Testimony
Responses to additional written questions for the record.
Submitted to The Committee on Agriculture, Nutrition, and Forestry, Subcommittee on Food and Nutrition, Specialty Crops, Organics, and Research, United States Senate

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Dear Chairman Booker, Ranking Member Braun, and distinguished Members of the Subcommittee:

Thank you for the opportunity to response to the additional written questions from Senators Boozman, Klobuchar, and Ernst. My responses are below.

This testimony reflects my expertise and experiences as a cardiologist, scientist, and public health expert. I am the Dean of the Friedman School of Nutrition Science & Policy at Tufts University; a Professor of Medicine at Tufts School of Medicine; and an Attending Physician in the Division of Cardiology at Tufts Medical Center. My career has focused on the science and practice of what we actually need to eat to keep our bodies healthy and to treat disease; and on which policy and systems changes are most effective and cost-effective to support nutrition security and health. As a doctor, I see firsthand people of all ages and backgrounds suffering from diet-related illnesses. As a public health scientist, I see the incredible challenges Americans face, every day, to obtain and eat nourishing food.

Questions from Senator John Boozman

1) We know that nationwide there are massive supply chain issues and historically high inflation that is plaguing businesses, families, and schools. In every part of the country, schools are struggling to get enough food, a variety of food, even the trays, utensils and products necessary to serve the food to students. Our school nutrition professionals are true heroes and are to be commended for their continual hard work during this difficult time.

I have been pleased that USDA has provided flexibility to schools to serve meals, and now it's even more clear how important the meal pattern flexibilities in particular have been. Yet, I am concerned too many people are not fully understanding the gravity of the situation and want USDA to force schools and food companies to comply with the next phase of rigid nutrition standards. Many food companies halted product reformulation efforts to deal with the pandemic so foods that meet such standards are not available.

How would a school even make this work when they can't get any food – let alone specific whole grain or low sodium foods? Would you agree that now is not the time to be pushing ahead with additional standards in this environment?

Senator Boozman, thank you for this excellent question. School meal providers should be commended for their incredible commitment and efforts during the pandemic.[1] We should all sing their praises, from the rooftops. They do not get enough credit for what they have done, and continue to do.

During the pandemic, several temporary waivers and flexibilities have been important to help school meal providers serve food to students. While major supply chain challenges persist, the USDA should be empowered to provide continued emergency, temporary waivers and flexibilities as necessary.

At the same time, one of the most important pieces of legislation passed by Congress in the last 15 years was the 2010 Healthy, Hunger-Free Kids Act (HHFKA), because of its significant strengthening of nutrition standards for school meals, competitive foods, and early childcare. The HHFKA, passed in a bipartisan fashion and supported by hundreds of top U.S. military leaders including generals and admirals, dramatically improved the nutritional quality of school meals for millions of American children.[2]

Prior to 2010, 55-60% of all school meals consumed by children were of poor nutritional quality. Following the passage of the HHFKA, the nutritional quality of school meals rapidly and markedly improved, so that by 2018, the proportion of school meals of poor nutritional quality was cut by more than half, from 56% to 24%. This improvement was directly related to the standards of the HHFKA, with more consumed whole grains, less sodium, and less sugar-sweetened beverages.

Two points deserve emphasis. First, because of the stronger nutrition standards in the HHFKA, by 2018, school meals were actually the healthiest overall source of food consumed by American children – better than the average food consumed from grocery stores, restaurants, or other sources.[2] Second, these nutritional improvements from school meals were similar by race/ethnicity, household income, and parental education – all segments of American children benefited.

Today, American children are suffering from an onslaught of diet-related illness. About 1 in 4 teens have overweight or obesity, 1 in 5 have prediabetes, and 1 in 4 have fatty liver.[3,4] These statistics are shocking and unacceptable, and will cause devastating health consequences and rising healthcare spending for our nation for years to come.

In 1970, healthcare spending represented about 1 in 20 dollars in the total federal budget. Today, healthcare spending represents nearly 1 in 3 dollars in the total federal budget. The U.S. Government Accountability Office (GAO) recently published a report on federal nutrition policy, based on an comprehensive 3-year audit.[5] The GAO concluded that diet-related diseases are costly, deadly, and largely preventable. The found that 80% of healthcare spending is on chronic diseases, many of which are strongly diet-related. Federal and private healthcare spending continues to rise, with no end in sight. We will never get these healthcare costs under control until we improve the health of our nation's children. And school meals are a critical component for success.

While the pandemic created challenges for school meal service, it also significantly worsened the health of American children. During the pandemic, the rate of unhealthy weight gain among U.S children dramatically increased: compared to pre-pandemic rates, the rate of increase in body mass index doubled overall, and among children who were also obese, increased by more than 5-fold.[6] Thus, the pandemic has greatly amplified, not diminished, the urgent need to improve nutrition for American children.

