Building the Evidence Base for Nutrition Incentives and Health

Connecting food and nutrition to health outcomes to strengthen the case for cross-sectoral collaboration

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Introduction

The relationship between food, nutrition, and our health has been long understood. Recently, there has been greater attention focused on how food systems (the actors and mechanisms involved in producing, distributing, and consuming food) can be better supported to advance health goals. In the health sector, public health has historically prioritized nutrition as an approach to health, but the healthcare system, which holds the majority of resources, has not engaged substantively. However, as focus increases on the broader, non-medical drivers of health and the costs of health care continue to rise, health care's attention has turned to utilizing food and nutrition as levers for improving health and lowering costs. To capitalize on this shared focus on food and nutrition for health, there are opportunities to more deliberately align sectoral priorities and investments to accelerate improvements in population health while supporting food system strengths.

Food affects health in at least two ways. Food insecurity, or not having access to sufficient food of adequate quality for basic needs, is one. Nutrition, or the content of what one eats, is another. Together and independently, food insecurity and poor nutrition impact our ability to be healthy and increase the unnecessary utilization of health care.[1,2] Efforts to enable better health via the food system have focused on reducing food insecurity and improving nutrition by increasing access to healthier foods. The United States Department of Agriculture (USDA), for example, addresses food insecurity via the Supplemental Nutrition Assistance Program (or SNAP), providing financial resources to 40 million low-income people to purchase food. Additionally, the USDA supports better nutrition through the Gus Schumacher Nutrition Incentive Program (GuSNIP); this grant program supports initiatives like Double Up Food Bucks (DUFB) that provides a mechanism across more than 38 states to 'double up' money from SNAP that individuals choose to spend on produce. The healthcare system has also begun to assess the feasibility, viability, and benefits of reducing food insecurity and improving nutritional quality of diets as a route to health. A suite of programs have been introduced and are being tested including "food farmacies" at clinics, "produce prescriptions" that can be redeemed in diverse settings, and "medically tailored meals" delivered to homes are examples of what is being termed "Food as Medicine" (FaM).

Currently, FaM and large-scale food insecurity and nutrition incentive programs have been created and continue to evolve in largely distinct settings. FaM is assessed by the health system as a 'treatment' for individuals recently discharged from hospitalization or living with chronic conditions, whereas SNAP and DUFB-type programs are focused on large-scale population

health benefits via investments into food and agricultural systems. Both are part of a family of approaches relevant to improving health, but building on these initiatives will require traversing a fragmented environment. For example, agricultural, food systems, public health, and healthcare stakeholders are all represented among the more than 20 federal agencies in the United States that set food and nutrition policy and funding priorities. Healthcare policy in turn is not monolithic; instead it is guided by diverse federal, state, and local priorities as well as the private sector. As a result of this fragmentation, the full potential of cornerstone programs like SNAP or DUFB that come from the food and agricultural sector has not been achieved yet while showing promise to contribute even more to improving health.

Leveraging large-scale food incentive programs for health requires cross-sector alignment. Pragmatic research and exploratory pilots are needed to establish evidence linking these programs to health outcomes. Building value propositions that focus on results rather than services will be crucial as the healthcare system transforms its payment approach.

The health system itself faces challenges in reducing costs and improving outcomes. One of the major impediments is the method that the healthcare system uses to pay for services. For example, paying for the delivery of a surgery means the system is disincentivized from reducing the need for the surgery. So if food were to make people healthier and require fewer complex (and expensive) interventions, the current method of payment would create a barrier to adoption. Fortunately, the health system is gradually moving toward "alternative payment models" to prioritize results rather than services only. This movement will also be important to accelerate if the full potential of food for health is to be realized.

This paper illustrates how innovative food and nutrition incentive programs can effectively reduce rates of food insecurity and improve health outcomes for the millions of Americans suffering from diet-related chronic diseases. A focus on evaluating specific health outcomes will align these initiatives with the priorities of the health system and allow for the products of the food system to be appropriately valued. The paper concludes with a set of opportunities for advancing health outcomes through nutrition programs that maximize broader benefits to both food and health systems.

I. Food, nutrition, and health

Over the past 100 years, public health efforts and advancements in medical technologies have greatly altered the burden of disease. While the incidence and mortality of infectious diseases have seen a remarkable reduction (with a global spike due to the COVID-19 pandemic), there has been a notable increase in the prevalence and mortality of chronic conditions.[3,4] This shift can be attributed to several factors, including increased awareness and prioritization of public health initiatives, improved treatment and diagnostic technologies, and an aging population.

