

# More Than a Hill O' Beans:<sup>1</sup> A Typology for Incorporating Plant-Based Protein Measures into Municipal Climate Action Plans

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## ABSTRACT

*Urban areas are responsible for a large percentage of the country's greenhouse gas (GHG) emissions and are on the front lines of adapting to the effects of climate change. Rising to the challenge, municipalities around the country have pledged to reduce their GHG emissions and to develop climate action plans (CAPs) that outline the actions they will take to achieve targeted reductions. Missing from many municipal CAPs, however, are actions to reduce emissions from food production, transport, handling, and disposal—despite the growing recognition that addressing food-related emissions is key to meeting climate mitigation goals. This Article demonstrates that municipalities are well-positioned to incorporate food-related measures into their CAPs and, in particular, measures that increase the availability of plant-based proteins and engage the public on their benefits. Plant-based proteins, including whole-food plant proteins (such as beans and tofu) as well as meat analogs (such as plant-based burgers), represent not only an opportunity to advance climate mitigation goals but also provide co-benefits in the areas of environment, public health, resilience and food security, equity and inclusion, and animal welfare, while expanding the range of food choices available to municipal employees, residents, and visitors.*

*The Article begins by identifying key considerations for incorporating plant-based protein actions into CAPs. It then identifies key legal and policy considerations related to the scope of municipal authority and compliance and alignment with existing municipal policies. Based on this analysis, the Article then proposes a first-of-its-kind typology of municipal plant-based protein actions to increase*

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1. The phrase “hill of beans” is used to describe “something of negligible importance or value.” See *Hill of Beans*, MERRIAM-WEBSTER (11th ed. 2003). It was made popular in the movie *Casablanca*. See *Hill of Beans*, WORLD WIDE WORDS (Jan. 11, 2003), <https://perma.cc/CB8Y-UJA2>.

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*the availability of plant-based proteins and engage the public on their benefits. The seven categories of actions in the typology include over thirty specific examples that range from incremental to ambitious. The Article also provides valuable resources for city managers, lawyers, and advocates in an appendix that identifies examples of each action drawn from a review of over thirty existing municipal CAPs.*

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## INTRODUCTION

Urban areas are responsible for 75% of the global greenhouse gas (GHG) emissions that drive climate change.<sup>2</sup> They are also on the front lines of adapting to the devastating effects of climate change. As a result, municipal governments are well-positioned to both take action to reduce their climate impacts and benefit from those actions.<sup>3</sup>

Rising to the challenge, many municipalities around the United States have pledged to reduce their GHG emissions and to develop *climate action plans* (or CAPs) that outline the specific actions that can be taken to achieve targeted reductions.<sup>4</sup> A municipality typically conducts a GHG inventory to establish baseline emissions levels, sets targets for the municipality and the community, and then develops a plan containing various actions for achieving these targets.<sup>5</sup>

Efforts to reduce GHG emissions have long focused on the burning of fossil fuels for energy generation and transportation. Today, however, there is increasing recognition of the substantial role played by food-related emissions—that is, the GHG emissions attributable to food production, transport, handling, and disposal.<sup>6</sup> New York City, for instance, found that food accounted for 25% of households’ consumption emissions (i.e., emissions calculated based on where products are consumed rather than where products are produced)—a share that is comparable to the national average.<sup>7</sup> Municipalities stand to make significant

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2. See *Cities and Climate Change*, U.N. ENV’T PROGRAMME (UNEP) (Aug. 8, 2024), <https://perma.cc/48U9-CRCP>.

3. Michael Burger & Amy E. Turner, *Urban Climate Law: An Earth Institute Sustainability Primer* (Oct. 2023).

4. See U.S. State Climate Action Plans, CTR. FOR CLIMATE AND ENERGY SOLS. (Nov. 2023), <https://perma.cc/25PD-74MJ>.

Note that this Article uses the term “municipality” throughout to encompass cities, towns, and similar units of local government. However, many of the approaches and concepts discussed here also apply to county government.

5. See, e.g., *Climate Action Plans*, MUN. RSCH. & SERV. CTR. OF WASH. (MRSC), (Aug. 8, 2024), <https://perma.cc/7SVD-2D58>. A climate action plan may also set forth climate adaptation strategies that the community will pursue. See also, e.g., *What Is a Climate Action Plan?*, THE CITY OF BURLINGTON (VT.), <https://perma.cc/9BYW-JNRB> (“Climate action plans, at a minimum, include an inventory of existing emissions, reduction goals or targets, and analyzed and prioritized reduction actions. Ideally, a climate action plan also includes an implementation strategy that identifies required resources and funding mechanisms.”).

6. Jason J. Czarneski, *Food, Law & the Environment: Informational and Structural Changes for a Sustainable Food System*, 31 UTAH ENV’T L. REV. 263 (2011).

7. The majority of emissions associated with food result from the production phase. See, e.g., ECODATALAB, NEW YORK CITY HOUSEHOLD CONSUMPTION-BASED EMISSIONS INVENTORY: 2019 BASE YEAR, 4, 11, 25 (2023), <https://perma.cc/4F4X-P7HK>; *Food and Climate Change: Healthy Diets for a Healthier Planet*, U.N. CLIMATE ACTION, <https://perma.cc/5CAH-WT7Z>; see also, e.g., Christopher M. Jones & Daniel M. Kammen, *Quantifying Carbon Footprint Reduction Opportunities for U.S. Households and Communities*, 45 ENV’T SCI. & TECH. 4088 (2011); Rebecca Boehm et al., *A Comprehensive Life Cycle Assessment of Greenhouse Gas Emissions from U.S. Household Food Choices*, 79 FOOD POL’Y 67, 70, 72 (2018) (finding that 67.9% of average weekly household GHG emissions from food spending come from the agriculture and food manufacturing stages of the food

progress on this front, and, indeed, research suggests that without action in the food sector the world will be unable to meet global climate targets.<sup>8</sup>

The discussion of food as a driver of climate change necessarily begins with protein. Protein foods are an essential part of a healthy diet. But some protein foods are more carbon-friendly than others, and *plant-based proteins* have the significant potential to reduce food-related emissions due to their low carbon footprint per gram of protein.<sup>9</sup> A plant-based protein is any protein that comes from a plant source—such as beans, peas, nuts, nut butters, seeds, and soy products.<sup>10</sup> Plant-based proteins include whole-food plant proteins (such as beans, legumes, and tofu) as well as meat analogs (such as plant-based burgers).<sup>11</sup> Plant-based foods can provide a healthy way to meet protein requirements<sup>12</sup>—particularly when a variety of these foods are consumed throughout the day.<sup>13</sup> Additionally, the Intergovernmental Panel on Climate Change (IPCC) has noted that “a dietary pattern that is higher in plant-based foods, such as vegetables, fruits, whole grains, legumes, nuts, and seeds” is both health-promoting and associated with lower GHG emissions and reduced environmental impacts.<sup>14</sup> Accordingly, plant-based proteins can be leveraged to address climate change.

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supply chain, and that industries that produce animal proteins account for 30% of average weekly household GHG emissions, the largest share of any food industry).

8. *Id.* at 67; Michael A. Clark et al., *Global Food System Emissions Could Preclude Achieving the 1.5 ° and 2 °C Climate Change Targets*, 370 SCI. 705 (2020).

9. For example, a recent large-scale study in the United Kingdom found that plant-only eaters had 25% of the climate impact of high-volume animal-based eaters. Peter Scarborough et al., *Vegans, Vegetarians, Fish-Eaters and Meat-Eaters in the UK Show Discrepant Environmental Impacts*, 4 NATURE FOOD 565, 565 (July 20, 2023); *see also, e.g.*, Isabelle Gerretsen, *What is the Lowest Carbon Protein?* BBC (Dec. 15, 2022), <https://perma.cc/8BAH-4JJD>.

10. *See, e.g., Protein Foods*, U.S. DEP'T. OF AGRIC. (USDA) MYPLATE, <https://perma.cc/J49L-DDQC>; UNEP, *supra* note 2.

11. Plant-based meat analogs are produced directly from plants. Like animal-based meat, plant-based meat analogs comprise protein, fat, vitamins, minerals, and water. *See* GOOD FOOD INST., 2022 STATE OF GLOBAL POLICY REPORT: PUBLIC INVESTMENT IN ALTERNATIVE PROTEINS TO FEED A GROWING WORLD 6 (2023). Plant-based meat analogs are one type of *alternative protein*, a category that also includes cultivated meat and meat produced by a fermentation process. *Id.* at 5–6. Increasingly, meat companies are becoming involved in the alternative protein industry, manufacturing their own plant-based products, partnering with or acquiring existing plant-based brands, and investing in research and development for alternative proteins. Companies have framed this portfolio diversification as a means of expanding consumer choice, providing healthier options, and (although less frequently cited) offering less climate-intensive products. *See, e.g.,* CAROLINE BUSHNELL ET AL., GOOD FOOD INST., STATE OF THE INDUSTRY REPORT: PLANT-BASED MEAT, SEAFOOD, EGGS, AND DAIRY 26 (2023); CONAGRA BRANDS, CONAGRA BRANDS CDP CLIMATE CHANGE 2022 REPORT 7, 12, 14–15 (2022).

Additionally, while plant-based dairy alternatives such as oat milk, almond milk, and soy milk are beyond the Article's discussion of plant-based *proteins*, these alternatives can be ingredients in meals that feature plant-based proteins.

12. USDA MYPLATE, *supra* note 10.

13. *See, e.g.,* Amity Warme, *Plant-based Protein - A Simple Guide to Getting Enough*, COLO. STATE UNIV. KENDALL REAGAN NUTRITION CTR. (May 2022), <https://perma.cc/E4H9-PUXS>.

14. Cheikh Mbow et al., IPCC, *Food Security, in CLIMATE CHANGE AND LAND: AN IPCC SPECIAL REPORT ON CLIMATE CHANGE, DESERTIFICATION, LAND DEGRADATION, SUSTAINABLE LAND MANAGEMENT, FOOD SECURITY, AND GREENHOUSE GAS FLUXES IN TERRESTRIAL ECOSYSTEMS* 481 (P.R. Shukla et al. eds., 2019).

Municipalities are situated to take advantage of this opportunity by adopting measures to increase the availability of plant-based proteins and engage the public on their benefits.<sup>15</sup> These measures can take a wide variety of forms including ordinances, policies, strategies, and convenings. Because CAPs typically set out “actions” municipalities intend to take to meet their climate change goals, these measures are collectively referred to as “plant-based protein actions.”

By including these plant-based protein actions in a municipal CAP, a municipality can advance climate-related, public health, and other benefits while expanding the range of food choices available to residents, visitors, and municipal employees.<sup>16</sup> And plant-based protein actions can complement a broader municipal sustainability strategy that includes reducing food waste and diverting food waste from landfills.

None of the actions identified in Part II mandate the consumption of plant-based foods or prohibit the consumption of animal-based foods. Whether municipal residents, employees, and visitors ultimately decide to consume more plant-based proteins remains a personal decision. But a municipality can, as a matter of sound public policy, make plant-based proteins more readily available, increase public awareness of plant-based proteins and their range of benefits, and engage with the public on these benefits.

To advance plant-based protein actions, municipalities can leverage their existing on-the-ground expertise, local policymaking authorities, purchasing power, partnerships, and community outreach programs. Nationwide, institutional food service facilities purchase and serve about \$120 billion worth of food annually, shaping the diets and health of some of America’s most vulnerable.<sup>17</sup> Designing

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15. Municipal efforts to make food consumption more sustainable and resilient by leveraging the benefits of plant-based proteins can be analogized to local climate initiatives that have been taken in the transportation sector. For instance, municipalities can improve walkability, add bike lanes, expand mass transit, and green the fleet—all while encouraging and incentivizing local buy in—without prohibiting the use of cars.