With Child Nutrition Reauthorization coming up, it's a crucial time to further strengthen school nutrition standards. A recent analysis found that the National School Lunch and Breakfast Program is a net positive economic investment, with an $18.7 billion annual cost returning $39.5 billion each year in improved health outcomes and poverty reduction – a net $21 billion return on investment (ROI).[7] A further strengthening of school meal nutrition standards – for example, more whole grains, fruits, beans, vegetables, and seafood, and less processed meat and added sugars – would create an estimated additional net ROI of at least $1.5 billion per year.[7]

In summary, we cannot afford *not* to further strengthen nutrition standards for school meals, and now is the time to do so. At the same time, the USDA should be empowered to provide emergency, temporary waivers and flexibilities as necessary during the pandemic.

2) I would appreciate hearing more on any evidence-based outcomes from the SNAP Nutrition Education program, the Expanded Food and Nutrition Education Program, and other efforts – including incentive programs - to help SNAP recipients and others buy, prepare and consume healthy foods. Between just SNAP-Ed and EFNEP, Congress spends around $600 million a year, and I know there are other efforts across the federal government. With the continual increases in obesity, diabetes and chronic-diseases, it begs the question of how these programs are helping consumers make healthy choices. Are there evidence-based outcomes to show that nutrition education and incentive programs actually lead to improved health outcomes?

Another excellent set of questions. I will start with incentive programs, then SNAP-Ed, and then EFNEP.

Nutrition incentives

There is strong evidence that economic incentive programs for better nutrition lead to improved diet quality and improved health outcomes. The Healthy Incentive Pilot in SNAP, for example, showed that a 30% incentive to purchase fruits and vegetables led to significant increases in fruit and vegetable consumption among SNAP participants.[8] Tufts faculty at the Friedman School of Nutrition Science & Policy are currently pooling data from 8 completed Produce Prescription programs, each providing financial incentives for healthier eating. Our ongoing evaluation demonstrates that these programs lead to significant improvements in fruit and vegetable consumption as well as health outcomes, including less obesity, lower blood pressure among those with high blood pressure, and lower HbA1c among those with diabetes. A meta-analysis of 13 Produce Prescription programs, which each provided economic incentives in healthcare settings to purchase healthier foods, showed a nearly 1 serving/day increase in fruit and vegetable consumption, a 0.6 kg/m2 reduction in BMI, and a nearly full percentage point improvement in HbA1c.[9] The Vitality health insurance program in South Africa, now extended in the U.S. though a partnership with John Hancock Life Insurance, has also demonstrated that incentive programs for healthier eating and lifestyle work, with improved health and lower healthcare costs.

While expanding incentive programs for purchase of healthier foods in SNAP will increase the overall cost of the program, research shows that in the long-term this is a cost-effective approach to improving health.[10] An alternative approach would combine incentives for purchasing healthier foods with disincentives (rather than absolute restrictions) for purchasing unhealthy foods. Research estimates that this strategy, which has been termed SNAP Plus, would be even more effective at improving health outcomes than incentives alone, and further would lead to immediate cost-savings in the SNAP program as well as reduced healthcare costs. [10] Thus, this combined "SNAP Plus" incentive/disincentive approach would preserve choice, improve nutrition, improve health, and reduce federal government expenditures. I urge Congress to work with USDA and the various states to pilot this and other similar behavioral economic programs in SNAP to improve nutrition and health.

Even more importantly, the healthcare system represents a critical and underutilized venue for incentivizing healthier eating. As outlined in my original written testimony, suboptimal nutrition is the leading cause of poor health in the U.S., and yet is largely ignored by the healthcare system. This is crazy – and fixable. As described above, Produce Prescription programs are a highly promising "Food as Medicine" intervention to cost-effectively improve nutrition and health outcomes. I urge Congress to ask HHS to evaluate and report on produce prescription programs within Medicare and Medicaid, whether directly in the programs or through CMMI. Similar assessments should be performed within the VA and Indian Health Service as well. I encourage you and other members of Congress to meet with the National Produce Prescription Collaborative (NPPC) (https://nationalproduceprescription.org/), of which Tufts is a member. The NPPC brings together organizations across the country experienced in leveraging Produce Prescription programs for prevention and intervention for diet-related disease through federal policy change and further embedding this effective model into healthcare and community food systems.

SNAP-Ed

The impact of SNAP-Ed on diet quality has been assessed in several studies. These generally suggest that Americans who participate in SNAP-Ed have modestly improved nutrition, such as higher intake of fruits and vegetables and less fast food, as well as greater physical activity.[11-13] However, the scale and designs of these

studies tend to be less rigorous than ideal to draw definitive conclusions. And, a review of multiple research studies and reports concluded that there is generally stronger evidence for SNAP-Ed as an effective means of improving food security than for its effects on improving nutrition security or dietary outcomes.[14] This review concluded that challenges for assessing SNAP-Ed include inconsistency in measurement tools and outcomes and a lack of strong study designs focused on nutrition or dietary outcomes. Clearly, more work is needed to assess the impact of SNAP-Ed on nutrition and health.

