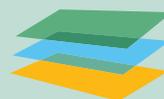


Climate-Friendly Diets: How Cities Can Cut Emissions and Improve Public Health

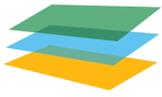
Amelia Linn

July 2018



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at NYU School of Law



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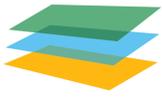
*Climate-Friendly Diets: How Cities Can
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EXECUTIVE SUMMARY

In the absence of federal leadership, 241 U.S. cities, including New York City, Los Angeles, and Atlanta, have pledged to take a greater role in climate action. However, many of these cities have overlooked a significant piece of their own climate footprint—the greenhouse gas (GHG) emissions embodied in meat and dairy.

Globally, livestock accounts for an estimated 14.5% of all GHG emissions. For U.S. cities that have conducted consumption-based emissions inventories, food is often one of the biggest categories of emissions—in some instances 15-20% of a city's total emissions. And meat and dairy account for a disproportionate share of food-related emissions. Numerous studies have shown the average emissions embodied in meat and dairy to be significantly higher than those of plant-based foods. Over an entire diet, the dietary emissions of people who eat meat can be twice as high as the dietary emissions of people who eat a plant-based diet.

Reducing meat and dairy consumption can also lead to significant public health benefits, as eating less meat has been shown to reduce the risk of obesity, heart disease, type 2 diabetes, and certain types of cancer. Reduced livestock production has additional environmental benefits, such as major reductions in water usage and pollution.

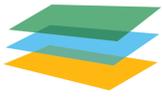
In light of these benefits, this paper investigates a number of policy options and programs available to U.S. cities interested in reducing meat and dairy consumption. Three specific categories of policies and programs are explored, along with the opportunities and challenges inherent to each approach.

Informational policies would seek to raise public awareness of the benefits of reduced meat and dairy consumption, and can be used as antecedents for additional measures. Such policies may include Meatless Monday resolutions, public awareness campaigns, recognition in city climate action plans, and carbon footprint labels.

Procurement policies would seek to reduce a city's purchasing of meat and dairy products. This may be done through a city's food procurement policy and/or standards or through creating programs in individual public institutions within the city.

Economic incentives would alter the price (or comparative price) of meat and dairy in order to influence consumer choices. While examples of such policies are yet to be implemented, taxes on meat have been considered in other countries.

In Annex I, special attention is given to the ways New York City can enhance and expand on its existing meat and dairy reduction programs and serve as a model for cities across the country.



INTRODUCTION

In recent years, U.S. city governments have been among the most vocal actors in pledging climate action. Yet, in both their greenhouse gas (GHG) inventories and their climate action plans, cities are often leaving out a significant piece of their own climate footprint—the GHG emissions embodied in the meat and dairy products consumed in cities.

Policy measures to reduce meat and dairy consumption may be effective in several contexts, but in the U.S., cities have significant potential to achieve meaningful emissions reductions in this sector. Cities hold a direct link to individuals and communities and have increasingly taken on the role of promoting sustainability and public health.¹ Additionally, U.S. cities in particular hold significant power to develop and implement their own policies and goals for climate action.²

And yet, while many U.S. cities regularly conduct GHG inventories to measure their emissions and track changes in emissions over time, most cities—and most international rules and guidelines for city GHG inventories—use production-based inventories, which include only those emissions produced within the given geographic area.³ Such inventories do not include emissions embodied in food—those emissions that primarily occur outside of the city (such as in the production of food) but that are caused by activities of the city (such as the consumption of food).

Consumption-based inventories, on the other hand, include the direct and lifecycle emissions of goods and services consumed by the residents of a city, regardless of where the actual emissions occur.⁴ For U.S. cities, many of which consume far more than they produce, the total emissions represented in a city’s consumption-based inventory are often more than double the emissions reflected in their production-based inventory.⁵ Globally, consumption-based emissions from cities are estimated to make up 60-70% of all GHG emissions.⁶

For those U.S. cities that have conducted consumption-based emissions inventories, food is often one of the biggest categories.⁷ In San Francisco, for instance, food and beverage emissions make up 20% of the city’s consumption-based GHG inventory.⁸ In Multnomah County, Oregon (which includes the city of Portland),

¹ See Sarah Fox, *Home Rule in an Era of Local Environmental Innovation*, 44 *ECOLOGY L.Q.* 575 (2017).

² The Tenth Amendment reserves power not delegated to the federal government to the States or to the people. U.S. CONST. amend. X. The States, in turn, have empowered local governments to exercise varying degrees of control over local affairs. See DALE KRANE, PLATON N. RIGO & MELVIN B. HILL, JR., *HOME RULE IN AMERICA: A 50 STATE HANDBOOK* 1 (2001). This form of municipal self-government is typically referred to as “home rule,” and in many states, including New York, home rule authority incorporates a right to enact local legislation that promotes the “safety, health and well-being of persons and property” within the municipal limits. N.Y. CONST., art. IX, § 2(10).

³ See PETER ERICKSON ET AL., STOCKHOLM ENV’T INST., *REDUCING GREENHOUSE GAS EMISSIONS ASSOCIATED WITH CONSUMPTION: A METHODOLOGY FOR SCENARIO ANALYSIS* 3-4 (2012).