16. The actions set out in the typology do not depend for their success on municipal employees, residents, and visitors eating *only* plant-based sources of protein, much less shifting to entirely “plant-based diets.” See, e.g., Giulia Viroli et al., *Exploring Benefits and Barriers of Plant-Based Diets: Health, Environmental Impact, Food Accessibility and Acceptability*, 15 NUTRIENTS 4723 (2023) (defining plant-based diets as dietary patterns that emphasize the consumption of plant-based foods while eliminating most or all animal products and noting the wide variety of plant-based diets practiced today). Targeted plant-based protein interventions (even just once a week) can have a significant impact on food-related emissions. See, e.g., Amanda Schupak, *Climate-Friendly Diets Can Make a Huge Difference—Even If You Don’t Go All-Out Vegan*, THE GUARDIAN (June 2, 2022), <https://perma.cc/73ZD-3MQX>.

17. UNION OF CONCERNED SCIENTISTS, PURCHASING POWER: HOW INSTITUTIONAL “GOOD FOOD” PROCUREMENT POLICIES CAN SHAPE A FOOD SYSTEM THAT’S BETTER FOR PEOPLE AND OUR PLANET 1 (2017); see also Katrina Wyman & Emma Dietz, *Integrating Food into Local Climate Policy*, 24 NYU J. LEGIS. & PUB. POL’Y 725, 730 (2023) (arguing that “local governments are well-positioned to add food policy more squarely to their climate policy toolkits and, perhaps in so doing, to broaden the agenda of climate policy to incorporate more food policy measures”).

menus to include plant-based proteins—in public hospitals, school districts, correctional facilities, shelters for the unhoused, municipal departments, and at municipal events—provides an opportunity to reduce GHG emissions while expanding available food options within the community and increasing the quality and healthfulness of institutional food. Municipalities can also help reduce community-wide emissions by encouraging businesses, organizations, and the broader community to take steps to expand the availability of plant-based proteins.

Though plant-based protein actions are well-suited for inclusion in municipal CAPs and broader local sustainability initiatives, these actions have not, to date, been widely adopted. Furthermore, municipalities interested in pursuing plant-based protein measures have faced the labor-intensive task of researching best practices used in other jurisdictions or crafting their own actions from scratch.

The Article proceeds in two parts. **Part I** sets forth key considerations associated with incorporating plant-based protein actions in CAPs and surveys the climate benefits and many co-benefits of adopting plant-based protein actions, in addition to highlighting potential challenges that the municipality may encounter. Part I closes by providing insights on key legal and policy considerations including, but not limited to, those related to the scope of municipal authority, range of potential governance tools, role of semiautonomous and quasi-governmental entities, and alignment of the plant-based protein actions with municipal policies, programs, and plans. **Part II** sets forth a typology of actions to increase the availability of plant-based proteins and engage the public on their benefits covering over thirty specific examples of targeted actions in seven categories. These actions range from discrete and more incremental to ambitious and more involved. Many actions can be implemented at low cost. Municipalities that already have CAPs can incorporate new plant-based protein actions and implementation measures, while municipalities that are developing CAPs can include these actions in the first instance. Even outside of the CAP context, municipalities can adopt plant-based protein actions on a stand-alone basis or to support existing sustainability efforts.<sup>18</sup>

The **Appendix**<sup>†</sup> provides examples of each action from municipalities that have taken that action (or a similar action that can serve as a basis for a plant-based protein approach) and provides additional resources drawn from the review of existing municipal CAPs, as well as food system and sustainability plans, from thirty-five different U.S. municipalities. These ranged from large cities that are

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18. Although the Article was written with CAPs in mind, the plant-based protein actions included here can be included in other municipal planning and strategic documents, such as food policy plans, or implemented à la carte.

<sup>†</sup> The Appendix can be found online for viewing and downloading on SSRN and the *Georgetown Environmental Law Review* website: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=5114989](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5114989) (SSRN), and <https://perma.cc/ANH2-Q9RT> (Georgetown Environmental Law Review).

leaders in climate action (such as New York, Austin, Portland, and Chicago) to mid-size and smaller cities (including, for example, Cincinnati, Chattanooga, Blacksburg, and Carrboro). In addition, the authors conducted extensive secondary research that covered municipal food procurement, food system sustainability, urban agriculture, and plant-based behavioral interventions.

### I. KEY CONSIDERATIONS: BENEFITS AND CHALLENGES

A municipality can strengthen its climate change mitigation efforts by incorporating into its CAP—or building into other municipal sustainability efforts—one or more of the plant-based protein actions described in Part II. These actions, which can be adopted individually or on a complementary basis, are intended to increase the availability of plant-based proteins and engage the public on their benefits.

Plant-based protein actions are a relatively recent feature of the municipal CAP landscape. As such, the following discussion is offered to support municipal sustainability officials, other local policymakers, and communities considering the adoption of plant-based protein actions in making the case for these actions—and answering questions about them.

Specifically, this Article identifies the climate benefits and many co-benefits that a municipality can realize from implementing plant-based protein actions;<sup>19</sup> anticipates expected challenges to adopting and implementing plant-based protein actions; and offers insights on several key legal and policy considerations.

#### A. CLIMATE BENEFITS<sup>20</sup>

The evidence that food production contributes significantly to climate change is clear. Producing the average U.S. resident's diet is estimated to generate 2.5 tons of carbon dioxide equivalent annually.<sup>21</sup> Livestock production, in particular, is a large source of the potent greenhouse gas methane—which, after carbon dioxide, is the second largest driver of climate change—and is responsible for over one-third of

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19. The climate benefits and co-benefits of implementing plant-based protein actions are realized only when municipal residents, employees, and visitors actually consume a greater amount of plant-based proteins relative to other sources of protein. A municipality can facilitate this by taking action to increase the availability of plant-based proteins and engage the public on their benefits. Nevertheless, as observed *supra*, none of the proposed actions enumerated in the Article mandate individual dietary decisions.

20. The Article focuses primarily on plant-based protein actions as a means of reducing GHG emissions—i.e., these actions are a tool for climate *mitigation*. But implementing plant-based protein actions can also support climate *adaptation* efforts, in part by helping municipalities to achieve a more resilient food system. See *infra* notes 45–49 and accompanying text.

21. Hadi Afrouzi et al., *A Comprehensive Review on Carbon Footprint of Regular Diet and Ways to Improving Lowered Emissions*, 18 RESULTS IN ENG'G 1, 7 (2023).

total U.S. anthropogenic methane emissions.<sup>22</sup> Most plant-based proteins have a comparatively small carbon footprint because plants require less in the way of resources and energy to grow, harvest, and distribute.<sup>23</sup> For example, according to one study, “depending on the specific type of alternative products, plant-based meat . . . emits 30–90% less greenhouse gas . . . .”<sup>24</sup>

Project Drawdown has concluded that “plant-rich diets” have enormous climate mitigation potential and can “be adopted incrementally with small behavioral changes that together lead to globally significant reductions in greenhouse gas emissions.”<sup>25</sup>

The potential GHG emissions reductions could be particularly significant in the United States because, according to the Center for Biological Diversity, “Americans consume more meat than almost any other country”—“four times the global average.”<sup>26</sup> For example, if 50% of animal-based foods in the U.S. diet were replaced with plant-based foods, the annual emissions reductions would equal the emissions associated with 420 coal-fired power plants.<sup>27</sup>

Municipalities are well-positioned to take actions that can promote these climate benefits. Almost 80% of all globally produced food is consumed in urban areas.<sup>28</sup> And as of 2017, food was one of the main sources of urban GHG emissions, accounting for an average of over 25% of consumption emissions attributable to households in U.S. municipalities.<sup>29</sup>

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22. See U.S. ENV'T PROTECTION AGENCY (EPA), DATA HIGHLIGHTS—INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS & SINKS: 1990–2021 3 (2023) (finding manure management and enteric fermentation processes responsible for 9% and 27%, respectively, of U.S. methane emissions—a greater methane contribution than that from natural gas and petroleum systems, combined).

Methane is also important in the context of food loss and waste. See, e.g., J.A. Moulton et al., *Greenhouse Gas Emissions of Food Waste Disposal Options for UK Retailers*, 77 FOOD POL'Y 50, 54–55 (2018) (estimating that when animal protein decomposes in a landfill, it releases three times the amount of methane as fruits and vegetables).

23. See Yonghui Li, *Feeding the Future: Plant-Based Meat for Global Food Security and Environmental Sustainability*, 65 CEREAL FOODS WORLD 1, 2 (2020).

24. *Id.*

25. *Plant-Rich Diets*, PROJECT DRAWDOWN, <https://perma.cc/C4ME-9ZYA>; see also Eugene A. Mohareb et al., *Cities' Role in Mitigating United States Food System Greenhouse Gas Emissions*, 52 ENV'T SCI. & TECH. 5545, 5552 (May 2018) (estimating that 77% of production and primary processing GHG emissions in the American diet in 2010 were attributable to animal-based food consumption); see also *supra* note 9.

Without addressing GHG emissions attributable to food production, it will likely be impossible to meet international climate goals. See, e.g., Clark, *supra* note 8.

26. *Appetite for Change: A Policy Guide to Reducing Greenhouse Gas Emissions of U.S. Diets by 2030*, CTR. FOR BIOLOGICAL DIVERSITY, <https://perma.cc/3JGX-7SEL>.

27. *Id.*

28. See *EAT Cities*, EAT, <https://perma.cc/Y2TC-EMM5>.

29. *Id.* A consumption-based approach accounts for GHG emissions based on where products are consumed (i.e., within the municipal boundary) rather than where products are produced. See *infra* notes 88–92 and accompanying text.

## B. CO-BENEFITS

Municipal efforts to increase the availability of plant-based proteins and engage the public on their benefits can contribute to a variety of co-benefits, beyond climate mitigation. These co-benefits are in the areas of expanded consumer choice, environment, health, resilience and food security, equity and inclusion, animal welfare, and cost savings.

### 1. Consumer Choice

Increasing the availability of plant-based proteins within a municipality expands overall consumer choice with respect to food. In so doing, it also provides more inclusive—and often much-needed—food options for residents, visitors, and municipal employees with specific dietary needs. For instance, thirty to fifty million Americans are lactose intolerant.<sup>30</sup> And many others have special dietary requirements related to their religious practices.<sup>31</sup> In addition, more and more people are choosing to incorporate plant-based proteins into their diets for health reasons.<sup>32</sup> It is more inclusive, less alienating, and more supportive of freedom of choice to ensure that the range of available food options in various municipal settings includes plant-based proteins.

### 2. Environment

Plant-based proteins offer numerous advantages from an environmental perspective. Their production has a relatively small water footprint, with tofu and unprocessed oats, for example, requiring just 6 and 3.8 gallons of water per gram of protein, respectively, as compared to beef which requires between 20 and 80 gallons of water per gram of protein.<sup>33</sup> With at least forty states anticipating water shortages, according to the U.S. Environmental Protection Agency (EPA), water-efficient plant-based protein production is likely to become increasingly valuable.<sup>34</sup>

Furthermore, plant-based proteins do not present the threat to surface water and groundwater caused by manure.<sup>35</sup> For example, plant-based (as compared to

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30. See *Lactose Intolerance*, BOS. CHILDREN'S HOSP., <https://perma.cc/Z6F7-JCTC>. The vast majority of African Americans, Native Americans, and Asian-Americans are lactose intolerant. *Id.*

31. See *Inclusivity*, GREENER BY DEFAULT, <https://perma.cc/CYF2-6F82>.

32. See *Consumer Insights*, GOOD FOOD INST., <https://perma.cc/9XFU-VAF9>.

33. Dana Hunnes, *The Case for Plant Based*, UCLA SUSTAINABILITY, <https://perma.cc/S653-ANWW>; see also Martin Armstrong, *Which Foods Need the Most Water to Produce?*, WORLD ECON. F. (June 7, 2021), <https://perma.cc/9APW-Y87K>; see also Brian Machovina et al., *Biodiversity Conservation: The Key is Reducing Meat Consumption*, 536 SCI. TOTAL ENV'T 419, 424 (2015); Davy Vanham et al., *The Water Footprint of the EU for Different Diets*, 32 ECOLOGICAL INDICATORS 1, 5 (2013).