USDA has recognized some of these challenges. Recently, the USDA released the SNAP-Ed Evaluation Framework as a tool for SNAP-Ed implementing programs to use to measure their success. A recent national study found that of the 51 recommended indicators, SNAP-Ed implementors on average plan to target 19 indicators in their interventions and to assess 12 indicators in their evaluations. Also, more implementors intend to target and assess short- or medium-term indicators, rather with long-term indicators

One of the real missed opportunities in SNAP and SNAP-Ed has been a historical focus on food security, rather than nutrition security. Food security generally emphasizes, through its screening and measurement tools, the availability of sufficient calories; while nutrition security adds an additional core emphasis on diet quality – consistent access, availability, and affordability of foods and beverages that promote well-being and prevent (and if needed, treat) disease.[15] Secretary Tom Vilsack has been a powerful and effective champion for a shift to incorporate nutrition security across all USDA programs. This represents a major advance in USDA policy, which should be further encouraged, supported, and catalyzed.

Specific, actionable recommendations to better leverage SNAP for improved nutrition and health outcomes have been published by the Bipartisan Policy Center.[16] These include, for example, to (1) make nutrition and diet quality a core SNAP objective, including reporting on progress toward this objective, (2) authorize funds for USDA to conduct a range of evidence-based pilots to improve SNAP participants' diets, (3) strengthen SNAP retailer standards to increase healthier food availability for all shoppers, (4) create a robust SNAP-Ed infrastructure to support its implementation and evaluation, while realigning EFNEP and SNAP-Ed to work synergistically while avoiding duplication, (5) coordinate SNAP with Medicaid, Medicare, and VA health services to improve nutrition and diet-related health outcomes, (7) work across Congress' health and agriculture committees to better align SNAP, Medicaid, Medicare, and other federal programs, (8) prioritize nutrition within the Medicaid program, and (9) coordinate federal investments, programs, and data related to food and nutrition across all of the federal agencies.

<u>EFNEP</u>

Collectively, 76 land-grant universities conduct EFNEP to serve low-income adults and youth in rural and urban communities through Cooperative Extension. EFNEP is available in all 50 states, six U.S. territories, and the District of Columbia. In 2020, USDA NIFA received $69 million to conduct EFNEP, employing 1,322 educators who are members of the communities they serve (see the 2020 EFNEP Impact Report from NIFA for full details). In 2020, EFNEP educators worked with 59,853 adults and 204,525 youth, providing tailored lessons on diet quality, physical activity, food resource management, food safety, and food security. This included a shift to remote teaching methods in March of that year.

Evaluating diets among adults after vs. before participation, EFNEP participants increased their consumption of whole grains by 38%; vegetables, by 13%; fruits, by 29%; and dairy, by 6%. 4 in 5 adults also improved their physical activity practices after participation. EFNEP participants also report improved satisfaction with quality of life following participation.[17]

We know from a range of established science that increasing consumption of whole grains, vegetables, and fruits will improve health. A national modeling study also estimated that EFNEP appears most cost effective in its impact on nutrition practices, followed by food resource management practices, and then food safety practices;[18] with an estimated cost-effectiveness that is considered "high value" or a "best buy" compared to highly cost-effective medical interventions to improve health.[19]

A need for greater research

Despite some of the promising evidence above, to my knowledge, a direct evaluation of the impact of EFNEP and SNAP-Ed on health outcomes has not been reported. Such research would be critical to demonstrate the specific health benefits for different participants, as well as which components of the program are more vs. less effective. A large proportion of EFNEP participants will also be on SNAP, and large proportions of participants in each of these programs will also be on Medicaid and Medicare. Yet, the enrollment in, data on, and evaluations of these different federal programs are not coordinated or harmonized. Shouldn't we assess Medicaid, Medicare, and VA health outcomes and costs based on EFNEP and SNAP participation directly? It seems a no-brainer.

The need for greater federal investment in nutrition research to assess these and other important questions was highlighted in a recent white paper,[20] and further supported by the Federal Nutrition Advisory Coalition, a remarkable coalition of nearly 100 U.S. businesses, advocacy groups, and academic organizations.[21] This coalition recognizes that a strengthening of federal nutrition research will provide many benefits for our nation and a significant return on investment. Such research is crucial to lay the foundation for accelerated scientific advances to improve and sustain the health of all Americans, reduce health disparities, lower healthcare spending, strengthen our food system, improve military readiness, and advance innovations and stimulate economic growth. One recommendation from respected academic and former government leaders is to create a new National Institute of Nutrition at the NIH,[20] which can support foundational basic and translational research, such as that outlined by your question, and provide huge ROI for the U.S. economy.

A need for greater coordination

Beyond advancing research, there is an urgent need for greater harmonization and coordination across the multiple federal investments to address nutrition. This was a major conclusion of several recent reports, including the peer-reviewed white paper on *Strengthening national nutrition research: Rationale and options for a new coordinated federal research effort and authority*,[20] the Bipartisan Policy Center report on *Leading with Nutrition: Leveraging Federal Programs for Better Health*,[16] and the GAO report on *Chronic Health Conditions: Federal Strategy Needed to Coordinate Diet-Related Efforts*.[5] The GAO, for example, identified 200 different federal efforts, fragmented across 21 different agencies, aiming to improve nutrition. Several concrete, evidence-based strategies are outlined in these reports for improving harmonization and coordination of federal investments to improve nutrition, advance health, increase health equity, and reduce healthcare spending. These include the need for new structure, authority, and leadership for such coordination.

