Committee Public Meeting. [transcript]. March 13, 2020. Time stamp 1:15:10. <https://www.dietaryguidelines.gov/sites/default/files/2020-06/2020DGACMtg5TranscriptDay2FINAL.pdf>.

### C. Racial and Ethnic Disparities

Racial and ethnic minorities experience unique health and wellness challenges and are at a greater risk of having food insecurity as well as obesity.<sup>57 58</sup> Moreover, these disparities begin while minority children are still in the womb, necessitating early interventions to ameliorate them before they amplify over time. The Scientific Report found “[r]acial and socioeconomic status disparities exist with regard to chronic diseases. Racial variation exists for almost all the health conditions the Committee examined, including during pregnancy. Asian Americans have a relatively lower prevalence of most chronic health conditions examined, though pregnant Asian women have the highest prevalence of gestational diabetes. Low birth weight among non-Hispanic Blacks is at the highest level in more than 25 years.”<sup>59</sup> When examining these disparities using its life stage approach, the Scientific Report noted disparities during pregnancy and at the earliest stages of infants’ lives:

“The 2020 Committee has come to realize that each individual life stage also holds unique implications for dietary intake and the risk of disease. In terms of life stages, while young infants appear to be generally well-nourished, some gaps exist. The risk of chronic disease begins early in life, with important health consequences for the fetus based on the dietary intake of the mother and subsequent feeding behaviors. Early life nutritional exposures have emerged as an etiological risk factor associated with later-life chronic disease risk. For example, breastfeeding has been associated with various patterns of intake that differ from infants receiving formula, and though infants appear to be generally well-nourished, these differences in feeding patterns leave room for improvement. Non-Hispanic Black infants are the least likely to be breastfed and have differential fruit and vegetable intake patterns starting early in life and continuing throughout the life course. This cumulative difference in feeding behavior for Black infants may set a course for higher risk of nutrition-related chronic disease that underpins many of the disparities seen today. Indeed, non-Hispanic Asian breastfeeding rates are higher and duration is longer; higher diet quality was observed among non-Hispanic Asians across all age groups examined. Differences in feeding are related to many factors that determine if or how long a woman breastfeeds a child. Data reviewed by the Committee did not include the context of such factors, but future research to better understand what drives the differences is of interest. Thus, **concerted efforts to advance progress made in breastfeeding initiation and duration should continue, and culturally specific food recommendations are needed across the life course.**”<sup>60</sup>

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<sup>57</sup> Vaccaro JA, Huffman FG. Sex and Race/Ethnic Disparities in Food Security and Chronic Diseases in U.S. Older Adults. *Gerontol Geriatr Med.* 2017(3). doi:10.1177/2333721417718344. Published June 30, 2017. (“Although the national average of household food insecurity is 14%, it is 22.4% for Hispanic households and 26% for African American households as compared with 11% for White non- Hispanics.”) (Internal citations omitted).

<sup>58</sup> Wang L, Southerland J, Wang K, et al. Ethnic Differences in Risk Factors for Obesity among Adults in California, the United States. *Journal of Obesity.* 2017;2017:10 pages. <https://doi.org/10.1155/2017/2427483>.

<sup>59</sup> Scientific Report at 175, citing National Center for Health Statistics. Health, United States, 2015: With Special Feature on Racial and Ethnic Health Disparities. Hyattsville, MD. 2016.

<sup>60</sup> Scientific Report at 182-183 (emphasis added). See, also Scientific Report at 108 (“The prevalence of low birthweight among U.S. infants by race-ethnicity was examined using data from the NVSS 2017. 17 The prevalence of low birthweight

The Departments should endeavor to ensure these disparities are ameliorated through evidence-based programs and health care interventions, which likely requires new funding commitments. Initiating these programs early is essential because these health disparities continue as children get older:

“Differences by race and ethnicity are apparent, especially for intakes of sweetened beverages. Non-Hispanic Black children have the highest intakes of sweetened beverages and Asian children have the lowest intakes. Within the category of sweetened beverages, fruit drinks in particular are reported by non-Hispanic Black children more frequently than by any other race or ethnic group. In addition, 100% juice is reported by significantly more Hispanic (34 percent) and non-Hispanic Black (33 percent) than non-Hispanic White (25 percent) or Asian (23 percent) children. Fewer Hispanic (78 percent) and non-Hispanic Black (76 percent) children report water than did non-Hispanic White (86 percent) or Asian children (93 percent). Milk is consumed by a smaller proportion of non-Hispanic Black (34 percent) children than children of other race/ethnic groups (45-56 percent).”<sup>61</sup>

The Academy offers additional specific comments in Section VII(B), *infra*, on interventions and programs — when developed and implemented with a health equity lens — that can help to address these racial and ethnic disparities.

#### **D. Americans with Low Socioeconomic Status or Food Insecurity**

It is the position of the Academy of Nutrition and Dietetics that systematic and sustained action is needed to achieve food and nutrition security in the United States. To achieve food security, effective interventions are needed, along with adequate funding for and increased utilization of, food and nutrition assistance programs; inclusion of nutrition education in such programs; strategies to support individual and household economic stability; and research to measure impact on food insecurity- and health-related outcomes.<sup>62</sup> The Academy has found “individuals residing in food-insecure households often follow dietary patterns that are inadequate in specific foods and nutrients. These nutritional inadequacies may contribute to malnutrition and increased risk of poor health, chronic disease, and other outcomes.”<sup>63</sup>

Food insecurity is pervasive, with the Scientific Report conservatively stating “that food insecurity and lack of access to affordable healthy food affect more than 37 million people, including 6 million

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(born at less than 2,500 grams) increased to 8.27 percent in 2017 from 8.17 percent in 2016. The prevalence of moderately low birthweight (born at 1,500 to 2,499 grams) was 6.77 percent, and the prevalence of very low birthweight (born at less than 1,500 grams) was 1.40 percent. From 2016 to 2017, the prevalence of low birthweight: increased for non-Hispanic Black women (13.68 percent to 13.88 percent), increased for Hispanic women (7.32 percent to 7.42 percent), and remained relatively unchanged for non-Hispanic White women (6.97 percent to 7.00 percent). Non-Hispanic Black women have the highest prevalence of low birthweight at 13.88 percent, and the highest prevalence reported since the data started being collected in 1993.”). *See also*, Scientific Report at 118 (“Breastfeeding initiation rates are high, but exclusive breastfeeding past age 3 months and any duration at age 6 months is 57 percent, with notable differences observed by race and ethnicity.”).

<sup>61</sup> Scientific Report at 620 (internal citation omitted).

<sup>62</sup> Holben DH, Marshall MB. Position of the Academy of Nutrition and Dietetics: Food Insecurity in the United States. *J Acad Nutr Diet*. 2017;117(12):1991-2002.

<sup>63</sup> *Ibid.*, citing Hanson KL, Connor LM. Food insecurity and dietary quality in US adults and children: A systematic review. *Am J Clin Nutr*. 2014;100(2):684-692; and Dixon LB, Winkleby MA, Radimer KL. Dietary intakes and serum nutrients differ between adults from food-insufficient and food-sufficient families: Third National Health and Nutrition Examination Survey 1988-1994. *J Nutr*. 2001;131(4):1232-1246.

children.”<sup>64</sup> Recognizing “[r]ace and ethnicity and income also were associated with differential intakes of food groups, nutrients, and food components,”<sup>65</sup> including a “higher prevalence of inadequate intakes...observed among Americans living in low income (350 percent of the poverty level, especially for calcium, magnesium, phosphorous, and vitamins A and C. Americans living in low income (350 percent of the poverty level),”<sup>66</sup> **the Academy believes it is essential for the Departments to both make clear this association between food insecurity and inadequate intakes in the final *Guidelines* and develop and fund new strategies for ameliorating it.** Although “[t]he 2015 Committee described a need to understand how food security shapes dietary intakes[, the Scientific Report made clear d]ata on dietary patterns and intakes of nutrients and food components by food security status were not available to this [2020] Committee.”<sup>67</sup> **We strongly agree with the Committee that “[f]uture work to understand how overall income and food security status interact to predict dietary intakes and the resulting diet quality is needed:”**<sup>68</sup>

“To facilitate shifting American dietary intakes toward healthier directions, access to healthy food options is critical. The Committee recognizes that several barriers and facilitators affect access and influence consumers’ dietary behaviors beyond nutritional considerations, including food costs and food security status. The Committee recommends that the Departments of Agriculture and of Health and Human Services continue to assess how food costs and food security status influence food intake and resulting nutritional status in the American public. The Departments have done a significant amount of work on understanding the cost of the recommended Food Plans. The Healthy U.S.-Style Pattern described in this chapter will serve as the foundation for updating the USDA Food Plans that calculate market basket costs of a healthy eating pattern at 4 levels: the Thrifty Food Plan (*i.e.*, minimal cost), Low Cost, Moderate Cost, and Liberal Food Plans. These Food Plans demonstrate that healthy eating does not need to be cost-prohibitive. However, little information exists on how food insecurity, which is the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways, affects food purchasing behaviors. Approximately 11 percent of U.S. households experienced food insecurity in 2018. Future research is needed to understand how food security status interacts with food costs to shape dietary behaviors.”<sup>69</sup>

We also note that the likelihood that an increase in dental caries and other oral diseases could increase as a result of low income and vulnerable populations having a lack of access to healthy, nutritionally

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<sup>64</sup> Scientific Report at 26.

<sup>65</sup> Scientific Report at 179.

<sup>66</sup> Scientific Report at 169.

<sup>67</sup> Scientific Report at 179.

<sup>68</sup> Scientific Report at 179.

<sup>69</sup> Scientific Report at 763 (internal citation omitted).

adequate diets<sup>70</sup> and to dental services that are closed or limited by the coronavirus.<sup>71</sup> The time is now for the Departments to recommend Americans across the lifespan adopt routine oral health preventive practices and include them in the 2020-2025 *Dietary Guidelines for Americans*.

The Academy strongly underscores the Scientific Report’s finding that “[u]p-to-date nutrition advice in the *Dietary Guidelines* can help improve the health of Americans by encouraging food and beverage choices that are affordable, enjoyable, promote health, and help prevent chronic disease, taking into account that availability and access to nutritious food is important for all Americans, including those who are food insecure.”<sup>72</sup> The Academy’s position paper on food insecurity concludes “[c]onsistent with other preventable health conditions and diseases, avoiding food insecurity or addressing it earlier in its cycle would be a wise and more cost-effective approach.”<sup>73</sup> As food insecurity improves, chronic disease improves. Many health care facilities are screening for food insecurity during hospital or clinic admission, and developing programs to treat this condition in their surrounding communities as part of their population health initiatives. The challenge is to find funding that will sustain these programs over time.

## E. Americans with Overweight and Obesity

### 1. Focus on Obesity and Overweight is Important

The Scientific Report explicitly detailed the obesity epidemic in America and its associated comorbidities:

“As was true for the 2010 and 2015 Committees, the 2020 Committee’s work took place against a backdrop of several significant nutrition-related issues in the United States.

- “More than 70 percent of Americans have overweight or obesity, and the prevalence of severe obesity has increased over the past 2 decades. The increasing prevalence of overweight and obesity at young ages is of particular concern because of their effects on the current health of the child as well as the risks of persistent overweight or obesity into adulthood.
- “The high rates of overweight and obesity are an important public health problem in and of themselves, and they are a driver for prevalent diet-related chronic diseases, such as cardiovascular disease (CVD), type 2 diabetes, and some types of cancer. At present, 6 in 10 Americans have a chronic condition and 4 in 10 Americans have 2 or more chronic conditions. Various factors contribute to the prevalence of these chronic diseases. Prominent

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<sup>70</sup> Centers for Disease and Prevention. Fruit and Vegetable Consumption Among High School Students — United States, 2010. *Morbidity and Mortality Weekly Report*. 2011. 60(46);1583-1586.

<sup>71</sup> Nasseh K and Vujicic M. Modeling the Impact of COVID-19 on U.S. Dental Spending — June 2020 Update, Health Policy Institute. American Dental Association. June 2020. [https://www.ada.org/~/media/ADA/Science%20and%20Research/HPI/Files/HPIBrief\\_0620\\_1.pdf?la=en](https://www.ada.org/~/media/ADA/Science%20and%20Research/HPI/Files/HPIBrief_0620_1.pdf?la=en). Accessed July 17, 2020.

<sup>72</sup> Scientific Report at 26.

<sup>73</sup> Holben DH, Marshall MB. Position of the Academy of Nutrition and Dietetics: Food Insecurity in the United States. *J Acad Nutr Diet*. 2017;117(12):1991-2002 (emphasis added).

among these are unhealthy dietary patterns and a lack of physical activity.”<sup>74</sup>

- “The Committee identified these themes to address the major public health challenges in the U.S. population of overweight and obesity and their related co-morbidities that are associated with dietary patterns in which typical food choices result in excess energy intake and inadequate nutritional quality.”<sup>75</sup>
- “In many instances, overweight and obesity may be the earliest manifestation of energy imbalance and poor nutritional status, and many of the chronic conditions that the Committee examined develop as a consequence of overweight and obesity. Given that most Americans and [sic] overweight or obese this is quite concerning.”<sup>76</sup>

2) *The Dietary Guidelines Are Intended to Be Nutrition Recommendations for the “General Public”*

As the 2010-2015 *Dietary Guidelines* made clear, “Primary prevention of obesity and related risk factors is the single most powerful public health approach to reversing America’s obesity epidemic over the long term.”<sup>77</sup> However, as discussed below, the 2020-2025 Committee made the decision to exclude studies on weight loss despite weight loss being the single most effective strategy to prevent obesity. Indeed, one of the 2020-2025 Advisory Committee members noted many of the public comments had been focused on the need to address obesity, given its prevalence in the American population, and he urged the Committee to explain “with a little bit of . . . detail[] and the reasons why [obesity and diets that might be shown to prevent it] were not taken into consideration in this iteration of the *Dietary Guidelines*.”<sup>78</sup>

As noted above, the *Guidelines* “shall contain nutritional and dietary information and guidelines for the *general public*,”<sup>79</sup> which creates significant uncertainty and tension when the general public has obesity, overweight, or one or more other chronic diseases. The Committee notes “[e]arly editions [of the *Guidelines*] focused on healthy members of the general public but, recognizing the growing prevalence of diet-related chronic diseases, such as heart disease, type 2 diabetes, obesity, and some forms of cancer, more recent editions have covered individuals with increased risk of chronic disease as well.”<sup>80</sup> Given the Americans’ health statuses, continuing to focus on ‘healthy members of the general public,’ of course, would actually exclude from consideration the vast majority of Americans:

“Excess adiposity is driving an increase in other chronic diseases considered by the 2020 Committee. ***To address this public health epidemic, reducing***

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<sup>74</sup> Scientific Report at 13.

<sup>75</sup> Scientific Report at 5.

<sup>76</sup> Scientific Report at 175.

<sup>77</sup> U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans*, 2010. 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010 at 58.

<sup>78</sup> Schneeman B. 2020 Dietary Guidelines Advisory Committee Public Meeting. [transcript]. March 13, 2020. <https://www.dietaryguidelines.gov/sites/default/files/2020-06/2020DGACMtg5TranscriptDay2FINAL.pdf>.

<sup>79</sup> United States Department of Agriculture. Charter for the 2020 Dietary Guidelines Advisory Committee, Section 3:1. <https://www.dietaryguidelines.gov/sites/default/files/2019> (emphasis added).

<sup>80</sup> Scientific Report at 26.

*the incidence and prevalence of overweight and obesity is critical at every stage of life to preserve ideal health.* Dietary patterns that focus on nutrient-dense foods to prevent excessive weight gain starting in pregnancy, continuing through infancy and childhood, adolescence, and adulthood are of high public health relevance.”<sup>81</sup>

To avoid entirely excluding research relevant to the 70 percent of Americans with one or more chronic diseases, the Committee and NESR staff developed a variety of revised inclusion and exclusion criteria:

- “Thus, NESR included studies that comprise participants who are representative of the general public, including studies done in participants who are healthy and/or who are at risk for a chronic disease. NESR also included studies that enroll some subjects with a disease, including those with obesity, or with the health outcome of interest (intermediate or health outcomes).”<sup>82</sup>
- “**NESR excluded studies that exclusively enrolled participants with a disease or the health outcome of interest (i.e., studies designed to medically treat individuals who already have the disease outcome of interest).** In systematic reviews that examined the relationship between diet and risk of obesity, for example, studies that enrolled some participants classified as having obesity, as well as people at risk of obesity and healthy people were included; studies that exclusively enrolled individuals with obesity, like those that aim to treat individuals with obesity, were excluded.”<sup>83</sup>
- “Most studies enrolled participants who were overweight or obese, or exhibited features of metabolic syndrome.”<sup>84</sup>

Although “[t]he Committee included evidence from studies that included people with overweight and obesity to reflect this reality of our current population,”<sup>85</sup> we note the exclusion criteria limited studies examining caloric restriction and weight loss and specific exclusion criteria in the systematic reviews were not consistent across subcommittees or topics; for example, they excluded:

- “Studies examining energy-restricted diets that induce weight loss or treat overweight and obesity for the purposes of treating additional or other medical conditions were excluded.”<sup>86</sup>

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<sup>81</sup> Scientific Report at 515 (emphasis added).

<sup>82</sup> Scientific Report at 68.

<sup>83</sup> *Ibid.* (Emphasis added.)

<sup>84</sup> 2020 Dietary Guidelines Advisory Committee and Nutrition Evidence Systematic Review Team. Dietary Patterns and Risk of Cardiovascular Disease: A Systematic Review. 2020 Dietary Guidelines Advisory Committee Project. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, July 2020. <https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews>.

<sup>85</sup> Scientific Report at 3.

<sup>86</sup> Systematic Review Question. What is the relationship between dietary patterns consumed and growth, size, body composition, and risk of overweight and obesity? | Nutrition Evidence Systematic Review. <https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews/dietary-patterns-subcommittee/dietary-patterns-growth-size-body-composition-obesity>; 2020 Dietary Guidelines Advisory Committee and Nutrition Evidence Systematic Review Team. Dietary Patterns and Risk of Cardiovascular Disease: A Systematic Review. 2020 Dietary Guidelines Advisory Committee Project. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, July 2020. <https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews>.

- “Studies that exclusively enroll participants classified as obese (*i.e.*, studies that aim to treat participants who have already been classified as obese).”<sup>87</sup>
- “Studies that exclusively enroll participants classified as obese (*i.e.*, studies that aim to treat participants who have already been classified as obese) or who are post-bariatric surgery.”<sup>88</sup>
- “Studies that used hypocaloric or energy-restricted diets to induce weight loss in participants with overweight or obesity were excluded, as it is not possible to isolate whether outcomes were due to reduced energy intake, the proportion of macronutrients or dietary pattern consumed, and/or weight loss.”<sup>89</sup>
- “It did not examine evidence relating certain macronutrient profiles (*i.e.*, ratios of carbohydrates, fats, and protein to energy intake) to weight loss or treatments for specific diseases or categories of disease.”<sup>90</sup>

### 3) *Reaching and Maintaining a Healthy Weight Is Both Primary and Secondary Prevention*

Complicating this issue is the fact that weight loss is not merely a treatment for the disease of obesity; it is also primary prevention for many chronic diseases. The Academy is concerned that broad exclusion of studies in which individuals are seeking to lose weight or restrict calories may be too limiting. We agree with the Committee that “[d]iet is a modifiable factor that is ***critically relevant to the primary and secondary prevention*** of most non-communicable chronic diseases that are the leading causes of disability and death affecting Americans.”<sup>91</sup> The Committee also recognized that “[d]ietary intake also is an important determinant of body weight and risk of overweight and obesity. Development of overweight and obesity begin early in life and trigger development of the [sic] risk factors that [sic] such as hypertension, elevated blood glucose, insulin resistance and dyslipidemia that remain public health problems in all age groups. Overweight and obesity are both a health outcome ***and a contributor to risk*** for most of the health outcomes that the Committee examined.”<sup>92</sup>

The Academy appreciates that the Committee struggled with the complexity of this issue and looks forward to the opportunity to work with the Departments in advance of the protocols and inclusion and exclusion criteria being developed for the 2025-2030 *Guidelines*. We also encourage the Departments to adopt the National Academies recommendations<sup>93</sup> to use Technical Expert Panels in advance of convening the Advisory Committee.

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<sup>87</sup> What is the relationship between beverage consumption and growth, size, body composition, and risk of overweight and obesity? DietaryGuidelines.gov. [https://www.dietaryguidelines.gov/sites/default/files/2020-04/Bev-GSBC-Final\\_Protocol-04-20-2020.pdf](https://www.dietaryguidelines.gov/sites/default/files/2020-04/Bev-GSBC-Final_Protocol-04-20-2020.pdf).

<sup>88</sup> 2020 Dietary Guidelines Advisory Committee and Nutrition Evidence Systematic Review Team. Dietary Patterns and Risk of Cardiovascular Disease: A Systematic Review. 2020 Dietary Guidelines Advisory Committee Project. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, July 2020. Page 90. <https://nestr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews>.

<sup>89</sup> Scientific Report at 484.

<sup>90</sup> Scientific Report at 37.

<sup>91</sup> Scientific Report at 182 (internal citations omitted; emphasis added).

<sup>92</sup> *Ibid.* (Internal citations omitted; emphasis added.)

<sup>93</sup> National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Food and Nutrition Board; Committee to Review the Process to Update the Dietary Guidelines for Americans. Redesigning the Process for Establishing the Dietary Guidelines for Americans. Washington, DC: National Academies Press (US); November 16, 2017. <https://www.ncbi.nlm.nih.gov/books/NBK469828/> (recommending “Technical expert panels to provide content and methodological consultation during evaluation of the evidence”).

## F. Older Americans

The Scientific Report purports<sup>94</sup> to “take a full lifespan approach in its dietary recommendations,”<sup>95</sup> which would be a change from previous iterations that led the Government Accountability Office (GAO) to note previous *Guidelines*’ failure to sufficiently differentiate between the dietary needs of “adults” at age 20 years old and those at ages 65 or 90.<sup>96</sup> There is an opportunity to remedy this discrepancy. The GAO report states that, “HHS plans to focus on older adults in a future update to the *Guidelines* but has not documented a plan for doing so.”<sup>97</sup> It recommends “[d]ocumenting such a plan could help ensure guidelines better address the needs of the population.” We respectfully request the opportunity to work with the Departments to address these issues as soon as practicable, enabling a more robust plan to be developed and solidified in advance of the 2025-2030 *Guidelines*.

We are pleased to note this Scientific Report does make some references to the needs of older Americans, recommending “changes in metabolism, due in part to age-related loss in skeletal muscle, and physical activity may require adjustments in eating frequency and portion sizes. They also may generate special needs for selected nutrients, such as protein and vitamin B12, especially among women.”<sup>98</sup> In addition, the Academy supports the Committee’s recognition of the need to “[e]xamine optimal dietary factors to support healthy aging, including preventing age-related cognitive decline.”<sup>99</sup>

## G. Dental Caries

### 1) Background

The Academy and the Oral Health Alliance — of which we are a member — have shared extensive research and evidence demonstrating prevention of dental caries and other oral infectious diseases is critical to maintaining an individual’s capacity to chew food, consume nutrient-rich diets, and sustain optimal nutrition status, throughout the 2020-2025 *Dietary Guidelines* development process. Pain and infection from dental caries makes it difficult to consume the appropriate amounts of fruits, vegetables, dairy, and lean protein recommended in the *Dietary Guidelines*.<sup>100,101</sup> The reduced intake of these foods puts individuals with dental caries at risk for under-consuming fiber, calcium, iron, and other essential vitamins and minerals. With many food groups unavailable, individuals with dental caries may choose softer, more calorie-dense foods. Preventing dental caries early and throughout life can also improve

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<sup>94</sup> Scientific Report at 30 (“[T]he recommended dietary intakes support healthy weight trajectories at each stage of life, including healthy growth and development from infancy through adolescence, appropriate weight gain during pregnancy, energy needs during pregnancy and lactation, weight stability during mid-life, and **healthy body composition late in life.**”) (emphasis added).

<sup>95</sup> *Ibid.*

<sup>96</sup> Nutrition Assistance Programs: Agencies Could DO More to Help Address the Nutritional Needs of Older Adults. United States Government Accountability Office: Report to Congressional Requesters. November 2019. <https://www.gao.gov/assets/710/702788.pdf>.

<sup>97</sup> *Id.* at 2.

<sup>98</sup> Scientific Report at 35.

<sup>99</sup> Scientific Report at 13.