34. See *Water Management at EPA*, EPA, <https://perma.cc/V3M7-6G26>.

35. SOREN RUNDQUIST & CRAIG COX, ENV'T WORKING GRP. (EWG) CASE STUDY: IOWA CITIES STRUGGLE TO KEEP FARM POLLUTION OUT OF TAP WATER 6–7 (2018).

conventional) meat “causes 51–91% less aquatic nutrient pollution,” according to one study.<sup>36</sup>

Plant-based proteins do not generate the methane and ammonia emissions associated with livestock operations.<sup>37</sup> A Proceedings of the National Academy of Science (PNAS) study found that 15,900 air-quality related deaths annually are from food production, of which “80% are attributable to animal-based foods, both directly from animal production and indirectly from growing animal feed.”<sup>38</sup>

Also, because plant-based proteins are less resource-intensive, food loss and waste from plants embody comparatively fewer wasted resources and therefore have a smaller overall environmental and climate impact.<sup>39</sup>

### 3. Health

Research shows that over 35% of Americans have poor diet quality,<sup>40</sup> and diet is the leading cause of premature death in the United States, causing over one half million deaths annually.<sup>41</sup> Insufficient intake of fruits and vegetables contributes to high levels of national obesity, type-2 diabetes, and heart disease, as well as certain cancers.<sup>42</sup> According to the federal *Dietary Guidelines for Americans*, a healthy diet can be achieved by incorporating plant protein, part of the expansive “protein foods group” that comprises foods from both animal and plant sources.<sup>43</sup> But a majority of Americans have diets low in vegetables and fruits—and most

36. Li, *supra* note 23.

37. See *Air*, USDA NAT'L INST. OF FOOD & AGRIC. (NIFA), <https://perma.cc/TFW8-HWU8>. However, plant-based proteins can be associated with water pollution that results from agricultural runoff.

38. Nina Domingo et al., *Air Quality-Related Health Damages of Food*, 118 PNAS 1, 1 (2021), <https://perma.cc/7Z6N-BZX3>.

39. Andrew Berardy et al., *Comparison of Plate Waste between Vegetarian and Meat-Containing Meals in a Hospital Setting: Environmental and Nutritional Considerations*, 14 NUTRIENTS 1174, 1174 (2022); Katharina Scholz et al., *Carbon Footprint of Supermarket Food Waste*, 94 RES., CONSERVATION, & RECYCLING 56 (2015).

40. Junxiu Liu & Dariush Mozaffarian, *Trends in Diet Quality Among U.S. Adults From 1999 to 2020 by Race, Ethnicity, and Socioeconomic Disadvantage*, 177 ANNALS OF INTERNAL MED. 841, 841 (2024).

41. Ali H. Mokdad et al., *The State of US Health, 1990-2016: Burden of Diseases, Injuries, and Risk Factors Among US States*, 319 J. AM. MED. ASS'N 1444, 1449 (2018).

42. USDA & U.S. DEP'T OF HEALTH & HUM. SERVS. (HHS), *DIETARY GUIDELINES FOR AM.S. 2020-2025* 5, 97 (9th ed. 2020) (hereinafter *Dietary Guidelines*). The *Dietary Guidelines* provide science-based advice on what to eat and drink to promote health, help reduce risk of chronic disease, and meet nutrient needs. The *Dietary Guidelines* also form the foundation of federal food, nutrition, and health policies and programs.

43. See *id.* at 30, 33. It is also notable that some municipalities—including, for example, New York City and Philadelphia, have adopted their own nutrition standards covering food purchased and served by the municipality. See, e.g., *New York City Food Standards*, N.Y.C., <https://perma.cc/X47M-C3UD>; *City of Philadelphia Nutrition Standards*, CITY OF PHILA., <https://perma.cc/9LHQ-WJ28>; see also *Vegetarian Choices in the Protein Foods*, USDA MYPLATE, <https://perma.cc/56HV-Q9YM>; *How to Get Protein without the Meat*, BRIT. HEART FOUND., <https://perma.cc/TN5C-DLKM>.

do not satisfy the recommendation for plant-based protein intake. Specifically, more than half of Americans do not meet the recommendation for nuts, seeds, and soy products.<sup>44</sup> As a result, “[s]hifts are needed within the protein foods group to add variety to subgroup intakes. Selecting from . . . the beans, peas, and lentils subgroup more often could help meet recommendations while still ensuring adequate protein consumption.”<sup>45</sup> Furthermore, the Academy of Nutrition and Dietetics has previously taken the position (which it is expected to soon reaffirm) that appropriately planned plant-based diets are healthful, nutritionally adequate, and may provide health benefits in the prevention and treatment of certain diseases.<sup>46</sup>

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44. See *Dietary Guidelines*, *supra* note 42, at 30, 34.

45. See *id.* at 34. The *Dietary Guidelines* provide particularized nutritional guidance for particular life stages, including infants and toddlers and pregnant women. *Id.* at chs. 2-6; see also François Mariotti & Christopher D. Gardner, *Dietary Protein and Amino Acids in Vegetarian Diets—A Review*, 11 NUTRIENTS 2661, 2661 (2019).

There has long been a perception that plant-based proteins are inadequate in comparison to animal-based proteins. See, e.g., SUE DIBB & IAN FITZPATRICK, EATING BETTER, LET’S TALK ABOUT MEAT: CHANGING DIETARY BEHAVIOUR FOR THE 21ST CENTURY 1, 8 (2014). An in-depth discussion of nutrition is beyond the scope of this Article. However, for additional technical resources on meeting dietary needs through plant-based proteins, including potential limitations, see, e.g., Laurianne Dimina et al., *Combining Plant Proteins to Achieve Amino Acid Profiles Adapted to Various Nutritional Objectives—An Exploratory Analysis Using Linear Programming*, 8 FRONTIERS IN NUTRITION 1, 9 (2022); Stefan H. M. Gorissen et al., *Protein Content and Amino Acid Composition of Commercially Available Plant-Based Protein Isolates*, 50 AMINO ACIDS 1685 (2018); Chesney K. Richter et al., *Plant Protein and Animal Proteins: Do They Differentially Affect Cardiovascular Disease Risk?* 6 ADVANCES IN NUTRITION 712 (2015).

Additionally, there has of late been an increased focus on the healthfulness of what are known as ultra-processed foods (UPFs); the next iteration of the *Dietary Guidelines* may include recommendations in this regard. See Anahad O’Connor, *Dietary Guidelines May Soon Warn Against Ultraprocessed Foods*, WASH. POST (Nov. 7, 2023), <https://perma.cc/F35N-32UP>. While this concern could potentially implicate alternative proteins such as plant-based meat analogs, the evidence to date is that these products do not pose health risks in this regard like other UPFs. See, e.g., Reynalda Cordova et al., *Consumption of Ultra-Processed Foods and Risk of Multimorbidity of Cancer and Cardiometabolic Diseases: A Multinational Cohort Study*, LANCET REG’L HEALTH – 35 EUR. 2, 2 (finding that UPF subgroups such as plant-based alternatives not associated with risk); GOOD FOOD INST. EUR., PLANT-BASED MEAT & HEALTH IN EUROPE 31 (2023) (“When comparing plant-based meat against the typical definitions used for ultra-processed foods, it is clear that they do not neatly fit . . . . Plant-based meat is rarely mentioned in landmark studies on UPFs, but in various studies (including a meta-analysis) breaking down impacts by food group, UPFs providing a source of fibre, such as plant-based meat, were associated with reduced health risks.”); *The Ultra-Processed Myth*, BRYANT RSCH. (2023), (citing current research and noting that while replacing animal meat with plant-based meat analogs may mean eating more processed foods, it also means cutting down on calories, cutting down on saturated fat, and boosting intake of fiber); see also Justin McCarthy & Scott Dekoster, *Nearly One in Four in U.S. Have Cut Back on Eating Meat*, GALLUP (Jan. 27, 2020), <https://perma.cc/HRG7-G4EC>; Laura Reiley, *The Fastest-Growing Vegan Demographic is African Americans. Wu-Tang Clan and Other Hip-Hop Acts Paved the Way*, WASH. POST (Jan. 24, 2020); Clare Bassi et al., *Declining Greenhouse Gas Emissions in the U.S. Diet (2003–2018)*, 35 J. CLEANER PROD. 131465 (June 2022).

46. See Vesanto Melina et al., *Position of the Academy of Nutrition and Dietetics: Vegetarian Diets*, 116 J. AM. DIETETIC ASS’N 1970, 1970 (2016) (position expired, but expected update is likely to reaffirm position).

Municipal implementation of plant-based protein actions can help residents, employees, and visitors to meet the recommendations of the *Dietary Guidelines*. Greater adherence to dietary recommendations, especially by way of eating more whole grain and nutrient-dense plant-based foods, can help to avert some diseases and prevent deaths as well as reduce the corresponding health care costs<sup>47</sup> borne by individuals—and also by the municipality, in situations where it pays for healthcare.

For example, New York City, led by the Mayor's Office of Food Policy, has been at the forefront of linking plant-based meals to improved health. By making plant-based meals its default offering and enhancing patients' experience with food, NYC Health + Hospitals was, as of mid-2023, on pace to serve 850,000 plant-based meals during the year.<sup>48</sup> This is part of New York City's effort to expand its lifestyle medicine programming, which centers on plant-based foods as a tool to combat chronic disease and address health disparities disproportionately impacting Black and Brown residents.<sup>49</sup>

#### 4. Resilience and Food Security

Diversifying protein sources in the local food supply can increase resilience, a point that has been emphasized by the Good Food Institute and others.<sup>50</sup> Because plant-based proteins tend to result from short paths to market, consisting of fewer links and actors, they are better insulated from unexpected changes and disruptions, such as natural disasters, and also extreme weather events associated with climate change or pandemics.<sup>51</sup>

Additionally, the production of plant-based proteins in municipalities and surrounding areas in home and community gardens can offer benefits by way of climate change adaptation, resilience, and mitigation. For example, vegetation combats urban heat by providing shade and deflecting radiation from the sun and enhances stormwater runoff management by capturing, absorbing, and filtering stormwater.<sup>52</sup> Growing certain protein-rich plants, such as beans and peas, does

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47. Marco Springmann et al., *Analysis and Valuation of Health and Climate Change Cobenefits of Dietary Change*, 113 J. NAT'L ACAD. SCIS. 4146, 4148–49 (2016). Another study has concluded that suboptimal diet costs approximately \$300 per person in the United States, or \$50 billion nationally, accounting for 18% of all heart disease, stroke, and type-2 diabetes costs. Thiago Veiga Jardim et al., *Cardiometabolic Disease Costs Associated with Suboptimal Diet in the United States*, 16 PLOS MEDICINE 1, 1 (2019).

48. CITY OF N.Y., FOOD FORWARD NYC: 2-YEAR PROGRESS REPORT, 13–14 (2023).

49. See, e.g., CITY OF N.Y., *Mayor Adams, NYC Health + Hospitals Expand Access to Lifestyle Medicine Services City-Wide* (Feb. 2022), <https://perma.cc/XK9G-F4RA>.

50. See, e.g., CLIMATE ADVISORS & GOOD FOOD INST., *WHY THE UNITED STATES SHOULD CHAMPION ALTERNATIVE PROTEINS AS A FOOD AND NATIONAL SECURITY SOLUTION* 5 (2022).

51. CAITLIN WELSH ET AL., *CTR. FOR STRATEGIC & INT'L STUDS., THE FUTURE APPETITE FOR ALTERNATIVE PROTEINS* 25–26 (2023), <https://perma.cc/JZA3-CRQF>.

52. See *Climate Smart Urban Agriculture*, CLIMATE ADAPT (2023), <https://perma.cc/5LG7-RNGY>; Thin Lei Win, *Urban Farms 'Critical' to Combat Hunger and Adapt to Climate Change*, REUTERS (Jan. 11, 2018), <https://perma.cc/W3UY-BAFL>.

not require extensive space and is well-suited to urban and suburban settings.<sup>53</sup> In the event of global stressors and shocks, the presence of local agriculture can serve to diversify the food supply and provide more ready access to fresh food.<sup>54</sup>

## 5. Equity and Inclusion

Many of the CAP actions outlined in Part II can advance municipal environmental equity goals, as well as public health equity goals. As a general matter, communities of color and low-income communities already are experiencing and will continue to experience many climate change impacts “first and worst.”<sup>55</sup> These communities also experience a range of health inequities.<sup>56</sup> The plant-based protein actions address both of these overarching inequities by mitigating climate impacts and fostering greater access to healthy, affordable, and culturally appropriate low-carbon foods.