After Sept 11, Congress recognized the need for greater harmonization and coordination of our federal investments in national intelligence, leading to the creation of the highly successful Office of the Director of National Intelligence. Our federal investments in food and nutrition greatly exceed our federal investments in national intelligence, and are far more fragmented; and the health and economic burdens of poor nutrition for our nation greatly exceed the burdens of terrorism and conflict. In its recent report, the GAO recommended that Congress address this lack of coordination of federal nutrition policy to improve health, reduce diet-related chronic diseases, and reduce healthcare costs.[5] One recommended approach from respected academic and former government leaders is to create a new Office of the National Director of Food & Nutrition, based on the tested and successful model of the Office of the Director of National Intelligence.[20]

3) What do you think is the root cause of poor nutrition and what do you see as the number one strategy to address it?

I see the root cause as our intentional creation of a national and global food system, in the last century, to address 20th century goals of addressing mass starvation and vitamin insufficiency, which achieved these goals but unintentionally created a legacy food system that is now increasing overweight, obesity, diabetes, and other chronic nutrition-related diseases. The important corollary is that these are all relatively new problems, mostly

rising within the past 30-40 years, and accompanied by relatively new science that shows how to fix these problems, mostly within the past 20 years – and so our national attention and policies have not yet caught up.

In brief, we have a 20th century food system built to address 20th century priorities, but we face 21st century problems.

As outlined in my original written testimony as well as in the recent GAO report on federal nutrition policies,[5] poor nutrition, consequent diet-related diseases, and resulting preventable healthcare and other economic burdens are together perhaps the leading overall challenge to our federal budget and our country's overall well-being, resilience, and economic security. This is not small potatoes.

We can fix all this, within 1-2 decades, with a carefully considered, rationally designed, and prudently implemented national plan to improve nutrition and reduce diet-related illness. But only if we have a national strategy – an actual plan.

The science supports specific actions across 6 domains:

(1) Advancing nutrition science and research
(2) Incorporating Food as Medicine into healthcare
(3) Leveraging our federal nutrition programs
(4) Catalyzing business innovation and entrepreneurship
(5) Expanding nutrition education and public health
(6) Creating federal leadership, structure, and authority for food and nutrition policy coordination

The relevant actions in each of these domains are listed in my original written testimony. Each of these can and should be pursued now by appropriate congressional, agency, and private sector actions. At the same time, our nation can harmonize, streamline, and greatly accelerate this process by bringing all the stakeholders together for a 2022 White House Conference on Food, Nutrition, Hunger, and Health. It's been 52 years since the nation came together to address food, in the last 1969 Conference convened by President Nixon. A half century later, we face very different burdens, and incredible positive opportunities. It's time to address these burdens, and grasp these opportunities.

4) With increasing incidences of food allergies, especially in minority communities, it's important that federal feeding programs accommodate participants with allergies. But the WIC food package, for example, has limited options for those who might be allergic to eggs, milk, peanuts, and/or wheat. How can we address these concerns?

The CDC has found that, over the past 20 years, the percentage of children with any food allergy has more than doubled and, for peanut or tree nut allergy, tripled. A combination of underdiagnosis and rising food allergy makes public schools a common site of anaphylactic attacks, with 1 in 4 such attacks occurring in children with no previously known food allergies.[22]

Food Allergy Research & Education (FARE), a leading non-governmental organization engaged in food allergy advocacy and the largest private funder of food allergy research toward treatment and prevention, recommends that Competent Professional Authorities (CPA) assisting WIC families discuss food allergy management, prevention, and infant early introduction to reduce the risk of developing food allergy. In addition, similar education should be a tool for use by nutrition educators in SNAP, as not all SNAP eligible families may qualify for or enroll in the WIC program.

Early introduction is one crucial prevention strategy. In 2015, the Learning Early About Peanut Allergy (LEAP) trial showed that early introduction of peanut in infant diets reduced the risk of peanut allergy. This approach for early introduction of potentially allergenic foods is supported by the NIH National Institute of Allergy and Infectious Disease (NIAID), American Academy of Pediatrics, American Academy of Allergy, Asthma and

Immunology, American College of Allergy, Asthma and Immunology, and the 2020-2025 Dietary Guidelines for Americans (DGA). The DGA states, "Potentially allergenic foods (e.g., peanuts, egg, cow milk products, tree nuts, wheat, crustacean shellfish, fish, and soy [plus sesame given the FASTER Act requirements that adds sesame as the ninth food allergen required to be labeled] should be introduced when other complementary foods are introduced to an infant's diet. Introducing peanut-containing foods in the first year reduces the risk that an infant will develop a food allergy to peanuts …. There is no evidence that delaying introduction of allergenic foods, beyond when other complementary foods are introduced, helps to prevent food allergy."

Based on the DGAs, the WIC program should provide education to all participants on infant feeding that includes early introduction of food allergens to reduce the risk of food allergy. The WIC program should also include the early introduction of food allergens in the WIC food package for infants between 4 and 12 months.

Current WIC food packages do not provide sufficient substitutions for those with food allergy that also deliver target nutrients to achieve WIC's goals for nutrition. A 2017 report from the Food & Nutrition Board of the National Academy of Medicine recommends the need for substitutions for WIC participants with food allergy.