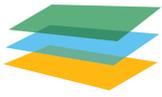
⁴ C40 CITIES, *CONSUMPTION-BASED GHG EMISSIONS OF C40 CITIES* 15 (Mar. 2018). A recent C40 report recommended that cities begin using consumption-based inventories in addition to their production-based inventories, noting that this “would encourage a more holistic view of GHG emissions” and would “enable decision-makers to consider a wider range of opportunities to reduce GHG emissions.” *Id.* at 15. It is important to note that while production-based inventories and consumption-based inventories may look at emissions from different perspectives, the two inventories will likely overlap. For example, both inventories would cover emissions from goods that are both produced *and* consumed within the given geographic area. ERICKSON ET AL. *supra* note 3, at 4.

⁵ C40 found that “15 cities, mostly in Europe and North America, have consumption-based GHG emissions at least three times the size of their sector-based emissions.” C40 CITIES *supra* note 4, at 7. For King County, Washington (including the city of Seattle), the consumption-based inventory resulted in a countywide emissions footprint of 55 million MTCO_{2e}—more than double the emissions found using the production-based inventory (23 million MTCO_{2e}). STOCKHOLM ENVIRONMENT INSTITUTE, *GREENHOUSE GAS EMISSIONS IN KING COUNTY* 19 (Feb. 2012), available at www.sei.org/publications/greenhouse-gas-emissions-in-king-county/.

⁶ UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME, *GLOBAL REPORT ON HUMAN SETTLEMENTS 2011 CITIES AND CLIMATE CHANGE: POLICY DIRECTIONS* (2011), available at unhabitat.org/?mbt_book=cities-and-climate-change-global-report-on-human-settlements-2011.

⁷ C40 CITIES *supra* note 4, at 9.

⁸ S.F. DEP’T OF THE ENV’T, *SAN FRANCISCO CLIMATE ACTION STRATEGY: 2013 UPDATE* 41 (Oct. 2013), available at sfenvironment.org/sites/default/files/engagement_files/sfe_cc_ClimateActionStrategyUpdate2013.pdf.



emissions from food make up 15% of the county's consumption-based GHG inventory.⁹ New York City has not yet conducted its own consumption-based inventory, but one estimate attributes 19% of the average New York City household GHG footprint to food—and more than 10% of the footprint to meat and dairy specifically.¹⁰

As a growing percentage of the global population moves to urban environments, cities have an increasingly vital role to play in addressing climate change. In the United States, the population living in cities is expected to grow 20% by 2050.¹¹ If U.S. cities hope to manage their own emissions and compensate for the lack of action at the federal level as many have promised, they will need to address the full range of options available to reduce GHG emissions, especially those related to food.

This paper provides policy options and programs for U.S. cities to enhance their climate action through reducing meat and dairy consumption. Part I outlines the climate impact of livestock as well as the vast health and environmental co-benefits of reducing meat and dairy consumption. Part II explores city-level policy options and programs in three categories— informational policies, procurement policies, and economic incentive-based programs—by looking at existing examples in U.S. cities and discussing potential opportunities for and challenges to implementing each. Part III discusses the importance of measuring the effectiveness of implemented policies and programs, and Part IV provides a brief conclusion. While the paper offers insights for all U.S. cities, New York City is highlighted to illustrate the range of initial policy options available at the city level. These recommendations are expanded in Annex I.

PART I. IMPACTS OF MEAT AND DAIRY CONSUMPTION

EMISSIONS FROM LIVESTOCK

Globally, emissions from livestock constitute 14.5% of global GHG emissions; more than the global tailpipe emissions from all forms of transportation (all cars, trucks, planes, and ships) combined.¹² The vast majority of emissions from the livestock sector are methane (CH₄), nitrous oxide (N₂O), and carbon dioxide (CO₂) produced by enteric fermentation, manure, and feed production.¹³ As is the case for most food, the production phase of livestock contributes a much greater percentage of total lifecycle emissions than the transport or sale of the livestock products.¹⁴

Lifecycle emissions of different livestock products vary significantly—for instance, beef has higher emissions per unit of protein than chicken or pork.¹⁵ In fact, emissions from cattle (including both beef production and milk production) constitute about 65% of total livestock sector emissions.¹⁶

⁹ CITY OF PORTLAND AND MULTNOMAH COUNTY, CLIMATE ACTION PLAN 36 (June 2015), available at www.portlandoregon.gov/bps/49989.

¹⁰ COOLCLIMATE NETWORK HOUSEHOLD CALCULATOR, coolclimate.berkeley.edu/calculator (last visited Mar. 9, 2018).

¹¹ *Deadline 2020: Special Report on U.S. Cities*, C40 CITIES 4, www.c40.org/researches/deadline-2020-us (last visited Mar. 9, 2018).

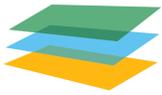
¹² P.J. GERBER ET AL., F.A.O., TACKLING CLIMATE CHANGE THROUGH LIVESTOCK – A GLOBAL ASSESSMENT OF EMISSIONS AND MITIGATION OPPORTUNITIES 15 (2013); LAURA WELLESLEY, CATHERINE HAPPER & ANTONY FROGGATT, CHATHAM HOUSE ROYAL INST. INT'L AFF., CHANGING CLIMATE, CHANGING DIET: PATHWAYS TO LOWER MEAT CONSUMPTION 1 (2015). See also IPCC, CLIMATE CHANGE 2014: MITIGATION OF CLIMATE CHANGE, CONTRIBUTION OF WORKING GROUP III TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Cambridge University Press 2014). In 2016, emissions from the agriculture sector in the United States (which do not include emissions from fuel combustion or certain land use emissions) totaled 562.6 MMT CO₂e or 8.6% of total U.S. emissions. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2016, (2018) available at www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2016.