Assessment of the equity value of the plant-based protein actions in Part II can be informed by the equity framework set forth in an Urban Sustainability Directors Network report which outlines four different types of equity: procedural, distributional, structural, and trans-generational.<sup>57</sup> Each of these types of equity potentially can be achieved through plant-based protein CAP actions.

As discussed in Part II, as a threshold matter, procedural equity can be achieved by ensuring that all communities affected by a proposed plant-based protein CAP action are given the opportunity to be meaningfully involved in the development of the action.

In addition, the CAP actions outlined in Part II, particularly those in Category 6, help achieve distributional equity, in part by focusing on “those of highest need,”<sup>58</sup> through actions such as supporting kitchen incubators and launching training and

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53. See, e.g., Jeremy Dore, *Supports for Climbing Beans and Peas*, GROWVEG (Apr. 22, 2011), <https://perma.cc/ML94-CMFE>; Elaina Hancock, *For Plant-based Proteins, Soy is a Smart Choice*, UCONN TODAY (May 18, 2022), <https://perma.cc/9LY4-2MJW>.

54. For more on the various dimensions of urban agriculture, see, e.g., Esteve Giraud, *Urban Food Autonomy: The Flourishing of an Ethics of Care for Sustainability*, 10 HUMANS. (SPECIAL ISSUE: FOOD CULTURE & SUSTAINABILITY) 1, 10 (2021); Aydali Campa, *A New Push Is on in Chicago to Connect Urban Farmers with Institutional Buyers Like Schools and Hospitals*, INSIDE CLIMATE NEWS (Dec. 7, 2022), <https://perma.cc/D5TB-P3ZF>; Eric Adams, OFFICE OF BROOKLYN BOROUGH PRES. ERIC ADAMS, *The New Agrarian Economy: Past, Present, and Future of Urban Agriculture in New York City* (2021); Marielle Dubbeling et al., *Urban Agriculture as a Climate Change and Disaster Risk Reduction Strategy*, 20 FIELD ACTIONS SCI. REPS. (SPECIAL ISSUE) 32, 34 (2019).

55. *Frontline and Fenceline Communities*, THE CLIMATE REALITY PROJECT, <https://perma.cc/Q6CK-PPGC>; *African American Communities and Climate Change*, ENV'T DEF. FUND, <https://perma.cc/PG3R-PTR5>.

56. TAYLOR SCOTT, UNHEALTHY INEQUALITIES: A DISCUSSION ON THE INTERSECTION OF HEALTH, RACISM AND FOOD INEQUALITY FOR BLACK AMERICANS AND HOW RIGHTS BASED LAWS CAN PROMOTE HEALTH EQUITY AND SOCIAL JUSTICE 1 (2023).

57. ANGELA PARK, URB. SUSTAINABILITY DIRECTIVE NETWORK (USDN), EQUITY IN SUSTAINABILITY: AN EQUITY SCAN OF LOCAL GOVERNMENT SUSTAINABILITY PROGRAMS 3 (2014).

58. *Id.* at i:1.

assistance programs for convenience stores in low-income communities and communities of color.

Many of the plant-based protein actions reflect recognition of “the historical, cultural, and institutional dynamics and structures that have routinely advantaged privileged groups in society and resulted in chronic, cumulative disadvantage for subordinated groups.”<sup>59</sup> For example, several actions attempt to address structural inequities that have resulted in low-income communities and communities of color having less access to certain types of plant-based proteins as well as fruits and vegetables more generally.<sup>60</sup> Specifically, CAP actions that support urban agriculture<sup>61</sup> projects as well as training programs for health care practitioners and school chefs can help increase access to plant-based proteins. These types of actions can also advance food sovereignty—“the ability of marginalized communities to not only have stake in the food system, but to control what they eat and how they eat it.”<sup>62</sup>

Furthermore, many of the plant-based protein actions could have trans-generational impacts that help avoid unfair burdens on future generations. The CAP actions can help mitigate climate change which impacts low-income communities, communities of color, and their descendants disproportionately,<sup>63</sup> and the public health equity co-benefits can be passed down to future generations.<sup>64</sup> These actions that can advance trans-generational equity are critically important and yet can be undervalued. As Professor Michael Vandenberg explains: “Policy debates tend to focus on the next several months or years, and justice advocates often focus on the burdens of climate mitigation and the wealth disparity among populations living in developed and developing countries today, rather than the tens or hundreds of future generations that will live in a disrupted world.”<sup>65</sup>

## 6. Animal Welfare

CAP actions that increase the availability of plant-based proteins may sidestep growing concerns about the welfare of farm animals. It is estimated that between

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59. *Id.*

60. *See, e.g.*, ANTHONY LEISEROWITZ ET AL., YALE PROGRAM ON CLIMATE CHANGE COMM’N, CLIMATE CHANGE AND THE AMERICAN DIET 10 (2020).

61. *Urban Agriculture*, USDA CLIMATE HUBS, <https://perma.cc/4GRU-5E76>.

62. *See* Nina Ignaczak, *Can Detroit Become a Food-Sovereign City?* CTR. FOR REG’L FOOD SYS.: MICH. GOOD FOOD CHARTER (Feb. 2016), <https://perma.cc/LUU7-9D49>; Brionna Colson-Fearon & H. Shellae Versey, *Urban Agriculture as a Means to Food Sovereignty? A Case Study of Baltimore City Residents*, 19 INT’L J. ENV’T RSCH. & PUB. HEALTH 1, 12 (2022).

63. *See* Michael P. Vandenberg, *Reconceptualizing the Future of Environmental Law: The Role of Private Climate*, PACE ENV’T L. REV. 382, 385 (2015).

64. Mauro Fisberg, Nathalia Gioia, & Priscila Maximino, *Transgenerational Transmission of Eating Habits*, 100 JORNAL DE PEDIATRIA S82, S85–86 (2024).

65. Vandenberg, *supra* note 63, at 385.

nine and ten billion farm animals are slaughtered in the United States each year,<sup>66</sup> nearly all of them raised in a system of intensive confinement.<sup>67</sup> Amidst well-documented concerns regarding animal treatment and welfare<sup>68</sup>—as well as new state legislation to protect farm animals,<sup>69</sup> and efforts by food businesses to address animal welfare within their supply chains<sup>70</sup>—research indicates that consumers care about farm animal welfare and perceive a need to improve this issue.<sup>71</sup>

For the municipality, then, a co-benefit of including plant-based protein actions in their CAPs is that doing so may allow consumers to more effectively express animal welfare concerns through their food choices.

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66. HUMANE SOC'Y OF THE U.S., *Improving the Lives of Farm Animals*, <https://perma.cc/UYW7-6LT6>.

67. The use of “concentrated animal feeding operations,” or CAFOs, is prevalent in the United States; CAFO is a technical term defined by EPA in its federal Clean Water Act regulations. 40 C.F.R. § 122.23 (2012).

By one estimate, based on data from the USDA Census of Agriculture, 99% of U.S. farmed animals are maintained in intensive confinement. See Jacy Reese Anthis, *US Factory Farming Estimates*, SENTIENCE INST. (Apr. 11, 2019), <https://perma.cc/Z9G7-GD8D>.

68. See, e.g., Elizabeth A. Overcash, *Overview of CAFOs and Animal Welfare Measures*, ANIMAL LEGAL & HIST. CTR., MICH. STATE UNIV. COLL. OF L. (2011), <https://perma.cc/QXP3-KQLT> (“In terms of animal welfare, one of the greatest concerns is the close confinement and crowdedness of the animals. These conditions create boredom and stress in the animals, as well as physical and mental illnesses.”); PEW COMM'N ON INDUS. FARM ANIMAL PROD., *PUTTING MEAT ON THE TABLE: INDUSTRIAL FARM ANIMAL PRODUCTION IN AMERICA (EXECUTIVE SUMMARY)* 13 (2008) (“Confinement animals are generally raised indoors and, in some cases (e.g., poultry, laying hens, hogs), the group size when raised indoors is larger than the group size when raised outdoors. In other cases (e.g., veal crates or gestation crates for sows), animals are separated and confined to spaces that provide for only minimal movement. The fundamental welfare concern is the ability of the animal to express natural behaviors: rooting and social behavior for hogs, walking or lying on natural materials, and enough floor space to move around with some freedom at the minimum. Gestation crates, the most restrictive farrowing crates, battery cages, and other intensive confinement systems fail to allow for even these minimal natural behaviors.”).

The independent Pew Commission was formed by The Pew Charitable Trusts and the Johns Hopkins Bloomberg School of Public Health to examine the farm animal industry. From 2006 to 2008, the Commission conducted a comprehensive, fact-based, and balanced examination of key aspects of industrial farm animal production. Commissioners represented diverse backgrounds and perspectives and came from the fields of veterinary medicine, medicine, agriculture, public health, business, government, rural advocacy, and animal welfare. See JOHNS HOPKINS CTR. FOR A LIVABLE FUTURE (CLF), *Pew Commission on Industrial Farm Animal Production*, <https://perma.cc/BQ5P-V8C5>. The Commission’s work resulted in recommendations to solve problems in four primary areas: public health, the environment, animal welfare, and rural communities. Key recommendations included phasing out intensive confinement, as well as ultimately banning the nontherapeutic use of antibiotics in farmed animals to help avoid antibiotic resistance in humans. EXECUTIVE SUMMARY, *supra* at 21–22.

69. See, e.g., *Nat’l Pork Producers Council v. Ross*, 598 U.S. 356 (2023) (upholding against constitutional challenge California’s Proposition 12, which prohibits the sale of meat from pigs confined in a “cruel” manner).

70. See, e.g., *News: Companies Making Progress in Farm Animal Welfare*, ASPCA, (Oct. 22, 2021), <https://perma.cc/7U7M-TNWM>.

71. See, e.g., Marta E. Alonso et al., *Consumers’ Concerns and Perceptions of Farm Animal Welfare*, 10 ANIMALS 385 (2020); GQR, CLF, *NATIONAL SURVEY ON CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFOs)* (2019).

## 7. Cost Savings

Whole food plant-based protein meals (especially when they include proteins from sources such as rice and beans, tofu, lentils, and quinoa) tend to be inexpensive—and in fact, less expensive than comparable options.<sup>72</sup> Not surprisingly, there is evidence that municipalities, their institutional partners, and local businesses stand to save on food-related costs by increasing the availability of protein sources such as beans, legumes, and grains.<sup>73</sup>

For example, some municipalities have seen a decrease in food-related costs through increased plant-based procurement measures. New York City is projected to save \$1 million annually from the NYC Health + Hospitals plant-based default program, implemented by Sodexo at eleven hospitals.<sup>74</sup> Similarly, by increasing procurement of fruits, vegetables, and legumes, the Oakland Unified School District achieved a 1% reduction in dollars spent per meal served, for a total savings of \$42,000 over a two-year period.<sup>75</sup> Businesses also stand to benefit from reducing food-related costs while potentially varying their clientele.<sup>76</sup>

Factoring plant-based meat analogs (such as plant-based burgers) into the cost conversation can add complexity, as these alternatives tend to be more expensive. Even so, industry market research suggests that plant-based products are moving toward price parity.<sup>77</sup> And while roughly half of Americans view plant-based

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72. See, e.g., HANA KAHLEOVA ET AL., VEGAN DIET AND FOOD COSTS AMONG ADULTS WITH OVERWEIGHT: A SECONDARY ANALYSIS OF A RANDOMIZED CLINICAL TRIAL 2 (2023) (finding that a low-fat vegan diet was associated with an approximately 16% decrease in total food costs); Erin Campbell et al., *Post Hoc Analysis of Food Costs Associated with Dietary Approaches to Stop Hypertension Diet, Whole Food, Plant-Based Diet, and Typical Baseline Diet of Individuals with Insulin-Treated Type 2 Diabetes Mellitus in a Nonrandomized Crossover Trial with Meals Provided*, 119 AM. J. CLINICAL NUTRITION 769, 775 (2024) (finding that a whole-food, plant-based diet demonstrated the lowest food costs in a comparative analysis and that “[d]espite public perception to the contrary, food cost analyses have found vegan and vegetarian diets economical when compared with other healthy diets”).