USDA's Food and Nutrition Service has noted plans to issue a proposed rule in 2022 to update WIC food packages. It's important that revised food packages include expanded substitution options for those with food allergy. A few examples: plant- or nut-based milk alternates for those with milk allergy; sunflower butter or other nut butters for those with peanut allergy; healthy whole grain corn, rice, and oat cereal options for those with wheat allergy; and additional substitution options for eggs beyond current WIC guidance.

The upcoming Child Nutrition Reauthorization Act (CNR) provides another opportunity to reduce the harmful impact of food allergies, by incorporating food allergy training for those providing meals to children through school meals, summer meals, and child and adult care food programs.

Questions from Senator Amy Klobuchar

1) In June 2020, I led a letter with Senator Sherrod Brown and a group of 20 Senators urging the Department of Agriculture to prioritize programs intended to minimize food deserts and support local and regional food development projects. I remain concerned about how a lack of access to healthy, affordable food is contributing to food insecurity and hurting low-income communities and leading to adverse health outcomes.

From your perspective, how do food deserts specifically contribute to adverse health outcomes and what can we do to minimize them while improving access to healthy, affordable food?

Senator Klobuchar, thank you for this important question.

Tufts University research has shown that the majority of Americans have poor quality diets, with highest rates among children, racial and ethnic minorities, and those with lower education and income. Thus, I would emphasize that insufficient access to nutritious food is a problem for the majority of Americans, as well as disproportionately harming low-income Americans.

Access can be defined and influenced in many ways, including based on dollar cost, time cost (e.g., the opportunity cost of shopping, prepping, and cooking meals), transportation barriers, and the physical built-food environment (the physical locations of grocery stores, corner stores, farmers markets, fast food and full service restaurants, etc.).

Among these different factors, the physical locations of stores have received a lot of public attention, including popularity of the "food deserts" concept. However, the evidence for major impacts of the built-food environment (the physical locations and types of food outlets) and food deserts on nutrition or health outcomes among Americans is surprisingly limited. We and others have reviewed this evidence systematically.[23] Even cross-sectional studies (a snapshot at one time point) do not consistently support strong linkages between the physical proximity or density of different types of food retail outlets/restaurants and residents' nutrition or health outcomes. And, even when some cross-sectional studies suggest an association, interpretation is strongly hampered by the challenge of directionality of effect: do residents of specific neighborhoods not purchase healthier foods because of lack of retail stores, or are retail stores less common in specific neighborhoods because the residents are less likely to purchase healthier foods? This is not a trivial question. Improving nutrition security for all Americans requires a clear understanding of the directionality of this effect, and the underlying reasons for it.

Prospective studies are a much stronger design for understanding the influence of the built-food environment on nutrition and health. In such studies, the changes over time in locations and types of stores, a person's residence, and nutrition and health outcomes are compared. In these studies, there is little evidence that changing the types of stores or restaurants around a person's residence has a meaningful influence on their nutrition or health outcomes. As one example, under the Obama administration, the Healthy Food Financing initiative invested more than $500 million through one-time financing assistance to bring grocery stores and other healthy food retailers to underserved urban and rural communities across America. Rigorous, independent evaluations of these efforts by the RAND Corporation and others showed that opening supermarkets in a 'food desert' resulted in little improvement in net availability of healthy foods, or improved nutrition among residents, challenging the underlying assumptions of such policies.[24]

The overall evidence suggests that other factors are larger barriers for low-income Americans accessing healthier foods, including food cost, food convenience (the opportunity cost of time spent shopping, prepping, and cooking meals), and knowledge. These barriers reduce demand for more nutritious food, which then results in less supply, creating a harmful vicious cycle of nutrition insecurity.

To increase access to healthier food, food cost and food convenience must be addressed. This will increase demand, and the market will respond to this increased demand by increasing food outlet locations in neighborhoods with increased demand.

It's time for specific actions to normalize the costs of healthier food. I use the term "normalize" because the true costs of food are not currently captured in food prices. A recent analysis by The Rockefeller Foundation[25] found that our nation spends about $1.1 trillion each year on food in direct dollar costs across the supply chain. And, in addition, each year our nation's economy *loses* another $1.1 trillion from health consequences of poor nutrition, specifically preventable healthcare spending and lost productivity due to chronic diseases caused by poor diet. This is not a winning proposition: for every $1 we spend on food, our economy loses another $1 from health consequences of poor nutrition.

A set of evidence-based actions can rapidly normalize the costs of healthier food and increase demand and purchasing power by low-income Americans.

First, we must leverage the power and investments in the healthcare system to support purchasing of healthier food for patients with diet-related conditions. Several evidence-based strategies can integrate preventive nutrition and healthy eating into Medicare, Medicaid, private insurance, DOD, VA, and IHS to improve health, reduce health disparities, and lower costs:

a. Incorporate and scale Produce Prescription programs in Medicaid, Medicare, VA, and IHS that provide healthy produce to patients with specific medical conditions, such as type 2 diabetes.
b. Incorporate and scale Medically Tailored Meals in these programs that provide prepared, nutritionally tailored meals to patients with severe, complex diseases and high healthcare utilization.
c. Ensure reimbursement for registered dieticians to see patients with common diet-related diseases.
d. Integrate Medicaid, Medicare, VA, and DOD healthcare goals, assessments, enrollments, and strategies with SNAP, WIC, and senior nutrition programs for individuals being served by both programs.
e. Ensure appropriate nutrition education for doctors and other clinical providers, for example by updating medical school, residency, and fellowship accreditation standards and physician and specialty licensing exams.