<sup>100</sup> Centers for Disease Control and Prevention. Fruit and vegetable consumption among high school students — United States, 2010. *MMWR Morb Mortal Wkly Rep.* 2011;60(46):1583–1536.

<sup>101</sup> Brennan DS, Singh KA. Dietary, self-reported oral health and socio-demographic predictors of general health status among older adults. *J Nutr Health Aging.* 2012;16(5):437–441.

social interactions, school performance,<sup>102</sup> military readiness and effectiveness,<sup>103</sup> and job opportunities. Avoiding the oral infections resulting from poor oral health may decrease risk of heart disease, diabetes, dementia, rheumatoid arthritis, and even premature birth.<sup>104,105</sup> Likewise, nutrition and dietary patterns can affect the development and integrity of the oral cavity and progression of oral diseases.<sup>106</sup> The increase in snacking throughout the day in place of three-meals a day raises risk of obesity<sup>107</sup> and developing dental caries throughout the life cycle.<sup>108,109,110,111,112,113,114</sup>

We appreciate the Committee incorporating much of the data and recommendations organizations concerned with oral health have provided. The Scientific Report outlines the significance of the current dental crisis, providing specific data on the prevalence of dental caries and tooth loss for children, young adults, and older adults:

“The prevalence of total dental caries (treated and untreated) for children ages 2 to 19 years was 45.8 percent, while the prevalence of untreated dental caries was 13.0 percent. Hispanic youth are the most likely to have treated and untreated dental caries (57.1 percent), but non-Hispanic Black youth are most likely to have untreated dental caries (17.1 percent). The overall prevalence of dental caries among adults ages 20 to 64 years was 89.9 percent and 96.2 percent among adults ages 65 years and older, respectively. The prevalence of both total caries and untreated caries is highest among low income groups. The overall prevalence of complete tooth loss is 2.2 percent among adults ages 20 to 64 years and 17.3 percent among adults ages 65 years and older. Tooth loss may compromise dietary intakes.”<sup>115</sup>

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<sup>102</sup> Jackson SL, William VF. et al. Impact of Poor Oral Health on Children's School Attendance and Performance. *AJPH*. 2011;101(10):1900-1906.

<sup>103</sup> Lots to lose: How America's health and obesity crisis threatens our Economic Future. Bipartisan Policy Center. 2012. and Simecek JW, Colthirst P, Wojcik BE: The incidence of dental disease non-battle injuries in deployed U.S. Army personnel. *Mil Med*. 2014;179(6):666-73.

<sup>104</sup> Han Y.W. . Oral Health and Adverse Pregnancy Outcomes – What's Next? *J Dent Res*. 2011;90(3): 289-293.

<sup>105</sup> Boggess KA and Edelstein BL. Oral Health in Women during Preconception and Pregnancy: Implications for Birth Outcomes and Infant Oral Health. *Matern Child Health J*. 2006;10(Suppl 1):169-174.

<sup>106</sup> Touger-Decker R, Mobley C; Academy of Nutrition and Dietetics. Position of the Academy of Nutrition and Dietetics: Oral health and nutrition. *Journal of the Academy of Nutrition and Dietetics*. 2013;113(5):693-701.

<sup>107</sup> Mattes R. Energy intake and obesity: Ingestive frequency outweighs portion size. *Physiology & Behavior*. 2014;134:110-118.

<sup>108</sup> Gaudilliere D, Thakur Y, Ku M, Kaur A, Shrestha P, Girod SC. Caries Management By Risk Assessment in a Cleft and Craniofacial Center: *The Journal of Craniofacial Surgery*. 2014;25:e529-36.

<sup>109</sup> Chaffee BW, Cheng J, Featherstone JDB. Baseline caries risk assessment as a predictor of caries incidence. *Journal of Dentistry*. 2015;43:518-24.

<sup>110</sup> Jain P, Gary JJ. Which is a stronger indicator of dental caries: oral hygiene, food or beverage? A clinical study. *Gen Dent*. 2014;62:63-8.

<sup>111</sup> Domejean S. Validation of the CDA CAMBRA Caries Risk Assessment — A Six-Year Retrospective Study. *Journal of the California Dental Association*. 2011;39:709-15.

<sup>112</sup> Elangovan A, Mungara J, Joseph E. Exploring the relation between body mass index, diet and dental caries among 6-12-year-old children. *Journal of Indian Society of Pedodontics and Preventive Dentistry*. 2012;30:293.

<sup>113</sup> Monaghan N. Sugar before bed: a simple dietary risk factor for caries experience. *Community Dental Health*. 2017;8-13.

<sup>114</sup> Evans, EW, Hayes, C, Palmer, CA, Bermudez, OI, Naumova, EN, Cohen, SA, Must, A. Development of a Pediatric Cariogenicity Index. *Journal of Public Health Dentistry*. 2013;73:179-186.

<sup>115</sup> Scientific Report at 117.

We agree with and reiterate the Committee’s recommendation “the translation of the Committee’s scientific review into the *Dietary Guidelines for Americans* should extend beyond topics incorporated within the specific questions addressed by the Committee and should include related dietary practices that remain of public health concern including those that have been reviewed by previous Committees,”<sup>116</sup> and included “preventing dental caries”<sup>117</sup> among other topics to include in the *Guidelines*.

Given these current dietary patterns of many Americans — making oral health preventive practices, such as brushing, cleaning between teeth, drinking fluoridated water where available<sup>118</sup> and chewing sugar-free gum to avoid dry mouth and increase saliva flow,<sup>119,120</sup> routine for individuals of all ages — is essential to prevent and/or reduce widely experienced dental caries and other oral infectious diseases. The Academy also encourages consideration of the role of sugar-sweetened beverages in contributing to dental caries.

2) *General Justification for including oral health preventive practices in the 2020-2025 Dietary Guidelines*

a. History

Both 2010 and 2005 *Dietary Guidelines* included language on Oral Health Practices, but the 2015 version did not. The 2010 *Guidelines* stated “A combined approach of reducing the amount of time sugars and starches are in the mouth, drinking fluoridated water, and brushing and flossing teeth, is the most effective way to reduce dental caries.”<sup>121</sup> The 2005 *Dietary Guidelines* recommended “[r]educ[ing] the incidence of dental caries by practicing good oral hygiene and consuming sugar- and starch containing foods and beverages less frequently.”<sup>122</sup> There is a well-established and solid body of

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<sup>116</sup> Scientific Report at 39-40.

<sup>117</sup> Scientific Report at 40.

<sup>118</sup> Meyer J, Margaritis V, Mendelsohn A. Consequences of community water fluoridation cessation for Medicaid-eligible children and adolescents in Juneau, Alaska. *BMC Oral Health*. 2018;18:215-25. <https://doi.org/10.1186/s12903-018-0684-2>.

<sup>119</sup> Imfeld T. Chewing gum—facts and fiction: a review of gum-chewing and oral health. *Crit Rev Oral Biol Med*. 1999;10(3):405-19.

<sup>120</sup> Dodds MWJ. The oral health benefits of chewing gum. *J Irish Dent Assoc*. 2012;58(5):253-261.

<sup>121</sup> U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans*, 2010. 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010 at 61.

<sup>122</sup> U.S. Department of Health and Human Services and U.S. Department of Agriculture. *Dietary Guidelines for Americans*, 2005. 6th Edition, Washington, DC: U.S. Government Printing Office, January 2005 at 11.

research<sup>123,124,125,126,127,128,129,130,131,132,133,134,135,136,137</sup>, including a new systematic review<sup>138</sup>, that supports adding the practice of chewing sugar-free gum for 20 minutes after meals or snacks, along with brushing, cleaning between teeth, and drinking fluoridated water to improve our oral health.

#### b. Public Health Significance

HHS has identified oral health as one of the 12 health indicators. As stated in the Scientific Report and noted above, the NHANES 2015-2016 found the prevalence of total dental caries (treated and untreated) for children ages 2 to 19 years was close to half, while the prevalence of untreated dental caries was almost one-fifth.<sup>139</sup> The racial disparity for dental caries among children<sup>140</sup> was also reported above. Almost nine in 10 adults ages 20 to 64 years have dental caries and over 95 percent of adults ages 65

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<sup>123</sup> Beiswanger BB et. al. The Effect of Chewing Sugar-free Gum After Meals on Clinical Caries Incidence. *J Am Dent Assoc.* 1998;129(11):1623-1626, 1624.

<sup>124</sup> J. Szöke et. al. Effect of After-Meal Sucrose-Free Gum-Chewing on Clinical Caries. *J Dent Res.* 2001;80(8):1727, 1728.

<sup>125</sup> Finn SB, Frew RA, Leibowitz R, Morse W, Manson-Hing L, Brunelle J. The effect of sodium trimetaphosphate (TMP) as a chewing gum additive on caries increments in children. *JADA.* 1978;96(4):651-655.

<sup>126</sup> Richardson AS, Hole LW, McCombie F, Kolthammer J. Anticariogenic effect of dicalcium phosphate dihydrate chewing gum: results after two years. *J Can Dent Assoc (Tor).* 1972;38(6):213-218.

<sup>127</sup> Machiulskiene V, Nyvad B, Baelum V. Caries preventive effect of sugar-substituted chewing gum. *Community Dent Oral Epidemiol.* 2001;29(4):278-288.

<sup>128</sup> Glass RL. A two-year clinical trial of sorbitol chewing gum. *Caries Res.* 1983;17(4):365-368.

<sup>129</sup> Alanen P, Holsti ML, Pienihakkinen K. Sealants and xylitol chewing gum are equal in caries prevention. *Acta Odontol Scand.* 2000;58(6):279-284.

<sup>130</sup> Alanen P, Isokangas P, Gutmann K. Xylitol candies in caries prevention: results of a field study in Estonian children. *Community Dent Oral Epidemiol.* 2000;28(3):218-224.

<sup>131</sup> Kovari H, Pienihakkinen K, Alanen P. Use of xylitol chewing gum in daycare centers: a follow-up study in Savonlinna, Finland. *Acta Odontol Scand.* 2003;61(6):367-370.

<sup>132</sup> Peng B, Petersen PE, Bian Z, Tai B, Jiang H. Can school-based oral health education and a sugar-free chewing gum program improve oral health? Results from a two-year study in PR China. *Acta Odontol Scand.* 2004;62(6):328-332.

<sup>133</sup> Makinen KK, Bennett CA, Hujoel PP, et al. Xylitol chewing gums and caries rates: a 40-month cohort study. *J Dent Res.* 1995;74(12):1904-1913.

<sup>134</sup> Makinen KK, Hujoel PP, Bennett CA, Isotupa KP, Makinen PL, Allen P. Polyol chewing gums and caries rates in primary dentition: a 24-month cohort study. *Caries Res.* 1996;30(6):408-417.

<sup>135</sup> Kandelman D, Gagnon G. A 24-month clinical study of the incidence and progression of dental caries in relation to consumption of chewing gum containing xylitol in school preventive programs. *J Dent Res.* 1990;69(11):1771-1775.

<sup>136</sup> Petersen PE, Razanamihaja N. Carbamide-containing polyol chewing gum and prevention of dental caries in schoolchildren in Madagascar. *Int Dent J.* 1999;49(4):226-230.

<sup>137</sup> Isokangas P, Alanen P, Tiekso J, Makinen KK. Xylitol chewing gum in caries prevention: a field study in children. *JADA.* 1988;117(2):315-320.

<sup>138</sup> Newton JT, Awojobi O, Nasseripour M, Warburton F, Di Giorgio S, Gallagher JE, Banerjee A. A systematic review and meta-analysis of the role of sugar-free chewing gum in dental caries. *JDR Clin Trans Res.* 2019.

<https://doi.org/10.1177/2380084419887178>. Published November 19, 2019.

<sup>139</sup> Scientific Report at 117.

<sup>140</sup> Fleming E, Afful J. Prevalence of total and untreated dental caries among youth: United States, 2015–2016. NCHS Data Brief, no 307. Hyattsville, MD: National Center for Health Statistics. 2018.

years and older were found to have dental caries.<sup>141</sup> New National Center for Health Statistics data<sup>142</sup> confirm the prevalence of complete tooth loss among adults aged 65 and over was almost 13 percent and for those over 75 increased to almost 18 percent. Black non-Hispanics, individuals of lower socioeconomic status, and individuals with less education bare a disproportionate share of this burden, similarly to overweight and obesity. Fluoridation of water supplies and improvements in lifestyles have helped reduce the prevalence of caries, but dental diseases increasingly have a detrimental effect on quality of life in both childhood and older age.<sup>143,144</sup>

### c. Potential Federal Impact

Because the *DGAs* provide the framework for health promotion in SNAP education, WIC nutrition education, school nutrition education, and Older Americans programs, enhancing messages about oral hygiene strengthens the existing messages about healthy diets and physical activity. Given the public health significance of dental caries and poor oral health, the final 2020-25 *Dietary Guidelines* issued by the Departments should include recommendations to educate and motivate individuals — through multiple education and care settings — to routinely brush teeth effectively with a soft brush and fluoridated toothpaste, clean between teeth, chew sugar-free gum, drink fluoridated water, and limit the frequent and constant use of fermentable carbohydrates. The oral health preventive practices work synergistically; and a practice such as chewing sugar-free gum for 20 minutes after eating or drinking does not replace brushing or flossing but may be a more readily available practice. Federal nutrition programs offer excellent opportunities to start education about the benefits of oral health preventive practices during pregnancy and extending through childhood and old age. Last year, WIC Works through the USDA Food and Nutrition Service provided a webinar on the relationship of poor oral health and infection related to heart disease and promoted the importance of starting oral health promotion with pregnant women. The home delivered and center-oriented meal programs for older adults offer education programs through state Offices on Aging and could include education on oral health preventive practices.

### 3) *Summary*

We encourage the Departments to recommend Americans across the lifespan adopt routine oral health preventive practices and include in the 2020-2025 *Dietary Guidelines for Americans* the statement:

*“Individuals of all ages should follow a daily oral hygiene routine, which includes brushing their teeth with fluoridated toothpaste, cleaning between their teeth where possible, chewing sugarfree gum for 20 minutes after meals or snacks if possible, drinking fluoridated water where available, and limiting frequent or constant use of dietary fermentable carbohydrates.”*

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<sup>141</sup>Dye BA, Thornton-Evans G, Li X, Iafolla TJ. Dental caries and tooth loss in adults in the United States, 2011–2012. NCHS Data Brief No. 197. Hyattsville, MD: National Center for Health Statistics. 2015.

<sup>142</sup>Fleming E, Afful and Griffin SO. Prevalence of Tooth Loss Among Older Adults: United States, 2015–2018. NCHS Data Brief No. 368, June 2020.

<sup>143</sup>Moynihan P, Petersen PE. Diet, nutrition and the prevention of dental diseases. *Public Health Nutrition*. 2004;7:201–226.

<sup>144</sup>Nuttall NM, Steele JG, Pine CM, White D, Pitts NB. The impact of oral health on people in the UK in 1998. *Br Dent J*. 2001;190:121-126.

## V. REVIEW OF RELEVANT SCIENCE AND THE SUBCOMMITTEES' CONCLUSIONS

### A. Added Sugars and Beverages

The Scientific Report of the Dietary Guidelines Academy Committee begins by laying out the reality of health in America: 70 percent have overweight or obesity, which drives highly prevalent diet-related chronic diseases at the same time as over 37 million people are suffering from food insecurity and a lack of access to affordable healthy food.<sup>145</sup> **The Academy suggests that from a diet perspective, sugar-sweetened beverages (SSB), alcohol, and added sugars may be significant contributors to both the crises of overweight and obesity and lack of healthy food issues.** SSBs also may be the primary contributor to dental caries in young children,<sup>146</sup> and we anticipate forthcoming research looking at lifelong beverage consumption controlling for oral hygiene and fluoride.

**Academy experts in this area reviewed chapters of the report relevant to beverages and added sugars and while they generally agreed with the work of the Committee, we seek to highlight certain areas of ambiguity. Specifically, we note some inconsistency in how food groups were treated between the chapters and inconsistency with the degree of grading some conclusion statements. It also is difficult to discern how much weight the conclusions from the data analysis work will be given in comparison to the systematic reviews from NESR, since they are not graded.** Examples of some of these inconsistencies include:

- Difficulty understanding why some conclusions (*e.g.*, SSB) received limited grades and others received moderate (*e.g.*, alcohol) grades.
- Tea and coffee are included in the Added Sugars section but not in the SSB section.<sup>147</sup>

As nutrition researchers and practitioners, the Academy finds it troubling to see such a significant lack of data throughout the entire Scientific Report — particularly in such impactful areas as SSB, beverages in general and added sugars. This lack of evidence makes it very difficult to have evidence-based recommendations that can be supported across the board. Although this is due in part to the lack of funding for nutrition research in general, it is also a result of the lack of funding specifically for translational research that can be used to inform the *Dietary Guidelines*. As discussed in Section IX, *infra*, we suggest the formation of a National Institute of Nutrition as part of the National Institutes of Health (NIH) could foster research with comparable study designs that would allow important gaps to begin to be filled.<sup>148</sup>

Specific concerns in each of the main areas are identified below for the Departments to consider prior to drafting the final *Guidelines* recommendation statements:

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<sup>145</sup> Scientific Report at 13.

<sup>146</sup> Marshall TA, Broffitt B, Eichenberger-Gilmore J, Warren JJ, Cunningham MA, Levy SM. The roles of meal, snack, and daily total food and beverage exposures on caries experience in young children. *J Public Health Dent.* 2005;65(3):166-173. doi:10.1111/j.1752-7325.2005.tb02807.x; Marshall TA, Levy SM, Broffitt B, et al. Dental caries and beverage consumption in young children. *Pediatrics.* 2003;112(3 Pt 1):e184-e191. doi:10.1542/peds.112.3.e184.

<sup>147</sup> Scientific Report at 615, 684. *See, also*, Scientific Report at 703 (“It is important to note that the analysis of typical choices does not account for beverages, including alcohol, soft drinks, or coffee and tea, which are not constituents of food groups or subgroups. Therefore, the contribution of these beverages to energy intake and added sugars is not addressed or captured in the Exercise 3.”).

<sup>148</sup> *See, e.g.*, Fleischhacker SE, et al. Strengthening national nutrition research: rationale and options for a new coordinated federal research effort and authority. *The American Journal of Clinical Nutrition.* 2020;00:1-49. <https://academic.oup.com/ajcn/article/doi/10.1093/ajcn/nqaa179/5873352>.

## 1) Milk

*Limited evidence suggests that milk intake is not associated with adiposity in children. (Grade: Limited)*

*Insufficient evidence is available to draw a conclusion about the relationship between the type of milk (i.e., milk fat content, flavor) and adiposity in children. (Grade: Grade not assignable)*

*Limited evidence suggests that higher milk intake is associated with a greater increase in height compared to lower intake in children. (Grade: Limited)*

*Limited evidence suggests that milk intake is not associated with adiposity in adults. (Grade: Limited)*

- The Academy questions the level of grading in the area of milk. Although there was only one RCT, the evidence from observational studies was relatively consistent and thus the Committee could have graded this at a higher level in a manner similar to that with which it graded the moderate alcohol statement.
- We note the lack of substantial research on or references to flavored milk and whether it should be recommended as part of recommended milk consumption patterns. The Committee found “[i]nsufficient evidence is available to draw a conclusion about the relationship between the type of milk (i.e., milk fat content, flavor) and adiposity in children,” but other reputable entities who have reviewed guidelines (e.g., NASEM<sup>149</sup>) and done narrative reviews (Healthy Eating Research: *Healthy Beverage Consumption in Early Childhood*<sup>150</sup>) recommended not including flavored milk. We encourage the Departments to clarify its recommendations and distinguish any differences from that of other reputable bodies. **In addition, given the implications for federal nutrition programs that only serve children low-fat or non-fat milk, we seek clarification from the Departments as to implementation of this conclusion.**

## 2) Alcohol

### a. Primary Comparisons (Among Those Who Currently Drink Alcohol):

*Moderate evidence indicates that higher average alcohol consumption is associated with an increased risk of all-cause mortality compared with lower average alcohol consumption among those who drink. (Grade: Moderate)*

*Moderate evidence indicates that binge drinking (consuming 5 or more drinks for men or 4 or more drinks for women during a drinking occasion) is associated with increased risk of all-cause mortality, and that more frequent binge drinking is associated with increased risk of all-cause mortality compared with less frequent or no binge drinking among those who drink. (Grade: Moderate)*

### b. Secondary comparison (between those who currently drink alcohol and those who have never consumed alcohol):

*Limited evidence suggests that low average alcohol consumption, particularly without binge drinking, is associated with a lower risk of all-cause mortality compared with never drinking alcohol. However, in light of the many scientific and public health issues associated with alcoholic beverages, any conclusions about low average consumption compared to never drinking alcohol require careful consideration. (Grade: Limited)*

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<sup>149</sup> National Academies of Sciences, Engineering, and Medicine 2020. Feeding Infants and Children from Birth to 24 Months: Summarizing Existing Guidance. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25747>.

<sup>150</sup> Healthy Eating Research. Consensus Statement: Healthy Beverage Consumption in Early Childhood: Recommendations from Key National Health and Nutrition Organizations. September 2019. <https://healthyeatingresearch.org/wp-content/uploads/2019/09/HER-HealthyBeverage-ConsensusStatement.pdf>.

- The evidence indicates that low or light consumption may have benefit while the high or heavy is associated with increased mortality.
- The second question reviewed alludes to the more nuanced conclusion above but says that due to public health concerns the subcommittee felt it was warranted to recommend against consumption. We encourage the Departments to assess the extent to which the preponderance of evidence actually supports a recommendation on this basis.

### 3) Added Sugars

*Limited evidence from prospective cohort studies that were based primarily on sugar-sweetened beverages suggests that higher consumption of added sugars in adulthood is associated with increased risk of cardiovascular disease mortality. (Grade: Limited)*

*Insufficient evidence is available to determine the relationship between added sugars consumption and risk of cardiovascular disease in children. (Grade: Grade not assignable)*

*Insufficient evidence is available to determine the relationship between added sugars intake in adulthood and risk of stroke. (Grade: Grade not assignable)*

*Insufficient evidence is available to determine the relationship between added sugars intake in adulthood and incident ischemic cardiovascular disease events. (Grade: Grade not assignable)*

*Insufficient evidence is available to determine the relationship between added sugars intake in adulthood and risk of peripheral artery disease. (Grade: Grade not assignable)*

*Insufficient evidence is available to determine the relationship between added sugars intake in adulthood and risk of heart failure. (Grade: Grade not assignable)*

- The Academy notes that there appears to be a gap in the questions' priorities as they leap from impact on nutrients to cardiovascular disease and appear to not thoroughly address obesity. It is also a significant gap that the impact of added sugars on dental caries, adiposity, and type 2 diabetes is not reflected here despite these questions being established at the outset of the *Guidelines* development.

### 4) Additional Issues

The Academy experts identified additional key gaps within relevant chapters, including:

- Water — The Scientific Report includes no specific recommendations or conclusions, given that water is so integral in a healthy diet and a healthy planet. We recognized the paucity of evidence to answer some critical questions and emphasize that it is extremely important to address this as a nutrient.
- Dental caries — related to added sugar or SSBs, has an impact on disparities due to lack of access to dentists and dental care in populations who may be at higher risk for consuming more SSBs.