Cost savings can result from substituting entire meals or ingredients, especially when plant-based proteins are purchased in their dry form.

73. See, e.g., *Nutrition: Plant-Based Protein*, NYC HEALTH, see also, e.g., Neal Barnard et al., *Universal Meals: A Novel Program to Provide Healthful Nutrition to Diverse Communities*, AM. J. LIFESTYLE MED. (2022) (discussing the creation of plant-based “Universal Meals”—simple, healthful recipes that omit animal-derived ingredients and can be adapted to larger production sizes for institutional use—and documenting their relative cost effectiveness on a per-meal basis).

74. DefaultVeg, *NYC Hospitals Flip Food Norms, Serving Plants by Default*, MEDIUM (Oct. 4, 2022), <https://perma.cc/6T4C-4ZP7>.

75. KARI HAMERSCHLAG & JULIAN KRAUS-POLK, FRIENDS OF THE EARTH, *SHRINKING THE CARBON AND WATER FOOTPRINT OF SCHOOL FOOD: A RECIPE FOR COMBATING CLIMATE CHANGE* 3 (2017).

76. James Tapper, *Restaurants Dropping Meat Dishes As Costs Rise and Veganuary Grows More Popular*, THE GUARDIAN (Jan. 1, 2023), <https://perma.cc/8JQC-ZFDN>; Katrina Fox, *These Restaurants Removed Animal Products from Their Menus and Went Vegan—Here Are the Results*, FORBES (Apr. 4, 2018); Emma E. Garnett et al., *Impact of Increasing Vegetarian Availability on Meal Selection and Sales in Cafeterias*, 116 PROCEEDINGS NAT’L ACAD. SCI. 20923, 20923 (2019).

77. See, e.g., *Plant-Based Protein: Parity on the Horizon*, KEARNEY (Mar. 20, 2022), <https://perma.cc/HNF9-EBSM>.

foods as more costly than other proteins, a majority agree that they would be willing to make a substitution if plant-based alternatives were cheaper.<sup>78</sup>

Although cost savings are a notable co-benefit of plant-based protein actions, municipalities would do well to consider both the perception and reality of cost implications in including these actions in their CAPs. To highlight opportunities for cost savings, it may be beneficial to pair accessibility actions from Part II with educational actions aimed at increasing awareness of lower-cost plant-based protein meals. Also, municipalities may want to explore how potential cost savings can be leveraged to benefit low-income communities and communities of color<sup>79</sup> and to design plant-based protein measures with equity a central consideration.<sup>80</sup>

A caveat: the preceding discussion of the cost savings co-benefit does not necessarily address a given municipality's *cost of implementation* for plant-based protein actions. When developing their CAPs, municipalities often assign cost estimates by action. Given the wide variation in available plant-based protein actions and the potentially significant differences in implementation from one municipality to the next, this Article does not offer specific cost estimates by action.<sup>81</sup>

### C. CHALLENGES

A majority of the American public is motivated to incorporate plant-based foods into their diet.<sup>82</sup> This creates an opportunity for municipalities to successfully adopt and implement plant-based protein actions. Polling suggests that health is the leading motivation behind increasing plant-based food consumption, followed by environmental concerns, food safety, animal welfare, and peer influence.<sup>83</sup>

Still, and despite the rising popularity of flexitarianism,<sup>84</sup> municipalities may encounter challenges in incorporating plant-based protein actions into their CAPs

78. LEISEROWITZ ET AL., *supra* note 60, at 3.

79. *See supra* notes 55–65 and accompanying text.

80. *See* USDN, *supra* note 57.

81. Where cost of implementation is a significant concern, municipalities seeking to identify new funding sources to support their CAP development and implementation plans may wish to consult government-funded grant programs. This includes examining opportunities available under the landmark Inflation Reduction Act of 2022 (IRA), which authorizes billions of dollars in funding to address climate change and could support local measures. *See, e.g.,* C40 AND CLIMATE MAYORS, CLIMATE ACTION AND THE INFLATION REDUCTION ACT: A GUIDE FOR LOCAL GOVERNMENT LEADERS (2022) (guidebook developed to help mayors and their staff understand the climate provisions included in the Act, the opportunities for local government, and the roles that they can play in maximizing the benefits of the law).

C40 is a global network of nearly 100 mayors of the world's leading cities that are taking action on climate change. *See About C40*, C40, <https://perma.cc/Z3XE-3NXA>.

82. *See, e.g.,* Karine Lacroix et al., *Understanding Differences in Americans' Motivations for Eating Plant-Rich Foods*, YALE PROGRAM ON CLIMATE CHANGE COMM'N (Apr. 7, 2022), <https://perma.cc/6XW4-M27A> (discussing new survey tool for identifying groups willing to adopt plant-based diets).

83. *Nutrition and Food*, GALLUP, (Sept. 2019), <https://perma.cc/A4YG-PS4K>.

84. Marcy Kreiter, *Veganuary 2022 Coincides with Growing Flexitarian Trend*, THE FOOD INST. (Jan. 5, 2022), <https://perma.cc/JC2D-U9XB>.

and giving effect to these actions. The most likely challenges, discussed below, arise in the areas of quantifying GHG emissions reductions and achieving behavioral change.

### 1. Quantification of GHG Reductions

Municipalities often quantify the GHG emissions associated with each CAP action, but estimating food-related emissions—that is, GHG emissions associated with food consumed within the municipal boundary—can be challenging.

The Global Protocol for Community-Scale Greenhouse Gas Inventories is the most widely used standard for measuring GHG emissions.<sup>85</sup> The Protocol classifies emissions pursuant to a “scopes” framework, based on where the emissions physically occur, as well as by sector. Most food-related emissions are classified as scope 3, which are emissions that occur outside of the municipal boundary as a result of activities taking place within the boundary.<sup>86</sup> The Protocol requires that a municipality report scope 3 emissions only from the waste sector, including food waste; consequently, other food-related emissions are not covered. The Protocol points out, however, that measuring “other” scope 3 emissions, such as food-related emissions, allows municipalities to “take a more holistic approach to tackling climate change by assessing the GHG impact of their supply chains . . . .”<sup>87</sup>

Today, as scope 3 emissions receive greater attention,<sup>88</sup> more municipalities are reporting their scope 3 emissions through what is known as *consumption-based accounting*. This approach assigns emissions attributable to goods on the basis of where the goods are *consumed* (in this case, within the municipality), rather than where they were *produced* (somewhere outside the municipality).<sup>89</sup> Consumption-based accounting can help to present a more complete picture of

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85. WEE KEAN FONG ET AL., WORLD RES. INST., GLOBAL PROTOCOL FOR COMMUNITY-SCALE GREENHOUSE GAS INVENTORIES: AN ACCOUNTING AND REPORTING STANDARD FOR CITIES (Version 1.1, 2021).

86. *Id.* at 178. Scope 1, or territorial, emissions are emissions from sources located within the municipal boundary. Scope 2 emissions are emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam, or cooling within the municipal boundary. *Id.*

87. *See id.* at 37; *see also Scope 3 Inventory Guidance*, EPA, <https://perma.cc/J4A7-8WHA> (discussing scope 3 emissions); GLOBAL COVENANT OF MAYORS FOR CLIMATE & ENERGY, GUIDANCE NOTE: EXPLANATORY NOTE ACCOMPANYING THE GLOBAL COVENANT OF MAYORS COMMON REPORTING FRAMEWORK 33 (9th ed. 2019).

88. For example, under California’s landmark Climate Corporate Data Accountability Data Act (SB 253), very large companies doing business in California will be required, beginning in 2027, to disclose their scope 3 emissions annually. CAL. HEALTH & SAFETY CODE § 38532.

89. *See, e.g., Climate Action Planning Guide—How to Develop and Manage a City-Wide Greenhouse Gas Emission Inventory*, C40 CITIES CLIMATE LEADERSHIP GRP., JASON ANGELL & JOCELYN APICELLO, CLIMATE SMART PHILIPSTOWN, SINK, STORE, REDUCE, OFFSET: AN INNOVATIVE GHG INVENTORY AND ITS IMPLICATIONS FOR ACHIEVING CARBON NEUTRALITY, 35–44 (2020); C40 CITIES CLIMATE LEADERSHIP GRP., THE FUTURE OF URBAN CONSUMPTION IN A 1.5°C WORLD 14–15 (2019).

municipal emissions, including the carbon impact of different foods consumed within the municipality. This information, in turn, can inform municipal efforts to mitigate climate change.<sup>90</sup> New York City, for example, developed a household consumption-based emissions inventory and found that food was the leading source of emissions attributable to households, comprising 25% of total residential consumption emissions. The report also found that New York City's average household emissions from food were below the U.S. average.<sup>91</sup> This suggests that most American cities have an opportunity to reduce their food-related emissions.

A consumption-based emissions inventory is comprehensive and involves estimating the GHG emissions from food as well as other products consumed within the city boundary (and not *just* from municipal operations). As a modest initial step, for the purpose of evaluating plant-based protein actions for inclusion in a CAP, a municipality might focus more narrowly on municipal operations—and estimate only the emissions from food procured by municipal government—instead of the more time- and resource-intensive process of measuring all types of consumption (not only food consumption) from both the municipality and the community.<sup>92</sup>

Ultimately, given the wide variation in plant-based protein actions introduced in Part II and the many potential differences in implementation from one municipality to the next, the actions are not assigned estimated GHG emissions reductions. Municipalities seeking to quantify estimated emissions reductions for their plant-based protein actions may wish to consult existing municipal CAPs,<sup>93</sup> as well as online emissions calculators.<sup>94</sup> Another option, where resources allow, is

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90. Although relatively few municipalities have to date performed consumption-based emissions analyses, and most will likely continue to use the Global Protocol, consumption-based accounting is “a helpful complement in demonstrating climate leadership and achieving deeper carbon reductions.” MICHAEL BURGER & AMY E. TURNER, *URBAN CLIMATE LAW: AN EARTH INSTITUTE SUSTAINABILITY PRIMER* 138–39 (2023).

91. ECODATALAB, *supra* note 7.

92. See Wyman & Dietz, *supra* note 17, at 748–58.

93. See, e.g., TOWN OF CARRBORO, N.C., *COMMUNITY CLIMATE ACTION PLAN: REDUCING GREENHOUSE GAS EMISSIONS, SAVING ENERGY, GENERATING RENEWABLE ENERGY, AND ENHANCING ECOSYSTEMS* 9 (2017), <https://perma.cc/ZH3N-8569>; SEATTLE CLIMATE ACTION PLAN, *GREEN RIBBON COMMISSION RECOMMENDATIONS* (2013), <https://perma.cc/SFR7-Y6GN>.

94. See, e.g., Richard Waite, Daniel Vennard & Gerard Pozzi, *Cool Food Calculator*, WORLD RES. INST. (Sept. 24, 2019), <https://perma.cc/SCY2-TSU2>. This calculator, and the Cool Food Pledge methodology, are well-suited to measuring GHG emissions from the *municipality's own operations* and focus on the following metrics: food purchases by food type; food-related GHG emissions from agricultural supply chains (tons of carbon dioxide equivalent); food-related land use (hectares); food-related carbon opportunity costs (tons of CO<sub>2</sub>e); and normalized metrics (several possible units of measure). Richard Waite, Daniel Vennard & Gerard Pozzi, *Tracking Progress Toward the Cool Food Pledge*, WORLD RES. INST. (Sept. 2019).

See also *CoolClimate Calculator*, UNIV. CAL. BERKELEY, (click the tabs in the top row to fill out your household usage and determine your household footprint). This calculator helps *households and individuals* estimate their daily emissions from food and breaks down emissions from different foods.

to engage outside technical experts, including from local universities, to assist in developing estimates tailored to a municipality's needs and circumstances.

## 2. Behavioral Change

In evaluating actions to include in a CAP, municipalities should be aware that individual dietary choices can be difficult to sway, particularly because human behavior is complicated and can be unpredictable. Fortunately, a growing body of behavioral research in a range of disciplines—from social and cognitive psychology to behavioral economics—offers insights that can inform the choice, design, implementation, and communication of plant-based protein actions.