One of the most pressing areas of concern is the growth in diet-related chronic conditions. These conditions reflect the current American food landscape, which is dominated by

processed foods which are attractive to food producers aiming to maximize profit margins and to consumers who are trying to lower costs and increase convenience. This results in foods available and eaten that often lack the essential nutrients needed for good health and are often high in detrimental ingredients like added sugars, saturated fats, and unhealthy oils. The overconsumption of these types of foods has led to a rise in conditions like type II diabetes, cardiovascular disease (CVD), and certain forms of cancer.[5] According to estimates, more than one million Americans die each year as a result of diet-related conditions.[6]

In this section, we discuss:

- The well-known impact of food insecurity and poor nutrition on health outcomes, and the challenge that public health faces in improving health through nutrition, and
- The promise of nutrition incentives and food benefit programs in improving health, and specifically for nutrition incentive programs to support chronic disease prevention.

The nutrition challenge for public health

Much of the reduction in mortality in the 20th century can be attributed to large-scale public health initiatives (vaccine drives, smoking cessation), including early Environmental Protection Agency activity which reduced pollutants and health irritants in our built environment. However, such initiatives are less effective at addressing the industrial ecosystem that influences individual health, particularly through diet.

Public health has long advocated for healthier dietary guidelines, reducing the consumption of high-sugar and processed foods, and increasing the consumption of fresh fruits and vegetables. The high level of sugar consumption in the US, which contributes to type II diabetes, obesity, and heart disease, is a prime example of the challenges public health initiatives face in promoting healthy diets.[5,7] According to the CDC, American adults on average consume 13.5% of their total daily caloric intake in added sugars, doubling recommended limits and contributing to the decades-long growth in obesity rates in the United States, now accounting for more than 40% of all adults.[8,9] This situation highlights the need for greater efforts to support healthy eating.

Access to quality food (food security) and a healthy diet (nutrition) are both important factors that affect our health outcomes. Improving the evidence connections between these factors to improvements in health outcomes that are of relevance to the healthcare industry could encourage cross-sector investments.

While some progress has been made—largely relating to a broad consumer preference shift—these nutrition-focused public health initiatives are often at odds with the food production system. The Food and Beverage industry spends billions annually to market, lobby, and influence policy making. This spending and message proliferation can lead to consumer confusion on what constitutes a healthy diet. For example, the updated 2020-2025 USDA evidence-based dietary guidelines, that should prioritize health and wellness, has achieved limited consensus from the public health community.[10-12]

Although a noted priority for decades, relatively few structural changes have been implemented to support better collaboration between the food production and public health sectors. In part, this is due to the limited evidence base, differing priorities, and the infrequent opportunities to seat these two sectors at the same table. However, the research base for nutrition-based incentive programs and associated research agendas have started to show more direct and robust linkages between programs addressing nutrition and improvements in health.[13-15]

Food insecurity

An adjacent but distinct concern is persistent high rates of food insecurity in the US. Food insecurity refers to the "lack of consistent access to enough food for every person in a household to live an active, healthy life."[16] Food insecurity is primarily the byproduct of limited financial resources that restricts the quantity and quality of food purchases. Of note, while there is a basic logical and evidentiary intersection between food insecurity and nutrition, food insecurity unto itself impacts an individual's health, wellness, and healthcare utilization. Research has highlighted a robust association between individual's experience with food insecurity and the prevalence of negative health outcomes for children, non-senior adults, and seniors across a host of behavioral and physical health metrics.[17]

In the United States, food insecurity affects millions of people, particularly children, elderly individuals, and low-income households. In 2021, more than 33.8 million people experienced food insecurity in the US.[18] Further, there are notable differences in the levels of reported food insecurity rates across race and ethnicity, with Black (19.8%) and Latinx (16.2%) populations disproportionately experiencing food insecurity compared to White (7.0%) counterparts.[19] Rates of food insecurity also ebb and flow with natural economic cycles—periods of widespread job loss, reductions in household income, and inflation can make it increasingly difficult to put healthy food on the table.

To address food insecurity, the US government operates several programs aimed at providing food assistance to those in need. The most well-known of these programs is the Supplemental Nutrition Assistance Program (SNAP). SNAP, authorized under the USDA's Farm Bill, currently provides direct food benefits and additional incentives to more than 41.5 million people in 2021, accounting for nearly 13% of the total United States population.[20] Total program expenditures for 2021 were in excess of $108 billion, an increase of $34 billion compared to 2020.[20] In aggregate, these figures make SNAP the largest US government assistance program focused on food security and hunger.