### 5) Summary

**The Committee should be commended for the enormous amount of work and the excellent product they have published in the Scientific Report, although the Academy suggests it may be appropriate to reconsider or newly consider several aspects of the report.** In reviewing the evidence that informed each of the conclusion statements, it is difficult to make a clear connection back to both the data analysis results (since they are not graded) and the evidence from the NESR systematic reviews. Recognizing that the systematic reviews do have tables with the results of each section of the risk of bias tool used to measure quality of the articles included into the analysis, we are concerned there was no

overall quality rating from the risk of bias and thus the risk of bias results could not be included into the summary of findings table. This lack of risk of bias within the summary of findings table (which is to summarize each study including quality) means it is difficult to see the totality of the evidence and the summary of the quality of the evidence. **Notably, this inability to connect these dots may lead to some of the inconsistencies seen in difference in conclusion statements, including those for SSBs and alcohol.**

## **B. Birth to 24 Months; Pregnancy and Lactation**

### *1) Support for Birth to 24 and Pregnancy and Lactation Guidelines*

**The Academy is fully supportive extending the *Dietary Guidelines*' recommendations beyond its existing target demographics to include women with pregnancy and children from birth to 24 months ("B-24") as essential to improved primary prevention, including focused recommendations supporting breast-feeding.** Good nutrition throughout the first two years of life helps lay the foundation for a child's future health well into adulthood. New research in the fields of neuroscience and the early origins of adult health is shedding light on how infants' brains develop, how children and adults become susceptible to diseases, and how capacities and skills are either nourished or thwarted, beginning at least during pregnancy and continuing through the first two years of life.<sup>151 152</sup>

In addition, we strongly support research into and dietary recommendations related to the nexus between maternal diet and health of both mother and child. Recognizing families need credible, evidence-based recommendations and concrete guidelines to develop their children's good eating patterns at a young age, the Academy and the American Academy of Pediatrics (AAP) in 2011 urged the agencies' leadership to convene a joint expert task force charged with developing dietary guidelines for B-24 in advance of the 2015-2020 *Dietary Guidelines*.<sup>153</sup> The Academy's commitment to infant and early childhood dietary guidance was underscored when our Chief Science Officer Alison Steiber and her team worked with the Eunice Kennedy Shriver National Institute of Child Health and Human Development to initiate the Pre-B Project in 2014, the "first step in the development of evidence-informed practice guidelines that will address [the full range of nutritional issues beyond nutrient exposure caregivers face]" in caring for preterm infants.<sup>154</sup>

This growing body of scientific research indicates the foundations for lifelong health — including predispositions to obesity and certain chronic diseases — could be significantly determined by poor nutrition early in life that impacts not only a child's health, but also potentially that of the child's

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<sup>151</sup> See, e.g., Center on the Developing Child at Harvard University. The Foundations of Lifelong Health Are Built in Early Childhood. 2010. <https://developingchild.harvard.edu/resources/the-foundations-of-lifelong-health-are-built-in-early-childhood/> Accessed July 10, 2020.

<sup>152</sup> Mcmillen IC, Adam CL, Mühlhäusler BS. Early origins of obesity: programming the appetite regulatory system. *J Physiol (Lond)*. 2005;565(Pt 1):9-17.

<sup>153</sup> Letter to Howard K. Koh (Assistant Secretary for Health, US Department of Health and Human Services), Catherine Woteki (Under Secretary for Research, Education, and Economics, US Department of Agriculture) and Kevin Concannon (Under Secretary for Food, Nutrition, and Consumer Services, US Department of Agriculture) (written communication by S. Escott-Stump and P.M. Babjak, November 15, 2011).

<sup>154</sup> Raiten DJ Steiber AL. Hand RK Executive summary: Evaluation of the evidence to support practice guidelines for nutritional care of preterm infants—The Pre-B Project. *Am J Clin Nutr*. 2016;103:599S-605S. <https://doi.org/10.3945/ajcn.115.124222>.

offspring.<sup>155</sup> **The damaging effects caused by poor nutrition in early life could have the potential to cascade down through generations of children and lock families into a cycle of poor health, making comprehensive, actionable recommendations for infants and children essential.**

The recently issued Scientific Report — pursuant to federal law — provides the evidence-base to effectuate the Academy’s and AAP’s calls for B-24 *Guidelines*:

“Historically, the *Dietary Guidelines for Americans* focused on nutrition and food-based recommendations for health promotion and disease prevention for individuals ages 2 years and older. Over the years, however, a growing body of evidence made it increasingly clear that proper nutrition during the earliest stages of life was critical to support healthy growth and development during childhood and help promote health and prevent chronic disease through adulthood, that is, across the lifespan. ...”<sup>156</sup>

Thus, “[t]he systematic reviews included in this report are the first to assess questions that specifically examine relationships between food and beverage patterns or micronutrients during pregnancy and maternal-fetal outcomes that affect large groups of women and their progeny.”<sup>157</sup> We know “a mother’s health and nutritional status during the first 1,000 days of an infant and child’s life, beginning at conception and continuing through the second year of life, are crucial for ensuring optimal physical, social, and psychomotor growth and development and lifelong health. The intergenerational, or epigenetic, effects of intrauterine exposures highlight the potential for long-term benefits to be gained from optimizing nutrition during pregnancy.”<sup>158</sup>

## 2) *Allergenic Foods and Maternal and Infant Intake Support*

The Academy strongly supports the Committee’s new work examining the risk of food allergies and atopic allergic diseases. These findings are important and will benefit those who adopt them, and we look forward to their inclusion in the final *Guidelines*:

- “Consumption of common allergenic foods, such as eggs and cow milk, during pregnancy did not appear to be associated with an increased risk of food allergies, asthma, and related atopic disease outcomes in the child.”<sup>159</sup>
- “Strong evidence suggests that introducing peanut in the first year of life (after 4 months of age) may reduce risk of food allergy to peanuts [Grade: Strong]. This evidence is strongest for introducing peanut in infants at the highest risk (with severe atopic dermatitis and/or egg allergy) to prevent peanut allergy, but is also applicable to infants at lower risk.”<sup>160</sup>

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<sup>155</sup> Borja JB. The impact of early nutrition on health: key findings from the Cebu Longitudinal Health and Nutrition Survey (CLHNS). *Malays J Nutr.* 2013;19(1):1-8.

<sup>156</sup> Scientific Report at 27. *See also, Id.* at 197 (“Although the influence of maternal dietary intake during pregnancy on birth weight has been considered in prior editions of the *Dietary Guidelines for Americans*, this is the first time that beverage intakes during pregnancy have been explicitly examined in relation to an infant outcome (birth weight standardized for gestational age and sex.”); (235/835) (“The systematic reviews included in this report are the first to assess questions that specifically examine relationships between food and beverage patterns or micronutrients during pregnancy and maternal-fetal outcomes that affect large groups of women and their progeny.”).

<sup>157</sup> *Id.* at 235.

<sup>158</sup> *Id.* at 193 (internal citations omitted).

<sup>159</sup> *Id.* at 16.

<sup>160</sup> *Id.* at 394.

- “Moderate evidence suggests that introducing egg in the first year of life (after 4 months of age) may reduce risk of food allergy to egg [Grade: Moderate]. Limited evidence suggests that there is no relationship between the age of introduction to egg and risk of atopic dermatitis/eczema and asthma [Grade: Limited].”<sup>161</sup>

### 3) *Issues of Concern*

#### a. Clarifying Conflicting and Conflating Language

The Academy strongly recommends the Departments revise and clarify certain provisions of the Scientific Report in the final *Guidelines* to ensure they are consistent with the evidence the Committee reviewed and the report’s conclusions. One example is the report’s conflation of evidence related to consumption of healthy dietary patterns *before* pregnancy and consumption *during* pregnancy.

The Scientific Report states, “Evidence suggests that consuming foods within healthy dietary patterns before and/or during pregnancy may modestly reduce the risk of gestational diabetes, hypertensive disorders of pregnancy, and preterm birth.”<sup>162</sup> However, a review of the Scientific Report’s conclusions reveals conflicts irreconcilable with this current report language: “Evidence is insufficient to estimate the association between dietary patterns during pregnancy and risk of gestational diabetes mellitus. Grade: Grade Not Assignable.”<sup>163</sup>

**In addition to inaccurately suggesting an association between gestational diabetes and dietary patterns during pregnancy, the above statement also ignores the conflicting conclusions for minority women and those of lower socioeconomic statuses:** “Evidence is insufficient to estimate the association between dietary patterns before and during pregnancy and risk of hypertensive disorders of pregnancy in minority women and those of lower socioeconomic status. Grade: Grade Not Assignable”<sup>164</sup> We also note a lack of clarity in some instances as to the nature of the diet that helped or harmed. **Given the importance of the *Guidelines* and their influence in setting federal policy, it is critical that the Departments tie each statement in the final *Guidelines* back to available evidence. Moreover, the Departments should clearly acknowledge this limitation in the final *Guidelines* and emphasize culturally appropriate guidance relevant for America’s diverse general public.**

Similarly, the Scientific Report’s findings on folic acid supplementation is unclear as to whether it includes supplementation during preconception or pregnancy or both. We suggest additional examination of supplementation related to adult and children's health.

#### b. Definition of Breast-feeding: “Ever vs. Never”

The Academy recognizes the difficulty in arriving at a definition of breast-feeding that facilitates review of the full body of literature and enables the Committee to arrive at viable conclusions. Many of our member experts expressed concerns about the impact of the Committee's categorization of “infants into two groups: those with reports of human milk and no infant formula, and those with any reported intake

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<sup>161</sup> *Id.* at 394.

<sup>162</sup> *Id.* at 16.

<sup>163</sup> *Id.* at 205.

<sup>164</sup> *Id.* at 206. *See also*, (236/835) (“Although the associations between certain dietary patterns and reduced risk of hypertensive disorders were consistent, the strength of the evidence was judged to be limited and only applicable to healthy White women with access to health care. Evidence was insufficient for women of other races and ethnicities and those of lower SES. In addition, issues with methodology, measurement and limited representation of diverse groups of women hampered the ability to draw robust generalizable conclusions.”).

of infant formula”<sup>165</sup> (*i.e.*, “ever vs. never”), and we appreciate that the Committee itself considered “the limitations of this strategy.”<sup>166</sup> For example,

“A large degree of overlap may exist between current literature examining the duration of exclusive human milk feeding (which may terminate with complementary feeding) and the timing of the introduction of complementary foods and beverages (which may immediately follow a period of exclusive human milk feeding). Yet, the degree of overlap is difficult to ascertain; infant feeding research does not often specify whether exclusive human milk feeding is followed by complementary feeding or formula feeding or both, and complementary feeding research does not often specify whether complementary foods and beverages are introduced to infants fed human milk exclusively or fed infant formula in some amount. It would be beneficial for future researchers to be mindful about this potential ambiguity when designing and conducting research about the duration of exclusive human milk feeding or the timing of the introduction of complementary foods and beverages strive to help clarify any unique contributions of each of the two feeding practices on atopic disease and other outcomes.”<sup>167</sup>

Academy members report the separation of ‘ever versus never’ of the two groups for infant feeding is not substantial enough. It fails to consider how breastmilk is given (*i.e.*, breast-fed; bottle-fed; mixed feeding; and to what extent). These delineations need to be considered and teased out appropriately by defining and segmenting in research to validate or refute other research claims.

The definition of breast-feeding is thus critical, and we know the literature is often lacking in specificity and there is a wide range of definitions used. On the one hand, if the simplistic definition of ‘ever breast-fed’ includes everything on the spectrum of human milk consumption from at least once (notably, regardless whether the infant is fed from the breast or a bottle) to exclusive consumption of human milk fed from the breast indefinitely, we should be pleased with some of the outcomes with higher grades of evidence. On the other hand, there is significant value in more distinctive definitions related to exclusivity and duration compared to never consuming human milk. **We strongly encourage the Departments and future Advisory Committees to identify and specify existing weaknesses and complexity in the literature regarding the definition of breast-feeding.**

Additional imitations to consider include the fact that a categorization of ‘ever versus never’ conflates infants consuming 90 percent human milk with those consuming 90 percent infant formula, which can impact health outcomes. We emphasize that due to the complexity with mixed-feeds studies, more research and evidence is needed in this area. More research is also needed examining the form (*i.e.*, partially or extensively hydrolyzed) of infant formula. In addition, we note only about 25 percent of women exclusively breast-feed at six months (CDC),<sup>168</sup> and while the Academy strongly encourages breast-feeding, we recognize the need to meet people where they are and provide associated guidance on the safety and use of infant formula (*e.g.*, buy from reputable locations, follow manufacturer mixing instructions, and reject the use of homemade formula).

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<sup>165</sup> *Id.* at 99.

<sup>166</sup> *Id.* at 99.

<sup>167</sup> *Id.* at 357-358.

<sup>168</sup> Breastfeeding Report Card. Centers for Disease Control and Prevention. 2018. <https://www.cdc.gov/breastfeeding/data/reportcard.htm>. Accessed August 13, 2020.

### c. Research Methodologies

**Studies with small sample sizes can be a limitation and the implications must be clearly defined and discussed.** It is adequately described that data from What We Eat in America (WWEIA) NHANES 2007-2016 were combined for examining intakes of infants and toddlers ages six to 12 and 12 to 24 months.<sup>169</sup> However, we note the annual contribution to the relatively small data set (N < 1,000 infants) per each age group is not provided; including, by year, the number of infants and toddlers would allow the reader to better assess how many subjects had data from more recent years. Throughout the description of the data, the Committee noted observed differences, although significance testing was not done. Without statistical assessment, the comparisons between the groups can be considered a bias and are potentially misleading.

We note NHANES 2015-2016 data were used for infants and toddlers from B-24,<sup>170</sup> and we encourage the Departments to include the N in which this data is based. Within the 2011-2012 NHANES data set, there were 584 infants from age B-24 months in which weight-for-length was included;<sup>171</sup> we seek clarification from the Departments why the Committee did not use other data sources, such as CDC data or other nationally representative data sources, with large N. We also seek the N for the National Survey of Children's Health used for percentages of infants offered CFB at various age groups,<sup>172</sup> as it is not included within Figure 4 of the Data Supplement files for Infants and Toddlers and no reference is identified. Within the 'Supplementary Data Analysis: Infants and Toddlers: Food Group and Nutrient Intakes,' the total N for ages six to 11 months is 988, with the majority (N=847) in the formula group. We encourage the Departments to make clear these recommendations appear to be based on a limited number of 154 breast-fed infants and lack the necessary racial and ethnic diversity to generalize across the general public.<sup>173</sup> Moreover, it is necessary to indicate how many of these infants have more recent dietary data (*e.g.*, 2015-2016), compared to data that are more than 5 years old.

The Scientific Report does not include a rationale for using the 1,000 kcal pattern established in the 2015-2020 *Dietary Guidelines for Americans* for modeling CFB for ages less than 24 months and we encourage the Departments to clarify the basis for this decision.

Within the Food items column on Table D7.2,<sup>174</sup> it would be more relevant to target audiences to include food sources from the NHANES food database that children six to 24 months consumed with any frequency, rather than top sources of these food items that are infrequently offered (*e.g.*, octopus, squid, snails, liver, anchovies). It is also unclear why only four nutrients are included in Table D7.2 and why fortified foods are not included. As caregivers are encouraged to use this table to meet nutrient needs for subsequent CFB tables (D7.5- D7.11), it would be important to include additional nutrients, such as vitamin E.

The Academy also questions the rationale for using the European Food Safety Authority recommendation of 450 mg of calcium, rather than U.S. recommendations and encourages the Departments to clarify how EFSA use is consistent with the Committee's other methodologies.

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<sup>169</sup> Scientific Report at 99.

<sup>170</sup> *Id.* at 107, citing Fryar CD, Carroll MD, Ogden CL. Prevalence of low weight-for-recumbent length, recumbent length-for-age, and weight-for-age among infants and toddlers from birth to 24 months of age: United States, 1999–2000 through 2015–2016. National Center for Health Statistics. September 2018.

<sup>171</sup> Ogden, et al. Prevalence of Childhood and Adult Obesity in the United States, 2011-2012. *JAMA*. 2014;311(8):806-814.

<sup>172</sup> Scientific Report at 120.

<sup>173</sup> *Id.* at 121.

<sup>174</sup> *Id.* at 440.

#### d. Complementary Feeding

**As the Departments finalize the *Guidelines*, it is important to ensure they represent an accurate and consistent reading of the scientific conclusions. Throughout the Scientific Report, there appears to be mixed messaging regarding the appropriate age to introduce complementary foods.** In an overarching recommendation, the Scientific Report states “the Committee supports the following recommendation[to e]ncourage exclusive breastfeeding, ideally for the first 6 months of life, with continued breastfeeding through the first year of life or longer as desired by the mother and infant.”<sup>175</sup> However, the Scientific Report’s conclusions repeatedly reference infants as young as four months of age and above:

- “Moderate evidence suggests that introducing complementary foods and beverages at 4 months of age compared to 6 months of age offers no long-term advantages or disadvantages in terms of iron status among healthy, full-term infants who are breastfed, fed iron-fortified formula, or both. Grade: Moderate.”<sup>176</sup>
- “Strong evidence suggests that introducing peanut in the first year of life (after 4 months of age) may reduce risk of food allergy to peanuts.”<sup>177</sup>
- “Moderate evidence suggests that introducing egg in the first year of life (after 4 months of age) may reduce risk of food allergy to egg.”<sup>178</sup>
- “Limited evidence suggests that introducing fish in the first year of life (after 4 months of age) may reduce risk of atopic dermatitis/eczema.”<sup>179</sup>
- “Moderate evidence suggests that first introduction of any complementary food or beverage (CFB) between 4-5 months compared to approximately 6 months of age is not associated with weight status, body composition, body circumferences, weight, or length among generally healthy, full-term infants.”<sup>180</sup>
- “Limited evidence suggests that introducing complementary foods or beverages before age 4 months of age may be associated with higher odds of overweight or obesity.”<sup>181</sup>
- “Moderate evidence suggests that introducing complementary foods and beverages at 4 months of age compared to 6 months of age offers no long-term advantages or disadvantages in terms of iron status among healthy, full-term infants who are breastfed, fed iron-fortified formula, or both.”<sup>182</sup>
- “The Committee concluded that introducing CFB between ages 4 and 5 months, compared with age 6 months, offers no long-term advantages or disadvantages in terms of weight status, body composition, body circumferences, weight, or length of healthy, full-term infants. This conclusion was considered applicable to the U.S. population but was graded as “Moderate”

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<sup>175</sup> *Id.* at 370.

<sup>176</sup> *Id.* at 389.

<sup>177</sup> *Id.* at 406.

<sup>178</sup> *Ibid.*

<sup>179</sup> *Ibid.*

<sup>180</sup> *Id.* at 384.

<sup>181</sup> *Ibid.*

<sup>182</sup> *Id.* at 389.

because the evidence included only 2 RCTs and the observational studies were limited by lack of controlling for all of the key potential confounders and other methodological issues.”<sup>183</sup>

- “Several of these guidelines indicate that complementary foods should be introduced at ‘about’ or ‘around’ 6 months, although some recommend an age range of 4 to 6 months.”<sup>184</sup>

The Academy believes greater clarity is essential for health care providers, such as RDNs and NDTRs, and the general public we serve. We recognize there is some variability within AAP guidelines as to whether complementary foods should begin at six months or between four and six months of age.<sup>185</sup> As the factors are variable (*e.g.*, identification of the developmental signs of readiness to start solids, such as the tongue-thrust movement; gut readiness; or immunity of the child), the *Guidelines* should be explicit given the safety implications to begin after 4 months if developmentally ready. We suggest that as the scientific evidence evaluated did not show strong evidence for this question, it may be appropriate to recommend that the advice for when to start solid foods continue to follow current government guidelines (such as that included in WIC) or other reputable sources of information. Guidance on infant and young child feeding should also be specifically tailored to the infant’s health care professionals, such as RDNs or pediatricians. In addition, this guidance should be clear and transparent if predicated upon industry involvement or funding of underlying research.

**In addition, we encourage the final *Guidelines* to emphasize real, whole foods for complementary feeding when possible.** We suggest greater emphasis of the Committee’s finding that no added oils or fats are needed in the youngest age infant diets,<sup>186</sup> as this will likely be new to many readers. The Departments should also include specific recommendations that families communicate with their child’s health care provider with any concerns about growth and development, including advice on specific feeding strategies to address nutrient gaps and unique requirements.

The Scientific Report states, “The complementary feeding period typically continues to age 24 months as the child transitions fully to family foods,” but given the current nature and intake of so-called “family foods,” this is not universally desirable. We also note breast-feeding usually meets DHA needs of term infants (CNM DPG00 mg/d), but may not meet higher requirements of very low birthweight infants (VLBWI) who may require supplementation.

Supplements or fortified products are encouraged by the Committee, including fortified dairy products to supply vitamin D and fortified infant cereals to supply zinc and iron, which is appropriate for both breast-fed and mixed-fed infants. Similarly, we note the recommendation of iron-fortified formula as the option for infants who are not breast-fed or who are weaned from the breast before 12 months of age. Accordingly, we suggest the Departments adopt a *similar* recognition of the ability to meet nutrient goals of children aged 12 to 14 months with a vegan diet with the use of particular supplements and fortified products.<sup>187</sup> We encourage the Departments to refine the relevant conclusion statement, because, as currently presented, it could be potentially harmful to parents who may be reluctant to give iron supplements when prescribed or be reluctant to start iron-rich foods as first foods due to fear of slowed growth.

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<sup>183</sup> *Id.* at 399.

<sup>184</sup> *Id.* at 408 (internal citations omitted).

<sup>185</sup> American Academy of Pediatrics Recommendations for Complementary Feeding. Ronald E. Kleinman. *Pediatrics* Nov 2000, 106 (Supplement 4) 1274

<sup>186</sup> Scientific Report at 446, 466.

<sup>187</sup> *Id.* at 467.

We also note “[t]he Committee was not able to establish a recommended food pattern for infants ages 6 to 12 months but was able to develop potential combinations of CFB that come close to meeting all nutrient needs,” and we encourage the Departments to clarify and provide recommendations for the “potential combinations” the Committee identified. In addition, choline, vitamin D, and vitamin E and do not appear to be identified as nutrients of concern in the methods section (*e.g.*, from NASEM, WIC report),<sup>188</sup> and we encourage the Departments to include a reference, as they are assumed to be inadequate in above nutrients within ages six to 12 months.<sup>189</sup> Continued breast-feeding after 12 months may require parents to pay careful attention to offering foods rich in calcium, iron, and vitamins E and D or consider supplementation in cases of food intolerance, allergy, or enhanced nutrient needs related to health conditions and status.

Finally, it is important to note that food pattern modeling was apparently achieved for those from aged one year and onward, but approximate amounts of food groups and subgroups is provided for infants ages six to 12 months. We encourage the Departments to clarify the extent to which this differentiation impacts either the Committee’s conclusions or the recommendations that will be included in the final *Guidelines*.

e. Inclusion of Guidance on ‘How to Feed’

**The Scientific Report notes that, “[f]or the birth to age 24 months population, it is especially important to examine the ‘how’ of feeding behaviors, not just the ‘what’ aspect.”<sup>190</sup> The Academy could not agree more and we hope guidance on this subject is included in the *Guidelines* as soon as practicable.** As the Committee noted, “Parents, guardians and caregivers exert the primary influence on dietary intake for the first few years of life. Dietary intakes of children resemble those of their parents, suggesting the importance of understanding more about this feeding environment to improve dietary intake during childhood.”<sup>191</sup> We encourage the Departments to include in the final *Guidelines* factors in the feeding environment that are important using as a resource the recent National Academies report on *Feeding Infants and Children from Birth to 24 Months*.<sup>192</sup>

**The Academy strongly suggests the Departments develop additional recommendations for responsive feeding, duration, frequency, amount and general guidance regarding breast-feeding and formula feeding.** We encourage the Departments to look at existing guidance from the CDC, FDA, and USDA to align since there was limited or insufficient evidence or an inability to review on a large number of the scientific questions tasked to the Committee. The Academy strongly supports and encourages breast-feeding, but recognizes that with the majority of families introducing infant formula at some point in the first year,<sup>193</sup> federal *Guidelines* must provide balanced information (both breast and formula) applicable and relevant to these families. We also encourage the Departments to consider including strategies for the role modeling of eating healthy foods to encourage children to eat healthfully.

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<sup>188</sup> *Id.* at 159.

<sup>189</sup> *Id.* at 194.

<sup>190</sup> *Id.* at 40.

<sup>191</sup> *Ibid.*

<sup>192</sup> National Academies of Sciences, Engineering and Medicine. *Feeding Infants and Children from Birth to 24 Months: Summarizing Existing Guidance*. Washington, DC: The National Academies Press. 2020. <https://doi.org/10.17226/25747>.

<sup>193</sup> Results: Breastfeeding and Infant Feeding Practices: Infant Feeding Practices Study II and Its Year Six Follow-Up. Centers for Disease Control and Prevention. December 28, 2019. <https://www.cdc.gov/breastfeeding/data/ifps/results.htm>. Accessed August 10, 2020.

f. Diverse Populations

**The Academy underscores the Committee’s recognition that many of the studies relied upon in the Scientific Report only or primarily included white women with access to health care as study participants.<sup>194</sup> These limitations represent a critical impediment to the generalizability of evidence and recommendations. Unrepresented and unstudied demographics represent a majority of the population and the lack of relevant studies examining them raises questions as to their applicability to the general public.**

We strongly encourage the Departments to initiate and fund a call to action for more research questions and study designs dedicated to accounting for underrepresented groups that also examine different family structures. **The lack of evidence relevant to minority and low SES populations remains a weakness in the literature and needs to be elevated as a priority going forward.** Specifically, we urge the Departments to specifically strive towards consistency and transparency in all future conclusion statements related to source of evidence and population in studies. Related to health disparities, we urge the Departments to undertake, fund, or advocate for more research on minority groups and birth outcomes, such as the effects of vitamin D supplementation on birth outcomes in Black mothers.<sup>195</sup>

g. Dental Caries

Forty-two percent “of children 2 to 11 have had dental caries in their primary teeth... 23 [percent] of children 2 to 11 have untreated dental caries,”<sup>196</sup> and “[t]he overall prevalence of dental caries among adults ages 20 to 64 years was 89.9 percent and 96.2 percent among adults ages 65 years and older, respectively.”<sup>197</sup> With this public health problem, the 2020-2025 *Dietary Guidelines for Americans* should include the recommendation that individuals at any age should practice routine oral health preventive practices, even if they cannot get to a dentist regularly, if at all. With tailored and appropriate education, individuals can adopt the preventive practices that are universally available and affordable for most individuals.