¹³ GERBER ET AL., *supra* note 12, at 15-17. Methane makes up about 44% of all livestock emissions. *Id.*

¹⁴ *Id.*; See also Christopher L. Weber & H. Scott Matthews, *Food-Miles and the Relative Climate Impacts of Food Choices in the United States*, 42 ENVTL. SCI. & TECH. 3510 (2008).

¹⁵ IPCC, *supra* note 12, at 839.

¹⁶ GERBER ET AL., *supra* note 12, at 23.



However, the most striking emissions comparison is between livestock products and plant-based foods. Lifecycle analysis of GHG emissions across foods showed that, per kilogram, beef represents more than thirty-three times the emissions of legumes.¹⁷ Dairy products also represent high emissions, with cheese containing more than twenty times the emissions per kilogram as vegetables such as broccoli and kale.¹⁸ Over an entire diet, these differences quickly add up. In a U.K. study tracking the embedded GHG emissions of participants' diets, the dietary emissions of people who eat meat were found to be twice as high as those of vegans.¹⁹

At a national scale, dietary emissions become even more significant. A recent study found that if Americans replaced their beef consumption with beans (at a mass necessary to replace the protein and caloric content), that action alone would achieve 75% of the United States' 2020 emissions reduction target.²⁰

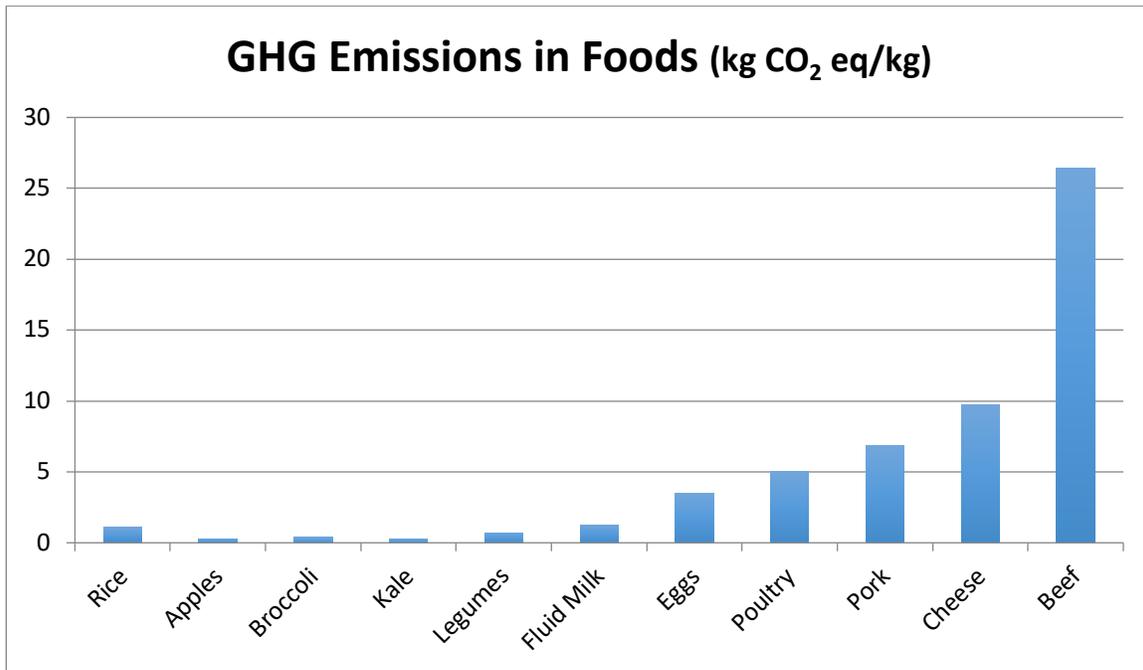


Figure 1. Average GHG emissions per kilogram based on lifecycle analysis studies. Data from Heller & Keoleian, *supra* note 17.

And global demand for meat is expected to rise more than 70% by 2050.²¹ Yet efforts to address livestock emissions lag behind mitigation actions in other sectors at the international, national, and sub-national levels.²²

¹⁷ Martin C. Heller & Gregory A. Keoleian, *Greenhouse Gas Emission Estimates of U.S. Dietary Choices and Food Loss*, 19 J. INDUS. ECOLOGY 391 (2014). Supporting information available at onlinelibrary.wiley.com/action/downloadSupplement?doi=10.1111%2Fjiec.12174&attachmentId=121085923.

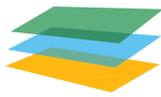
¹⁸ *Id.*

¹⁹ Peter Scarborough et al., *Dietary Greenhouse Gas Emissions Of Meat-Eaters, Fish-Eaters, Vegetarians And Vegans in the U.K.*, 125 CLIMATIC CHANGE 179 (2015). While dietary emissions may vary based on several factors, such as the origin and production methods of individual food products consumed, many studies have found similar decreases in dietary emissions for vegetarian and vegan diets when compared to meat-heavy diets. See Henrik Saxe et al., *The Global Warming Potential of Two Healthy Nordic Diets Compared with the Average Danish Diet*, 116 CLIMATIC CHANGE 249 (2013); Luciana Baroni et al., *Total Environmental Impact of Three Main Dietary Patterns in Relation to the Content of Animal and Plant Food*, 3 FOODS 443 (2014). As Americans eat far more meat per capita than the global average, in the U.S. shifting to plant-based diets could reduce food emissions 61-73%. J. Poore & T. Nemecek, *Reducing Food's Environmental Impacts Through Producers and Consumers*, 360 SCIENCE 987 (2018).