Connection of food and nutrition benefits to equitable community outcomes

Food benefit and nutrition incentive programs are necessary policy tools because economic and political systems leave millions experiencing food insecurity and poor nutrition. In the near term, these programs can provide a range of benefits for program participants at both a micro (individual) and macro (community) level, and can play a crucial role in promoting equitable

outcomes in communities, particularly for those impacted by systemic underinvestment and limited access to healthy food options. For individuals, SNAP and similar food benefit programs reduce food insecurity, improve health and educational outcomes, and improve the financial health of the individual, household, and broader community. Moreover, food benefit programs are an effective and powerful economic stimulus tool, creating jobs and boosting local economies by catalyzing spending at food distribution sites, such as grocery stores and farmers markets. By providing increased affordability and access to healthy food and addressing food insecurity, food benefit programs support the most vulnerable populations in our communities. [21]

Food benefit programs provide direct financial assistance for food purchases. **Nutrition incentives** aim to encourage the purchase and consumption of healthy foods, particularly fresh fruits and vegetables. **Food as Medicine (FaM)** programs embed food benefits and nutrition incentives into the healthcare system, with an explicit focus on improving health outcomes.

In addition to food benefits, which helps alleviate basic affordability and access needs, nutrition incentive programs, discussed in greater detail below, hold the dual promise of both reducing food insecurity and improving diet quality. Designed to increase access to and the affordability of nutritious foods like fresh fruits and vegetables, they center on the decisions of individuals, rather than placing explicit requirements on buying behavior—so individuals retain agency and choice to define strategies that work for them. For nutrition incentive programs to have an opportunity to make a lasting impact on addressing the growing burden of diet-related health problems, it is critical to scale them in a sustainable manner. To achieve this scale, collaboration across sectors while developing actionable evidence is key.

When implemented correctly, nutrition incentives should complement existing food insecurity programs like SNAP, allowing them to maintain their core focus of providing flexible financial resources. By layering nutrition incentives onto programs like SNAP, we can encourage healthier eating habits and further reduce food insecurity. This approach ensures that SNAP and similar programs continue to address immediate financial needs while simultaneously promoting improved nutrition and long-term food security.

II. Integrating food and nutrition for health will require cross-sectoral alignment.

Efforts to make it possible for individuals to eat healthier food and support health outcomes first begin with an understanding of the relevant levers at the policy and structural levels. Structural drivers of what food is produced, made available, and at what prices define the landscape that either enables or provides hurdles to healthier eating. Other environmental drivers include advertising from the food industry, the disparities in access to grocery stores, and available income to purchase healthier foods.. Against this predetermined landscape of influence, people make individual choices of what to purchase and eat. When these drivers lead

to diet-related illnesses, the healthcare industry becomes involved, an industry with its own barriers in creating solutions that involve food and nutrition. Structurally, the healthcare industry and fee-for-service model pays for specific services delivered when individuals become sick enough to need them—items like a primary care visit, a surgery, or prescriptions. In this context, what is allowed to be paid for, and how, is defined by a range of federal, state and local policies that currently don't allow for broad investment of food in response to the diet-related illnesses

Efforts are beginning to allow for cross-sectoral collaboration in the face of these very different levers to improve health outcomes through food and nutrition. Here we focus on aligning investments alleviating food insecurity and improving nutrition via incentives with health goals to maximize their benefits and enabling payments directly by health care for specific improvements in health. Below we provide a high-level overview of the funding and policy landscape and early efforts to intersect the food and health industries with shared goals.

In this section, we discuss:

- The policy and funding landscape for food and health programs,
- Gaps in the funding landscape—particularly in health care—for funding nutrition at scale, and
- Where coordination in food and health systems is happening to support nutrition, and other influences on the field.

The federal and state policy and funding landscape

In the United States, various arms of the federal government set and influence food-related policies and priorities. Because of this structure, no central entity is charged with setting food and nutrition agendas. In total, more than 200 programs spread across 20 separate departments and agencies work to set food and nutrition policy and research priorities.[22] For example, defining what is or is not healthy and at what levels is set primarily through the USDA and Health and Human Services (HHS) through the release of dietary guidelines, although both have competing stakeholder priorities. Defining food safety and determining when a food has a medicinal property (e.g., nutraceuticals) is largely within the purview of the Food and Drug Administration (FDA), a separate division within HHS. The prioritization of food products, indicated by government subsidies and incentive programs, to determine what food should be grown and how much, is set primarily within the USDA. These subsidies influence both food production and consumer choices, impact what food is made available and thus the diet and nutrition for the nation. As a final illustration of the various food and nutrition levers, the two primary food benefit and nutrition incentive programs in the US, SNAP and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), are both housed under the USDA and legislated through Congressional agricultural committees. SNAP is authorized from the Farm Bill cycle and WIC is authorized separately, and both are housed under the USDA's Food and Nutrition Services arm. But, these operate effectively as public health programs.