The Academy notes a variety of recommendations related to oral health for to the B-24 population<sup>198</sup> and encourage the final *Guidelines* to include recommendations for education and processes for preventative measures against dental caries for breast-fed infants when the first teeth erupt at age four to six months and throughout the first year of life. We also encourage the Departments to encourage evidence-based preventative measures in this population and information on the importance of parents’ oral health to reduce dental caries in infants.

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<sup>194</sup> Scientific Report at 206 (“Generalizability of the studies is limited to healthy White women who have access to health care. Women of other races and ethnicities and those of lower socioeconomic status are underrepresented in this body of evidence. A major reason for grading this evidence as ‘limited’ was the lack of adequately powered randomized controlled trials, few cohorts contributing to the observational studies, issues with risk of bias including self-reported exposure and outcome, and limited generalizability.”).

<sup>195</sup> See, e.g., Bodnar LM, Simhan HN. Vitamin D may be a link to black-white disparities in adverse birth outcomes. *Obstet Gynecol Surv.* 2010;65(4):273-284. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222336/>. doi:10.1097/OGX.0b013e3181dbc55b

<sup>196</sup> Dental Caries (Tooth Decay) in Children Age 2 to 11. National Institute of Dental and Craniofacial Research. July 2018. <https://www.nidcr.nih.gov/research/data-statistics/dental-caries/children>. Accessed August 10, 2020.

<sup>197</sup> Scientific Report at 118.

<sup>198</sup> Intermountain Healthcare. A Guide to Breastfeeding Living and Learning Together. Page 21. <https://intermountainhealthcare.org/ckr-ext/Dcmnt?ncid=51062832>.

#### 4) Summary

The Academy congratulates the Departments and the Committee for its work to develop the scientific basis for B-24 dietary guidelines for the first time and recognizes the work of Dr. Stoodly and her team in developing the important and substantial systematic review for this population that underpins the Committee's recommendations. When finalized in the 2020-2025 *Guidelines*, recommendations for the B-24 population will offer significant opportunities for providing health care practitioners and the general public with the knowledge and strategies necessary to establish and commit to healthy dietary patterns at the earliest stages of the lifespan.

### C. Dietary Patterns

#### 1) Importance of Dietary Patterns

The Academy generally supports the Committee's food-based recommendations and its focus on meal patterns. Thus, we encourage HHS and USDA to adopt these recommendations for healthy eating in the 2020-2025 *Dietary Guidelines for Americans*. Below, we raise specific concerns related to some of the Committee's conclusions on dietary patterns. Dietary patterns are a relatively simple way to deliver consumer-friendly guidance by utilizing existing knowledge of health and nutrition. As the Committee's recommendations are translated into real dietary guidance, individuals must be able to understand the types and amounts of foods they should consume as the basis for lifelong health.

We appreciate the clarity of the Committee's definition of dietary patterns "as the quantities, proportions, variety, or combination of different foods, drinks, and nutrients in diets, and the frequency with which they are habitually consumed"<sup>199</sup> and encourage consistency in definitions when the Departments finalize the *Guidelines*. We encourage the Departments to better clarify definitions for "lean meat," "processed meat," and "appropriate dairy." It also is important to reiterate definitional issues and associated research limitations identified by the Committee that the Departments should be aware of as they utilize specific terminology in the final *Guidelines*. Specifically:

"In identifying the dietary components, the Committee used the terminology in the papers evaluated and **a limitation is that terms such as lean meat, red meat, processed meat were not always defined clearly or differentiated from each other.** This type of specification is important for future work on dietary patterns."<sup>200</sup>

The focus on dietary patterns is particularly important given their connection to the current health challenges facing most Americans. The Committee undertook an important review of dietary patterns research for this iteration of the *Guidelines*, noting "[e]vidence on the association between dietary patterns and reduced risk of diet-related chronic diseases has expanded substantially since the 2015 Committee's review of this topic."<sup>201</sup> However, the Academy believes this assertion is specifically *not*

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<sup>199</sup> Scientific Report at 475, citing US Department of Agriculture, Center for Nutrition Policy and Promotion, Nutrition Evidence Library, Dietary Patterns Technical Expert Collaborative. A Series of Systematic Reviews on the Relationship Between Dietary Patterns and Health Outcomes. <https://nesr.usda.gov/sites/default/files/2019-06/DietaryPatternsReport-FullFinal2.pdf>. Published 2014. Accessed May 12, 2020.

<sup>200</sup> Scientific Report at 511 (emphasis added).

<sup>201</sup> Scientific Report at 36, citing Dietary Guidelines Advisory Committee. Scientific Report of the 2015 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture. US Department of Agriculture, Agricultural Research Service. <https://health.gov/ourwork/food-nutrition/2015-2020-dietary-guidelines/advisory-report>. Published 2015. Accessed April 30, 2020.

reflective of the paucity of new evidence related to children. We strongly agree with the Committee’s finding that:

“Excess adiposity is driving an increase in other chronic diseases considered by the 2020 Committee. ***To address this public health epidemic, reducing the incidence and prevalence of overweight and obesity is critical at every stage of life to preserve ideal health.*** Dietary patterns that focus on nutrient-dense foods to prevent excessive weight gain starting in pregnancy, continuing through infancy and childhood, adolescence and adulthood are of high public health relevance.”<sup>202</sup>

The Departments should ensure the final *Guidelines* recognize the imperative need to address America’s obesity epidemic by offering actionable, evidence-based strategies for adopting dietary patterns to prevent obesity and, in addition, provide clarity for the majority of Americans with overweight or obesity seeking to reach or maintain a healthy weight. Specifically, the *Guidelines* would be enhanced by providing evidence-based recommendations of specific food examples to emphasize and de-emphasize.

## 2) *Selecting or Transitioning to Healthier Dietary Patterns*

The Academy reiterates the significance of the Scientific Report’s new focus on strategies for improving dietary patterns as individuals transition across stages of the lifespan.<sup>203</sup> We agree with the Committee that:

One of the most important steps many Americans can take to achieve a dietary pattern associated with health and lowered risk of chronic diseases is to identify the foods that provide energy with little or no recommended nutrients or fiber in their current eating pattern, reduce their intake of these items, and shift their food choices to more healthful foods and beverages to meet energy goals. Such an approach enables individuals to focus on ***strategies to improve their dietary pattern that are most relevant at their life stage and can be carried forward to the next stage.***<sup>204</sup>

In attempting to clarify what is meant by a healthy dietary pattern, the Scientific Report concluded that:

“Across several types of experimentally defined dietary patterns and types of studies, the Committee found strong evidence that, in adults, a core dietary pattern characterized as higher in vegetables, fruits, nuts, legumes, whole grains, lean meats and seafood, appropriate dairy foods, and unsaturated vegetable oils, while being lower in red and processed meats, saturated fatty acids and cholesterol, and beverages and foods with added sugars is associated with reduced risk of all-causes of mortality.”<sup>205</sup>

Although we generally recognize the benefits the specified dietary patterns, we have associated concerns (detailed below) with making inferences about the contributions individual food groups make to the

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<sup>202</sup> Scientific Report at 515 (emphasis added).

<sup>203</sup> See, Section III(C)(2), *supra*.

<sup>204</sup> Scientific Report at 39 (emphasis added).

<sup>205</sup> *Id.* at 36.

overall effect observed for a dietary pattern. Again, we seek specific clarification regarding the unfamiliar term “appropriate dairy foods”<sup>206</sup> used by the Committee.

### 3) *Cultural and Regional Variations*

The Academy strongly supports final *Guidelines* that are culturally competent and relevant to most Americans by allowing a variety of appropriate dietary intakes consistent with personal, cultural, and religious preferences. We agree with the Committee “that a powerful aspect of using a dietary patterns approach is that it enables multiple adaptations to fit cultural, personal, and individual needs and preferences in food choices.”<sup>207</sup> As the Departments finalize the *Guidelines*, we believe it is essential to recognize that although “[a] distinct advantage of these structured patterns is the replication and comparability of study findings, ... these patterns may not represent all cultural or regional variations of dietary intakes.”<sup>208</sup>

The diversity of our nation is one of its strongest assets and the *Guidelines* should reflect the fact there is no ‘one-size-fits-all’ approach to help all Americans adopt healthy dietary patterns, particularly when the available research is often limited to white, upper middle-class individuals with access to health care<sup>209</sup> and systematic reviews failed to be adjusted for important “potential confounders such as race/ethnicity [and] socioeconomic status.”<sup>210 211</sup>.

We strongly agree with the Committee that “[t]o both encourage and facilitate a healthy diet, the focus needs to be not only on what Americans choose to eat, but also on the social, economic, and environmental contexts that determine dietary patterns. These contexts also drive dietary, and consequently, health disparities that exist in the United States.”<sup>212</sup>

**A particularly important context for the Departments to focus on in the final *Guidelines* is Americans’ increasing interest in and commitment to plant-based diets, such as the Healthy Vegetarian Food Pattern reviewed positively by the Committee.**<sup>213</sup> We encourage the Departments to emphasize that the three currently reviewed USDA food patterns all emphasize plant-based food as well as limited intake of added sugars, solid fats, and sodium. Relatedly, **we recommend that beans and legumes should be emphasized in the protein foods group for *all* healthy food patterns, not only for vegetarians.**

We express concern with the unfortunate fact that the Healthy Vegetarian Food Pattern was informed by outdated “reported dietary intakes of self-identified vegetarians using NHANES 2007-2010.”<sup>214</sup> Product

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<sup>206</sup> *Id.* at 33.

<sup>207</sup> *Id.* at 25.

<sup>208</sup> *Id.* at 476.

<sup>209</sup> Scientific Report at 206. *See also*, Scientific Report at 236 (“Although the associations between certain dietary patterns and reduced risk of hypertensive disorders were consistent, the strength of the evidence was judged to be limited and only applicable to healthy White women with access to health care. Evidence was insufficient for women of other races and ethnicities and those of lower SES. In addition, issues with methodology, measurement and limited representation of diverse groups of women hampered the ability to draw robust generalizable conclusions.”).

<sup>210</sup> Transcript of March 12, 2020 Afternoon Meeting of Dietary Guidelines Advisory Committee at 175; Boushey. Available at <https://www.dietaryguidelines.gov/sites/default/files/2020-06/2020DGACMtg5TranscriptDay1FINAL.pdf>.

<sup>211</sup> *See also*, Scientific Report at 232 (“The study populations did not fully represent the racial/ethnic or socioeconomic diversity of the U.S. population.”).

<sup>212</sup> *Id.* at 182.

<sup>213</sup> *Id.* at 43-45.

<sup>214</sup> *Id.* at 454.

availability and eating habits have changed significantly since 2007, so these dietary intakes are not necessarily reflective of what vegetarians are eating more than a decade later.

Similarly, noting the Committee’s recognition of the “growing interest in low-carbohydrate diets”<sup>215</sup> and “the high level of interest in low-carbohydrate diets relative to a variety of health outcomes,”<sup>216</sup> the Academy also encourages the Departments to consider providing guidance to Americans consuming common (but not necessarily recommended) diets that are not part of the selected dietary patterns, such as a lower carbohydrate diet, to assist in making healthier choices within these popular diet regimens.

#### 4) *Contributions to and Substitutions within Dietary Patterns*

The Academy notes the difficulty in making inferences about the contributions individual food groups make to the overall effect observed for a dietary pattern, and encourage use of an analytical approach to compare the contributions of these food group components to either overall scores or to the predictive performance of individual food groups.<sup>217</sup> These analyses could help determine whether any individual food group was correctly identified as positively or negatively contributing to the pattern score and disease risk. As a result, the possibility remains that individual food groups have a diminished or even opposite effect of what is expected, an effect that could be masked by other components of the diet pattern assessment techniques that are strongly performing. **The final *Guidelines* must address the concerns of substitution in relation to the removal of foods or beverages to assess the cumulative impact of dietary behavior change on dietary and nutrient intakes.**

We agree “Americans need to make shifts in their diets that do not add calories but make substitutions with nutrient-dense foods or beverages with lower contributions to energy.”<sup>218</sup> The Academy notes the Scientific Report’s conclusion “[w]hen nutrient-dense foods account for a low proportion of the total energy intake, it follows that nutrient-poor but energy-rich foods, such as refined grains and foods and beverages with added sugars and saturated fats, contribute a higher proportion of energy intake, thereby contributing to a higher risk of overweight and obesity and a range of related chronic diseases”<sup>219</sup> discussed further in Section V(D), *infra*. Analysis of current dietary patterns indicate food subcategories typically consumed have suboptimal nutrient density compared to other potential options:

- “Among older children and adolescents, the food subcategories that provide the majority of foods, energy, and nutrients include burgers and sandwiches, sweetened beverages, starchy vegetables, rice and pasta and grain-based dishes, chips and crackers and savory snacks, desserts and sweet snacks, poultry, meat, sweetened coffee and tea, and pizza (CAT\_DS). Food subcategories that are notably low compared to recommendations include seafood, fruit, vegetables (particularly red and orange and dark green varieties), whole grains, legumes, and dairy.”<sup>220</sup>
- “The food subcategories that provide the majority of food, energy, and nutrients to the diets of adults include burgers and sandwiches, sweetened beverages, yeast breads and tortillas, meat, poultry, sweetened coffee and tea, rice and pasta and grain-based dishes, and snacks and sweets

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<sup>215</sup> *Id.* at 5.

<sup>216</sup> *Id.* at 516.

<sup>217</sup> Nutrition Evidence Library. A Series of Systematic Reviews on the Relationship Between Dietary Patterns and Health Outcomes. United States Department of Agriculture. 2014. Accessed April 28, 2015. *and* Nutrition Evidence Library. 2015 DGAC Dietary Patterns NEL Systematic Reviews. United States Department of Agriculture. 2015. Accessed April 28, 2015.

<sup>218</sup> Scientific Report at 180.

<sup>219</sup> *Id.* at 758.

<sup>220</sup> *Id.* at 173.

(CAT\_DS). Among older adults, breakfast cereals and bars and meat and poultry and seafood mixed dishes also are significant contributors to energy and nutrient intakes. Food subcategories that are consumed in particularly low quantities include fruits, vegetables, dairy, whole grains, and legumes.”<sup>221</sup>

Thus, it is critical for the *Guidelines* to distinguish between healthy food patterns that include nutrient-dense foods, such as milk<sup>222</sup> or meat, “that are lean or low in solid fats and do not have added solid fats, sugars, starches, or sodium” and highly-processed foods or foods with added sugars or sodium or are fried or otherwise prepared in a manner that adds significant saturated fats. As described in the Scientific Report, “The most nutrient-dense forms of foods are those *prepared* with the lowest amounts of sodium, saturated fat, and added sugars.”<sup>223</sup> **Substituting foods prepared with saturated fats with foods polyunsaturated fat is an important strategy for lowering risk of cardiovascular disease.**

Recognizing associated benefits, we note there are complications arising from the Committee’s exclusion of dietary patterns based on nutrients, which might offer opportunities to help us to compare and replicate study findings even where there are variations in foods and beverages due to culture and region.

#### 5) *Synergistic Effect of Dietary Pattern Components*

The Scientific Report concludes “[t]he evolving evidence showed that components of a dietary pattern could have interactive, synergistic, and potentially cumulative relationships, such that they could predict overall health status and disease risk more fully than could individual foods or nutrients.”<sup>224</sup> To enhance this understanding, patterns should focus on the first 1,000 days looking at the health of the mother, nutrient density during pregnancy, the effects on birth and breast-feeding and through introduction of proper foods and feeding behaviors. All factors are functionally considered together, making a further examination of the impact warranted, especially to consider health during pregnancy, at birth, and throughout breast-feeding would help to appropriately guide future recommendations.

#### 6) *Discussion of Specific Conclusions in the Scientific Report*

The Academy offers comments below related to the grading of or research underpinning certain specified conclusions to scientific questions made in the Scientific Report for consideration by the Departments as they finalize the 2020-2025 *Dietary Guidelines for Americans*.

##### *Dietary Patterns for Children (Grade: Limited):*<sup>225</sup>

- More research is clearly needed regarding dietary patterns and health outcomes among children and adolescents. The Academy does note there is evidence to support the consumption of these

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<sup>221</sup> *Id.* at 174.

<sup>222</sup> *Id.* at 630.

<sup>223</sup> *Id.* at 62.

<sup>224</sup> *Id.* at 28. *See also, Id.* at 475 (“Foods and their associated nutrients are known to have synergistic effects, complicating the detection of an effect of a single food or nutrient. Identification of a dietary pattern may reveal a stronger association with a particular indicator of health and may allow for a more comprehensive and inclusive understanding of how nutrients and other bioactive compounds in our food are consumed and how patterns of consumption influence health outcomes. Thus, an emphasis on foods and beverages rather than individual nutrients has improved translation to dietary recommendations for the broad public. Ultimately, dietary patterns can be applied to the general population, allowing researchers to demonstrate the effects of diet on health outcomes and surrogate endpoints.”) (Internal citations omitted.).

<sup>225</sup> *Id.* at 491 (“Limited evidence suggests that dietary patterns consumed by children or adolescents that are lower in fruits, vegetables, whole grains, and low-fat dairy while being higher in added sugars, refined grains, fried potatoes, and processed meats are associated with higher fat-mass index and higher body mass index later in adolescence. Grade: Limited”).

individual food categories and an association with obesity. but highlights there is limited data for overall dietary patterns such as the Healthy Eating Index (HEI).<sup>226</sup>

*Dietary Patterns for Adults (2015 Dietary Guidelines Advisory Committee Grade: Moderate):*<sup>227</sup>

- Noting the Committee found “that the conclusion drawn by the 2015 Dietary Guidelines Advisory Committee *generally reflects* the current state of science,”<sup>228</sup> and there did not appear to be major changes listed for the three major healthy eating patterns (Healthy U.S.-Style Pattern; Healthy Mediterranean-Style Pattern; and Healthy Vegetarian Pattern), the Academy seeks clarification as to the nature of the process and understanding of the Committee and the Departments that underpins the phrase “generally reflects.”
- In addition, we note this Committee’s determination that the 2015 Committee’s conclusion should be carried over to the 2020-2025 Scientific Report is to be expected, given the present Committee did not change the way it examined dietary patterns. We are concerned that examining macronutrient distribution and health and comment on macronutrients within dietary patterns without examining dietary patterns based on macronutrients may appear to be cherry-picking when macronutrient content matters as compared to the actual foods and beverages contributing to those nutrients.

*Diets Based on Macronutrient Distribution for Children (Grade: Grade Not Assignable):*<sup>229</sup>

- The Academy is concerned that most studies assessed diet with methods not necessarily validated, reliable, or applicable for children. In addition, most studies in children are small with significant study heterogeneity.

*Diets Based on Macronutrient Distribution for Adults (Grade: Grade Not Assignable):*<sup>230</sup>

- The Academy notes there has been significantly more research on dietary patterns versus macronutrient distributions and the gradient between macro distributions was narrow within studies. We also recommend reexamining the inclusion criteria to include percentages that are part of the AMDR (*e.g.*, 45% of energy from carbohydrates).

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<sup>226</sup> Healthy Eating Index (HEI). Food and Nutrition Service of U.S. Department of Agriculture website.

<https://www.fns.usda.gov/resource/healthy-eating-index-hei#:~:text=The%20HEI%20uses%20a%20scoring,the%20Dietary%20Guidelines%20for%20Americans.>

<sup>227</sup> Scientific Report at 495 (“The 2020 Dietary Guidelines Advisory Committee reviewed newly published evidence using a systematic evidence scan and determined that the conclusion drawn by the 2015 Dietary Guidelines Advisory Committee *generally reflects* the current state of science. Moderate evidence indicates dietary patterns emphasizing vegetables, fruits, and whole grains; seafood and legumes; moderate in dairy products (particularly low and non-fat dairy) and alcohol; lower in meats (including red and processed meats), and low in sugar-sweetened foods and beverages, and refined grains are associated with favorable outcomes related to body weight, (including lower BMI, waist circumference, or percent body fat) or risk of obesity. Components of the dietary patterns associated with these favorable outcomes include higher intakes of unsaturated fats and lower intakes of saturated fats, cholesterol, and sodium. (2015 Dietary Guidelines Advisory Committee Grade: Moderate”). (Emphasis added.)

<sup>228</sup> *Ibid.*

<sup>229</sup> *Id.* at 492 (“No evidence is available to determine a relationship between diets based on macronutrient distribution consumed by children or adolescents and growth, size, body composition, and risk of overweight or obesity. Grade: Grade Not Assignable).

<sup>230</sup> *Ibid.* (“Insufficient evidence is available to determine the relationship between macronutrient distributions with proportions of energy falling outside of the Acceptable Macronutrient Distribution Range for at least 1 macronutrient and growth, size, body composition, and/or risk of overweight or obesity, due to methodological limitations and inconsistent results. Grade: Grade Not Assignable”).

*Diets Based on Macronutrient Distribution for Adults (Grade: Grade Not Assignable):*<sup>231</sup>

- The Academy highlights significant methodological limitations, inconsistent results, and insufficient evidence specific to this conclusion.

*Dietary Patterns and Colorectal Cancer (Grade: Moderate):*<sup>232</sup>

- We note the Scientific Report removed references to ethanol alcohol from the conclusion statement in its revision from the 2015-2020 conclusion, given “[a]lcohol was not consistently included within the patterns found to be inversely associated with colorectal cancer risk.”<sup>233</sup> We strongly encourage the Departments to review all references in the 2020-2025 Scientific Report related to alcohol and colorectal cancer to ensure the final *Guidelines* describe the association accurately and consistently.
- In addition, we suggest the need for clarification regarding the ratio of plant to animal foods and whether the evidence for a plant-based diet is insufficient.

*Dietary Patterns and Lung Cancer (Grade: Limited):*<sup>234</sup>

- The Academy has concerns regarding (1) wide confidence intervals indicating some degree of imprecision within the body of evidence; (2) several risks of bias including lack of adjustment for all key confounders; (3) assessment of dietary patterns done only once at baseline or in first few years of follow-up; and (4) a lack of accounting for possible changes to intake that may have occurred over follow-up.
- In addition, we suggest when setting dietary patterns, it is critical to distinguish saturated fats consumed as simple dairy or meats as opposed to saturated fats consumed in the most common patterns (*i.e.*, “mixed dishes containing cheese and/or meat, pizza, full fat dairy products (cheese, cream and ice cream, and whole milk), and baked goods and sweets.”<sup>235</sup>

*Dietary Patterns and Prostate Cancer (Grade: Limited):*<sup>236</sup>

- The Academy notes few available studies were reviewed and reiterates concerns and issues indicated above regarding dietary patterns and lung cancer. In addition, we encourage additional research related to positive or inverse associations with dairy and diets high in calcium.

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<sup>231</sup> *Id.* at 495 (“Insufficient evidence is available to determine the relationship between macronutrient distributions with proportions of energy falling outside of the Acceptable Macronutrient Distribution Range for at least 1 macronutrient and risk of type 2 diabetes, due to methodological limitations and inconsistent results. Grade: Grade Not Assignable”).

<sup>232</sup> *Id.* at 500 (“Moderate evidence indicates that dietary patterns higher in vegetables, fruits, legumes, whole grains, lean meats and seafood, and low-fat dairy and low in red and processed meats, saturated fat and sugar-sweetened beverages and sweets relative to other dietary patterns are associated with lower risk of colon and rectal cancer. Moderate evidence also indicates that dietary patterns that are higher in red and processed meats, French fries, potatoes, and sources of sugars (e.g., sugar-sweetened beverages, sweets and dessert foods) are associated with a greater colon and rectal cancer risk. Grade: Moderate”).

<sup>233</sup> *Id.* at 502.

<sup>234</sup> *Id.* at 500 (“Limited evidence suggests that dietary patterns containing more frequent servings of vegetables, fruits, seafood, grains and cereals, legumes and lean vs higher fat meats and lower fat or non-fat dairy products may be associated with lower risk of lung cancer, primarily among former smokers and current smokers. Grade: Limited”).