Second, we must leverage the power and investments in the federal nutrition programs to support purchasing of healthier food for low-income Americans. This includes:

a. Leverage technology and behavioral economics to pilot and scale innovative programs to improve nutrition security in SNAP. These should including "SNAP Plus" incentive/disincentive programs that combine incentives for purchasing healthier foods with disincentives (rather than absolute restrictions) for purchasing unhealthy foods. Research estimates that this strategy, which has been termed SNAP Plus, would be even more effective at improving health outcomes than incentives alone, and further would lead to immediate cost-savings in the SNAP program as well as reduced healthcare costs.[10]
b. Strengthen school meal and government office nutrition standards and procurement policies, including an emphasis on nutritious foods from local and regional food systems

Third, we must leverage and catalyze the power and innovation of the private sector, including farms, food manufacturers, retailers, and restaurants, to reward (and lower the cost of) healthier, more convenient foods. The recent Build Back Better legislation passed by the U.S. House provides a example of federal strategy for advancing business innovation in green energy and climate. A similar federal strategy needs to developed and passed to advance business innovation for food that is nourishing, equitable, and sustainable. This can include:

a. Coordinate agency policies with a new national strategy for tax policy and other incentives for R&D, marketing, and sales of healthier and more equitably accessible foods across food sectors.
b. Create a new Task Force to review and provide recommendations on how to create a national entrepreneurship ecosystem to sustain the U.S. as the 21st century leader for global innovation focused on a healthier, more equitable and sustainable food system.

c. Create opportunity zone incentives for food, nutrition, and wellness capital investments to improve health, reduce hunger, and reduce nutritional disparities.
d. Develop new federal grants and low-interest loans that support BIPOC food entrepreneurs, advancing economic empowerment and nourishment in minority communities.
e. Encourage and guide ESG (Environment, Social, and Governance) investment around food and nutrition to catalyze and quantify new metrics for food-sector companies.
f. Encourage and provide tax benefits for Benefits Corporations that value and integrate social and environmental priorities around nutrition, hunger, and health.
g. Develop new public-private partnerships to advance nutrition science and translation.

Fourth, we must leverage the power of consumer demand through smarter investments in nutrition education and public health. Evidence-based approaches can support opportunities to increase public knowledge and reduce consumer confusion and gain from shared community knowledge and learnings.

f. Coordinate dedicated funding for regular updates and dissemination of the Dietary Guidelines for Americans and the Dietary Reference Intakes with HHS, VA, DOD, and IHS healthcare goals and with SNAP, school meal, WIC, and elderly nutrition program goals.
g. Leverage FDA regulatory authority for consumer communication and education including health claims, front of package labeling, nutrition labeling, warning labels, and industry standards for additives like sodium and added sugar.
h. Greatly strengthen and expand CDC public health efforts around nutrition, physical activity, and obesity, integrated with HHS/CMS goals and national food and nutrition surveillance efforts.
i. As described above, ensure reimbursement for RDs for major diet-related conditions; and appropriate nutrition education for doctors and other clinical providers by means of updates to program accreditation standards and specialty licensing exams.
j. Integrate and leverage SNAP-Ed with healthcare system efforts and goals to reduce nutrition insecurity and diet-related chronic diseases.

Questions from Senator Joni Ernst

1) In your testimony, you mentioned the importance of increasing "accessibility, availability, and intake of fruits, vegetables, beans/legumes, whole grains, and nuts/seeds, especially from small and mid-sized US farms…" However, I'm concerned that I do not see you mention meat or dairy products.
a. Why have you not included meat and dairy?
b. Do you believe these nutrient-dense products should be part of a balanced, healthy diet?

Senator Ernst, I appreciate your thoughtful questions.

My testimony focused on the major food groups with strongest evidence for health impacts in the U.S. I and others have reviewed and reported on this evidence in depth.[26-29]

For example, among all U.S. deaths from heart disease, stroke, or diabetes (cardiometabolic deaths), suboptimal intake of just 10 dietary factors is estimated to cause about 45% of all these deaths, or about 320,000 deaths, each year.[29] This can be compared to ~385,000 U.S. deaths from COVID-19 in 2020. Among protective dietary factors, largest numbers of preventable diet-related cardiometabolic deaths are due to low nuts/seeds (~59,000 preventable deaths), low seafood (~55,000 preventable deaths), low vegetables (~53,000 preventable deaths), low fruits (~53,000 preventable deaths), and whole grains (~41,000 preventable deaths). Among harmful dietary factors, largest numbers of preventable diet-related cardiometabolic deaths are due to high sodium (~67,000 preventable deaths), high processed meats (~58,000 preventable deaths), and high sugar sweetened beverages (~52,000 preventable deaths).