Similarly, for health and health care, large-scale investment and guidance also comes from a variety of federal, state, and local sources. Much of food and nutrition support for health might be considered to be a public health priority. However, the resources are in the healthcare system (18% of GDP) versus the public health system (0.5% GDP).[23] Spending on healthcare services comes via different kinds of health insurance, some of which are managed directly by the government, including Medicare (federal) and Medicaid (federal/state). Other healthcare investments and covered services are directly influenced through the Affordable Care Act (ACA) marketplace and its guidelines. Still others, such as commercial employment-based insurance, are influenced more indirectly. Additionally, many cities and states have implemented localized tax-based approaches to support both the un- and under-insured. Beyond insurers, large healthcare entities, including hospitals, have leeway in how to invest their returns and what initiatives to prioritize.

Leveraging food benefit and nutrition incentive programs to promote healthier eating and improve health outcomes requires an understanding of policy levers that influence institutional and individual decisions. One area of coordination is between the US Department of Agriculture (USDA) and Health and Human Services (HHS), with one supporting food access from the perspective of building the resilience of the food production system, and the other investing in areas to promote health.

Healthcare direct investment hasn't traditionally funded food at scale.

The current healthcare delivery system has not yet invested or funded food-related programs at any notable scale, although these programs may improve the health of those they serve and reduce healthcare utilization and long-term cost. Currently, one of the largest interactions of health systems with the food system is through hospital purchases that support the daily needs of patients and staff alike. However, these purchases have traditionally been disconnected from 'healthy' food—though momentum is shifting, so that options for admitted patients and hospital staff are healthier. Beyond the needs of patients and staff in meeting their food needs while working or undergoing medical services, relatively minimal investments have been made to address and promote healthy food eating directly within the healthcare sector. For example, the hospital food services market is projected to reach $26B in 2026,[24] while a recent assessment of health system expenditures on social determinants of health estimated $300 million of spending on food and nutrition in 2019.[25]

Conversely, the public health and social service sectors have shown a willingness to prioritize and invest long term in food access and nutrition related initiatives. Currently, many of the nutrition incentive programs are facilitated directly through local public health agencies or with public health bodies acting as a strategic partner. However, structurally, the public health sector and the healthcare/medical ecosystem are not highly connected and are in some ways inversely incentivized given the payment model of the US healthcare system.

Some federal and state-level interactions/coordination currently exists

Although cross-sectoral coordination on a programmatic level has been limited, there are programs bridging the gaps between stakeholders. GusNIP (Gus Schumacher Nutrition Incentive Program) is a federal program that promotes a community-level approach to encouraging healthy eating, providing economic activity to local farmers, farmers markets, and grocery stores while also reducing food insecurity and impacting health in beneficial ways. Another area of coordination stems from SNAP. SNAP provides a debit card with funding to support uncooked food items from stores for those who are at federal poverty level or below. Although effectively positioned as an anti-hunger program, SNAP is being evaluated more intensely from a health and healthcare utilization standpoint, with recent research showing promise on improving health outcomes and reducing cost. [26,27]

Efforts to address gaps and create a more robust research base that might further influence cross-sectoral collaboration have gained momentum, with the National Institute of Health's (NIH) 2020-2030 strategic plan including a specific focus on FaM. The strategic plan prioritizes research focused on individualized nutrition, nutrition and disease risk relations, and evaluation of such programs in healthcare delivery settings. Such research and learning agendas are a first step in the full integration into the healthcare sector and show that the federal government considers this work a priority and understands its potential innovation. In fact, one of five pillars included in the Biden Administration's strategy on hunger, nutrition, and health, is the integration of nutrition and health. This opens the door more widely for cross-sector alignment in an area that has to date seen increased interest yet limited activity in definitive research, and program development and implementation.

Health care investment in food: what's moving

In an industry with burgeoning costs and increased scrutiny, health care continually looks to identify solutions to improve health while simultaneously controlling costs. Non-medical drivers of health have moved to the fore as opportunities to address the growing numbers of people with chronic disease and its associated costs as the US population ages. We have seen small steps toward the inclusion of food within the healthcare payers' offerings. These inclusions have been primarily for the 'treatment' of patients with chronic conditions, not for community-level programs that may offer preventative benefits.