²⁰ Helen Harwatt et al., *Substituting Beans for Beef as a Contribution Towards U.S. Climate Change Targets*, 143 CLIMATIC CHANGE 261 (2017).

²¹ GERBER ET AL., *supra* note 12, at 1.

²² See ROB BAILEY, ANTONY FROGGATT & LAURA WELLESLEY, CHATHAM HOUSE ROYAL INST. INT'L AFF., *LIVESTOCK – CLIMATE CHANGE'S FORGOTTEN SECTOR* 7-9 (2014); WELLESLEY ET AL., *supra* note 12, at 46; ERICKSON ET AL., *supra* note 3, at 16. At the



In order to address livestock emissions, mitigation measures can take one of two forms. The first is demand-side measures that focus on reducing the consumption of livestock products in order to ultimately reduce the amount of meat and dairy produced.²³ The second is supply-side, often technical measures aimed at increasing the efficiency of livestock production. Studies have consistently found that the emissions reductions from these technical measures on the supply-side pale in comparison to demand-side actions.²⁴ In addition, demand-side mitigation measures provide major health and environmental co-benefits.

CO-BENEFITS OF REDUCED MEAT AND DAIRY CONSUMPTION

Co-benefits, particularly those related to public health, have often been the primary drivers of policies aimed at reducing meat and dairy consumption.

- **Public Health** Reducing consumption of meat and dairy has extensive public health benefits. Vegetarian and vegan diets are associated with reduced risk of obesity, heart disease, type 2 diabetes, and certain types of cancer.²⁵ In addition, the World Health Organization lists processed meat as a known human carcinogen and red meat as a probable human carcinogen.²⁶ A 2017 study found that shifting to a healthier diet—including by reducing or eliminating consumption of red and processed meat—could reduce the risk of coronary heart disease, colorectal cancer, and type 2 diabetes by 20-45% and could lead to \$77-93 billion dollars in annual savings in U.S. healthcare costs.²⁷ Finally, antimicrobial resistance, which today is responsible for 700,000 deaths per year and is projected to put 10 million lives at risk per year by 2050, has been linked to the improper use of antibiotics in livestock.²⁸ In the United States, antibiotic-resistant bacteria have been reported in an alarming percentage of grocery store meat.²⁹

international level, progress at the United Nations Framework Convention on Climate Change (UNFCCC) within the agriculture sector has been relatively slow in comparison to other sectors, with 2017 seeing the greatest progress in several years with the adoption of the Koronivia joint work on agriculture. Decision 4/CP.23, UNFCCC, Doc. FCCC/CP/2017/11/Add.1 (Feb. 8, 2018). At the national level, few countries have set emissions reduction targets in the livestock sector. BAILEY ET AL. *supra* note 22, at 7-8. There are two international initiatives working with cities on food and climate issues, the EAT Forum (eatforum.org) and the C40 Food Systems Network (c40.org/networks/food_systems). In addition, 163 cities, including New York City, are signatories to the Milan Urban Food Policy Pact. *Signatory Cities*, MILAN URBAN FOOD POLICY PACT, www.milanurbanfoodpolicypact.org/signatory-cities/ (last visited Apr. 5, 2018). The pact includes aspirational goals for cities to develop sustainable food systems to mitigate the impacts of climate change. Milan Urban Food Policy Pact, Oct. 15, 2015, *available at* www.milanurbanfoodpolicypact.org/wp-content/uploads/2016/06/Milan-Urban-Food-Policy-Pact-EN.pdf. In late 2017, the Food and Climate Coalition called on U.S. cities and counties to address meat and dairy consumption as part of their climate action. Food and Climate Coalition, *How “We Are Still In” Cities and Counties Can Include Food in Climate Action*, Nov. 30, 2017, medium.com/@foodandclimatecoalition/how-we-are-still-in-cities-and-counties-can-include-food-in-climate-action-e67f54f88f5a.

²³ Another important demand-side measure to reduce emissions from food is reducing food loss and food waste. IPCC, *supra* note 12, at 838. “Globally, rough estimates suggest that ~30-40% of all food produced is lost in the supply chain from harvest to consumption.” *Id.*

²⁴ *Id.* at 840; Pete Smith et al., *How Much Land-Based Greenhouse Gas Mitigation Can Be Achieved Without Compromising Food Security and Environmental Goals?*, 19 GLOBAL CHANGE BIOLOGY 2285 (2013); Elke Stehfest et al., *Climate Benefits Of Changing Diet*, 95 CLIMATIC CHANGE 83 (2009); Alexander Popp, Hermann Lotze-Campen & Benjamin Bodirsky, *Food Consumption, Diet Shifts and Associated Non-CO₂ Greenhouse Gases from Agricultural Production*, 20 GLOBAL ENVTL. CHANGE 451 (2010).

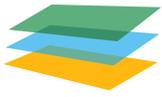
²⁵ Vesanto Melina et al., *Position of the Academy of Nutrition and Dietetics: Vegetarian Diets*, 116 J. ACAD. NUTRITION & DIETETICS 1970 (2016).

²⁶ *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, INT’L AGENCY FOR RESEARCH ON CANCER, W.H.O., monographs.iarc.fr/ENG/Classification/latest_classif.php (last visited Mar. 9, 2018).

²⁷ Elinor Hallstrom et al., *A Healthier U.S. Diet Could Reduce Greenhouse Gas Emissions from Both the Food And Health Care Systems*, 142 CLIMATIC CHANGE 199 (2017).