Compared with the evidence for health harms of processed meats (meats preserved with sodium, nitrites, and/or other preservatives), unprocessed red meats appear to have relatively neutral health effects, with possible modest

harmful effects on type 2 diabetes (perhaps owing to harms of the heme iron content) and little to no effect on cardiovascular diseases or cancers. There is no meaningful evidence for benefits on health outcomes of unprocessed red meat consumption. Unprocessed red meats can provide some specific nutrients, such as iron, B12, and zinc, that can be more challenging to obtain from plant sources. So, for people who wish to consume red meat, I generally recommend no more than 1-2 servings per week of unprocessed meat, and to minimize processed meats. But, there is no need to increase accessibility, availability, or intake of red meat in Americans' diets.

Dairy is one of the most interesting, and understudied, food groups in science. Dairy products represent ~10% of calories in the United States. Yet, surprisingly, for such a major share of the food supply, their health effects remain remarkably uncertain, insufficiently studied, and controversial. Dietary guidelines on dairy remain largely based on theoretical considerations about isolated nutrients: for example, theorized benefits of calcium and vitamin D, and theorized harms of calories, total fat, and saturated fat, result in current recommendations to consume 3 daily servings of reduced-fat dairy. However, emerging research is studying the actual health effects of dairy consumption on outcomes, rather than theoretical effects.

For example, a systematic review and meta-analysis of 37 randomized controlled trials including 184,802 participants assessed the effects of dairy foods on body weight and body composition.[30] This study found that higher intake of dairy has no major overall effects on body weight. But, higher intake of dairy reduced body fat mass and increased body lean (largely muscle) mass. In addition, there is growing evidence that different dairy foods should not be grouped together, but rather that milk, cheese, yogurt, and butter are distinct foods, with distinct health effects, based on a complex, incompletely understood interplay of various nutrients and processing characteristics (e.g., probiotics, fermentation, milk fat globule membrane, and more).[31,32] Thus, we should be doing research on, and making dietary recommendations on, milk, cheese, yogurt, and butter separately.

Another separate relevant question is on the fat content of dairy. While reduced-fat dairy is recommended in current U.S. dietary guidelines, growing evidence suggests that higher intake of dairy fat may lower the risk of type 2 diabetes.[33] This science calls into question the soundness of conventional dietary recommendations to avoid dairy fat.[34] Dairy fat contains a complex mix of different saturated fats, other unsaturated and conjugated fatty acids, and other constituents, each with varying biological effects. Physiologic effects of dairy fat further vary according to content of milk fat globule membrane, which alters dietary cholesterol absorption and perhaps skeletal muscle responses to exercise.[35,36] Also, cheese, the major source of dairy fat in most diets, is a fermented food and a rich source of bacteria-derived menaquinones (vitamin K2) which may improve insulin secretion and sensitivity through osteocalcin-related pathways.[31] Food rich in dairy fat may be especially beneficial as a replacement for foods rich in other animal fats or refined carbohydrates.[37] Thus, there is currently insufficient scientific evidence to make any strong recommendations for whole-fat vs. reduced-fat dairy.

For major health outcomes, the current (and still not firmly established) evidence suggests that yogurt reduces weight gain and risk of diabetes (and is consumed at too low levels in the U.S.), that fermented dairy including cheese may reduce risk of type 2 diabetes and cardiovascular disease, and that overall dairy consumption increases lean body mass and reduces body fat. Dairy consumption also increases bone mineral density in post-menopausal women,[38] while yogurt and milk consumption in the U.S. are also associated with lower risk of hip fracture.[39] Based on this evidence, I recommend 2-3 daily servings of dairy, including unsweetened yogurt and cheese, for general health.

But, I would like to emphasize that, as a physician and scientist who has been studying foods, nutrition, and health for my entire career, I cannot tell you definitively what are the health effects of different dairy foods, because of insufficient federal investment in the science. This should shock you, your Senate colleagues, and all Americans. We can literally send a man or woman to the moon, but we do not have enough science to say whether cheese is good or bad for you. This is one reason why respected academic leaders and former government leaders have said it is time for Congress to create a new National Institute of Nutrition at the NIH,[20] to support critical foundational, basic, and translational research, such as that outlined by your question. A new

National Institute of Nutrition will also provide a huge return on investment for the U.S. economy. I would draw your attention to the Federal Nutrition Advisory Coalition, a remarkable coalition of nearly 100 U.S. businesses, advocacy groups, and academic organizations,[21] who is calling for a strengthening of federal nutrition research to provide many benefits for our nation and a significant return on investment. Such research is crucial to lay the foundation for accelerated scientific advances to improve and sustain the health of all Americans, reduce health disparities, lower healthcare spending, strengthen our food system, improve military readiness, and advance innovations and stimulate economic growth.