- **Medicare:** Medicare serves adults age 65 and older and those with disabilities. As the largest health coverage program driven by the federal government, Medicare is furthest along in supporting the food needs of its members. Some Medicare Advantage (MA) plans have begun to incorporate a number of food benefits into their packages. These include both home-delivered prepared meals for a limited period, often after hospitalizations, as well as grocery cards and food allowances. Centers for Medicare & Medicaid Services' (CMS) 2020 development of Special Supplemental Benefits for the Chronically Ill (SSBCI) allows MA plans to include food as a treatment for specific chronic illnesses. These early efforts, while growing, lack rigorous evaluation of their

contribution to both health and financial outcomes, the two areas the industry hopes to address with such solutions.

- **Medicaid:** As a federal/state partnership to provide healthcare coverage to eligible low-income Americans, each state's Medicaid program is different. Medicaid serves many children and high-needs individuals, including those with disabilities and pregnant women, so it is a high opportunity program to leverage food to improve health. Early efforts to include non-medical drivers of health within Medicaid health plan offerings are limited, including within state demonstration waivers, as health plan value-added services, and expansion across a few states of targeted programs offering food as a cost-effective way to avoid preventable costs, such as hospitalization. Lack of analysis on the health outcomes as well as the economic case have contributed to the slow growth in this opportunity area. The complexities of incorporating such services into the existing transactional infrastructure that underlies health plan rate setting have also proven challenging.

- **Commercial Insurance:** The majority of Americans obtain their health insurance through employer-based group plans. While less common than in Medicare or Medicaid, commercial insurance has begun to include meals, groceries, and nutrition education among their offerings, depending on the demographics and needs of their beneficiaries. A few self-insured employer groups have also embraced food benefits, looking for better health outcomes for their employees. Individuals who do not have an affordable health plan offered through their employer can purchase insurance coverage, and often do so through ACA marketplaces, which offer premium and cost-sharing subsidies based on income. These plans would be less likely to have food offered as part of their benefits.

- **County Health Systems:** Tax-funded county health systems charged with providing healthcare access for uninsured individuals within their counties have begun to explore opportunities within the non-medical drivers of health domain. Food is an option of interest as it is more readily deployable than solutions to address other health factors.

Influencers of what food is grown, made available, accessible and considered healthy and safe and drivers of health care and health expenditures and priorities are managed separately and influenced in different ways, but are beginning to be managed together in a few cases, with a growing understanding of how one influences the other. GusNIP offers the best summary of this work to date.

III. Bridging the gap between nutrition policy and healthcare investment: the GusNIP model.

GusNIP is an innovative program within the USDA's National Institute of Food and Agriculture (NIFA). With funds appropriated by Congress of $250 million over five years, the program explicitly links food, nutrition and health, inviting applications to distribute food and produce and measure impacts on diet, health, and health care.

GusNIP operates between sectors and provides opportunities to bridge the gap between federal nutrition policy and direct healthcare investment. By bringing together stakeholders from the agricultural and healthcare sectors, GusNIP seeks to "improve the health and nutrition status of participating households, facilitate growth in underrepresented communities and geographies, as well as collect and aggregate data to identify and improve best practices on a broad scale."[28]

In this section, we discuss:

- How GusNIP works to bridge nutrition and health policy, and
- Gaps in evidence for connecting nutrition incentives to health outcomes.

One way GusNIP achieves this goal is through community-based nutrition incentive programs. The largest and only cross-state incentive program is called Double Up Food Bucks (DUFB) . DUFB layers onto SNAP benefits, providing low-income households who use SNAP with cash incentives to subsidize the cost of and increase the quantity of fresh fruits and vegetables purchased and consumed. DUFB allows for fresh fruits and vegetable purchases made via SNAP to be doubled, up to a set dollar amount. DUFB, launched as a pilot program in al limited geography by a nonprofit, Fair Food Network (the sponsor for this paper), in 2009, and has since expanded through local partnerships. DUFB in effect 'doubles' SNAP dollars and started with a focus on participating farmers markets and has now begun to add grocery stores.

DUFB has now expanded to 30 states, benefiting more than 300,000 families, 882,000 people, and 5,500 farmers. Both through FFN's metrics and independently conducted studies, a body of work has demonstrated that:[29,30]

- Incentives could be effectively paired with large-scale income support programs like SNAP.
- Incentives for produce increase consumption of fresh fruits and vegetables (FFV), as DUFB participants consumed 10% more FFV than the average American.
- The program was an effective local economic catalyst for local farms, farmers markets, and grocery stores, with more than $41million in economic activity generated between 2021-2022.[31]
- Extended participation in DUFB increased self-perceived health status.[31]

Building on the early pilot, Congress has increasingly appropriated funds for nutrition incentives. The 2018 Farm Bill provides $45mm - $56mm annually for large-scale nutrition