²⁸ THE REVIEW ON ANTIMICROBIAL RESISTANCE, TACKLING DRUG-RESISTANT INFECTIONS GLOBALLY: FINAL REPORT AND RECOMMENDATIONS (May 2016) [Report commissioned by the U.K. Prime Minister] *available at* amr-review.org/Publications.html.

²⁹ DAWN UNDURRAGA, ENVIRONMENTAL WORKING GROUP, SUPERMARKET MEAT STILL SUPERBUGGED, FEDERAL DATA SHOW (June 2018) *available at* www.ewg.org/research/superbugs/.



- **Water Savings** Agriculture accounts for 92% of water usage globally, and, of that, nearly a third is used for livestock production.³⁰ The water footprint for beef is 15,415 liters per kilogram compared to 4,325 liters per kilogram for chicken, 962 liters per kilogram for fruits, and 322 liters per kilogram for vegetables.³¹ In the Oakland Unified School District, reducing purchases of animal products by almost 30% led to a water savings of 7 gallons per meal—or 42 million gallons per year.³²
- **Reduced Pollution** In the United States, concentrated animal feeding operations (CAFOs) have been responsible for large-scale air and water pollution, mainly associated with the storage and management of animal waste.³³ Manure from these facilities is often sprayed over fields or stored in lagoons, which can break or overflow.³⁴ In North Carolina, one of the country's top pig-producing states, floodwaters from storms have caused manure storage lagoons to overflow, including as recently as Hurricane Matthew in 2016, which flooded fourteen lagoons “holding millions of gallons of liquid hog manure.”³⁵ In addition, pollutants such as ammonia and hydrogen sulfide result from animal manure and can affect air quality near CAFOs, in some cases causing human health risks.³⁶

PART II. POLICY OPTIONS AT THE CITY LEVEL

Building on existing research concerning the reduction of meat and dairy consumption,³⁷ this section presents policy options specifically tailored to cities, including examples of policies and programs implemented in U.S. cities. Three categories of options are explored—informational policies, procurement policies, and economic incentives—illustrating the opportunities and potential challenges of enhancing efforts to reduce meat and dairy consumption. While a variety of policy options are discussed in this section, strategies continue to emerge, so this list should not be considered exhaustive.

INFORMATIONAL POLICIES

Awareness measures are often cited as a necessary precondition for the implementation of additional, more interventionist policies.³⁸ This is particularly true when it comes to changing eating behaviors. Indeed, public awareness campaigns have been recognized as an essential part of a broader policy change.³⁹

³⁰ P.W. Gerbens-Leenes et al., *The Water Footprint of Poultry, Pork and Beef: A Comparative Study in Different Countries and Production Systems*, 1-2 WATER RESOURCES & INDUS. 25 (2013).

³¹ Mesin M. Mekonnen & Arjen Y. Hoekstra, *Global Assessment of the Water Footprint of Farm Animal Products*, 15 ECOSYSTEMS 401 (2012).

³² KARI HAMERSCHLAG & JULIAN KRAUS-POLK, FRIENDS OF THE EARTH, SHRINKING THE CARBON AND WATER FOOTPRINT OF SCHOOL FOOD: A RECIPE FOR COMBATING CLIMATE CHANGE (2017), available at foe.org/resources/shrinking-carbon-water-footprint-school-food/.

³³ CARRIE HRIBAR, NAT'L ASS'N OF LOCAL BOARDS OF HEALTH, UNDERSTANDING CONCENTRATED ANIMAL FEEDING OPERATIONS AND THEIR IMPACT ON COMMUNITIES (2010). “States with high concentrations of CAFOs experience on average 20 to 30 serious water quality problems per year as a result of manure management problems.” *Id.* at 4.

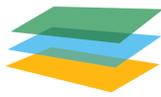
³⁴ *Id.*

³⁵ SOREN RUNDQUIST, ENVTL. WORKING GROUP, EXPOSING FIELDS OF FILTH (2016), available at www.ewg.org/research/exposing-fields-filth-hurricane-matthew#_WlurC5M-fq0.

³⁶ HRIBAR, *supra* note 33, at 5-7.

³⁷ See WELLESLEY ET AL., *supra* note 12; JANET RANGANATHAN ET AL., WORLD RESOURCES INST., SHIFTING DIETS FOR A SUSTAINABLE FUTURE (Apr. 2016), available at www.wri.org/sites/default/files/Shifting_Diets_for_a_Sustainable_Food_Future_0.pdf.

³⁸ See WELLESLEY ET AL., *supra* note 12; RANGANATHAN ET AL., *supra* note 37. On the flip side of public awareness may be policies that restrict the advertising of meat and dairy products. Such food advertising restrictions have often focused on restricting ads aimed at children. *Protecting Children from the Harmful Effects of Food and Drink Marketing*, WORLD HEALTH ORG. (Sept. 2014) www.who.int/features/2014/uk-food-drink-marketing/en/. For example, several countries restrict the advertising of foods high in fats and/or sugars to children. WORLD CANCER RESEARCH FUND INTERNATIONAL, NOURISHING FRAMEWORK: RESTRICT FOOD ADVERTISING AND OTHER FORMS OF COMMERCIAL PRODUCTION (FEB. 2018) available at www.wcrf.org/sites/default/files/4_Restrict%20advertising_Feb2018_FINAL.pdf. See also Jennifer L. Harris et al., *Protecting Children from Harmful Food Marketing: Options for Local Government to Make a Difference*, 8 PREVENTING CHRONIC DISEASE (2011), available at www.uconnruddcenter.org/files/Pdfs/FoodMarketingPolicyOptions_PCD_9_11.pdf.