2) To quote Retired U.S. Army Lieutenant General Mark Hertling, "Over the last decade, we have experienced increasing difficulty in recruiting soldiers due to the decline in the health of our nation's youth. Unless we see significant change in physical activity and nutrition in America our national security will be affected." As a combat veteran and former commander, I wholeheartedly agree and just last week, over 300 retired military leaders wrote a letter sounding the alarm on the state of childhood nutrition in this country. The National School Lunch Program was started after many recruits were rejected for WWII due to malnutrition. A strong military demands the importance of good diet and physical activity be instilled at a young age.
a. What can we do to increase physical activity in schools?

Many controlled trials show that physical activity alone is insufficient to address obesity. And, the simple addition of physical education in schools is also insufficient to reduce overweight or obesity among children.

The problem – the elephant in the room – is the food that American kids eat. We will not address overweight, obesity, or other diet-related illness in U.S. children until we improve nutrition. Today, American children are suffering from an onslaught of diet-related illness. About 1 in 4 teens have overweight or obesity, 1 in 5 have prediabetes, and 1 in 4 have fatty liver.[3,4] These statistics are shocking and unacceptable, and not only reduce national security but will cause devastating health consequences and rising healthcare spending for our nation for years to come.

In brief, we are living with a food system created for 20th century goals (preventing mass starvation, providing vitamins), but with 21st century problems.

As outlined in my original written testimony as well as in the recent GAO report on federal nutrition policies,[5] poor nutrition, consequent diet-related diseases, and resulting preventable healthcare and other economic burdens are together perhaps the leading overall challenge to our federal budget and our country's overall well-being, resilience, and economic security. This is not small potatoes.

We can fix all this, within 1-2 decades, with a carefully considered, rationally designed, and prudently implemented national plan to improve nutrition and reduce diet-related illness. But only if we have a national strategy – an actual plan.

The science supports specific actions across 6 domains:

(1) Advancing nutrition science and research
(2) Incorporating Food as Medicine into healthcare
(3) Leveraging our federal nutrition programs
(4) Catalyzing business innovation and entrepreneurship
(5) Expanding nutrition education and public health
(6) Creating federal leadership, structure, and authority for food and nutrition policy coordination

The relevant actions in each of these domains are listed in my original written testimony. Each of these can and should be pursued now by appropriate congressional, agency, and private sector actions. At the same time, our nation can harmonize, streamline, and greatly accelerate this process by bringing all the stakeholders together for a 2022 White House Conference on Food, Nutrition, Hunger, and Health. It's been 52 years since the nation came together to address food, in the last 1969 Conference convened by President Nixon. A half century later,

we face very different burdens, and incredible positive opportunities. It's time to address these burdens, and grasp these opportunities.

3) Along these lines, we know the nutritional benefits of protein and yet it's not a requirement that meat be served in the School Breakfast Program. New science is telling us that full fat dairy is actually better for people, too, keeping them fuller for longer and providing them with a great source of protein.
a. Shouldn't protein be prioritized to start a child's day?

There is actually very little evidence that American need more protein, or that there are health benefits to higher protein consumption. Higher intake of protein, especially protein from animal foods, is actually linked to higher risk of type 2 diabetes.[40] This is likely because excess dietary protein, like excess starch and sugar, is quickly converted to fat by the liver, as demonstrated in a recent controlled trial.[41] In short, American are not protein deficient, and we do not need to be encouraging more protein in the diet.

It's also relevant to highlight the outdated and nonsensical way that dietary guidelines continue to group completely different foods – like unprocessed red meats, processed meats, poultry, eggs, milk, cheese, beans, soy, and more – into one category as "protein" foods. This is left over from the 1940s and 1950s, when we were worried about protein deficiency. We should be providing dietary guidance, with supportive government policies, for different foods based on the actual health effects of each food, not based on some theoretical construct organized around a single nutrient. We have learned this lesson for most of the Dietary Guidelines for Americans, which are mostly now based on foods. But, we still have one crazy corner of the USDA plate that is reserved for "protein." Let's drop this and recommend specific foods, based on their health effects.

I agree with you on the lack of convincing science to recommend reduced-fat dairy products. The evidence for this is outlined in my response to your first question. I believe the scientific evidence supports adding back whole-fat plain milk to the school lunch program (and dropping sugar sweetened milk, whatever its fat content, or at least greatly reducing the sugar content).

4) If the legislation were to pass or the White House decided to go ahead and hold a Conference on Food, Nutrition and Health, I am sure many of you might be consulted or have input into how the conference will be structured and who will have a seat at the table.
a. Will all of you commit to us that you would support representation of all the various agriculture stakeholders being at the table and fully engaged in this process?

As described in my oral testimony and original written testimony, it's high time for a second White House Conference. This Conference can be instrumental to create smart food and nutrition policies to improve and sustain the health of all Americans, reduce health disparities, lower healthcare spending, strengthen local and regional food systems, improve military readiness, advance innovation, create new small businesses and jobs, and stimulate economic growth including for farmers. To be successful, it will require a thoughtful and inclusive process, leading up to and following the conference, that brings together all the agencies, both houses of Congress, and a diversity of external stakeholders. I agree with you that various agriculture stakeholders should be included at the table and fully engaged in this process. Success will also require real commitment from the President, Cabinet, and both parties in the Senate and the House to implement the recommendations arising from the conference. I urge you to work with all your colleagues to ensure this happens, for the good of our nation and the American people.

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