<sup>235</sup> *Id.* at 559.

<sup>236</sup> *Id.* at 500 (“Limited evidence suggests no relationship between dietary patterns and risk of prostate cancer. Grade: Limited”).

*Dietary Patterns and Sarcopenia in Older Adults (Grade: Grade Not Assignable):*<sup>237</sup> *Insufficient evidence is available to determine the relationship between dietary patterns and sarcopenia in older adults. (Grade: Grade Not Assignable)*

- Academy member experts expressed surprise at the lack of evidence identified by the Committee for this scientific question and encourages the Departments to adopt the National Academies' recommendation to use Technical Expert Panels<sup>238</sup> and timely peer review consistent with the National Academies' recommendations to help design the research protocol and inclusion and exclusion criteria in future iterations of the *Guidelines* development process to ensure inclusion of all relevant, material evidence.

*Dietary Patterns Consumed and All-Cause Mortality*<sup>239</sup>

- All-cause mortality had the strongest evidence being linked to dietary patterns with a similar pattern emerging for the other examined outcomes:

“Patterns emphasizing higher consumption of vegetables, legumes, fruits, nuts, whole grains, fish, lean meat or poultry, and unsaturated fats relative to saturated fats, either as a ratio of monounsaturated fatty acids to saturated fatty acids or monounsaturated fatty acids + polyunsaturated fatty acids to saturated fatty acids, or olive oil specifically were generally associated with decreased risk of all-cause mortality.”<sup>240</sup>

- We note the Scientific Report identified that dietary patterns deemed healthiest were similar across all health conditions and “certain characteristics of the diet were consistently identified.”<sup>241</sup> The report concludes with highlighting the consistent foods groups across all conditions:

“Common characteristics of dietary patterns associated with positive health outcomes include higher intake of vegetables, fruits, legumes, whole grains, low- or non-fat dairy, seafood, nuts, and unsaturated vegetable oils, and low consumption of red and processed meats, sugar-sweetened foods and drinks, and refined grains. Although vegetables and fruits were consistently identified in every conclusion statement across the health outcomes, whole grains were identified in all except 1 of the health outcomes examined. Low- or non-fat dairy, seafood, legumes and nuts were identified as beneficial components of the diet for many, but not all, outcomes. In addition, the Committee found that negative (detrimental) health outcomes were associated with dietary patterns characterized by higher intake of red and processed meats, sugar-sweetened foods and beverages, and refined grains. A noteworthy difference from the 2015 Committee report is that whole grains are now identified with almost the same consistency as vegetables and fruits as beneficial for the outcomes examined, suggesting that these 3

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<sup>237</sup> *Id.* at 505 (“Insufficient evidence is available to determine the relationship between dietary patterns and sarcopenia in older adults. Grade: Grade Not Assignable”).

<sup>238</sup> National Academies of Sciences, Engineering, and Medicine. 2017. *Redesigning the process for establishing the Dietary Guidelines for Americans*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24883>.

<sup>239</sup> Scientific Report at 507.

<sup>240</sup> *Id.* at 508.

<sup>241</sup> *Id.* at 510.

plant-based food groups are fundamental constituents of a healthy dietary pattern.”<sup>242</sup>

7) *Summary*

It is important to recognize the significant research gaps highlighted in the report and call on both the National Institutes of Health and the Departments to specifically address these gaps to better inform the next iteration of the *Guidelines*. (See, Section IX, *infra*, for in-depth discussion of additional specific research needs.) Specifically, the report highlights gaps in current research (*e.g.*, research with children and adolescents, macronutrient distribution, and prostate cancer). We note historically dietary patterns became a part of the *Dietary Guidelines* before there was substantial underlying research to definitively support their link to health, and we still lack long-term studies to provide material data. In addition, the Academy underscores the need for more granular information on time duration of studies and respective impact or lack; studies were included when they were at least 12 weeks long.<sup>243</sup>

Finally, we respectfully query whether the review of dietary pattern literature at present may be somewhat stagnated. We suggest future Dietary Guidelines Advisory Committees expand on the definition of dietary patterns, nutritional adequacy, and intermediate outcomes especially as it relates to markers for cancer. We also encourage future committees to expand on their reviews of (or at least comment on) the state of the literature with regards to dietary patterns using macro and micronutrients as well as inflammatory markers as intermediaries to keep our national recommendations on pace with the strongest, most compelling current research.

#### D. Types of Dietary Fats

1) *Scientific Report Conclusions*

a. Relationship between types of dietary fat consumed and risk of cardiovascular disease in children?

The Scientific Report concluded:

*“Strong evidence demonstrates that diets lower in saturated fatty acids and cholesterol during childhood result in lower levels of total blood and low-density lipoprotein cholesterol throughout childhood, particularly in boys. Grade: Strong”*<sup>244</sup>

We commend the Committee for taking a lifestyle approach and including evidence focusing on dietary fat intake among children. Though, in general terms we agree that having a healthy dietary pattern that is low in saturated fat intake is beneficial, we note the studies leading to evidence on this topic specifically had children with elevated or higher than average blood lipid values and hence these statements need more specifics in terms of clarifying the population studied (*e.g.*, children at-risk or children with family history of risk). These blanket statements do not fit every child in the U.S. and may contribute to parental anxiety and possibly inappropriate dietary restrictions.

b. Relationship between types of dietary fat consumed and risk of cardiovascular disease in adults?

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<sup>242</sup> *Ibid.*

<sup>243</sup> Spahn JM, Reeves RS, Keim KS, Laquatra I, Kellogg M, Jortberg B, Clark NA. J Am Diet Assoc. 2010 Jun;110(6):879-91. doi: 10.1016/j.jada.2010.03.021. PMID: 20497777.

<sup>244</sup> *Id.* at 567.

The Scientific Report concluded:

*“Strong evidence demonstrates that replacing saturated fatty acids with polyunsaturated fatty acids in adults reduces the risk of coronary heart disease events and cardiovascular disease mortality. (Grade: Strong)”*

*“Strong and consistent evidence from randomized controlled trials shows that replacing saturated fatty acids with unsaturated fats, especially polyunsaturated fatty acids, significantly reduces total and low-density lipoprotein cholesterol. Replacing saturated fatty acids with carbohydrates (sources not defined) also reduces total and low-density lipoprotein cholesterol. However, we note a minority of individuals from our convened Academy Think Tank of experts express concern over the assigned grade (confidence in evidence) based on the narrative lipoprotein cholesterol, but significantly increases triglycerides and reduces high-density lipoprotein cholesterol. New evidence remains inadequate to differentiate among sources of carbohydrate and their impact on blood lipids. (Grade: Strong)”*

The majority of the Academy’s convened member experts agrees with these statements and the “strong” grades assigned to them. supporting evidence, target population of the included evidence (e.g., healthy, at-risk population, people with dyslipidemia, etc.) and dietary assessment methods. While there are numerous studies confirming the benefit of reducing saturated fats and replacing them with polyunsaturated fats,<sup>245</sup> the term “consistent” can be misleading as even the *Dietary Guidelines* state that, “almost half of the studies show beneficial effect.”<sup>246</sup> The inconsistencies of the evidence are likely the result of inadequate control of other dietary and lifestyle factors that also influence CVD and mortality. Instead, a recommendation that focuses on a more global improvement of dietary fat intake is warranted. A diet that reduces *trans* and saturated fats with focus on increasing intake of whole foods, emphasizing MUFAs and omega-3 provides a dietary fat pattern like the Mediterranean diet, which consistently demonstrates health improvement.<sup>247 248</sup> **Hence, when utilizing the information from the narrative review, it would be beneficial to consider the results from the studies that did *not* report a beneficial effect to provide more clarity and specificity of the value of substituting unsaturated fat for saturated fat in specific populations.**

A meta-analysis of RCTs that evaluated coronary heart disease (CHD) after replacing saturated fat with PUFA’s concluded studies that adequately controlled for dietary factors that also influence outcomes (e.g., *trans* fat, omega-3, sugar, fish, and vitamin E intake) did not find an effect on CHD events or mortality. When the results of all the RCTs were pooled, the results supported that replacing SFA mostly with PUFAs would significantly reduce risk of total CHD events, however not for major CHD events or

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<sup>245</sup> 2020 Dietary Guidelines Advisory Committee and Nutrition Evidence Systematic Review Team. Types of Dietary Fat and Cardiovascular Disease: A Systematic Review. 2020 Dietary Guidelines Advisory Committee Project. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, July 2020. Available at: <https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews>.

<sup>246</sup> Scientific Report at 571.

<sup>247</sup> Kris-Etherton PM, Krauss RM. Public health guidelines should recommend reducing saturated fat consumption as much as possible: YES. *The American Journal of Clinical Nutrition*. 2020;112(1):13-18. <https://doi.org/10.1093/ajcn/nqaa110>.

<sup>248</sup> Krauss RM, Kris-Etherton PM. Public health guidelines should recommend reducing saturated fat consumption as much as possible: Debate Consensus. *The American Journal of Clinical Nutrition*. 2020;112(1):25-26. <https://doi.org/10.1093/ajcn/nqaa134>.

mortality (either CHD mortality or total mortality).<sup>249</sup> This study supports what is noted in the *DGA* narrative review that “over half of the studies showed a beneficial effect.”<sup>250</sup> However, it appears it could be related to other dietary factors aside from saturated fat and PUFAs. Another recent meta-analysis of cohort studies by Zhu *et al.*<sup>251</sup> suggested no association between intake of total fat, SFA, MUFA, and PUFA and risk of cardiovascular disease. Subgroup analysis of studies that had follow-up of more than 10 years indicated a cardioprotective effect of PUFA. Updated Hooper *et al.*<sup>252</sup> meta-analysis of RCTs indicated reducing SFA had little or no effect on all-cause or CVD mortality, however, CVD events were reduced by 21%.

Although we recognize the term “saturated fat” is now familiar to many consumers, it is an imperfect categorization of a group of fatty acids that includes ones with varied effects on serum lipids and perhaps other aspects of health. In translating this scientific report into guidelines for the public we encourage a focus on food groups and food sources with recognition that the fatty acid profile of various food sources of saturated fat, as well as the overall nutrient composition, can be rather different. For instance, contrast lean red meat with high-fat processed meats; or contrast full-fat dairy products with tropical oils; or contrast natural foods with (well-defined) processed foods.

## 2) *Dietary Cholesterol*

The Academy agrees with the Committee’s statement on dietary cholesterol, as represented in the Executive Summary: “...because dietary cholesterol is found only in animal-source foods that are typically also sources of saturated fat, the independent effects of dietary cholesterol on CVD are difficult to assess.”<sup>253</sup> However, we advise that as the Scientific Report is translated into public guidelines and related materials, it is imperative the message *not* be interpreted as ‘dietary cholesterol does not influence human health,’ which could contribute to further increases in American intake of cholesterol. Instead, we encourage a message that focuses on healthy dietary patterns that inherently control cholesterol intake.<sup>254</sup>

## 3) *Sources of Dietary Fats*

As detailed in Section IX(C)(4)(b), *infra*, deeper research is needed on dietary fats related to the food source of various dietary fats as well as any processing or refining done to the original food source to render the final product.<sup>255</sup> In addition, it is important to fund and conduct research on saturated fat from different sources to separate the impacts of dietary saturated fat and dietary cholesterol, which are co-occurring in many animal sources, but not in vegetarian sources of saturated fat.<sup>256</sup>

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<sup>249</sup> Hamley S. The effect of replacing saturated fat with mostly n-6 polyunsaturated fat on coronary heart disease: a meta-analysis of randomized controlled trials. *Nutrition Journal*. 2017;16:30. doi: 10.1186/s12937-017-0254-5.

<sup>250</sup> Scientific Report at 571.

<sup>251</sup> Zhu Y, Bo Y, Liu Y. Dietary total fat, fatty acids intake, and risk of cardiovascular disease: a dose-response meta-analysis of cohort studies. *Lipids Health Dis*. 2019;18(1):91. Published April 6, 2019. doi:10.1186/s12944-019-1035-248

<sup>252</sup> Hooper\_L, Martin\_N, Jimoh\_OF, Kirk\_C, Foster\_E, Abdelhamid\_AS. Reduction in saturated fat intake for cardiovascular disease. *Cochrane Database of Systematic Reviews*. 2020;5. Art. No.: CD011737. doi:10.1002/14651858.CD011737.pub2.

<sup>253</sup> Scientific Report at 21.

<sup>254</sup> See, e.g., Carson et al. Dietary Cholesterol and Cardiovascular Risk: A Science Advisory from the American Heart Association. *Circulation*. 2020;141(3):e39-e53.

<sup>255</sup> Scientific Report at 791.

<sup>256</sup> *Id.* at 791-792.

#### 4) *Major Barriers in Evidence Vetting*

We applaud the Advisory Committee for drafting this detailed report and the Departments for crafting the systematic reviews for each question. However, it is very difficult for even expert readers to systematically review and examine the quality of the evidence as this report does not provide summary of findings tables (SoF). SoF tables provide key information concerning the quality of evidence, the magnitude of effect of the interventions examined, and the sum of available data on all important outcomes for a given comparison. Simply narratively reading the description does not bring all the components together.

Interpretation of the evidence should also account for the limitations of use of serum lipids as not being synonymous with hard outcomes, such as cardiovascular events themselves (*e.g.*, myocardial infarctions, stroke). Given the nature and extent of nutrition research, evidence from both types of endpoints should be carefully integrated in development of final advice to the public.

## VI. FOOD SYSTEMS STEWARDSHIP

The Academy supports the Committee’s recommendation to “[s]upport efforts to consider the *Dietary Guidelines* in relation to sustainability of the food system.”<sup>257</sup> We request that the Committee continue to emphasize the importance of sustainable food systems in the development, framing and implementation of the *Guidelines*. Looking ahead to future iterations of the *Guidelines*, we encourage the Departments and future Advisory Committees to embrace cross-disciplinary standards of evidence so they are equipped to incorporate a wider range of innovative research in this area.

### A. *Dietary Guidelines for Americans 2020: The Importance of a Food Systems Approach*

Dietary intake does not exist in isolation from broader food systems issues and we wish to offer a few examples to reinforce the importance of food systems.

One example is the interrelationship between dietary intake and food availability. An analysis of 2014 loss-adjusted food availability data by the USDA ERS determined that, even when including imports, the per capita availability of vegetables is 1.64 cups per day (short of the recommended 2.5 cups per day) and the per capita availability of fruit is 0.87 cups per day (short of the recommended 2 cups per day).<sup>258</sup> The current U.S. seafood system is also unable to support current recommendations for seafood intake;<sup>259</sup> thus, we appreciate the Committee’s recognition “that recommendations to increase seafood consumption by the American public can have environmental consequences and such impacts should be evaluated in the development of the *Dietary Guidelines for Americans*.”<sup>260</sup> Population-wide improvements in diet quality will require multiple approaches and inter-agency coordination. Developing food systems in which dietary guidance aligns with the reality of food production may require not only promoting consumer demand for nutritious foods and closing gaps through food waste reduction efforts,<sup>261</sup> <sup>262</sup> but it may also require inter-agency coordination to develop policies that facilitate the production of nutritious foods — for example, policies that reduce risk for specialty crop growers.

Diet quality relies not only on the availability of nutritious food, but also on the availability of safe water. At least 460,000 U.S. households lack plumbing facilities,<sup>263</sup> and these households are

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<sup>257</sup> *Id.* at 771.

<sup>258</sup> Bentley J. U.S. Trends in Food Availability and a Dietary Assessment of Loss-Adjusted Food Availability, 1970-2014, EIB-166. United States Department of Agriculture, Economic Research Service. <https://www.ers.usda.gov/webdocs/publications/82220/eib-166.pdf?v=6562.5>. Published 2017. Updated January 2017. Accessed July 27, 2020.

<sup>259</sup> Love DC, Fry JP, Milli MC, Neff RA. Wasted seafood in the United States: Quantifying loss from production to consumption and moving toward solutions. *Global Environmental Change*. 2015(35):116-124.

<sup>260</sup> Scientific Report at 594.

<sup>261</sup> Buzby JC, Wells HF, Hyman J. The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States. U.S. Department of Agriculture, Economic Research Service. *Economic Information Bulletin Number 121*. February 2014.

<sup>262</sup> Spiker ML, Hiza HAB, Siddiqi SM, Neff RA. Wasted Food, Wasted Nutrients: Nutrient Loss from Wasted Food in the United States and Comparison to Gaps in Dietary Intake. *J Acad Nutr Diet*. 2017;117(7):1031-1040.e22.

<sup>263</sup> U.S. Census Bureau; American Community Survey (ACS): Tenure by Plumbing Facilities, 2010-2018. <https://data.census.gov/cedsci/all?q=%20plumbing%20american%20community&hidePreview=false&tid=ACSDT1Y2018.B25049>. Accessed April 3, 2020.

disproportionately low-income, Native Alaskan, American Indian, African-American or Hispanic.<sup>264</sup> These populations are also more likely to be served by systems which recently violated Safe Drinking Water Act standards — a total of about 45 million Americans.<sup>265</sup> Thus, a significant gap between potable water supplies and water needs remains.<sup>266</sup> Notably, the COVID-19 pandemic has accentuated the critical role of water in public health and specifically in risk of chronic<sup>267</sup> and respiratory<sup>268</sup> diseases. Perception of poor water quality may result in decreased water consumption,<sup>269 270</sup> which may, in turn, increase consumption of sugar-sweetened beverages.<sup>271</sup> Research has shown when water is not consumed, it is often replaced with sugar-sweetened beverages resulting in consumption of nearly twice the amount of calories from hydration sources and exceeding the recommended amount of calories from added sugar.<sup>272</sup>

The relationships between diet quality, consumer demand, food supply, and other factors within the food system are complex, and it is challenging to identify feasible and effective levers of change to support improved diet quality at the population level. For this reason, we support the systems thinking approach outlined by the National Academies of Sciences, Engineering, and Medicine,<sup>273 274</sup> and we encourage the Advisory Committee to consider the potential of sustainable food systems to support healthy dietary intake over the long term. Additionally, we encourage the Advisory Committee to consider ways that coordination between federal agencies may be required in order to achieve the shared goals of population health.

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<sup>264</sup> Deitz S, Meehan K. Plumbing Poverty: Mapping Hot Spots of Racial and Geographic Inequality in U.S. Household Water Insecurity. *Ann. Am. Assoc. Geogr.* 2019;109(4):1092-1109. doi:10.1080/24694452.2018.1530587

<sup>265</sup> Fedinick KP, Taylor S, Roberts M. Watered Down Justice. Natural Resources Defense Council, Coming Clean and Environmental Justice Health Alliance. <https://www.nrdc.org/sites/default/files/watered-down-justice-report.pdf>. Published 2019. Accessed April 3, 2019.

<sup>266</sup> Nilsen E. What we know about the fourth coronavirus relief bill. *Vox.com*. <https://www.vox.com/2020/4/3/21206931/what-we-know-about-congress-fourth-coronavirus-bill>. Accessed April 3, 2020.

<sup>267</sup> Armstrong LE, Muñoz CX, Armstrong EM. Distinguishing Low and High Water Consumers-A Paradigm of Disease Risk. *Nutrients*. 2020;12(3):pii:E858. doi:10.3390/nu12030858.

<sup>268</sup> Ridley C, Thornton DJ. Mucins: the frontline defence of the lung. *Biochem Soc Trans.* 2018;46(5):1099-1106. doi:10.1042/BST20170402.

<sup>269</sup> Brooks CJ, Gortmaker SL, Long MW, Cradock AL, Kenney EL. Racial/Ethnic and Socioeconomic Disparities in Hydration Status Among US Adults and the Role of Tap Water and Other Beverage Intake. *Am J Public Health*. 2017;107(9):1387-1394.

<sup>270</sup> Hess JM, Lilo EA, Cruz TH, Davis SM. Perceptions of water and sugar-sweetened beverage consumption habits among teens, parents and teachers in the rural south-western USA. *Public Health Nutr.* 2019;22(8):1376-1387.

<sup>271</sup> Onufrak SJ, Park S, Sharkey JR, Sherry B. The relationship of perceptions of tap water safety with intake of sugar-sweetened beverages and plain water among US adults. *Public Health Nutr.* 2014;17(1):179-185.

<sup>272</sup> Rosinger AY, Bethancourt H, Francis LA. Association of Caloric Intake From Sugar-Sweetened Beverages With Water Intake Among US Children and Young Adults in the 2011-2016 National Health and Nutrition Examination Survey. *JAMA Pediatr.* 2019;173(6):602-604.

<sup>273</sup> Institute of Medicine and National Research Council. A Framework for Assessing Effects of the Food System. Washington, DC: The National Academies Press. 2015. <https://doi.org/10.17226/18846>.

<sup>274</sup> National Academies of Sciences Engineering and Medicine, Health, et al. In: *Sustainable Diets, Food, and Nutrition: Proceedings of a Workshop—in Brief*. Washington (DC): National Academies Press (US) Copyright 2018 by the National Academy of Sciences. All rights reserved.; 2018.

## B. Beyond 2020: Considering Evidence Quality for a Wider Range of Innovative Research in the Area of Sustainable Food Systems

A question that requires further investigation in future iterations of the *Dietary Guidelines* is the resource use and environmental impact of specific dietary patterns. A growing body of literature increasingly points to not only potential co-benefits but also potential trade-offs between diet quality and environmental impact.<sup>275 276</sup> A recent examination of global dietary guidelines suggested the 2015 *Dietary Guidelines* may be incompatible with food-related emission targets set by the Paris Climate Accord by over 300 percent.<sup>277</sup> Thus, dietary patterns can be viewed not only on the basis of their ability to promote health outcomes, but also on the basis of their ability to mitigate environmental impact and achieve the targets set by 197 member states outlined by the United Nations Sustainable Development Goals.

This is an area that requires cross-disciplinary collaboration in order to inform rigorous review methods. Should a future Advisory Committee wish to assess the bidirectional relationship between dietary intake and environmental factors, this will require standards for assessing evidence quality that differ from the standards used to assess diet-disease relationships. For example, when assessing the quality of research that uses life cycle assessments to quantify environmental impact, criteria such as whether a study was randomized or double-blinded may not apply and different standards are needed to judge evidence quality. This does not mean future Advisory Committees should shy away from incorporating evidence from other disciplines; rather, we reinforce the importance of collaborating with related disciplines to ensure the *Guidelines* can draw from a range of high-quality evidence on a multitude of factors that affect and are affected by dietary intake.

## C. Summary

The Academy encourages the Advisory Committee to emphasize the importance of food systems within 2020-2025 *Dietary Guidelines for Americans* and to consider the importance of cross-disciplinary collaboration and inter-agency coordination in order to operationalize a systems approach to improving population-level diet quality. Considering sustainability and food systems stewardship in the final recommendations addresses the need for improved access to healthy food.

A report of the United Nations Food and Agriculture Organization states food security and nutrition policy is best approached within a sustainable food system framework underpinned by the right to food.<sup>278</sup> Registered dietitian nutritionists recognize the opportunity and responsibility to integrate the principles of sustainable, resilient, and healthy food and water systems into our respective practice areas as a means to secure, preserve, and strengthen these systems now and for the future. The Academy continues to develop and implement standards of professional performance for practitioners in

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<sup>275</sup> Nelson ME, Hamm MW, Hu FB, Abrams SA, Griffin TS. Alignment of Healthy Dietary Patterns and Environmental Sustainability: A Systematic Review. *Adv Nutr.* 2016;7(6):1005-1025.

<sup>276</sup> Reinhardt SL, Boehm R, Blackstone NT, et al. Systematic Review of Dietary Patterns and Sustainability in the United States. *Adv Nutr.* 2020;11(4):1016-1031.

<sup>277</sup> Springmann M, Spajic L, Clark MA, Poore J, Herforth A, Webb P, et al. The healthiness and sustainability of national and global food based dietary guidelines: modelling study. *British Medical Journal.* 2020;370:m2322.

<sup>278</sup> HLPE. Food security and nutrition: building a global narrative towards 2030. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. 2020. <http://www.fao.org/3/ca9731en/ca9731en.pdf>.

sustainable, resilient, and healthy food and water systems to ensure we can better serve our clients and communities.<sup>279</sup>

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<sup>279</sup> Tagtow A, Robien K, Bergquist E, et al. Academy of Nutrition and Dietetics: Standards of professional performance for Registered Dietitian Nutritionists (Competent, Proficient, and Expert) in Sustainable, Resilient, and Healthy Food and Water Systems. *J Acad Nutr Diet*. 2014;114(3):475-488.e24.