Several studies have investigated public awareness of meat and dairy consumption as a climate change issue.⁴⁰ Low levels of public awareness about the contributions of the livestock sector to climate change were found in all countries studied (including Brazil, China, the U.S. and the U.K.) and increased awareness was linked to a greater willingness to reduce meat and dairy consumption.⁴¹

MEATLESS MONDAY RESOLUTIONS

One awareness-raising effort employed by many U.S. cities, including **Los Angeles**, **Philadelphia**, and **Washington, D.C.**, is a city council resolution designating or proclaiming Meatless Mondays in the city.⁴² While such resolutions are often ceremonial declarations that mandate no concrete actions, they can provide an opportunity to raise public awareness on the benefits of reducing animal product consumption. For example, the L.A. Meatless Monday resolution calls attention to the significant environmental impacts of the livestock sector, including the contribution to climate change, and encourages residents “to eat a more varied plant-based diet to protect their health, protect animals, and protect the environment.”⁴³

In some cities, Meatless Monday resolutions have been paired with or have led to additional actions. In **Sacramento**, twenty-two local restaurants celebrated the city’s Meatless Monday resolution by offering special vegetarian menus, and the city hosted a vegan chef competition.⁴⁴ In **L.A.**, a few months after the city council passed its Meatless Monday resolution, the Los Angeles Unified School District, the second largest public school district in the country, adopted Meatless Mondays in all its cafeterias.⁴⁵

PUBLIC AWARENESS CAMPAIGNS

Citywide sustainability awareness campaigns can also be excellent vehicles to raise awareness about meat and dairy consumption and climate change. For example, through their respective sustainability offices, **Austin** and **Portland** provide online resources for residents on sustainability and food. **Austin’s** “Tips for Sustainable Eating” encourage residents to try Meatless Mondays to promote health, water, and climate benefits, and **Portland’s** “Climate Action Now” campaign recommends reducing meat consumption to reduce an individual’s climate impact.⁴⁶

Similarly, **New York City’s** GreeNYC campaign takes a “marketing-centric approach” and seeks to educate and mobilize New Yorkers on a wide range of sustainability issues.⁴⁷ Using ads on subways and bus stops as well as social media campaigns and participation in community events, GreeNYC encourages residents to take simple

³⁹ WELLESLEY ET AL., *supra* note 12, at 16; RANGANATHAN ET AL., *supra* note 37, at 58.

⁴⁰ WELLESLEY ET AL., *supra* note 12; BAILEY ET AL., *supra* note 22.

⁴¹ WELLESLEY ET AL., *supra* note 12, at 23; BAILEY ET AL., *supra* note 22, at 19.

⁴² L.A., Cal., Res. 12-1721 (Nov. 13, 2012); Phila., Pa., Res. 130749 (Oct. 17, 2013); D.C., Res. 18-346 (May 4, 2010).

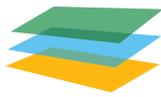
⁴³ L.A., Cal., Res. 12-1721 (Nov. 13, 2012).

⁴⁴ Anita Chabria, *Sacramento Declares Meatless Mondays to Honor Paul McCartney*, SACRAMENTO BEE, Sept. 27, 2016, www.sacbee.com/news/local/city-arena/article104453981.html.

⁴⁵ Carla Hall, *If It’s Monday, The L.A. Unified School Cafeteria Is Meatless*, L.A. TIMES, Mar. 5, 2013, articles.latimes.com/2013/mar/05/news/la-ol-if-its-monday-the-school-cafeteria-is-meatless-20130305.

⁴⁶ *Tips for Sustainable Eating*, CITY OF AUSTIN, www.austintexas.gov/page/tips-sustainable-eating (last visited May 6, 2018); *Do More to Fight Climate Change*, CITY OF PORTLAND, www.portlandoregon.gov/bps/article/499717 (last visited May 6, 2018).

⁴⁷ N.Y.C. MAYOR’S OFFICE OF SUSTAINABILITY, SMALL STEPS, BIG STRIDES 7 (2017), *available at* www1.nyc.gov/assets/sustainability/downloads/pdf/publications/greenyc_lessons_2017_online_final.pdf.



individual steps to “foster green behaviors.”⁴⁸ One of the campaign’s tips is to “Green Your Diet,” which encourages individuals to eat less red meat.⁴⁹

RECOGNITION OF MEAT AND DAIRY CONSUMPTION IN CITY CLIMATE ACTION PLANS

Another important public awareness opportunity is the recognition of the link between meat and dairy consumption and climate change in city climate action plans. For example, the City of **Portland** and Multnomah County’s Climate Action Plan sets “reduc[ing] consumption of carbon-intensive foods and support[ing] a community-based food system” as one of the plan’s twenty objectives.⁵⁰ Actions to meet this objective include outreach and education efforts to promote plant-based diets and to encourage campaigns such as Meatless Mondays.⁵¹

Other cities recognize the contribution of meat and dairy consumption to climate change and encourage residents to take individual actions. **Seattle**’s Climate Action Plan includes a chapter on what individual citizens can do to reduce emissions, including eating less meat and dairy and eating meat-free at least one day a week.⁵² Similarly, **Oakland**’s Energy and Climate Action Plan includes a Community Climate Action guide that recommends individuals eat less meat and consider going vegetarian.⁵³