### *a. Key Lessons from the Literature*

To start, behavioral research recognizes that people do not always make rational decisions. As the applied behavioral science organization Behavioural Insights Team outlines in its report, *A Menu for Change: Using Behavioural Science to Promote Sustainable Diets Around the World*, decisions are a function of three main drivers of behavior: individual drivers (such as personal preferences and tastes), social drivers (such as the opinions of friends and family), and material drivers (such as convenience).<sup>95</sup> Although a summary of all the social science literature potentially relevant to the success of plant-based protein actions is beyond the scope of this Article, some consensus lessons have emerged based on studies of the three main behavior drivers (each independently and in combination). The Behavioural Insights Team groups the lessons into several categories, which are relevant for assessing and selecting plant-based protein actions.

#### *i. Make it “Normal”*

A phenomenon known as the “default effect” describes people’s tendency to take the “default” route in any decision, rather than what is perceived as the “alternative.”<sup>96</sup> Given that plant-based proteins are still thought of as an “alternative,” normalizing plant-based proteins as an option and increasing their visibility may be an effective strategy.

Choice architecture and “nudge” strategies can help achieve these outcomes in a variety of ways, such as by instituting a weekly menu initiative (like “Plant Powered Fridays”) or making plant-based protein meals the default option for municipal-wide operations.<sup>97</sup> Sophisticated work is taking place in this space. For

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95. THE BEHAVIOURAL INSIGHTS TEAM, *A MENU FOR CHANGE: USING BEHAVIOURAL SCIENCE TO PROMOTE SUSTAINABLE DIETS AROUND THE WORLD* 28 (2020).

96. *See id.* at 36, 38.

97. *See, e.g.*, FOOD FOR CLIMATE LEAGUE, *SERVING UP PLANTS BY DEFAULT* 7 (2023) (finding that implementing plant-based dishes as the default in university dining halls reduces GHG emissions without causing major disruptions); Verena Kurz, *Nudging to Reduce Meat Consumption: Immediate and Persistent Effects of an Intervention at a University Restaurant*, 90 J. ENV'T ECON. & MGMT. 317,

example, the Better Food Foundation<sup>98</sup> aims to use nudge strategies to move people and institutions to adopt new plant-centered norms, and Greener by Default works with partner institutions to make plant-based foods the default in a variety of settings.<sup>99</sup>

Furthermore, in engagement efforts to normalize plant-based proteins as appropriate for all cultural backgrounds, municipalities can consider partnering with authentic representatives from a variety of socio-economic, cultural, ethnic, and racial backgrounds.

*ii. Make it “Appealing”*

Especially in routine decision-making—such as grocery shopping—humans tend to make quick, emotional, and intuitive decisions using a mode of thinking known as “System 1.”<sup>100</sup> Behavioral research has shown that thoughtfully crafted messages can exert influence on this intuitive system.<sup>101</sup> Marketing and outreach efforts that use appealing imagery and language to highlight certain benefits (taste, health, cost, etc.) can be effective,<sup>102</sup> though the strength of different messages may vary by target audience.<sup>103</sup> For example, research shows that the effectiveness of health-based messaging may depend on the health literacy of the consumer group.<sup>104</sup>

333 (2018); Johanna Meier et al., *Review: Do Green Defaults Reduce Meat Consumption?* 110 FOOD POL’Y 102298, 102303 (2022); Federico J.A. Perez-Cueto, *Nudging Plant-Based Meals Through the Menu*, 24 INT’L J. GASTRONOMY & FOOD SCI. 100346, 100348-49 (2021). Defaults can also be incorporated at the ingredient level. See GOOD FOOD INST., *supra* note 11.

98. The Foundation is an action tank that promotes plant-forward policies. See *Mission & Impact*, BETTER FOOD FOUND., <https://perma.cc/FPU4-TFCM>.

99. Greener by Default consults with institutions to apply behavioral science to food policy, nudging diners towards sustainable plant-based food while preserving freedom of choice. See *Our Mission*, GREENER BY DEFAULT, <https://perma.cc/Q8KR-EBZJ>. Greener by Default, which started as a project of the Better Food Foundation, collaborated with New York City on the groundbreaking plant-based default initiative of NYC Health + Hospitals. See *id.*; *Success in the Big Apple*, GREENER BY DEFAULT, <https://www.greenerbydefault.com/healthcare>.

100. THE BEHAVIOURAL INSIGHTS TEAM, *supra* note 95, at 33. System 1 cognitive processing was introduced by Daniel Kahneman in his book *Thinking, Fast and Slow* (2011).

101. THE BEHAVIOURAL INSIGHTS TEAM, *supra* note 95, at 33.

102. See, e.g., *Key Recommendations*, PAX FAUNA (2024), <https://perma.cc/GMP8-3SYX> (providing 15 key recommendations for messaging about plant-based proteins, including framing messages around naturalness or freedom of choice); WORLD RES. INST., *PLAYBOOK FOR GUIDING DINERS TOWARD PLANT-RICH DISHES IN FOOD SERVICE* 45, 49 (2020) (breaking down 23 different strategies related to plant-based proteins, including using language and presentation to increase appeal); Astrid Dannenberg & Eva Weingärtner, *The Effects of Observability and an Information Nudge on Food Choice*, 120 J. ENV’T ECON. & MGMT. 102829, 102830, 102839–41 (2023); Hannah E. Piester et al., *“I’ll Try the Veggie Burger”*: *Increasing Purchases of Sustainable Foods with Information About Sustainability and Taste*, 155 APPETITE 104842, 104842–43, 104848 (2020).

103. Aidan Kankyoku, *A Review of Contemporary Research into Public Perceptions of the Slaughter Industry*, PAX FAUNA (Nov. 29, 2022), <https://perma.cc/6985-ZN2L>.

104. THE BEHAVIOURAL INSIGHTS TEAM, *supra* note 95, at 30.

Furthermore, messages about environmental impact may resonate more with certain groups, such as young people and women.<sup>105</sup>

*iii. Make it “Easy and Convenient”*

Research has shown that a change in values does not always lead to behavioral change, as individuals tend to sacrifice their values when the cumulative impacts are high, meaning that an action is *less* enjoyable, affordable, or convenient than the alternative.<sup>106</sup> Therefore, strategies that make it easier for individuals to eat plant-based proteins can be effective: for example, increasing the availability and variety of plant-based options in stores or including eco-labels on food products to make it easier for consumers to make judgments.<sup>107</sup>

*b. Recognize that Awareness Campaigns Alone May Not Suffice*

Research indicates that information and awareness campaigns alone may have limited effects on behavior change, although they may raise support for a given policy.<sup>108</sup> Accordingly, municipal plant-based protein actions to engage the public may be more effective when combined with complementary strategies, such as measures that increase the availability of these proteins.

*c. Consider Spillover Effects*

Behavioral change does not occur in isolation—there can be ripple effects. The potential for both positive and negative spillover effects should be considered in selecting plant-based protein actions.<sup>109</sup> For example, a positive spillover effect

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105. *Mind the Gap: Gen Z is Craving a More Sustainable Food System*, MCKINSEY & CO., <https://perma.cc/YR6G-MCN4>; Piester et al., *supra* note 102.

106. *Compare* THE BEHAVIOURAL INSIGHTS TEAM, *supra* note 95, at 32, with JACOB R. PEACOCK, PRICE-, TASTE-, AND CONVENIENCE-COMPETITIVE PLANT-BASED MEAT WOULD NOT CURRENTLY REPLACE MEAT 1 (2023) (presenting evidence that a majority of current consumers would continue eating primarily animal-based meat even if plant-based meat analogs were price-, taste-, and convenience-competitive).

107. Piester et al., *supra* note 102; *see also* Valerija Gottselig, Amelie Wuppermann, & Christoph Herrmann, *Effects of Green Nudges on Consumer Valuation of Sustainable Food: A Discrete Choice Experiment*, 32 GAIA - ECOLOGICAL PERSPS. FOR SCI. & SOC'Y 233, 239 (2023) (finding that green nudges increase individuals' willingness to pay more for products that have ecology and animal welfare labels); WORLD RES. INST., *supra* note 102.

108. THE BEHAVIOURAL INSIGHTS TEAM, *supra* note 95; *see also* Marleen Onwezen & Hans Dagevos, *A Meta-Review of Consumer Behaviour Studies on Meat Reduction and Alternative Protein Acceptance*, 114 FOOD QUALITY & PREF. 105067, 105067, 105076, 105080–81 (2024) (finding that “information as such is not a powerful instrument to change behaviour” and noting the importance of framing and of targeting audience segments).

109. *See* Heather Barnes Truelove et al., *Positive and Negative Spillover of Pro-Environmental Behavior: An Integrative Review and Theoretical Framework*, 29 GLOB. ENV'T CHANGE 127, 129–30 (2014) (offering model to assess how pro-environmental behavior may lead to positive, negative, or no spillover effect); Kenneth Gillingham et al., *The Rebound Effect is Overplayed*, 493 NATURE 475, 475–76 (2013) (providing evidence that rebound effect—e.g., that greater energy efficiency leads to greater energy usage—is overplayed).

was found in one study that concluded, “eliminating meat one day per week increases the likelihood of further decreasing meat intake and making other dietary changes.”<sup>110</sup> On the other hand, negative spillover effects may occur when individuals’ uptake of plant-based proteins decreases their likelihood to take other pro-environmental behaviors, like reducing food waste.<sup>111</sup>

#### D. LEGAL AND POLICY CONSIDERATIONS

##### 1. Scope of Municipal Authority

The legal and institutional framework governing a municipality<sup>112</sup> can be complex. Municipalities vary widely in the scope of authority they have been granted by their states which, in turn, may affect whether a specific plant-based protein action can be incorporated into a CAP. For example, some jurisdictions have limited authority to adopt policies and ordinances under their state constitutions and statutes, while others, mostly “home rule” jurisdictions, may have broad authority.<sup>113</sup> In some jurisdictions, municipal home rule charters also specify municipal powers and functions.<sup>114</sup>

In addition, the type or form of municipal government (such as mayor/council, council/city manager) can affect the delineation of authorities and responsibilities between the legislative and executive branches.<sup>115</sup>

Furthermore, some CAP actions may involve facilities that are subject to laws and institutional oversight that extend beyond the municipality’s circumscribed authority. For example, food service at institutions such as public schools, hospitals, and correctional facilities can implicate state and even federal law, with which a plant-based protein action may need to be harmonized. State law may, for example, provide for school nutritional standards; state law can also, in some instances, pre-empt local action on a subject altogether.<sup>116</sup> And if federal funds are used for a program, consistency with federal laws and regulations is required.<sup>117</sup> Thus, it is important for the municipality to be aware of the broader state (and potentially federal) legal landscape in considering actions to include in a CAP.

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110. Daphne Altema-Johnson et al., *Dietary Changes Among People Practicing Meatless Monday*, 55 J. NUTRITION EDUC. & BEHAV. S69 (2023).

111. Truelove et al., *supra* note 109.

112. This Article focuses on “municipalities,” but the actions in the typology can also be included in the CAPs of other types of local governments, such as counties and regional entities.

113. OSBORNE M. REYNOLDS, LOCAL GOVERNMENT LAW 150 (5th ed. 2019).

114. NAT’L LEAGUE OF CITIES, PRINCIPLES OF HOME RULE FOR THE 21ST CENTURY 11, 30 (2020).

115. *Cities 101 – Home Page*, NAT’L LEAGUE OF CITIES, <https://perma.cc/X43L-QB7W> (“There are many ways cities are created, and there exists considerable variation in the power and authority.”).

116. NICOLE DUPUIS ET AL., NAT’L LEAGUE OF CITIES, CITY RIGHTS IN AN ERA OF PREEMPTION: A STATE-BY-STATE ANALYSIS 3 (2018), <https://perma.cc/YZM6-E5R7>.

117. *See, e.g.*, 42 U.S.C. §§ 1751-69; 7 C.F.R. § 210 (federal legislation and regulations implementing the National School Lunch Program (NSLP), a federally assisted meal program operating in public and non-profit private schools and residential child-care institutions).