> Large-scale food insecurity and nutrition incentive programs that are also designed to increase the resilience of agricultural and food systems provide a unique opportunity for cross-sectoral alignment. Double Up Food Bucks (DUFB), an incentive to purchase fruits and vegetables] layered onto the Supplemental Nutrition Assistance Program (SNAP) that alleviates food insecurity more broadly, is just such an example.

incentive programs. DUFB is among several, with 50% of the cost of the incentive subsidized by this federal source. In addition, GusNIP via the Farm Bill supports pilots of other more 'medicalized' incentive models such as produce prescriptions.[28] Produce prescription programs, along with medically tailored meals and other incentives for healthy foods, work with healthcare stakeholders to address and treat specific diet-related chronic diseases. These programs provide a combination of specific food-related support, medical case management and wrap-around services, which may include nutrition education and cooking classes. Early research has provided promising evidence—although not consistently so, and with limited scope and generalizability. Evaluations have found reductions in food insecurity, better diabetes management, improved dietary intake, and better mental health. [13,14, 32, 33]

Since 2019, more than $270mm in direct federal assistance has been allocated to more than 190 nutrition incentive and produce prescription programs across 38 states. The level of investment and active programming positions GusNIP as a potential cross-sector research partner for both community-based and healthcare embedded nutrition incentive programs.

IV. Opportunities for cross-sectoral collaboration on generating the evidence to maximize the possibilities of food for health.

Both the mounting individual and societal burden of diet-related chronic disease and food insecurity's role in poor health demand action that drives change in policy and enables individual consumer choice. Nutrition incentives programs and FaM applications are promising ways to respond to this reality. However, for them to further scale, there needs to be more cross-sector coordination to define research agendas that will bolster both the food and health systems while improving health outcomes. This includes:

Cross-sector coordination of funding to promote collaborative research agendas: Cross-sector alignment is required to deliver the desired integration of health and food systems. In addition, with cross-sectoral alignment new research opportunities arise to capture a larger set of benefits based on social service, economic development or related sectors.

A focus on health outcomes: A focus on health outcomes will connect food and nutrition programs and policies more explicitly to public health and healthcare metrics. This will allow for investment and payment from the public health and private healthcare sectors.

The implicit research agenda focused on health outcomes can be implemented by cross-sector stakeholders who care about health outcomes and are interested in food and nutrition. We highlight some examples of these pilots below.

In this section, we discuss using cross-sector collaboration and an explicit focus on health outcomes to:

- Explore how research questions can help advance cross-sector collaboration to scale the health impacts of food, and
- Highlight pilots that can support this research agenda.

Research agenda opportunities possible with cross-sector collaboration

There is an opportunity to leverage large-scale incentive programs for public health as well as for more specific health system use cases. If done right, incentive programs can encourage healthier eating while stimulating local economies and promoting a healthier food system. Collaboration across sectors will allow the development of a research agenda focused on health system parameters of interest, while aligning principles for the more sustainable development of our agricultural, economic, and food systems.

DUFB is a scaled implementation of a nutrition incentive tied to existing mechanisms for income-based provision of financial assistance (SNAP). Implementing health research tied to the national infrastructure that DUFB provides could be particularly fruitful. DUFB is covered at 50% by federal support through the Farm Bill, making it even more attractive as a coinvestment from the healthcare system. Could, for example, CMS partner with GusNIP to couple payment possibilities for Medicare or Medicaid to cover the cost of the subsidized DUFB incentives for the purchase of produce? Doing so would allow for a test of a financially attractive health solution and enable a focus on results, such as medical outcomes and healthcare costs, that could accelerate the path to sustained payment. In addition, DUFB ties the usage of the incentive for purchasing fruits and vegetables to locally supplied produce markets, like farmers markets. Thus at the same time as the individual and population health effects might be measured, there is an opportunity to measure the community's economic and food system "health." Other GusNIP funding opportunities pave the way for continued investment in testing incentive programs at scale.

To realize the promise of these opportunities, we propose two kinds of research agendas: one that advances cross-sectoral alignment to benefit both food and health systems, and the other that works on maximizing health outcomes towards relevant evidence for decision-making within the health system.

A related research agenda may explore the net effects on health of the foundational food program provided by SNAP. Research agendas are being established to ask these questions, including studies showing the reduction in healthcare utilization and cost.[26,27] Coordination between different arms of state government that manage SNAP enrollees and Medicaid enrollees could help develop data systems to link individuals enrolled across multiple programs in order to ask such questions more systematically. On this basis, additional questions can be asked about the multiplicative effects of standard nutrition incentive programs like DUFB or

experimentation with other programs that ensure flexibility in the core food insecurity support of SNAP but add on incentives to support choosing healthier foods and produce in the face of environmental challenges. Finally, looking at the impacts of SNAP usage with health improvements would allow for an assessment of an income support strategy as a health improvement strategy.