LABELING

To further inform and educate consumers, a government may regulate the labeling of products. Labels reflecting a product’s carbon footprint have been used in several European countries over the past decade.⁵⁴ In the case of meat and dairy products, a carbon label could be useful to highlight the high carbon footprint of these products relative to plant-based foods. While creating a carbon label for a product can be an expensive and complex process, the goal of such labels is twofold—to assist consumers in choosing sustainable products and to incentivize producers to reduce the carbon footprint of their product.⁵⁵

On the consumer side, a “value-action gap” is often found, as practical considerations (such as price and taste) win out over consumers’ intentions to make sustainable purchases.⁵⁶ In addition, the abundance of labels and certifications (many voluntary and not regulated by government) may become confusing to consumers interested in making choices based on sustainability.⁵⁷ Studies have also shown that even nutrition labeling may have limited impact on consumers’ purchases.⁵⁸

⁴⁸ *Id.* In 2009, then-New York City Council Member (now Mayor) Bill de Blasio proposed a resolution to reduce the city’s climate “Footprint,” which included a public awareness campaign focused on the climate impacts of food consumption and production patterns within New York City. N.Y.C., Proposed Res. 2049-2009 (June 30, 2009). The resolution would have also launched a series of climate-friendly programs and policies within the city. *Id.* However, this resolution was never passed.

⁴⁹ *GreenNYC At Home Tips*, N.Y.C. MAYOR’S OFFICE OF SUSTAINABILITY, www1.nyc.gov/site/greenyc/small-steps/at-home.page (last visited Mar. 9, 2018). See *infra* Annex I, recommendation 1.

⁵⁰ CITY OF PORTLAND AND MULTNOMAH COUNTY, *supra* note 9, at 100.

⁵¹ *Id.*

⁵² SEATTLE OFFICE OF SUSTAINABILITY AND ENV’T, SEATTLE CLIMATE ACTION PLAN 66, 71 (June 2013), available at www.seattle.gov/environment/climate-change/climate-action-plan.

⁵³ CITY OF OAKLAND, OAKLAND ENERGY AND CLIMATE ACTION PLAN 19 (Dec. 2012), available at www2.oaklandnet.com/Government/o/PWA/s/SO/OAK025294.

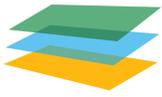
⁵⁴ *Following the Footprints*, ECONOMIST, June 2, 2011 (Technology Quarterly), www.economist.com/node/18750670. While such labels are commonly referred to as “carbon” labels, the labels would also include GHG emissions other than carbon dioxide, including methane and nitrous oxide, represented by the carbon dioxide equivalence of these gases. *Id.*

⁵⁵ *Id.*

⁵⁶ WELLESLEY ET AL., *supra* note 12, at 10; RANGANATHAN ET AL., *supra* note 37, at 56.

⁵⁷ WELLESLEY ET AL., *supra* note 12, at 9-10.

⁵⁸ See RANGANATHAN ET AL., *supra* note 37, at 50.



On the production side, experts have found that influencing producers is the most likely benefit of carbon footprint labels.⁵⁹ For example, Walkers, a producer of potato chips and one of the first to include a carbon label on a product in the U.K., used the process of calculating their product's carbon footprint to find emissions savings opportunities.⁶⁰ However, it is unclear to what extent carbon labels would influence meat and dairy producers as a substantial portion of the lifecycle emissions for these products are inherent in their production.⁶¹

Beyond the complexity involved in creating carbon labels and the uncertain impact on consumer behavior, past efforts to adopt nutrition-based labels have often met stiff resistance from powerful industry groups, and cities could face legal obstacles, including potential Commerce Clause and First Amendment challenges, in adopting similar schemes for carbon labels.⁶² New York City's menu labeling law⁶³ and Vermont's genetically engineered labeling law⁶⁴ provide useful examples of the types of legal challenges a carbon label could face.⁶⁵ Given the potential legal obstacles and the limited likelihood of influencing producers, carbon footprint labels may not be the most effective tool for cities to reduce emissions embodied in meat and dairy.

PROCUREMENT

Public procurement offers cities a range of opportunities to reduce consumption of meat and dairy products, whether through adopting new food procurement policies or by influencing purchasing within a single city agency, program, or building. Several resources and programs exist to assist city governments seeking to reduce meat and dairy consumption through procurement.

⁵⁹ ECONOMIST, *supra* note 54.

⁶⁰ *Id.*

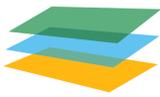
⁶¹ See *supra* text accompanying notes 13-14.

⁶² State laws requiring labels on food products may be challenged as violating the dormant Commerce Clause, which prohibits states from unduly burdening interstate commerce. U.S. CONST. art. I § 8, cl. 3. See, e.g., *Gibbons v. Ogden*, 22 U.S. 1 (1824); *Pike v. Bruce Church, Inc.*, 397 U.S. 137 (1970). Food product labels would be considered commercial speech and would be subject to the four-step test from *Central Hudson Gas & Electric Corp. v. Public Service Commission*. U.S. CONST. art. I § 8, cl. 3; *Cent. Hudson Gas & Elec. Corp.*, 447 U.S. 557 (1980). In *Zauderer v. Office of Disciplinary Counsel*, the Court held that a regulation compelling commercial speech of factual information need only bear a reasonable relationship to the government's stated interest. *Zauderer v. Office of Disciplinary Counsel*, 471 U.S. 626 (1985). Compare with *Nat'l Ass'n of Wheat Growers v. Zeise*, No. 2:17-2401 (E.D. Cal. Feb. 26, 2018) (granting-in-part a preliminary injunction of a California labeling requirement). For a further discussion of commercial speech and potential application to food menu labels, see Jennifer L. Pomeranz, *Compelled Speech Under The Commercial Speech Doctrine: The Case Of Menu Label Laws*, 12 J. HEALTH CARE L. & POL'Y 159 (2009).