## 2. Governance Tools

The typology does not specify the legal and policy mechanisms to be used in connection with each CAP action (for example, whether city council should enact an ordinance or the mayor should issue an executive order). CAPs vary widely with respect to whether they detail adoption and implementation tools. In addition, municipalities vary with respect to the governance tools at their disposal and even the nomenclature they use.<sup>118</sup> As a result, the same governance tool can be referred to in a variety of ways.

Typically, however, ordinances are enacted by a city council or similar legislative body.<sup>119</sup> An ordinance is the law of the jurisdiction and is the means of amending the municipal code to make substantive or procedural changes to the law.<sup>120</sup> An ordinance can be used to bind government actors as well as third parties, including by imposition of penalties for non-compliance.<sup>121</sup>

In contrast, executive orders are typically an appropriate governance tool for actions that address the administration of a municipality's internal functions or implementation of existing ordinances.<sup>122</sup>

Thus, as a general rule, if a municipality intends for compliance with the plant-based protein action to be entirely voluntary—for example, restaurants are encouraged to indicate climate friendly menu items—the municipality may be able to adopt and implement the measure without any formal legislative or administrative governmental action at all.<sup>123</sup> If, instead, the municipality intends for compliance with the action to be mandatory, the most likely mechanisms for adoption are an executive order or an ordinance.

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118. *Supra* note 115; see also *Municipal Codes: A Beginner's Guide*, LIBR. OF CONG., <https://perma.cc/5TA3-WM96> (noting that laws passed by a local governing body can be referred to by many names, including “ordinances,” “bylaws,” and “measures”).

119. DAVID J. MCCARTHY JR. & LAURIE REYNOLDS, *LOCAL GOVERNMENT LAW IN A NUTSHELL* 141–42 (5th ed. 2003).

120. See, e.g., NAT'L CIVIC LEAGUE, *MODEL CITY CHARTER* § 2.13 (9th ed. 2021) (action requiring an ordinance).

121. *Id.*; see also *Roles and Responsibilities of Local Government Leaders*, MUN. RSCH. & SERVS. CTR. (Feb. 16, 2024), <https://perma.cc/CWJ2-EZJ3>.

122. See, e.g., *Executive Orders: Mayor's Office Executive Orders 1974-2013*, NYC RECS. & INFO. SERVS., <https://perma.cc/M8PA-PHQ7> (“The Mayor of the City of New York, as the City’s Chief Executive Officer, has the authority to issue orders to executive branch agencies, offices, divisions, and bureaus. Generally, these orders concern the implementation of laws and/or mayoral policies.”); *Executive Orders*, CITY OF PHILA., OFF. OF THE MAYOR, <https://perma.cc/JT69-8HDV> (similarly characterizing mayoral authority to issue executive orders).

123. Another option is for the municipality to issue a resolution, which can be used to express the sense of city council or to provide public recognition. See, e.g., *Ordinances & Resolutions*, CITY OF SEATAC, <https://perma.cc/N8G9-AMV6> (“A ‘Resolution’ typically is less solemn and formal than an Ordinance and, ‘generally speaking, is simply an expression of the opinion or mind of the official body concerning some particular item of business or matter of administration coming within its official cognizance.’ In practice, Resolutions are often limited to expressions of opinion.”).

Furthermore, in some jurisdictions it may be more appropriate to use alternative tools, such as regulations or administrative policies, or a legislative vehicle such as a resolution.<sup>124</sup> For example, even in situations in which a mayor has the power to issue an executive order, an ordinance may be selected because it is more likely to last through transitions to future mayoral administrations. Ultimately, determining the optimal governance tool to employ requires an assessment of local circumstances. Municipal legal counsel or other local legal experts can determine the appropriate tools on a case-by-case basis.

### 3. Semiautonomous and Quasi-Governmental Entities

Some of the plant-based CAP actions may be advanced through an institution or entity that is only partially subject to municipal authority or control. *Semiautonomous entities* are local government units that have a degree of independence from a municipality or other form of central or general-purpose government. There are “numerous single-function and multiple-function districts, authorities, commissions, boards, and other entities, that have varying degrees of autonomy.”<sup>125</sup> These entities can take a wide range of forms and are referred to by various names, such as special districts, quasi-municipal corporations, and special authorities.<sup>126</sup> Common examples include school districts, airport authorities, and solid waste districts. Semiautonomous entities, for example, typically are not subject to executive orders, which are intended to govern executive branch activities. Jurisdictions differ, however, with respect to the general authorities granted to the mayor (or other executive authority)—and state laws, local ordinances, and municipal charters also may specifically address the scope of mayoral authority vis-à-vis semiautonomous and quasi-governmental entities.<sup>127</sup>

*Quasi-governmental entities* are typically defined as organizations that have both a public and a private component, such as convention centers and sports venues that are municipally owned but privately operated.<sup>128</sup> The extent to which a municipality can direct, influence, or encourage the actions of any of these entities must be examined on a case-by-case basis.

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124. OSBORNE M. REYNOLDS, JR. & EDWARD W. DE BARBIERI, *LOCAL GOVERNMENT LAW* 199 (6th ed. 2023).

125. *Government Units Survey Methodology, Population of Interest*, U.S. CENSUS BUREAU (last revised Oct. 8, 2021), <https://perma.cc/B4HZ-GBZM>.

126. *See, e.g.*, REYNOLDS, *supra* note 124, at 27–33. Semiautonomous entities are also referred to as “quasi-governmental” entities in some jurisdictions even though they do not have a private component. *See also* CINDY UPTON, LORA LITTLETON & JEAN ANN MYATT, LEGIS. RSCH. COMM’N, *TRANSPARENCY AND ACCOUNTABILITY OF QUASI-GOVERNMENTAL ENTITIES* (2011).

127. *See, e.g.*, BARBARA J. PARKER, CITY OF OAKLAND, *LEGAL OPINION: DOES THE MAYOR HAVE THE AUTHORITY TO ISSUE EXECUTIVE ORDERS?* (2015).

128. LAWRENCE L. MARTIN, INT’L CITY/CNTY. MGMT. ASS’N, *PUBLIC-PRIVATE PARTNERSHIPS (P3S): WHAT LOCAL GOVERNMENT MANAGERS NEED TO KNOW 2* (2017).

#### 4. Compliance with Municipal Procurement Requirements

Some plant-based protein actions in Category 3 of the typology implicate municipal procurement requirements (for example, by providing that a specified quantity, dollar value, or type of plant-based protein be purchased). *Procurement* refers comprehensively to purchasing activities undertaken by municipal government.<sup>129</sup> A municipality's policy and rules governing procurement are usually established by ordinance and may be set forth in the municipal code.<sup>130</sup> On a day-to-day basis, executive agencies and departments implement local procurement law and policy as they make purchasing decisions in support of their mandates. In some municipalities, a procurement board or chief purchasing officer plays a significant role in procurement decision-making.<sup>131</sup>

Local governments routinely deploy their procurement authority to achieve public policy objectives.<sup>132</sup> Promoting the consumption of plant-based proteins has been positioned as the next frontier for values-based procurement. For example, the Good Food Purchasing Program, a national program that supports institutional food purchasing, has developed one of the most comprehensive values-based food purchasing policies, and their newest standards have a requirement for institutions to serve and promote a plant-based entrée at every meal.<sup>133</sup>

When a plant-based protein action implicates municipal procurement, the action must comply with municipal procurement ordinances, regulations, guidelines, and practice—or amendments to the law must be considered.<sup>134</sup>

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129. A typical legal definition of procurement is: “buying, purchasing, renting, leasing or otherwise acquiring any supplies, services, or construction. It also includes all functions that pertain to the obtaining of any supply, service, or construction, including description of requirements, selection and solicitation of sources, preparation and award of contract and all phases of contract administration.” THE CODE OF THE METRO. GOV'T OF NASHVILLE & DAVIDSON CNTY., TENN. § 4.04.050.

130. Procurement requirements may also be found in executive orders issued by mayors; administrative regulations; and departmental-level policy statements and guidelines.

131. THE CODE OF THE METRO. GOV'T OF NASHVILLE & DAVIDSON CNTY., TENN. § 4.08.020 (“standards board shall have the authority and responsibility to promulgate regulations . . . governing the procurement, management, control and disposal of any and all supplies, services and construction to be procured by the metropolitan government and all its departments, boards, commissions, officers and agencies . . .”); CITY CODE OF SALT LAKE CITY, UTAH § 3.24.040 (“chief procurement officer shall . . . [p]ropose rules for adoption by the mayor to govern the management and operation of the city's purchasing function for all kinds of supplies and services . . .”).

132. These other policy aims are known in this context as “collateral policies.” See, e.g., Danielle M. Conway, *Sustainable Procurement Policies and Practices at the State and Local Government Level*, in GREENING LOCAL GOVERNMENT: LEGAL STRATEGIES FOR PROMOTING SUSTAINABILITY, EFFICIENCY, AND FISCAL SAVINGS 43, 44–45 (Keith H. Hirokawa & Patricia E. Salkin eds., 2012). Collateral policies may also be referred to as secondary or complementary policies, horizontal policies, or dual-use policies. In the food purchasing arena, this has recently been referred to as values-aligned or values-based food purchasing.

133. See GOOD FOOD PURCHASING PROGRAM, PURCHASING STANDARDS FOR FOOD SERVICE INSTITUTIONS 13 (2023); see generally INSTITUTIONS AS CONSCIOUS FOOD CONSUMERS: LEVERAGING PURCHASING POWER TO DRIVE SYSTEMS CHANGE (Sapna Elizabeth Thottathil & Annelies Goger eds., 2019).

134. Additionally, as a practical matter, changes with respect to municipal procurement may need to be reflected in changes to purchasing standards, specifications, and bid solicitation documents.

## 5. Alignment of Action with Municipal Policies, Programs, and Plans

Adoption of a plant-based protein action should align with other relevant municipal policies, programs, and plans (including, of course, the content of any existing municipal CAP) that have been adopted or endorsed in areas such as climate change and sustainability, health and nutrition, and environmentally preferable purchasing. At a minimum, it is important to avoid inadvertently introducing inconsistencies into a municipality's legal and policy framework.

### II. A TYPOLOGY OF PLANT-BASED PROTEIN CAP ACTIONS

To meet its climate goals, a municipality can include in its CAP one or more actions to increase the availability of plant-based proteins and engage the public on their benefits. These actions can be adopted individually or in combination so as to suit local priorities and needs. This Part provides a typology of these actions and examples within each category of targeted actions relating to plant-based proteins that have been carried out by municipalities, as well as novel actions. As with any measure included in a CAP, plant-based protein actions should be designed with early and meaningful involvement of the full range of community members—with particular attention to respectfully engaging low-income communities and communities of color.<sup>135</sup> The form and types of meaningful involvement will vary based on factors specific to each municipality.<sup>136</sup> Nevertheless, certain principles have emerged as best practices including that the public involvement process should be broadly accessible to community members, including those facing physical, cultural, or technological barriers.<sup>137</sup>

In addition, public input should be genuinely considered and decisions explained to the public, including the role that public input played. Furthermore, communities should be provided with information in a timely manner, particularly with respect to the parameters of participation to ensure that communities know what aspects of a decision are open to public input and influence.<sup>138</sup>

#### Category 1: Emissions Targets and Tracking

Actions in this category seek to establish food-related GHG emissions reduction targets and measure progress in meeting them.

**1.A. Emissions Inventories.** Develop a Consumption-Based Emissions Inventory (CBEI) to measure GHG emissions from food consumed within the

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135. See USDN, *supra* note 57.

136. See, e.g., *Types of Engagement: Thick, Thin, and Conventional*, Organizing Engagement, ORG. ENGAGEMENT (Sept. 17, 2024), <https://perma.cc/7Z8C-L74N>.

137. See JORDAN PERRY & LINDA BREGGIN, ENV'T L. INST., AN OVERVIEW OF HANDS-ON RESOURCES FOR HOSTING ACCESSIBLE EVENTS (2023); see also JORDAN PERRY & LINDA BREGGIN, ENV'T L. INST., AN OVERVIEW OF MULTILINGUAL OUTREACH, TRANSLATION, AND LANGUAGE JUSTICE RESOURCES (2022).