## VII. GUIDELINES IMPLEMENTATION

### A. Implementation Science and Translation Science

#### 1) Recommendation Development

##### a. Transparency

First and foremost, transparency in the guideline development process is an absolute requirement in order to gain public trust. In 2011, the National Academies of Medicine created standards for the development of clinical practice guidelines.<sup>280</sup> One of the standards prescribes that, “To be *trustworthy*, guidelines should ... be based on an explicit and transparent process that minimizes distortions, biases, and conflicts of interest.”<sup>281</sup> The detailed process used for the development the 2020-2025 *Dietary Guidelines* should be made available to the public. At minimum, methods reporting should include:

- Methodology used to select *Dietary Guidelines* Panel Members
- Names, affiliations and potential conflicts of interest of Panel Members, and
- Recommendation development methodology (including which conclusion statements were used and why).

##### b. Recommendation Rating System Evidence-Decision Framework

The guideline development group working on the *Dietary Guidelines* should utilize a systematic process in translating evidence to action-based recommendations. An evidence-decision framework such as *The GRADE Evidence to Decision (EtD) framework for health system and public health decisions*<sup>282</sup> should be used to ensure essential criteria and the best available evidence inform the evidence-based recommendations that should comprise the *Dietary Guidelines*. The GRADE framework includes criteria such as certainty of the evidence, importance of outcomes, resources requirements and health equity.<sup>283</sup>

##### c. Incorporation of Implementation and Dissemination

Implementation should be taken into consideration early in the guideline development process.<sup>284</sup> Inclusion of multidisciplinary key and diverse stakeholders early in the development process can promote identification of implementation barriers and facilitators unique to target audiences. The National Academy of Sciences *Feeding Infants and Children from Birth to 24 Months: Summary Existing Guidance (2020)* document provides a sample process for incorporating dissemination and implementation science into the guideline development process.<sup>285</sup>

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<sup>280</sup> Institute of Medicine (US) Committee on Standards for Developing Trustworthy Clinical Practice Guidelines. Clinical Practice Guidelines We Can Trust. In: Medicine Io, ed. Washington, DC: The National Academies Press; 2011 at 5.

<sup>281</sup> Institute of Medicine (US) Committee on Standards for Developing Trustworthy Clinical Practice Guidelines. Clinical Practice Guidelines We Can Trust. In: Medicine Io, ed. Washington, DC: The National Academies Press; 2011 at 5.

<sup>282</sup> Moberg J, Oxman AD, Rosenbaum S, et al. The GRADE Evidence to Decision (EtD) framework for health system and public health decisions. *Health Res Policy Syst.* 2018;16(1):45.

<sup>283</sup> Moberg J, Oxman AD, Rosenbaum S, et al. The GRADE Evidence to Decision (EtD) framework for health system and public health decisions. *Health Res Policy Syst.* 2018;16(1):45.

<sup>284</sup> Gagliardi AR, Marshall C, Huckson S, James R, Moore V. Developing a checklist for guideline implementation planning: review and synthesis of guideline development and implementation advice. *Implement Sci.* 2015;10:19.

<sup>285</sup> National Academies of Sciences Engineering and Medicine. Feeding Infants and Children from Birth to 24 Months: Summarizing Existing Guidance (2020). Washington, DC: The National Academies Press; 2020.

#### d. Recommendation Evaluation Tools

The *Dietary Guidelines* guideline development group should take the criteria proposed in guideline evaluation tools into consideration when translating evidence to action-based recommendations. For example, the *Guideline Implementation Appraisal Tool* identifies key criteria such as executability, decidability, and validity which can promote uptake by stakeholders.<sup>286</sup> AGREE II is an instrument that assesses the process of guideline development that can provide developers with concepts to also include in protocols.<sup>6287</sup>

#### 2) *Dissemination and Implementation of Dietary Guidelines for Americans*

##### a. Development

Development of dissemination and implementation strategies for the *Guidelines* should be a transparent process and this process should be made available to the public. Like guideline development, dissemination and implementation strategies should be developed using a systematic process by a multidisciplinary and diverse group of stakeholders. Utilization of an implementation framework such as the Consolidated Framework for Advancing Implementation Science<sup>288</sup> or the RE-AIM<sup>289</sup> can ensure consideration of key factors that will impact recommendation uptake.

Dissemination and Implementation Strategies should target key stakeholder groups and population segments:

- Health care providers, especially those in women's health and pediatrics
- Public health practitioners
- Policy makers in the public, non-profit and business sectors
- Educators in early, elementary, middle and high school education
- Researchers in multiple disciplines
- Institutions such as schools, early care and education centers, and hospitals
- Consumer groups that represent key population subgroups
  - Individuals
  - Older adults
  - Adults, including those of diverse race/ethnic, income and geographic backgrounds
  - Adolescents and their influencers
  - Parents and caretakers of young children
  - Race/ethnic and low-resource subgroups
- Food and beverage Industries
- Food retailers, such as grocery stores of all categories, convenience stores, and chain restaurants
- Food marketers, communications professionals, and mass media, including media targeting children and non-English speakers

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<sup>286</sup> Shiffman RN, Dixon J, Brandt C, et al. The GuideLine Implementability Appraisal (GLIA): development of an instrument to identify obstacles to guideline implementation. *BMC medical informatics and decision making*. 2005;5:23.

<sup>287</sup> Brouwers MC, Kho ME, Browman GP, et al. AGREE II: advancing guideline development, reporting and evaluation in health care. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*. 2010;182(18):E839-842.

<sup>288</sup> Damschroder LJ, Aron DC, Keith RE, et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci*. 2009;4:50.

<sup>289</sup> Dzawaltowski DA, Glasgow RE, Klesges LM, Estabrooks PA, Brock E. RE-AIM: evidence-based standards and a Web resource to improve translation of research into practice. *Annals of behavioral medicine: a publication of the Society of Behavioral Medicine*. 2004;28(2):75-80.

## b. Consider Existing Programs and Resources

- Food assistance programs and associated nutrition education/promotion programming
  - Child nutrition programs, such as the NSLP and SBP, CACFP
  - WIC, including breast-feeding and nutrition for parents and young children
  - SNAP, including small grocers, those offering Online EBT and GusNIP, and SNAP-Ed
  - TEFAP, FDPIR and the Farmers to Families food box program
  - Senior nutrition, including in congregate and home settings
  - DoD programs
- Health promotion
  - CDC nutrition, physical activity and obesity prevention programs
  - Maternal and Child Health Branch programs
  - Indian Health Service programs
  - Health promotion messaging
- Nutrition education
  - Elementary and secondary school education standards
  - Early care and education
  - Patient education
  - Curricula — all levels including interprofessional education (IPE) for health care professionals
  - Culinary professionals

## **B. Implementing the *Dietary Guidelines* in All Federal Programs**

Federal law requires “[a]t least every five years the Secretaries shall publish a report entitled ‘*Dietary Guidelines for Americans*.’ Each such report shall contain nutritional and dietary information and guidelines for the general public, and ***shall be promoted by each Federal agency*** in carrying out ***any*** Federal food, nutrition, or health program.”<sup>290</sup> Accordingly, “the U.S. Government uses the *Dietary Guidelines for Americans* as the basis of its food assistance programs, nutrition education efforts, and decisions about national health objectives. For example, the National School Lunch Program and the Elderly Nutrition Program incorporate the *Dietary Guidelines* in menu planning, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) applies the *Dietary Guidelines* in its program and educational materials, and the *Healthy People* objectives for the Nation include objectives based on the *Dietary Guidelines*.”<sup>291</sup> **Although the law aims for all federal agencies to utilize the guidelines for any federal food, nutrition, or health program, it does not empower a single coordinating body with the authority to ensure these guidelines are, in fact, being applied as statutorily mandated.**

As described in the Scientific Report and noted *supra*, the Committee’s work took place “in the backdrop of several significant nutrition-related issues in the United States. More than 70 percent of Americans have overweight or obesity and the prevalence of severe obesity has increased over the past two decades. The high rates of overweight and obesity are an important public health problem in and of themselves and they are a driver for prevalent diet-related chronic diseases, such as cardiovascular disease (CVD), type 2 diabetes, and some types of cancer. At present, 6 in 10 Americans have a chronic

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<sup>290</sup> 7 U.S.C. § 5341 ([Pub. L. 101–445, title III, § 301](#), Oct. 22, 1990, [104 Stat. 1042](#); [Pub. L. 113–79, title IV, § 4204](#), Feb. 7, 2014, [128 Stat. 822](#).) (emphasis added).

<sup>291</sup> Scientific Report at 28.

condition and 4 in 10 Americans have 2 or more chronic conditions.”<sup>292</sup> As noted above, the epidemic of chronic disease is exacerbated by the COVID-19 pandemic to produce what the Committee recognizes as “parallel epidemics [that] demonstrate the central role of nutrition and healthy dietary patterns in susceptibility to both infections and diet-related chronic diseases.”<sup>293</sup>

**At a time when the impact from diet-related diseases — including obesity — affects many aspects of society from health care costs to health disparities and military readiness to worker productivity,<sup>294</sup> the federal government must double-down on public health efforts and effectively infuse the updated *Guidelines*’ recommendations into *all* federal food and nutrition programs. The COVID-19 pandemic only makes this a more exigent necessity.** The Centers for Disease Control and Prevention lists people with obesity, diabetes and heart disease, as well as those undergoing dialysis for chronic kidney disease, as being at higher risk for severe illness from COVID-19, putting minority communities experiencing health disparities at higher risk of poor COVID-19 outcomes.<sup>295</sup> While nationwide data has not been made available, early data indicates Blacks are hospitalized and die from COVID-19 at substantially higher rates than Whites.<sup>296,297</sup>

**The Departments must transparently assess and detail how the recommendations in the Scientific Report will be translated into the final *Guidelines* and how the final *Guidelines* will be translated into practice for the health care providers for whom the *Guidelines* are targeted.** As discussed below, there are numerous examples demonstrating alignment with the *Dietary Guidelines* improves dietary quality and health outcomes and results in reduced health care costs, including WIC and the National School Lunch Program.

We also note other examples of federal nutrition programs that could better align with the *Dietary Guidelines* or require a real, adequate, and sustained commitment to funding and other resources to ensure the programs are implemented and function as intended. Opportunities for enhanced alignment with the *Dietary Guidelines* exist with Senior Nutrition Programs<sup>298</sup> and the Supplemental Nutrition Assistance Program.

#### 1) WIC

The current WIC food package, which was implemented in 2009, is science-based and prescriptive. To arrive at what is included in the WIC food package, the National Academy of Medicine reviewed data to identify nutrients lacking in the diets of mothers and children to make recommendations for WIC foods. All WIC food prescriptions are consistent with the *Dietary Guidelines for Americans* and offer regional, local, and culturally appropriate nutritious foods that are affordable and contribute to lifelong good health.

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<sup>292</sup> *Id.* at 21.

<sup>293</sup> *Id.* at 5.

<sup>294</sup> Obesity: Health and Economic Consequences of an Impending Global Challenge. *Human Development Perspectives*. <https://elibrary.worldbank.org/doi/book/10.1596/978-1-4648-1491-4>. Published February 2020.

<sup>295</sup> Centers for Disease Control and Prevention. People Who Are at Higher Risk for Severe Illness. CDC.gov. <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-at-higher-risk.html>. May 14, 2020.

<sup>296</sup> Centers for Disease Control and Prevention. COVID-19 in Racial and Ethnic Minority Groups. CDC.gov. <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/racial-ethnic-minorities.html>. April 17, 2020.

<sup>297</sup> New York City Department of Health and Mental Hygiene. COVID-19 Deaths by Race and Ethnicity. NYC Health. <https://www1.nyc.gov/assets/doh/downloads/pdf/imm/covid-19-deaths-race-ethnicity-04162020-1.pdf>. April 16, 2020.

<sup>298</sup> Nutrition Assistance Programs: Agencies Could DO More to Help Address the Nutritional Needs of Older Adults. United States Government Accountability Office: Report to Congressional Requesters. November 2019. <https://www.gao.gov/assets/710/702788.pdf>.

A recent study showed the 2009 WIC package was associated with a reversal of the increasing trend in obesity prevalence among WIC participants observed between 2000 and 2014.<sup>299</sup> A study from the Robert Wood Johnson Foundation examined the impact of the change in the WIC food package and its impact on a child’s diet and identified not only a significant decrease in overall obesity rates for children age zero to four, but also an increase in breast-feeding rates, which led to healthier mothers and babies.<sup>300</sup> Notably, the Scientific Committee concluded, “Given the documented health benefits for the mother and infant, the Committee supports broader implementation of Federal programs that promote, protect and support breast-feeding.”<sup>301</sup>

WIC is a proven cost-effective health service delivery model. The WIC program is found to have reduced the risk for preterm birth and low birth-weight babies by 25 to 44 percent; these conditions currently cost the U.S. over \$26 billion per year. In addition, for every dollar spent on pregnant women in WIC, up to \$4.21 is saved in Medicaid costs.<sup>302</sup> In a 2017 study conducted with approximately 500,000 Californians, WIC resulted in cost-savings of approximately \$349 million and prevented 7,575 preterm births, and spending a single dollar on prenatal WIC resulted in mean savings of \$2.48.<sup>303</sup>

## 2) National School Lunch Program; School Breakfast Program

The National School Lunch and Breakfast programs nutrition standards were updated, to better align with the *DGAs*, in 2010. According to the School Nutrition and Meal Cost study, the changes to the school meal nutrition standards significantly increased the dietary quality of both the lunch and breakfast program offerings.<sup>304</sup> The Healthy Eating Index scores for lunch and breakfast increased by a significant 41 percent and 44 percent, respectively.<sup>305</sup> A recent study suggests the implementation of updated nutrition standards is associated with a significant decrease in obesity risk for children living in poverty.<sup>306</sup> **Given that COVID-19 disproportionately impacts individuals with underlying health conditions and that children whose parents have overweight or obesity are more likely to themselves be at risk of obesity, it is essential to provide children with sufficient quantities of healthful foods and beverages that we know can reduce that risk.**

## 3) Senior Nutrition Programs

As noted above, the Government Accountability Office’s (GAO’s) recent report reviewing nutrition programs intended to serve seniors concluded these programs must ensure seniors’ meals meet nutrition requirements based on the *Dietary Guidelines*.<sup>307</sup> At the same time, the GAO concluded there were

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<sup>299</sup> Daepf MIG, Gortmaker SL, Wang YC, et al. WIC Food Package Changes: Trends in Childhood Obesity Prevalence. *Pediatrics*. 2019;143(5):e20182841.

<sup>300</sup> Chiasson, MA, Findley, SE, Sekhobo, JP, Scheinmann, R, Edmunds, LS, Faly, AS and McLeod, NJ Changing WIC changes what children eat. *Obesity*. 2013;21:1423–1429. doi:10.1002/oby.20295

<sup>301</sup> Scientific Report at 69 (internal citation omitted).

<sup>302</sup> WIC: Solid Returns on Investment While Reducing the Deficit. National WIC Association. [https://s3.amazonaws.com/aws.upl/nwica.org/WIC\\_Return\\_on\\_Investment.pdf](https://s3.amazonaws.com/aws.upl/nwica.org/WIC_Return_on_Investment.pdf). Accessed August 13, 2020.

<sup>303</sup> Niango et al. Economic evaluation of California prenatal participation in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) to prevent preterm birth. *Preventive Medicine*. 2019;124:42–49.

<sup>304</sup> USDA. School Nutrition and Meal Cost Study. [https://fnsprod.azureedge.net/sites/default/files/resource-files/SNMCS\\_Summary-Findings.pdf](https://fnsprod.azureedge.net/sites/default/files/resource-files/SNMCS_Summary-Findings.pdf). Accessed August 4, 2020.

<sup>305</sup> *Ibid.*

<sup>306</sup> Kenney EL, Barrett JL, Bleich SN, Ward ZJ, Craddock AL, Gortmaker SL. Impact Of The Healthy, Hunger-Free Kids Act On Obesity Trends. *Health Affairs*. 2020;39(7):1122–1129. doi:10.1377/hlthaff.2020.00133.

<sup>307</sup> Nutrition Assistance Programs: Agencies Could DO More to Help Address the Nutritional Needs of Older Adults. United States Government Accountability Office: Report to Congressional Requesters. November 2019. <https://www.gao.gov/assets/710/702788.pdf>.

insufficient methods to collect data to safeguard that meals were, in fact, meeting those requirements. Providing the appropriate policies, funding, and administrative oversight structure to ensure the *Guidelines* are being implemented and function as intended is essential to guarantee one of our most vulnerable populations are receiving the nutritionally appropriate foods they need. The Academy recognizes routine monitoring and sustained financial investment are needed to effectively implement these programs with fidelity.

#### 4) SNAP

The Supplemental Nutrition Assistance Program is another example that does not align with congressional intent to establishing the *Guidelines* as the foundation of federal food and nutrition programs. SNAP is the first line of defense against food insecurity in the United States; according to the USDA, “SNAP provides nutrition benefits to supplement the food budget of needy families so they can purchase healthy food and move towards self-sufficiency.”<sup>308</sup> However, there is consensus among researchers that the current SNAP benefit amount is insufficient to support healthy dietary behaviors.<sup>309</sup>

#### 5) *Government Nutrition, Nutrition Education, and Nutrition Promotion Programs: Utilizing an Effective Systems Approach*

We reiterate the Scientific Report’s conclusion “[t]he secretaries of USDA and HHS should commission research and evaluate strategies to develop and implement systems approaches into the *DGA*. The selected strategies should then begin to be used to integrate systems mapping and modeling into the *DGA* process.”<sup>310</sup> **The Academy agrees it is vital to use evidence-based systems frameworks, like the Social Ecological Model, to weave the 2020 Dietary Guidelines across all government nutrition, nutrition education, and promotion activities.** This includes identifying levers to influence behaviors beyond the individual consumer to other spheres including interpersonal, institutional, community, and systems.

This is not a new approach for the application of government funds; many federal nutrition programs already employ this type of model.<sup>311,312,313</sup> The Scientific Committee reinforced this recommendation by stating, “The Committee supports efforts by Federal programs, such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), that serve women who are lactating should encourage participants to take advantage of available nutrition counseling services. In addition, policy, systems, and environmental change strategies and competitive pricing of healthy food and beverage

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<sup>308</sup> Supplemental Nutrition Assistance Program (SNAP): Ending Hunger and Moving People Forward to Self Sufficiency. Food and Nutrition Service of U.S. Department of Agriculture website.

<https://www.fns.usda.gov/snap/supplemental-nutrition-assistance-program>.

<sup>309</sup> IOM (Institute of Medicine) and NRC (National Research Council). Supplemental Nutrition Assistance Program: Examining the evidence to define benefit adequacy. Washington, DC: 2013.

<sup>310</sup> Scientific Report at 41.

<sup>311</sup> Gregson J, Foerster SB, Orr R, Jones L, Benedict J, Clarke B, et al. System, environmental and policy changes: using the social-ecological model as a framework for evaluating nutrition education and social marketing programs with low-income audiences. *Journal of Nutrition Education*. 2001;33:S4-S15.

<https://www.sciencedirect.com/science/article/abs/pii/S1499404606600651>. Accessed January 5, 2020.

<sup>312</sup> Dalenius K, Grummer-Strawn L, Mackintosh H, Polhamus B, Smith BL. Health equity resource toolkit for state practitioners addressing obesity disparities.

<https://www.cdc.gov/obesity/downloads/CDCHealthEquityObesityToolkit508.pdf>. Accessed January 5, 2020.

<sup>313</sup> Naja-Riese A, Keller KJ, Bruno P, Foerster SB, Puma J, Whetstone L, et. al. The SNAP-Ed Evaluation Framework: demonstrating the impact of a national framework for obesity prevention in low-income populations. *Translational Behavioral Medicine*. 2019;9(5):970-979. <https://snaped.fns.usda.gov/program-administration/snap-ed-evaluation-framework>. Accessed January 5, 2020.

choices can help ensure that women of all economic strata can afford them. Similar healthy foods and beverages should be routinely stocked and distributed by food pantries and other food assistance venues and recommended by food assistance programs.”<sup>314</sup>

Effective policy, systems, and environment strategies have been successfully used across federal, state, and local programs. For example, the Centers for Disease Control and Prevention grantees reported food service guidelines were introduced in over 10,000 early childhood education facilities, over 2,300 worksites, and nearly 300 community settings, such as parks, concession stands, community centers, sports stadiums, and restaurants between 2012 and 2017.<sup>315</sup> The Supplemental Nutrition Assistance Program Education (SNAP-Ed) has a developed toolkit to help state SNAP-Ed administrative and implementing agencies identify evidence-based obesity prevention programs and policy, systems, and environmental (PSE) strategies and interventions to include in their SNAP-Ed plans.<sup>316</sup>

### C. Coordination of and Consistency for Implementation of the *Guidelines*

**The *Guidelines* should provide clarity, acting as a compass for the direction, development, and implementation of the federal food, nutrition, and health programs.** When there are challenges identified in meeting food patterns, the Departments should acknowledge them in advance and couple guidelines with known strategies to help facilitate behavior change (such as nutrition education) that facilitate full adoption of the *Guidelines* in different food environments.

There are many programs across several federal agencies that either should or already do use the *Guidelines* to inform their work, including the USDA, HHS, Department of Defense, Department of Veterans Affairs, Department of Education, Department of the Interior, and the Government Services Administration. However, there is no coordinating or monitoring body to ensure these programs are using the *Guidelines* as congress intended or to ensure the programs have adequate funding and support for effective implementation. Given the most recent call for coordination among federal agencies for other nutrition related priorities, such as research<sup>317</sup> and education<sup>318</sup> the implementation and dissemination of the 2020-2025 *Dietary Guidelines* is a unique opportunity for the government to better coordinate and invest in the resources needed to meet the intended expectations of the National Nutrition Monitoring Act of 1990 that established the *Guidelines*. Accordingly, the Academy strongly recommends the Secretaries of the Departments of should collaborate with an existing agency such as the Government Accountability Office or a committee such as the Interagency Committee on Human Nutrition Research to do the following:

- Take an inventory of which agencies and programs are currently providing food, nutrition or health programs;

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<sup>314</sup> Scientific Report at 320-321.

<sup>315</sup> Centers for Disease Control and Prevention Division of Nutrition, Physical Activity, and Obesity. DNPAO 2019 Year End Annual Update. <https://asphn.org/wpcontent/uploads/2019/11/DNPAO-2019-Year-End-Update.pdf>. Accessed August 7, 2020.

<sup>316</sup> Learning about Nutrition through Activities, LANA. USDA SNAP-Ed Connection. <https://snaped.fns.usda.gov/library/materials/learning-about-nutrition-through-activities-lana>.

<sup>317</sup> Fleischhacker SE, Woteki CE, Coates PM, Hubbard VS, et al. Strengthening national nutrition research: rationale and options for a new coordinated federal research effort and authority. *The American Journal of Clinical Nutrition*. nqaal79. <https://doi.org/10.1093/ajcn/nqaal79>.

<sup>318</sup> USDA Actions Needed to Assess Effectiveness, Coordinate Programs, and Leverage Expertise. GAO-19-572: Published July 25, 2019. Publicly Released July 25, 2019.

- Assess whether they are using the *Dietary Guidelines for Americans* as the basis for this work;
- Determine how these programs will update current practices/policies to utilize the 2020-2025 *Dietary Guidelines for Americans* while using a policy, systems and environment frame; and
- Identify the resources needed, including funding, to support these efforts.

#### D. Funding

Historically, the *Guidelines* have not included comprehensive dissemination and implementation strategies, which require appropriate allocation of resources and funding. Dissemination and implementation strategies are required to address the various complexities and communication channels of multiple stakeholder groups. Development of the *Dietary Guidelines* require a considerable amount of time and resources; a lack of strategies to promote uptake and maximum use of the *Guidelines* would manifest the lack of appropriate stewardship of taxpayer funding.