As nutrition incentive programs are tested for health outcomes relevant to the healthcare sector, some research opportunities might benefit from structural requirements that align assessments to parameters that reflect the priorities of the health systems. This is tricky because many of the parameters of interest to the health system are themselves not optimal. Requirements are tied, for example, to the excessive fragmentation of the system. And, the healthcare systems default payment mechanisms value products and services, not outcomes. Still, this is the way the health system currently conducts its business, and without a focus on these parameters there will be little traction. So, for example, programs designed for older adults might consider Medicare requirements. For Medicaid, programs may be tied to specific income levels and/or populations (e.g., in non-expansion states, these may be limited to children, pregnant women, or extremely low-income adults with multiple chronic conditions or disabilities). Without this specificity, the incentive program being tested will not be directly relevant to decision-makers. In some states there may be mechanisms to pay for food; while in others, there may be no way to make payments for nutrition incentives even if individual healthcare insurance entities wished to. Thus, assessments will need to be designed with specific policy and policy flexibility requirements as backdrop. More broadly, a balance will have to be struck between supporting incentives at scale where the goal is to reveal policy implications versus finding a way to support nutrition needs for states, where for example, possibilities are more limited because of the lack of Medicaid expansion.

TABLE 1: Potential research focused on the cross-sector impact of incentive programs

Research Opportunities:	Research Questions:
SNAP impacts on health outcomes	Can we connect data systems among those that administer SNAP and health coverage (such as Medicaid) to make it easier to assess the impacts of SNAP enrollment and usage on overall health and healthcare service utilization? This infrastructure can be leveraged to measure related health outcomes and inform future policy, including assessing the impact of increased SNAP benefits, such as the temporary boost in allotments during the COVID-19 public health emergency.
SNAP and nutrition incentives, multi-sector impacts	Can we measure net effects gained through large scale food and nutrition incentive programs across stakeholder groups—related to economic, healthcare, and agricultural outcomes—to ascertain the true value of SNAP + nutrition incentives?
Nutrition incentive program,	To what degree do nutrition incentive programs promote economic

food producer impact	growth among local or regional food producers and how can these systems better promote healthy food choices?

Research to inform maximizing health impacts of nutrition programs

Initial investigations into food and health were disjointed and narrow in their approach, in part because nutrition incentives and support for the purchase of food was created under the USDA. As health systems have begun to embrace the broader social drivers of health as worthy of investment, interest is broadening.

One example of the expanded interest is among funders that traditionally support research for medical purposes. Among these funders, the National Institutes for Health (NIH), have recently prioritized initiatives around FaM which will allow for more targeted research opportunities. This is a welcome focus. Such funders naturally gravitate to the most medical aspects of such interventions—for example, focusing on the nutritional content of food and which food products are more suitable for people with certain genetic profiles. But as these funders create new streams of funding, a focus on all aspects of connecting food with health should be explored. The experience during the pandemic exposed the difference between technical development (e.g., the rapid development of the vaccine) versus outcomes-focused priorities such as implementation design and adoption (e.g., the low rate of vaccinations especially in some of the communities that most needed them). Similarly, with food and health, the NIH and others might now better balance technical advancements with real-life questions tied to delivering results at scale and sustaining what works via the health system.

The focus on FaM approaches by healthcare institutions has also surfaced new research questions and opportunities. For example, if investment is being made to deliver medically tailored food to homes or even to a central site, are there other activities and synergies that can be explored that might happen in that moment of food distribution to further advance the health agenda? These include disease identification and clinical referrals (early detection), invitations for preventive and diagnostic screening, care coordination and general support. Such research questions and subsequent findings help to create the most attractive set of resources and services, of which food would be one, for vulnerable populations.

With this baseline acknowledgement that food and nutrition are important drivers of health, how can incentive programs best be positioned to maximize such outcomes? Questions we might answer to maximize outcomes include:

1. What is the relative benefit of basic access to food (food security) versus support tied to improving nutritional content of food purchased and eaten?
2. If food security is the central challenge, is this burden most effectively ameliorated by providing food directly or cash resources? (This, in turn, down the road, can inform income-focused strategies.)

3. If food is being delivered to address specific diet-related health conditions, what else might be done concurrently to create the most impactful bundle of health-related services for people (and patients), and in turn make the delivery of and access to food more cost-effective as it expands the scope beyond food?
4. What are the accumulated benefits of resilient, effective agricultural systems and labor and how can these areas be maximized in a way that reflects the impact of the food production system, specifically how it informs the food choices available and the impact on people's health?