138. WORKING GRP. ON LEGAL FRAMEWORKS FOR PUB. PARTICIPATION, MAKING PUBLIC PARTICIPATION LEGAL 14–15 (2013).

municipal boundary and to better understand the carbon impact of different foods (or: estimate GHG emissions from only municipal food procurement); ensure that data are made available to the public and to policymakers to promote awareness and accountability.

**1.B. Municipal Targets.** Set targets for reducing municipal food-related GHG emissions (e.g., reduce municipal emissions from food by X% by 2030), as well as measure and report on progress; consider partnering with an outside organization such as the Cool Food Pledge for help with measuring and reporting on progress.

**1.C. Government-wide Collaboration.** Encourage and collaborate with semi-autonomous and quasi-governmental entities that may not be fully subject to municipal authority (e.g., correctional facilities, public schools, hospitals, convention centers) to set targets for reducing their food-related emissions, as well as measure and report on their progress.

**1.D. Community Targets.** Set targets for reducing community food-related emissions from private, institutional, non-profit, and other sectors (e.g., reduce community emissions from food by X% by 2030), as well as measure and report on progress.

**1.E. Waste Tracking.** Create and implement waste audit programs or tracking systems for municipal operations; encourage households, businesses, educational institutions, and semi-autonomous and quasi-governmental institutions to measure GHG emissions from food loss and waste to better understand and compare the carbon impact of different foods.

## Category 2: Increased Availability

Actions in this category seek to increase the number of meals served or offered that contain plant-based proteins. Some of these actions implicate and can be strengthened by actions from Category 3, Municipal Procurement.

**2.A. Menu Initiatives.** Institute weekly menu initiatives (e.g., Veggie Tuesdays, Green Mondays, Plant Powered Fridays) for municipal operations; encourage semi-autonomous and quasi-governmental entities (e.g., correctional facilities, public schools, hospitals, convention centers) to institute their own.

**2.B. Municipal Events.** Require municipal operations and events sponsored by the municipality to offer at least one comparable plant-based protein option, as the first step toward expanding the number and diversity of plant-based protein options.

**2.C. Business Requirements.** Encourage (or in limited circumstances require) certain restaurants and other businesses to offer plant-based protein options.

**2.D. Plant-Based Defaults.** Make plant-based protein meals the default for municipal operations and events sponsored by the municipality; consult with a food service company that has been successful in integrating plant-based protein menu options and meals.

**2.E. Expert Partnerships.** Partner with an expert non-profit or consultant to advise on and support municipal and community-wide efforts to increase the availability of plant-based proteins, design institutional menus, and train chefs on how to prepare plant-based protein meals.

**2.F. Increased Access.** Increase access to plant-based proteins in communities that lack adequate access through vouchers, pick-up sites, community kitchens and fridges, shelters, food pantries, mobile food vendors, and other food distribution programs; and ensure that families receiving public benefits are aware of the range of opportunities.

### **Category 3: Municipal Procurement**

Actions in this category seek to increase the procurement of plant-based proteins by municipalities. Some of these actions can be used to strengthen the menu design and default actions in Category 2 (Increased Availability) when the municipality is the purchaser.

**3.A. Procurement Targets.** Establish targets for increased plant-based protein procurement for municipal operations (e.g., increase purchasing of plant-based proteins by X% by 2030, or ensure that at least Y% of proteins procured are plant-based).

**3.B. Purchasing Strategy.** Adopt a broad food and climate purchasing strategy to purchase healthy and low-carbon foods, particularly plant-based proteins.

**3.C. Pledge Programs.** Join the Good Food Purchasing Program and/or undertake the Cool Food Pledge, to increase plant-based protein procurement across municipal operations (which requires municipal operations to report food procurement for the purpose of calculating and tracking food-related emissions).

**3.D. Nutrition Guidelines.** Establish or update any existing municipal food standards and nutrition guidelines for municipal operations to include requirements and recommendations for increased plant-based protein procurement.

**3.E. Procurement Trainings.** Establish or update procurement trainings for municipal staff to include best practices for increasing plant-based protein procurement.

### **Category 4: Public Awareness**

Actions in this category seek to educate and engage the public on the climate benefits as well as the many co-benefits of plant-based proteins.

**4.A. Information Campaigns.** Launch a community-wide informational campaign on the personal, local, and global benefits of plant-based proteins, including easy plant-based recipes, and utilize municipal websites, social media platforms, public service announcements via radio, and posters on municipal infrastructure (e.g., billboards and bus stop shelters).

**4.B. Household Programs.** Sponsor a household-focused program on municipal social media platforms and websites, such as a plant-based protein home cooking challenge or virtual plant-based protein eating pledge, and provide recipes and other resources (e.g., webinar/panel).

**4.C. Menu Samples.** Incorporate food sampling opportunities for plant-based protein menu items across municipal food service locations to raise awareness, gauge which plant-based offerings are most popular, and garner media coverage.

**4.D. Awareness Raising.** Encourage incorporation of food sampling across public schools and other institutions for new plant-based protein menu items to raise awareness, gauge which plant-based offerings are most popular, and garner media coverage.

**4.E. School Curricula.** Encourage and support the inclusion in school curricula of information on the benefits of plant-based proteins, tailored for different age groups, and develop training programs and/or distribute materials outlining the benefits of plant-based proteins for students and parents.

**4.F. Training Programs.** Develop targeted training programs and resource materials outlining the benefits of plant-based proteins for use by municipal staff, policymakers, businesses, and food-service professionals.

**4.G. Menu Information.** Require municipal operations and encourage restaurants and other private food establishments to include environmental messaging on menus and/or indicate climate friendly menu items (including plant-based proteins), with or without carbon footprint data, similar to disclosing calorie counts on menus.

**4.H. Awareness Weeks.** Launch a Plant-Based Proteins Week (or Month) by mayoral proclamation, with or without an accompanying Restaurant Week/Month.

**4.I. Policy Workgroups.** Establish a plant-based proteins working group within a food policy council (or work through existing groups) to promote plant-based protein-related policy (possibly with interdepartmental and community input).

### **Category 5: Leadership and Recognition**

Actions in this category recognize and reward businesses and organizations that demonstrate leadership in increasing the availability of plant-based proteins and engaging the public on their benefits.

**5.A. Recognition Programs.** Launch a mayor's award or adopt a city council resolution to recognize private businesses, non-profits, and other organizations that highlight plant-based proteins through their food-service operations or in other ways, and recognize efforts via social media, newsletters, and other avenues.

**5.B. Food Festivals.** Sponsor a plant-based protein food festival that features food from local restaurants and food trucks and invite attendees to vote for their favorite dishes.

**5.C. Challenge Programs.** Establish a voluntary challenge for businesses and non-governmental organizations to increase the availability of plant-based proteins and contribute to meeting community food-related emissions targets;

consider collaborating with an outside partner, such as the Planted Society, Better Food Foundation, and/or Greener by Default.

**5.D. Certification Programs.** Expand or establish a municipal certification program to recognize institutional and business menus that highlight plant-based protein offerings; consider partnering with already existing certification programs.

**5.E. Celebrity Partnerships.** Partner with a local or national celebrity (e.g., consider athletes, actors, musicians, celebrity chefs) to produce a public service announcement on efforts to increase the availability of plant-based proteins.

### **Category 6: Incentives, Funding, and Technical Assistance**

Actions in this category seek to support businesses and organizations that would like to expand plant-based protein offerings and to facilitate access to plant-based proteins, especially in communities that lack adequate access.

**6.A. Food Insecurity.** Develop a local incentive program for food insecure households (or expand an existing program) to increase access to and awareness of plant-based proteins—potentially in conjunction with the federal Supplemental Nutrition Assistance Program (SNAP).

**6.B. Funding Initiatives.** Apply for state or federal funding initiatives—or develop municipal funding initiatives—to improve the availability of healthy plant-based proteins in communities that lack adequate access.

**6.C. Prescription Programs.** Develop municipal funding initiatives to establish a plant-based proteins “prescription program” for recipients of Medicaid and other public insurance programs (or expand an existing program).

**6.D. Urban Agriculture.** Provide funding or other support for community gardens, urban farms, and garden-to-cafeteria institutions that grow the food they serve with a stated goal of increasing access to plant-based proteins, with a focus on repurposing vacant municipal parcels.

**6.E. Convenience Stores.** Institute a training and technical assistance program to support convenience stores and markets in communities that lack adequate access to healthy, plant-based proteins.

**6.F. Green Carts.** Establish a “Green Carts” permitting program to increase access to healthy plant-based proteins or expand existing programs to focus on plant-based proteins.

**6.G. School Subsidies.** In jurisdictions where schools or educational institutions are subject to municipal authority (which is a less common arrangement), subsidize those that follow Good Food Purchasing Program guidelines or serve plant-based protein options.

**6.H. Economic Incentives.** Offer economic incentives for businesses and restaurants that offer an increasing minimum percentage of plant-based protein options and/or that use social marketing techniques to nudge plant-based protein purchases.

**6.I. Kitchen Incubators.** Support farm and kitchen incubators and accelerators that are helping to increase the availability of plant-based proteins—especially incubators that benefit communities that lack adequate access to healthy, plant-based proteins.

**6.J. Lifestyle Medicine.** Expand or establish municipal programs and offer free training to health care practitioners in the principles of lifestyle medicine with a focus on plant-based nutrition education and include educational materials on the links between diet and climate.

**6.K. Kitchen Staff.** Subsidize or offer other support for training and technical assistance for staff and chefs in municipal operations, schools, educational institutions, and other institutions in preparing plant-based protein meals and conveying their benefits to diners.

**6.L. Youth Engagement.** Establish a municipal youth climate corps (applying for funding from state and federal programs, when available) or youth employment initiative to support: work on urban farms and gardens; sale and distribution of plant-based proteins; and increased awareness of the benefits of plant-based proteins.

### **Category 7: Cooperation and Pledges**

Actions in this category relate to municipal endorsement of international, national, and state initiatives that promote plant-based proteins.

**7.A. International Declarations.** Support C40's Good Food Cities Declaration to achieve a "Planetary Health Diet" for all citizens by 2030.

**7.B. Policy Statements.** Issue a statement of support for the US to integrate plant-based food purchasing in its climate policy, such as by including food-related targets in its "nationally determined contributions" or supporting the proposed Plant Based Treaty.

**7.C. Policy Pacts.** Sign the Milan Urban Food Policy Pact aimed at building sustainable, local urban food systems and raise awareness about the Milan Pact Awards.

### **CONCLUSION**

Municipalities are on the forefront of efforts to address climate change; however, actions to increase the availability of and engage with the public about the benefits of plant-based proteins are often absent from their CAPs and other climate adaptation and mitigation plans. Municipalities are missing an important opportunity to not only advance their climate mitigation goals but also realize public health, resilience, equity, and other benefits. The new, research-informed typology and accompanying actions presented in this Article are intended to serve as a resource for municipalities that are considering plant-based protein actions for the first time as well as those that want to bolster existing plans.

## APPENDIX

The **Appendix** to this Article can be found on the *Georgetown Environmental Law Review* website and SSRN.<sup>†</sup> For each plant-based protein action (column 2), links are provided to examples (column 3) from existing municipal CAPs, sustainability plans, and other documents. These examples either illustrate how the action is being implemented or in the case of more novel plant-based protein actions, provide a helpful analogy (e.g., the example may focus on fruits and vegetables generally, rather than on plant-based proteins specifically). In some instances, a current sustainability action or initiative is included that provides a good starting point for increasing the availability of plant-based proteins and engaging the public on their benefits (e.g., supporting use of community gardens for plant-based proteins and highlighting their importance).

Also included are numerous resources (column 4) that offer background or further context for specific actions. Resources that provide hands-on materials—social media posts, recipes, menus, videos—are separately designated as outreach tools (column 5).

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<sup>†</sup> The Appendix can be found online for viewing and downloading on SSRN and the *Georgetown Environmental Law Review* website: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=5114989](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5114989) (SSRN), and <https://perma.cc/ANH2-Q9RT> (Georgetown Environmental Law Review).