**The Academy respectfully requests the Departments convene stakeholders in public health, including health care practitioners’ professional associations and relevant agencies across the federal family, to assess the extent to which appropriations are sufficient to meet the established missions of government programs and identified needs of Americans across the lifespan.**

#### E. Innovations, Incentives, and Industry Reformulation

As the Departments consider how to best implement the final *Guidelines*, the Academy offers as a paradigm to consider the recent implementation and dissemination efforts of the Food and Drug Administration related to the Nutrition Facts Panel, Menu Labeling, and opportunities associated with the FDA’s Nutrition Innovation Strategy. The Academy enthusiastically shares the goal that the Nutrition Innovation Strategy is designed to attain; we wholeheartedly agree “improvements in diet and nutrition offer us one of our greatest opportunities to have a profound and generational impact on human health.”<sup>319</sup> **We support the Departments using their authority to harness market forces to incentivize the formulation of healthy products and better enable industry to effectively and truthfully promote them. As noted by the Committee, fostering innovation and sparking competition among industry has significant potential to reduce preventable death and disease related to poor nutrition:** “Reducing the amount of added sugars in the diet, either through changes in consumer behavior or in how food is produced and sold, is an achievable objective that could improve population health.”<sup>320</sup>

We appreciate that industry is most likely to reformulate products when incentivized to accommodate consumer demand and meet their commitments to healthy, socially responsible products. We urge the Departments to focus on strategies to drive behavior change among consumers and industry and support the following recommendations in the Scientific Report:

- “The Committee also hopes that the 2020-2025 *Dietary Guidelines for Americans* will encourage the food industry to grow, manufacture, and sell foods and beverages that promote health and

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<sup>319</sup> Gottlieb S. Reducing the Burden of Chronic Disease. [speech] U.S. Food and Drug Administration website. Washington, DC. <https://www.fda.gov/news-events/speeches-fda-officials/reducing-burden-chronic-disease-03292018>. Published March 29, 2018.

<sup>320</sup> Scientific Report at (23/835).

contribute to the U.S. population consuming the appropriate level of calories while meeting recommendations for food groups, nutrients, and other dietary components.”<sup>321</sup>

- “Changing the production of commonly consumed foods to improve diet quality and nutrient density while decreasing excess energy is a strategic path towards improving population nutrition.”<sup>322</sup>

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<sup>321</sup> Scientific Report at (29/435).

<sup>322</sup> Scientific Report at (184/835).

## VIII. TRANSPARENCY AND CLARITY

### A. Transparency as Departments Draft *Guidelines*

The public must have confidence the *Guidelines* are indeed “based on the preponderance of the scientific and medical knowledge which is current at the time the report is prepared”<sup>323</sup> and they have not been “influenced by politics or other factors” noted by the National Academies.<sup>324</sup> **The Academy strongly agrees with the National Academies that, “In the steps of the process where public participation would be inappropriate, such as decision making for the *DGA* recommendations themselves, it will be critical for the agencies responsible for the *DGA* to explain to the public why key decisions were made.”**<sup>325</sup>

Given the Departments’ new, powerful role in dictating the scope of the research inquiry at the beginning of the *DGA* process, we agree with the National Academies that **novel, substantial transparency will be especially critical at the final stage of the process, when the agencies take the *DGAC*’s scientific report and transform it into the official *Guidelines*. As the National Academies recommended, “The secretaries of USDA and HHS should provide the public with a clear explanation when the *DGA* omit or accept only parts of conclusions from the scientific report.”**<sup>326</sup> We also agree with the National Academies that:

“The federal writing team — the group that updates the *DGA* based on the scientific report — needs to adhere to explicit and transparent standards for developing evidence-based guidelines and recommendations. These standards ought to be incorporated into the *DGA* process and updated to align with best practices in the field. **To enhance the integrity of the process, every effort needs to be made to ensure that the *DGA Policy Report* is transparent about what decisions were made about the *DGSAC*’s conclusions, and the secretaries should explain why any deviations exist.**”<sup>327</sup>

In addition, the Academy believes the need for transparency includes identifying the specific “HHS and USDA nutrition and health experts”<sup>328</sup> tasked with drafting and approving the final *Guidelines* to assure the scientific community and the public that these individuals have the skill set to ascertain whether the research reviewed, the Scientific Report’s conclusions, and the final recommendations of the *Guidelines* are consistent, relevant to the ‘general public,’ accurate, and reflect the preponderance of the best presently available science.

**Scientists — not politicians — should be formulating the guidelines in accordance with the statutory mandate, and it is not just the scientific community urging this: “Americans also voiced a strong preference for experts — not politicians — to develop the dietary guidelines. By a nearly**

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<sup>323</sup> National Nutrition Monitoring and Related Research Act of 1990 (Public Law 101-445 - Oct. 22, 1990).

<sup>324</sup> NASEM Report at 129.

<sup>325</sup> NASEM Report at 43 (emphasis added).

<sup>326</sup> Redesigning the Process for Establishing the Dietary Guidelines for Americans. Washington, DC: National Academies Press (US); November 16, 2017. <https://www.ncbi.nlm.nih.gov/books/NBK469828/> (emphasis added).

<sup>327</sup> Redesigning the Process for Establishing the Dietary Guidelines for Americans. Washington, DC: National Academies Press (US); November 16, 2017. <https://www.ncbi.nlm.nih.gov/books/NBK469828/> (emphasis added).

<sup>328</sup> U.S. Department of Health and Human Services and U.S. Department of Agriculture. *2015 – 2020 Dietary Guidelines for Americans*. 8th edition, Message from the Secretaries at vii. December 2015. <https://health.gov/dietaryguidelines/2015/guidelines/>. Accessed July 6, 2019.

4-to-1 margin (79 percent to 20 percent), survey respondents agreed that scientists, doctors, and health experts should be able to create recommendations free of interference.”<sup>329</sup>

Finally, it is essential the Departments’ proposed *Guidelines* are both peer reviewed and available for public comment *before* they are finalized to ensure compliance with the requirements of the National Nutrition Monitoring and Related Research Act of 1990 that the *Dietary Guidelines* “shall be based on the preponderance of the scientific and medical knowledge which is current at the time the report is prepared.”<sup>330</sup>

## B. Clarity, Carrying Forward Recommendations, and Existing Federal Guidance

Even if a topic is addressed through existing evidence-based federal guidance or in ERS and NIFA studies but is not addressed by the Committee, we believe it must be included in the *Guidelines* if it can help guide individual consumers or institutional policies towards healthier diets or ensure federal policies align with relevant science. If key topics are omitted, there will be significant gaps in evidence-based federal guidance for food and nutrition. Therefore, the 2020-2025 *Dietary Guidelines for Americans* should encompass all of the federal government’s evidence on sustainability and other dietary practices for optimal nutrition and food policies, “including new scientific evidence and current resource documents.”<sup>331</sup>

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<sup>329</sup> Wood-Wright N. New U.S. dietary guidelines ignore broad support for food sustainability. *Hub*, Johns Hopkins University. <https://hub.jhu.edu/2016/03/11/dietary-guidelines-sustainability-survey/>. Published March 11, 2016 (emphasis added).

<sup>330</sup> 42 U.S.C. 217a(2) (emphasis added).

<sup>331</sup> United States Department of Agriculture. Charter for the 2020 Dietary Guidelines Advisory Committee. <https://www.dietaryguidelines.gov/sites/default/files/2019-03/DietaryGuidelinesAdvisoryCommitteeCharter-10-05-18.pdf>. Accessed July 6, 2019.

## IX. RESEARCH GAPS

The *Dietary Guidelines* can only be as good as the research that underlies them. A lack of nutrition research has consistently limited the government’s ability to make recommendations in certain areas or to make recommendations that are based on a sufficiently robust research foundation able to withstand scientific scrutiny. Research gaps identified by the Committee have steadily grown since the shift in methodology towards an evidence-based approach in the 1990s.<sup>332</sup> As Myers, *et al.*, stated in their 2013 assessment of the Committee research needs identified from 1980 to 2010, **“When research gaps persist, they compromise health professionals’ ability to create and apply ‘evidence-based’ guidelines. If a paucity of research exists on critical topics, the guidelines based on less than optimal research might not yield the anticipated results.”**<sup>333</sup>

To address the backlog of nutrition research, the Academy offers the below recommendations for prioritizing federal nutrition research and for ways to improve national dietary surveillance systems. We also highlight a variety of specific gaps in nutrition research that should be included in a priorities list and provide a series of cross-cutting methodological considerations.

### A. Prioritize Federal Nutrition Research

The Academy encourages the federal government to enhance its investment in critical food and nutrition research to build on the work the Committee and the Departments are doing in the *Dietary Guidelines* development process. **We note that despite continual enumeration of the same research gaps by previous Committees, this chasm continues to widen because of a lack of a sustained, sufficient investment to address these fundamental research questions.**<sup>334</sup> **Specifically, it is imperative to develop substantial new prospective, translational research in humans including the entire life cycle, comparative effectiveness research, and population based policy studies that examine facilitators and barriers to healthy community environments and access to safe, high quality nutrition care.**

We must consider forming a National Institute of Nutrition at the National Institutes of Health because, as former leaders at the Departments recently wrote, “[O]ur country needs an institute devoted to research on the top cause of poor health.”<sup>335</sup> The Departments must finally make funding nutrition research a priority among the Departments, because *all* Americans eat and *all* Americans can benefit from research studies answering the numerous questions the Committee was unable to answer for a lack of sufficient evidence. A recent review of the Departments’ federal budget documents:

“reveals that at the National Institutes of Health and the Agriculture Department — the two agencies that fund the majority of government-backed nutrition science — the share of research dollars devoted to nutrition has stayed largely flat for at least three decades, and pales in comparison to many other areas of research.

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<sup>332</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet*. 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>333</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet*. 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>334</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet*. 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>335</sup> Yun J, Kessler DA, Glickman D. We Need Better Answers on Nutrition. *The New York Times* website. <https://www.nytimes.com/2019/02/28/opinion/nutrition-health.html>. Published February 28, 2019.

“Take NIH. In 2018, the agency invested \$1.8 billion in nutrition research, or just under 5 percent of its total budget. USDA’s Agricultural Research Service spends significantly less; last year, the agency devoted \$88 million, or a little more than 7 percent of its overall budget, to human nutrition, virtually the same level as in 1983 when adjusted for inflation. That means USDA last year spent roughly 13 times more studying how to make agriculture more productive than it did trying to improve Americans’ health or answer questions about what we should be eating.”<sup>336</sup>

**The Academy echoes the calls for a new National Institute of Nutrition to strengthen and expand federal nutrition research and play a central role in coordinating cross-governmental nutrition research priorities.** The Federal Nutrition Research Advisory Group recently outlined the potential structure and priorities for this work.<sup>337</sup>

In the absence of a single coordinating entity for nutrition research, we reiterate our previous recommendation that **the USDA and HHS form an advisory group to address this concern; work with the National Institutes for Health (NIH), National Institutes for Food and Agriculture (NIFA), the Centers for Disease Control and Prevention (CDC) and Congress to make funding available to conduct this research; define best practices and methodologies to address the identified needs; and establish a process to identify and resolve lingering research needs.** The NIH began this work with their 2020-2030 Strategic Plan for NIH Nutrition Research, which lays the foundation for broader, cross-governmental conversations.<sup>338</sup> In that report, investigating dietary patterns and defining the role of nutrition across the lifespan — research that is directly relevant to the *Dietary Guidelines* — were two of the four priority areas identified.

**However, none of these research plans can be actualized without sufficient funding commensurate with the utility, urgency, and importance of this research.** The limited funding for these fundamental health research efforts are resulting in the United States slipping from the leadership role in the global scientific community. At its core, the development of evidence-based guidelines hinge upon the quality and quantity of the science available to make recommendations.

We are pleased the Committee’s charge directs it to “provide its advice and recommendations the USDA Under Secretar[y] of ... Research, Education, and Economics (REE).” With the tremendous resource of respected scientists at its disposal, the agencies and offices of REE are exactly the right entities to undertake the necessary research consumers, public health practitioners, and the government have been essentially *begging for* since the first iteration of the *Guidelines* in 1980. The research these agencies undertake is essential to the scientific progress necessary to improve the health and well-being of Americans. The recent losses of staff and infrastructure within the USDA Agricultural and Food Research Institute (AFRI) resulting from being moved from Washington, D.C. to Kansas City will have a rippling, crippling effect for years in the development of science in the areas of food and agriculture research. **It will not only be incalculably devastating to the research needs for future iterations of the *Guidelines* and the health of the nation, it also will be woefully fiscally irresponsible to**

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<sup>336</sup> Boudreau C, Evich HB. How Washington keeps America sick and fa. Politico.com. <https://www.politico.com/news/agenda/2019/11/04/why-we-dont-know-what-to-eat-060299>. Published November 4, 2019.

<sup>337</sup> Fleischhacker SE, et al. Strengthening national nutrition research: Rationale and options for a new coordinated federal research effort and authority. *American Journal of Clinical Nutrition*. 2020;00:1-49. <https://doi.org/10.1093/ajcn/nqaa179>.

<sup>338</sup> NIH Nutrition Research Task Force. 2020-2030 Strategic Plan for NIH Nutrition Research. Bethesda, MD: National Institutes of Health. 2018. <https://www.niddk.nih.gov/about-niddk/strategic-plans-reports/strategic-plan-nih-nutrition-research>.

**decimate these offices and agencies by forcing an ill-considered relocation that results in mass retirements and resignations of some the nation's leading scientists.**

## **B. Improve National Surveillance Systems**

National surveillance systems such as NHANES, What We Eat in America (WWEIA) and others, including short-form dietary assessments such as Behavioral Risk Factor Surveillance System (BRFSS) and Youth Risk Behavior Surveillance System (YRBSS) in which some of the diet surveillance has decreased in recent years, provide critical information on the diets consumed by Americans, the contextual social factors surrounding their food choices, and the health outcomes of those circumstances and choices. Beyond the core surveillance systems that track dietary intake and nutritional status, the federal government conducts many more national surveys that are ripe for the inclusion of more questions elucidating nutrition-related issues. Surveys such as the American Community Survey and the Medical Expenditure Panel Survey, for example, foray into nutrition research through the lens of food insecurity. As the Academy commented to the Agency for Healthcare Research and Quality in July 2020,<sup>339</sup> AHRQ should consider trialing the inclusion of a short-form dietary assessment instrument as part of MEPS to provide information linking diet quality and current health status to medical expenditures.

These national surveys are at once invaluable sources of information for researchers and still lacking in the breadth, specificity, and alignment necessary to paint a full picture of nutrition in America and the long-term impacts of various dietary patterns on health outcomes and medical expenditures. The Academy, below, provides a series of recommendations that apply to national surveillance systems regarding sample composition, data collection instruments and longitudinal analyses to the agencies that oversee these surveillance systems or otherwise fund nationally representative nutrition and health research.

### *1) Sample Composition*

#### *a. Sample Diversity*

National Surveillance Systems such as NHANES currently oversample underrepresented groups, but these efforts do not go far enough to fully ascertain all of the population estimates that are necessary to inform nutrition research and dietary guidance.<sup>340</sup> This includes insufficient information on specific populations such as Native Americans, Pacific Islanders and Native Hawaiians from all life stages, as well as individuals from all racial and ethnic backgrounds that are in underrepresented life stages including women who are pregnant or lactating and children in the first 2 years of life.

#### *b. Align Age Groups*

The Committee noted the difficulty of applying and interpreting recommendations and findings from surveillance systems across age groups due to the differing definitions of various life-stages.<sup>341</sup> Utilizing standardized age groups across federal recommendations and research would improve this.

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<sup>339</sup> Academy of Nutrition and Dietetics Comments Re: Agency Information Collection Activities: Medical Expenditure Panel Survey (MEPS) Social and Health Experiences Self-Administered Questionnaire. July 6, 2020. [https://www.eatrightpro.org/-/media/eatrightpro-files/news-center/on-the-pulse/regulatorycomments/academy-of-nutrition-and-dietetics\\_meps-social-and-health-experiences-saq.pdf](https://www.eatrightpro.org/-/media/eatrightpro-files/news-center/on-the-pulse/regulatorycomments/academy-of-nutrition-and-dietetics_meps-social-and-health-experiences-saq.pdf). Accessed August 13, 2020.

<sup>340</sup> Scientific Report at 766.

<sup>341</sup> *Id.* at 767-768.

c. Family linkages

Surveys should include information linking family/household members together, particularly parent/caregiver-child relationships, to better understand how adult dietary practices impact the children in the household.<sup>342</sup> In the case of biological parent-child dyads, this could also enable controlling for family history of diet-related chronic diseases when studying children.

2) *Data Collection Instruments*

a. Questionnaire Breadth

National dietary and health surveillance systems should also include questions on socioeconomic status, food security status, cultural food traditions, and religious or ethnic food “rules” to better understand how these factors influence dietary intake.<sup>343</sup> Meal timing is also understudied in dietary surveillance systems and should include questions about timing of food and beverage intake to better understand how individuals consume food over the course of the day and how meal timing patterns may differ across ages or life stages.<sup>344</sup>

b. Intake Estimation Protocols

While not a new recommendation, the Committee reaffirms the need to develop better tools for ascertaining dietary intake to address what is assumed to be a systematic under-reporting of intake in adult and a systematic over-reporting of intake in children by their caregivers.<sup>345</sup>

c. Seafood Intake Estimation

Measures of seafood intake are not standardized across research studies, including national surveillance systems.<sup>346</sup> Validated measures including questionnaires and key biomarkers are needed, as is consensus on relevant controls. With no standardization of seafood consumption research, it is extremely difficult to conduct meta-analyses or otherwise combine or compare studies to develop specific dietary recommendations in this area.

d. Alcohol Intake Estimation

As with other areas discussed here, the methodology for estimating alcohol intake suffers from a lack of standardization and specificity. As noted previously, measurement should occur at multiple timepoints to ensure accurate consumption estimation. We also recommend funding additional well-designed studies on alcohol intake, and we note the Committee specifically suggests more Mendelian randomization studies that stratifies individuals based on relevant genetic variants before randomization.<sup>347</sup>

e. Measuring Eating Frequency

A variety of definitions exist to describe eating frequency, including variation in what is counted as ‘an eating occasion,’ whether beverages are included, and how much time must elapse to consider eating occasions to be distinct.<sup>348</sup> A lack of accepted terminology and validated instruments to measure eating

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<sup>342</sup> *Id.* at 768.

<sup>343</sup> *Id.* at 766-767.

<sup>344</sup> *Id.* at 768.

<sup>345</sup> *Id.* at 767

<sup>346</sup> *Id.* at 792-793.

<sup>347</sup> *Id.* at 795-796.

<sup>348</sup> *Id.* at 797.

frequency limits the ability to conduct meta-analyses or otherwise combine or compare studies to develop specific dietary recommendations in this area. We encourage standardization.

To efficiently generate data on eating frequency, research, including national dietary surveillance systems, researchers should begin to capture information on eating frequency, even if the primary focus of the research is on diet composition.<sup>349</sup>

f. Food Databases

USDA food databases need to include a broader array of foods and beverages, particularly those from underrepresented ethnicities. Without an accurate database of foods to choose from, national surveys cannot accurately capture the diets of diverse populations.<sup>350</sup> A broader array of micronutrients should also be included for more foods in the databases, including iodine content, which is lacking from many foods in the database but is a nutrient of concern during pregnancy.<sup>351</sup>

g. Biomarkers

In addition to better accounting for underrepresented populations in national surveillance systems, surveillance systems should also collect national data on biomarkers that are of significance for these populations. Specific recommendations from the Committee include iodine and zinc biomarkers in pregnant and lactating women and children in the first 2 years of life.<sup>352</sup> Without these biomarker data, there is no reliable way to produce population or sub-population estimates of deficiency and therefore no way to prioritize the promotion of these nutrients of concern within the *Dietary Guidelines*.

3) *Longitudinal Analyses*

In addition to the cross-sectional surveillance systems in place, there is a need for collection of longitudinal data from nationally representative samples to better understand the connections between dietary intake early in life (including infant feeding practices) and chronic disease status, taste preferences, and dietary patterns later in life.<sup>353</sup> Specifically identified by the Committee were the needs “to understand how early life dietary exposures, specifically types and ratios of dietary fatty acids, affect cardiovascular health across the lifespan.”<sup>354</sup> This research is needed to both refine dietary guidance in children and to understand the importance of a healthy diet in childhood. Despite the insights that the data could provide and despite calls from Committees as early as 1995 for this type of research,<sup>355</sup> sufficiently powered, long-term longitudinal studies on nutrition are still severely lacking, putting us years to decades away from knowing the answers to these longest-term questions. We note the National Academies’ report, *Evaluating Obesity Prevention Efforts*,<sup>356</sup> addresses surveillance of obesity and includes recommendations the Departments should incorporate into the final *Guidelines*, particularly including national and state plans for surveillance of obesity and related behaviors (e.g., diet).

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<sup>349</sup> *Id.* at 797-798.

<sup>350</sup> *Id.* at 766-767.

<sup>351</sup> *Id.* at 781.

<sup>352</sup> *Id.* at 767.

<sup>353</sup> *Id.* at 769, 776-777.

<sup>354</sup> *Id.* at 790.

<sup>355</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>356</sup> *Evaluating Obesity Prevention Efforts: A Plan for Measuring Progress.* Washington, DC: National Academies Press (US); 2013. <https://www.ncbi.nlm.nih.gov/books/NBK202507/>.

## C. Specific Gaps in Nutrition Research

### 1) *Dietary Reference Intakes*

The Dietary Reference Intakes need to be updated across all age-sex groups and life stages. The Committee specifically recommends additional DRI research on energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, amino acids and choline needs across all groups.<sup>357</sup> They also specifically noted the need for updated recommendations across all nutrients for children under 24 months as many of the recommendations for these groups are AIs and not RDAs and there are weaknesses in the human milk nutrient estimates used to develop many of these recommendations.

### 2) *Maternal and Child Health*

#### a. Impacts of Maternal Diet on Child Outcomes

More research is needed on how the diets of pregnant or lactating woman impact the taste preferences of their children and children's overall dietary intake.<sup>358</sup> Specifically, more research is needed connecting maternal consumption of seafood, omega-3 fatty acids, choline, iodine, iron and folate during pregnancy to all aspects of child development.<sup>359</sup> Similar research gaps regarding seafood and omega-3 intake during pregnancy and lactation were raised as early as 2010 by the committee,<sup>360</sup> indicating a lack of prioritization of this topic by researchers and funders for at least a decade.

Research is also lacking on maternal fatty acid and seafood intake during various stages of pregnancy and lactation and child neurocognitive outcomes, limiting the ability to make specific recommendations.<sup>361,362,363</sup> Beverage consumption during pregnancy and outcomes also is incredibly understudied but ripe for well-designed RCTs comparing different beverages types and pattern.<sup>364</sup>

The dietary patterns and nutritional status of women before and during pregnancy and lactation and the impact on child health, growth and development is also under-studied, including the role of meal frequency and macronutrient composition during pregnancy on maternal and child metabolic outcomes.<sup>365</sup> We also recommend additional research on dietary patterns specifically for women with gestational diabetes.

#### b. Impacts of Supplementation

Future research on maternal diets must include all sources of nutrients, including supplementation and fortified foods and should consider the relative contributions from these sources and the potential for harm from excess intake.<sup>366</sup> Nutrients of concern for the Committee include omega-3 fatty acids, folate,

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<sup>357</sup> *Id.* at 769-770.

<sup>358</sup> *Id.* at 778.

<sup>359</sup> *Id.* at 780.

<sup>360</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>361</sup> Scientific Report at 782.

<sup>362</sup> *Id.* at 792.

<sup>363</sup> *Id.* at 793.

<sup>364</sup> *Id.* at 794.

<sup>365</sup> *Id.* at 780.

<sup>366</sup> *Id.* at 779-780.

iron, vitamin D, choline, and iodine. The Committee also identified a lack of research on the impacts on maternal and child health outcomes of supplementation of iron and folate/folic acid during lactation.<sup>367</sup>

Supplementation in infants is similarly understudied, including iron supplementation for infants with iron deficiencies,<sup>368</sup> recognizing the frequency that iron supplementation is appropriate for breast-fed infants. More research is needed across a racially and ethnically diverse infant population to understand the impacts of iron supplementation on “growth, including potential effects on morbidity, the microbiome, zinc and copper status, and oxidative stress or lipid peroxidation.”<sup>369</sup> Similarly, research is needed on infant supplementation on vitamin D that considers maternal supplementation (for human milk fed infants), baseline vitamin D status, and various lengths and intensities of infant sun exposure.<sup>370</sup>

### c. Maternal Health Considerations

More research is needed to better understand the impact of various dietary patterns on appropriate gestational weight gain, postpartum weight retention, morbidity, and mortality for pregnant women.<sup>371</sup> The Committee also recommended future Committees assess the impacts of the intensive and duration of breast-feeding on post-partum weight retention/loss, maternal obesity risk, diabetes risk and other maternal health outcomes.<sup>372</sup> This information would allow recommendations on breast-feeding to be based on maximizing outcomes for both mothers and children.