TABLE 2: Targeted research to maximize the health impact of incentive programs

Research Opportunities:	Research Questions:
Food versus nutrition focused incentives and varying impact on health outcomes	To what degree do health outcomes vary between programs that focus on improving the nutrition of participants (e.g., fresh fruit and vegetable subsidies) versus those primarily focused on broader food benefits (e.g., SNAP)?
Cash subsidies versus direct food delivery to address targeted health outcomes	To what degree do participants' targeted health outcomes vary between programs that provide cash subsidies versus those that directly provide food through delivery?
Food / nutrition Incentives + healthcare coordination	Can health care leverage interactions with people who receive food and nutrition incentives to provide a 'bundle' of healthcare services to detect diseases and connect people to needed healthcare services, effectively compounding the net health benefit of the core incentive programs?

Improvements to healthcare policy are necessary to sustain food and nutrition programs

Developing a healthcare payment model that pays for health outcomes includes a multi-step transition. Traditional health care is paid based on services delivered, each of which is assigned a standardized code for documentation purposes. This codification allows for entry into health care's transactional infrastructure, the billing and payment of services. One approach to enable the payment for food as health is to assign billable codes to food—which raises further complexities that will require policy-level solutions. The codes will need to be defined as a medical expense, not an administrative expense. If it doesn't qualify as a medical expense, then the payment of these costs depletes 'special funds' that insurers can leverage rather than becoming a part of the normal payment system. However, one of the dangers of assigning billable codes to food is that this will lock food provision into healthcare's traditional fee-for-service model. As a result, food will be paid for per unit of cost; and competition between those who wish to deliver food will center on these costs considerations. However, this approach ignores that the purpose of the food was to improve health, and incentives for those delivering will be tied to lowering the cost of food, not to improving health outcomes. If the

health system is paying, payment would be better if tied to "quality" just as with other health interventions. In addition, lowering the cost of food puts pressure on the wages of those that work in the food system, where workers already have the lowest rates of access to health insurance across industries.

So, adding food as a category to the healthcare payment system must allow for it to be paid in such a way as to ensure continued improvement in health results. In fact, the healthcare sector is moving toward alternative, value- and outcome-based payment models that tie payments to results. Such payment models incentivize health outcomes while simultaneously providing flexibility to provider systems on how, and through which services they achieve the results. Thus, they will ensure that providers consider adding food as one of the services delivered, and when food providers are contracted, their provision of food might be measured with quality and health outcomes, as is the value-based payment trajectory for traditional medical interventions. Models of value-based care that preference outcomes will be necessary to expand payment to the programs we have discussed above.

The Future: Focusing on pilots

Current pilots are underway and, based on the evaluations, will provide more insights into when and how these investments in food and nutrition are effective, so that health care monies can be stewarded toward best practices and promising innovations. These pilots can provide an opportunity to answer some of the research questions that have been highlighted above. Additional work is needed to inform approaches to scale food and nutrition programs while maintaining their benefits for health.Future pilots should be designed with great intention and implemented in such a way as to provide answers to important health, policy, and economic questions.

POSSIBLE PILOTS	
Pilot	**Approach**
Scaling nutrition incentives to test population outcomes	State Medicaid agency, Traditional Medicare (CMS), or MA plan provides a 50% match to enable scaling and adoption of a GusNIP DUFB model for targeted recipients, and evaluates impact on medical outcomes, healthcare utilization, and healthcare costs.
Scaling payments for nutrition by health care	State Medicaid agency explicitly incentivizes food-based, multi-year pilots and formally recognizes pilot costs in rate-setting methodologies for future payments to managed care organizations.

We hope that future pilots that focus on the above research questions can help advance the field, and make better nutrition—and health outcomes—available to all.

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About Factor Health

Factor Health is an incubator that identifies and develops opportunities to address the broader drivers of health to rapidly improve outcomes that matter to people and health system patients, providers and payers. Factor Health works with a network of clinical, community and health system partners and leverages high-quality evidence, creative payment models, and program design with partners to scale health solutions outside the clinic. It is housed at Dell Medical School at the University of Texas, Austin, and is supported by the Episcopal Health Foundation. **https://sites.utexas.edu/factorhealth/**

About Project Evident

Project Evident harnesses the power of evidence for greater impact. We believe that by empowering practitioners to drive their own evidence building while also strengthening the surrounding ecosystem, we can increase the number of effective solutions in the social and education sectors and scale them faster—ultimately producing stronger, more meaningful, and more equitable outcomes for communities. **projectevident.org**

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