### d. Infant and Toddler Feeding

As the Committee noted, in their attempt to review the evidence on healthy diets in children under 2 years, they found “the evidence to answer the questions in the birth to age 24 months population was often scarce or insufficient, pointing to the need for additional research in this area.”<sup>373</sup> This echoes the consensus of a 2017 NIH workshop on human milk consumption that the “limited scope of Human Milk research initiatives has led to a lack of robust estimates of the composition and volume of [human milk] consumed and, consequently, missed opportunities to improve maternal and infant health.”<sup>374</sup> These gaps in this area are broad and spanned DRIs, dietary patterns including human milk consumption, feeding practices, taste preferences, and allergies.

An additional area of limited evidence relates to infant mixed feeding patterns (the use of both human milk and formula) and the proportion of human milk feedings at various times of the day and within individual meals.<sup>375</sup> There are high rates of mixed feeding in the U.S., but comparatively little research that assesses the nuances of various mixed feeding patterns. Research is similarly lacking on the impacts of human milk consumption directly from the breast versus from a bottle on child health outcomes.<sup>376</sup> This includes a lack of evidence on feeding dynamics.

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<sup>367</sup> *Id.* at 781.

<sup>368</sup> *Id.* at 786.

<sup>369</sup> *Ibid.*

<sup>370</sup> *Id.* at 786-787.

<sup>371</sup> *Id.* at 780.

<sup>372</sup> *Id.* at 782.

<sup>373</sup> *Id.* at 42.

<sup>374</sup> Casavale KO, Ahuja JKC, Wu X, et al. NIH workshop on human milk composition: summary and visions. *Am J Clin Nutr.* 2019;110(3):769-779. doi:10.1093/ajcn/nqz123

<sup>375</sup> Scientific Report at 783.

<sup>376</sup> *Ibid.*

More specificity in the literature is needed on non-exclusive human milk feeding and whether the non-exclusivity is due to the introduction of complementary foods or the use of formula.<sup>377</sup> Similarly, research on the introduction of complementary foods needs to separately assess introduction to children who were exclusively fed human milk, exclusively fed formula, or fed a mixed diet.

There is also a paucity of evidence on extended human milk feeding beyond 12 months of age.<sup>378</sup> Data are lacking that separately classify infants who never received human milk and those who received only small amounts or for a short duration of time, which limits the ability to separately study the impacts of breast-feeding initiation and duration. And little information exists on partial human milk feeding that may extend beyond 12 months, which limits the ability to completely understand food patterns in this age group.<sup>379</sup>

More research is needed on the relationship between the introduction of various foods and beverages (other than peanuts and eggs) and subsequent development of food allergies or atopic allergies.<sup>380</sup> Per the Committee's recommendation, these studies should use RCT study designs, valid and reliable measures and consistent definitions of diet diversity and/or dietary patterns, assess exposures and multiple timepoints, adjust for key confounders, account for physiological mechanism of action and account for the potential for reverse causality due to baseline risk.<sup>381</sup> There is also little evidence examining the introduction of sugar-sweetened beverages and juice during the complementary feeding stage and its impacts on childhood growth, size, and body composition.<sup>382</sup>

#### e. Human Milk Composition

There currently exists no standard reference for the nutritional value for human milk that spans the full course of lactation.<sup>383</sup> Needed research includes analysis of milk from a diverse population of women with children of varying ages. Samples should also be linked to data on maternal diet and relevant demographic characteristics such as age and parity to better understand how these characteristics affect milk composition.

### 3) *Dietary Patterns*

Since the 1980s, the *Dietary Guidelines for Americans* have shifted their focus from ingredients to nutrients to food groups to dietary patterns.<sup>384</sup> With this shift has come a growing recognition of the need for more research on understanding and defining dietary patterns and studying their associated health outcomes. NIH affirmed the need to go beyond molecular research and “investigate the role of dietary patterns and behaviors for optimal health” in its 2020-2030 Strategic Plan for NIH Nutrition Research.<sup>385</sup>

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<sup>377</sup> *Id.* at 784.

<sup>378</sup> *Id.* at 784-785.

<sup>379</sup> *Id.* at 788.

<sup>380</sup> *Id.* at 786.

<sup>381</sup> *Id.* at 405.

<sup>382</sup> *Id.* at 786.

<sup>383</sup> *Id.* at 768.

<sup>384</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>385</sup> NIH Nutrition Research Task Force. 2020-2030 Strategic Plan for NIH Nutrition Research. Bethesda, MD: National Institutes of Health. 2018. <https://www.niddk.nih.gov/about-niddk/strategic-plans-reports/strategic-plan-nih-nutrition-research>.

a. Defining Dietary Patterns

We need additional research to better understand and define the various dietary patterns that are represented across the U.S. population.<sup>386</sup> Currently, research focuses on how well eating patterns identified in national datasets align with the Healthy Eating Index, but this unidimensional classification system does not explain or define the patterns themselves. There is notable lack of research on eating patterns and macronutrient ratios in children and adolescents, the latter of whose meal timing and frequency often diverge significantly from adult patterns. This area of research could be improved to be more representative of the country's racial and ethnic diversity and the populations that have the highest rates of diet-related chronic diseases.

b. Low-Carbohydrate Dietary Patterns

Low-carbohydrate diets, in particular, are lacking in standardized definitions.<sup>387</sup> Among varying levels of carbohydrate restriction, cut-offs must also be defined for protein and fat intake. Similarly, more research is needed comparing low-carbohydrate diets of varying diet quality.<sup>388</sup> Even when macronutrient distribution is consistent, inconsistent dietary quality across studies and study participants can fail to isolate the impact of macronutrient distribution.

c. Vegetarian Pattern in Toddlers

More research is needed to understand whether the vegetarian-style food pattern supports adequate iron and zinc status given the lower bioavailability of iron in many common vegetarian sources and the absorption competition between zinc and phytates.<sup>389</sup> In addition to the above focus on deficiencies, we note a lack of research on plant-based diet patterns and children in general regarding issues such as obesity prevention, nutrient adequacy overall, and dietary quality.

d. Anti-Inflammatory Dietary Pattern

The Academy recommends expanding the criteria for what constitutes a dietary pattern. In their 2020 deliberations, the Committee studied largely the same patterns that had been studied by previous Committees, which does not reflect the evolution of American dietary patterns. For example, anti-inflammatory dietary patterns need more research and inclusion for consideration by future Committees.

e. Salt and Iodine Consumption in Young Children

With iodized salt contributing a significant portion of iodine to the American diet, more research is needed on the impacts of restricting added salt to complementary foods and beverages on infants' and toddlers' iodine and sodium statuses and how the use of sodium-containing prepared foods may or may not counterbalance a reduction in added salt.<sup>390</sup>

f. Bone Health

Previous Committees have focused on the need for more research on calcium and vitamin D on bone health,<sup>391</sup> but this Committee has recognized studies should go beyond those nutrients of concern.<sup>392</sup>

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<sup>386</sup> Scientific Report at 777.

<sup>387</sup> *Id.* at 788.

<sup>388</sup> *Id.* at 788-789.

<sup>389</sup> *Id.* at 788.

<sup>390</sup> *Id.* at 787-788.

<sup>391</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>392</sup> Scientific Report at 789.

More research is needed on how long-term bone health is impacted by a wider array of dietary patterns and physical activity levels and types.

g. Sodium

While not a primary focus for this Committee, the need for additional sodium research to inform *Dietary Guidelines* has been a consistently identified research gap by previous Committees including the impacts on blood pressure of sodium in children, the impacts of sodium on non-blood pressure variables such as bone mineral density, and the interactive effects of sodium and potassium intake levels.<sup>393</sup>

4) *Dietary Fats and Seafood*

a. Fat Replacement

When studying saturated or other types of fats, more research is needed on the impacts of replacing saturated fat with other macronutrients. Previous research focused more on examining the impacts of replacing saturated fat with different types of unsaturated fat and the metabolic and physiologic pathways through which these fats impacted serum lipids.<sup>394</sup> Less studied in well-controlled trials are the impacts of replacing saturated fat with different types of carbohydrates on blood triglyceride levels, LDL particle size.<sup>395</sup> More research also is needed that differentiates atherosclerosis risk by LDL particle size rather than simply assessing total LDL levels.

b. Sources of Fat

Deeper research is needed on dietary fats that goes beyond simply assessing total intake and cardiovascular outcomes. The Committee specifically recommends additional research on the food source of various dietary fats as well as any processing or refining done to the original food source to render the final product.<sup>396</sup>

Similarly, research on saturated fat from different sources is needed to separate the impacts of dietary saturated fat and dietary cholesterol, which are co-occurring in many animal sources, but not in vegetarian sources of saturated fat.<sup>397</sup> This echoes the concern of previous Committees that research on cholesterol needed to be conducted on a wider array of food sources.<sup>398</sup>

c. Trans Fat

The vast and rapid reduction of *trans* fat in the U.S. food supply means research on other types of fat and CVD risk from prior to the *trans* fat removal need to be conducted anew in the context of low-*trans* fat diets to account for potential confounding effects that significantly higher levels of *trans* fat may have had on the relationship between fat intake and CVD risk.<sup>399</sup>

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<sup>393</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>394</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>395</sup> Scientific Report at 790-791.

<sup>396</sup> *Id.* at 791.

<sup>397</sup> *Id.* at 791-792.

<sup>398</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>399</sup> Scientific Report at 792.

d. Impacts of Sex Hormones

Despite differing CVD risk by gender, there is little research on whether and how sex hormones themselves modulate the impact of blood lipids on the development of CVD at various ages.<sup>400</sup>

e. Seafood and Neurocognitive Impacts

Similar to the lack of research on maternal intake of seafood and child neurocognitive impacts, there is insufficient research, particularly RCTs, on the physiological relationship between seafood intake and neurocognitive development and health across the lifespan.<sup>401</sup>

f. Omega-3 Research

Omega-3 research should be expanded to include the study of non-seafood sources of the nutrient in the American diet and their impacts on neurocognitive health.<sup>402</sup> Additionally, there has not been enough omega-3 research to reach a consensus on the optimum ratio of DHA and EPA in the diet. These concerns have been echoed by Committees since as early as 2005 and there is still much left to be studied on omega-3s from seafood and non-seafood sources.<sup>403</sup>

5) *Beverages, Alcohol, and Added Sugars*

a. Beverage Patterns

As compared to the study of dietary patterns, there is a paucity of research on beverage patterns alone and in conjunction with various dietary patterns, which can lead to public confusion over the lack of recommendations.<sup>404</sup> The Committee specifically highlights the need for more research on beverage volume, timing, consumption frequency, macronutrient and caffeine content, total caloric contribution, and the timing of consumption relative to food consumption or exercise. As with other research, this needs to be broadly conducted across a range of genders, races, ethnicities, ages, and life stages.

Additional research also is needed on the relationship between these beverages (including alcoholic beverages) and beverage patterns and health outcomes such as growth and body composition and risk of developing CVD and type 2 diabetes.<sup>405</sup>

b. Physical Form of Food

With the prevalence of meal replacement drinks, smoothies, and other liquids marketed as substitutes for the consumption of solid meals, more research is needed to understand how the intake of calories and various nutrients in liquid versus solid meals may influence health impacts.<sup>406</sup>

c. Water

The consumption of water is understudied across all stages of life. The Committee specifically highlights the need for more research on water quantity, source, filtration, carbonation, and flavoring,

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<sup>400</sup> *Id.* at 791.

<sup>401</sup> *Id.* at 793.

<sup>402</sup> *Ibid.*

<sup>403</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>404</sup> Scientific Report at 793-794.

<sup>405</sup> *Id.* at 796.

<sup>406</sup> *Id.* at 794-795.

and proportion of total water consumed as pure water.<sup>407</sup> Additionally, the Committee recommends counting water consumption as an eating occasion for the purposes of research on eating frequency.<sup>408</sup>

d. Alcoholic Beverages

Research on alcohol consumption to understand the impacts of different amounts of different alcoholic beverages consumed as part of different patterns over the lifespan have on various health outcomes.<sup>409,410</sup> Similar to problems with how human milk consumption is measured, the Committee notes there is a lack of research that fully distinguishes between different alcohol consumption patterns such as life-long ‘never drinkers’ versus prior drinkers who now abstain entirely. Alcohol patterning is poorly understood, with much research assessing total or average alcohol consumption rather than a more complex analysis of frequency and volume.

e. Beverages and Health Outcomes

As was highlighted previously, research on dietary impact on neurocognitive outcomes is lacking. This includes a lack of understanding of the impacts of various beverages (dairy, juice, sugar-sweetened-beverage, etc.) and beverage patterns, including consumption of alcohol and added sugars.<sup>411</sup> Research also is lacking on the impacts of various beverage patterns and growth, body composition, and risk of CVD and type 2 diabetes.<sup>412</sup> These gaps exist in both adults and children, and current research suffers from a lack of specificity and detail on beverage types, study size and duration, validation of outcome measures, and standardization of intake assessment instruments. Understanding the health impacts of milk requires comparing types of milk based on fat content, and not just milk versus non-milk studies, which was a research gap identified by the 2010 Committee, but was still left unfulfilled by the research and funding community.<sup>413</sup>

f. Sugar Preferences

More research is needed to understand how preferences for sugar are impacted by genetic bases, exposure to added sugars and sweeteners at varying levels and across the lifespan, and how malleable these preferences are.<sup>414</sup>

6) *Eating Frequency and Timing*

Despite the impacts that eating frequency can have on appetite, digestion, and metabolism, limited evidence exists on the relationship between eating frequency and diet quality or health impacts in adults, children, adolescents, and pregnant and post-partum women.<sup>415,416</sup> While some studies exist on specific meals (*e.g.*, breakfast), little research spans the entire day or seeks to draw conclusions about overall frequency or timing patterns. This research could inform time-based dietary recommendations to complement pattern- and nutrient-based recommendations. The priority of this research gap is

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<sup>407</sup> *Id.* at 795.

<sup>408</sup> *Id.* at 798.

<sup>409</sup> *Id.* at 795-796.

<sup>410</sup> *Id.* at 797.

<sup>411</sup> *Id.* at 796.

<sup>412</sup> *Id.* at 796-797.

<sup>413</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

<sup>414</sup> Scientific Report at 797.

<sup>415</sup> *Id.* at 798.

<sup>416</sup> *Id.* at 799-800.

underscored by the growing public interests in concepts such as intermittent fasting, meal-skipping and other time-based dietary restrictions.

## 7) *Social Determinants of Health*

### a. Food Insecurity and Nutrition Assistance Programs

More research is needed on how food insecurity status and socioeconomic status interact to impact diet quality.<sup>417</sup> For example, the 2015 Committee concluded the current body of evidence on the links between access to retail food outlets and dietary intake was limited and inconsistent.<sup>418</sup>

More well-designed studies are also needed on the impacts of various food security programs such as the Supplemental Nutrition Assistance Program have on participants' diet quality and whether and how various programmatic changes might impact participants' diet quality.

Food insecurity should also be studied in the context of impacts on eating frequency.<sup>419</sup> Whether and how food insecurity drives eating frequency may be a mechanism for understanding the impacts of food insecurity on overall diet quality or health. Research is needed on how this and other short-term impacts of food insecurity may vary over the course of a month for individuals receiving cash or food assistance on a specified monthly or bimonthly basis.

## 8) *Public Health Intervention Research*

### a. Dietary Change Interventions

While not part of the 2020 Committee's charge, prior Committees have routinely stated the need to better understand how the *Dietary Guidelines* are used, including examining barriers to compliance, personal and societal motivations, communication and education strategies, and implementation tools to promote adherence to the *Guidelines* to promote weight balance and reduce the risk of CVD, type 2 diabetes, and other health outcomes.<sup>420</sup> We emphasize the role of behavioral nutrition in addressing these, such as the behavioral antecedents to dietary behavior.

The 2020 Committee noted this should be a renewed area of focus for future committees, indicating an absence from the 2020 guideline development process does not represent a lack of importance of these issues. These questions are particularly important to understand in populations that are at higher risk for diet-related diseases including some racial and ethnic minority groups and economically disadvantaged Americans. We encourage the Departments to fund well-designed interventions to examine how the *Guidelines* are implemented.

### b. Food Systems and Food Environments

As compared to previous committees, this Committee focused comparatively less on the outstanding need for public health intervention research. Nevertheless, there persist substantial gaps in our understanding of how the food system, food environments, and food marketing impact dietary patterns and how behavior change strategies can be contextualized in terms of these factors.

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<sup>417</sup> *Id.* at 777.

<sup>418</sup> Scientific Report of the 2015 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture. Part D. Chapter 4: Food Environment and Settings. First Print. Washington, DC: US Government Printing Office; 2015.

<sup>419</sup> Scientific Report at 799.

<sup>420</sup> Myers EF, Khoo CS, Murphy W, Steiber A, Agarwal S. A critical assessment of research needs identified by the dietary guidelines committees from 1980 to 2010. *J Acad Nutr Diet.* 2013;113(7):957-971.e1. doi:10.1016/j.jand.2013.03.023

There are currently gaps in agreement regarding best methods to determine the relationships between dietary intake and environmental impact. Diet quality, nutritional status, and health outcomes are dependent on a host of larger food system factors, and the Academy encourages USDA, HHS and future Advisory Committees to explore methods to operationalize the systems-thinking approach. The National Academies' report, *Evaluating Obesity Prevention Efforts*,<sup>421</sup> recently focused on environmental assessment of obesity and related behaviors and we encourage the Departments to incorporate the body of work being developed by Healthy Eating Research *consistent with* the findings of the Scientific Report.<sup>422</sup>

For example, if a future Advisory Committee wishes to incorporate data from life cycle assessments, criteria such as whether a study was randomized or double-blinded may not apply and different standards are needed to judge evidence quality. Examining the relationships between dietary intake and environmental impact requires cross-disciplinary collaboration in order to inform rigorous research and review methods and we encourage future reports to prioritize further evidence review and cross-disciplinary collaboration within this important area.

c. Breast-feeding Promotion

In addition to public health research on general dietary adherence, well-designed RCTs are also needed to examine breast-feeding promotion interventions and their relative efficacy in affecting measurable changes in rates of various breast-feeding goals, particularly among populations with the lowest rates of breast-feeding and/or human milk feeding.<sup>423</sup> This will become increasingly important as the 2020-2025 *Guidelines* and subsequent iteration include infant and early childhood recommendations, which represent an expanded audience for USDA and HHS.

d. Sustainability and Food Systems Stewardship

To examine these crucial relationships, the Departments and future Advisory Committees are encouraged to embrace cross-disciplinary standards of evidence to incorporate innovative research on the associations between dietary intake and environmental impact. Relationships requiring further investigation and incorporation into future iterations of the *Dietary Guidelines* include the impact of climate change on nutrient content of food commodities and crop yields and, therefore, availability of consumable food calories; and the environmental impact of specific dietary patterns and food production methods. The Academy requests the Departments assess the bidirectional relationship between dietary intake and food systems that may require standards for assessing evidence quality which differ from the standards used to assess diet-disease relationships.

9) *Genetics and Epigenetics*

A number of genetic markers have been identified as influencing how people utilize various nutrients but this research is incomplete. Epigenetic factors play a role in gene expression throughout the lifespan and more research is needed to understand the relationship between intake in early life (including maternal intake during pregnancy) and epigenetic expression.<sup>424</sup>

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<sup>421</sup> *Evaluating Obesity Prevention Efforts: A Plan for Measuring Progress*. Washington, DC: National Academies Press (US); 2013. <https://www.ncbi.nlm.nih.gov/books/NBK202507/>.

<sup>422</sup> Healthy Eating Research website. <https://healthyeatingresearch.org/>.

<sup>423</sup> Scientific Report at 784.

<sup>424</sup> *Id.* at 774.

## **D. Methodological Considerations**

### *1) Need for more RCTs*

Too few studies on dietary patterns are conducting as well-designed RCTs with sufficient sample sizes and duration to generate reliable evidence of the impacts of dietary patterns on health outcomes.<sup>425</sup> Additionally, research that does exist does not begin to cover all genders, races, ethnicities, ages, and life stages necessary to make conclusions across all populations.

### *2) Repeated Measurements*

Studies that have repeated measurements of dietary intake over time are more likely to accurately reflect participants' true dietary exposures and eating patterns and therefore draw more accurate conclusions on the relationship between exposures and outcomes.<sup>426</sup> Studies that rely on single assessments of dietary intake risk capturing data that is not reflective of participants' habitual intake and also fail to capture any changes in eating that may occur over time due to age, life stage, medical diagnoses, or other factors.<sup>427</sup> This negatively impacts surveillance systems by producing inaccurate estimates of national intake as well as interventional research by poorly estimating the effects of the intervention.

### *3) Collecting Sufficiently Detailed Information*

Studies on dietary patterns need to use sufficient instrumentation to collect detailed information on the amounts and types of food, beverages, and supplements consumed.<sup>428</sup> The level of detail of conclusions is limited by the level of detail collected about intake. The varying levels at which foods are classified and grouped also poses limitations when conducting meta-analyses. For these reasons, studies that classify foods into a smaller number of very broad categories without also reporting sub-analyses on smaller categories have limited utility in answering the often highly specific dietary questions that consumers and Committee members alike seek to answer.

#### *a. Confounding Factors*

Research on the impacts of dietary patterns and other aspects of nutrition on health outcomes must control for a litany of potentially confounding factors such as physical activity, race/ethnicity, weight status, and socioeconomic status to produce adequate effect estimates.<sup>429</sup> Under-controlled studies risk inappropriate interpretation of cause-and-effect leading to inaccurate guidance.

### *4) Studying Children*

#### *a. Data Collection Instruments*

Data collection methods that rely entirely on parental report may not paint a complete picture of the health and development of children. More research is needed to develop and validate age-appropriate measures of neurocognitive development.<sup>430</sup> Data collection tools must also be validated as culturally appropriate and reflective of the experiences and perceptions of diverse populations. Standardization of tools also will help in comparing and collectively assessing findings from different studies.

We also recognize the importance of studying children from a developmental perspective outside of B-24. For example, dietary intake and abilities are very different in a 6- to 8-year-old than in a 15- to 17-

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<sup>425</sup> *Id.* at 790.

<sup>426</sup> *Id.* at 776, 789-790.

<sup>427</sup> *Id.* at 789-790.

<sup>428</sup> *Id.* at 789.

<sup>429</sup> *Id.* at 789.

<sup>430</sup> *Id.* at 776.

year-old. In the same way in which adults differ at age 18 and age 80, one cannot simply aggregate children of all ages into one group.

b. Dietary Scoring for Young Children

Currently, there is no scorecard such as the Health Eating Index that applies to children in the first 2 years of life, which limits the ability to assess and compare diet quality in this population.<sup>431</sup>

c. Measure Standardization

There are a variety of ways to measure and classify child health, growth and development, and the lack of standardized usage of these measures limits the ability to conduct meta-analyses or otherwise compare or combine results across studies. The Committee identified measure of birth size as adjusted for gestational age and sex as one measure in need of standardization.<sup>432</sup>

d. Sibling-Pair Studies

The Committee identified a lack of sibling-pair studies, which provide strong genetic and environmental controls for observational studies, which are otherwise hard to fully control.<sup>433</sup>

5) *Studying Pregnant and Lactating Women*

a. Appropriate Confounding Variables

A variety of weight-related measures can confound the findings of studies on pregnant and lactating women. Variables such as total gestational weight gain and rate of weight gain and postpartum BMI, weight change and weight change rate should be included in studies, where appropriate, to better isolate the impacts of the dietary exposures being studied from the impact of weight gain/loss.<sup>434</sup>

## **E. Summary**

Every day researchers and funders within the federal government and academia delay the prioritization of critical nutrition research is a day longer that USDA, HHS, registered dietitian nutritionists and other public health professionals must wait to make evidence-based recommendations to the public. The time we have lost, particularly with regards to longitudinal research, can never be recaptured.

Many of these questions will take decades to fully answer, meaning we are still decades out from knowing the answers even if we start today. The *only* path forward is a strong, immediate prioritization by HHS, USDA and other nutrition and health researchers and funders of the long-standing questions that must be answered to issue more specific, evidence-based dietary guidance to the public.

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<sup>431</sup> *Id.* at 777.

<sup>432</sup> *Id.* at 779.

<sup>433</sup> *Id.* at 784.

<sup>434</sup> *Id.* at 779.

## X. CONCLUSION

The Academy of Nutrition and Dietetics appreciates the opportunity to comment on the Scientific Report issued by the Committee and provide input to the Departments as they finalize the *2020-2025 Dietary Guidelines for Americans*. We are happy to discuss these recommendations in greater detail. Please contact Alison Steiber at 202/775-8277, ext. 4860, or [asteiber@eatright.org](mailto:asteiber@eatright.org); or Pepin Tuma at 202/775-8277, ext. 6001, or [ptuma@eatright.org](mailto:ptuma@eatright.org), with any questions or requests for additional information.

Sincerely,



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