⁶³ Initially passed in 2006 and later revised in 2008 and 2015, New York City's menu labeling law requires food service establishments with fifteen or more locations to post the calorie count of each menu item. N.Y.C., N.Y., HEALTH CODE §81.50 (2006), *invalidated by* N.Y. State Rest. Ass'n v. N.Y.C. Bd. of Health, 509 F.Supp.2d 351 (S.D.N.Y. 2007); N.Y.C., N.Y., HEALTH CODE §81.50 (2008); N.Y.C., N.Y., HEALTH CODE §81.50 (2015). The law quickly faced two rounds of lawsuits from the New York State Restaurant Association on First Amendment and preemption grounds. *N.Y. State Rest. Ass'n*, 509 F.Supp.2d 351; N.Y. State Rest. Ass'n v. N.Y.C. Bd. of Health, 556 F.3d 114 (2d Cir. 2009). The federal district court struck down the 2006 version of the law finding that it was preempted by federal law. *N.Y. State Rest. Ass'n*, 509 F.Supp.2d at 354. The revised 2008 version of the law was upheld by the District Court and the Second Circuit. *N.Y. State Rest. Ass'n*, 556 F.3d 114. The law was again revised in 2015 to mirror federal requirements under the Affordable Care Act. N.Y.C., N.Y., HEALTH CODE §81.50 (2015); Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 (2010).

⁶⁴ VT. STAT. ANN. tit. 9, § 3043 (2014), *preempted by* National Bioengineered Food Disclosure Standard 7 U.S.C.A. § 1639 (2016). In *Grocery Manufacturers Association v. Sorrell*, the manufacturers association challenged Vermont's labeling law, which required food sold in Vermont to be labeled as genetically engineered if it was "entirely or partially produced with genetic engineering." *Grocery Mfr. Ass'n v. Sorrell*, 102 F. Supp 3d 583 (D. Vt. 2015). Under the Commerce Clause claim, the plaintiffs argued that the law violated the dormant Commerce Clause, as the "effects of Act 120 fall disproportionately on out-of-state food manufacturers" and would force manufacturers "to establish Vermont-specific distribution channels." *Id.* at 23. However, the district court refused to enjoin Vermont's law. *Id.*

⁶⁵ Additionally, such labels may pose WTO problems, as has been seen with the dolphin-safe tuna labeling standards. Reports of the Panels, *United States—Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products*, WT/DS381/RW2 (Oct. 26, 2017).



FOOD PROCUREMENT POLICIES AND/OR STANDARDS

A city's food purchasing may be governed by a food procurement policy or by more specific food procurement standards. Such policies and standards may cover food served in a variety of venues (including public schools, public hospitals, senior centers, parks, and correctional facilities), and can provide an opportunity for cities to encourage plant-based diets and reduce the total amount of meat and dairy purchased by the city. For instance, **San Diego County's** *Eat Well Practices* prioritize plant-based food and include offering vegetarian meals.⁶⁶ Friends of the Earth recently published *Meat of the Matter: A Municipal Guide to Climate-Friendly Food Purchasing*, which provides step-by-step instructions for municipalities interested in creating and implementing sustainable food procurement policies and/or standards.⁶⁷

The cities of **Los Angeles** and **Chicago**, as well as several school districts around the country, have adopted the Good Food Purchasing Program, which can assist cities in reducing meat and dairy purchases.⁶⁸ Initially developed for Los Angeles, the Good Food Purchasing Program provides a procurement model centered around five core values—local economies, environmental sustainability, valued workforce, animal welfare, and nutrition.⁶⁹ Through the environmental sustainability pillar, the program sets targets for reducing the carbon footprint of meat, poultry, and cheese purchases, and encourages institutions to participate in Meatless Mondays.⁷⁰ Within the animal welfare pillar, the program sets an overall meat reduction target.⁷¹

INSTITUTIONAL PROGRAMS

In addition to food procurement policies and standards, public institutions within the city can create programs to reduce meat and dairy consumption. Changes to food purchasing by public institutions, such as public schools and hospitals, as well as in city-regulated properties that serve food, such as stadiums and convention centers, can have a substantial impact on food-related emissions. In fact, many school districts, including the **Los Angeles** Unified School District, **Baltimore** City Public Schools, the **Philadelphia** School District, and the **Oakland** Unified School District have already implemented Meatless Mondays or similar programs.⁷²

While there have been few comprehensive studies on these programs, a 2017 analysis of the **Oakland** Unified School District's food programs offers compelling evidence of a variety of benefits that such programs can provide.⁷³ The two-year study tracked the carbon and water footprints of the Oakland Unified School District's food purchasing as it implemented programs such as Lean and Green Wednesdays (focused on reducing meat and increasing fruits and vegetables), California Thursdays (focused on local and regional foods), and the new requirements of the Healthy Hunger-Free Kids Act.⁷⁴ Under these programs, the district reduced its purchases of animal products by 30%.⁷⁵ This reduced the carbon footprint of the district's food services by 14% and reduced the water footprint by 6%.⁷⁶ In addition, these programs saved the district a total of \$42,000 or almost one cent

⁶⁶ EAT WELL PRACTICES, COUNTY OF SAN DIEGO, bosagenda.sdcountry.ca.gov/agendadocs/doc?id=0901127e804f6533.

⁶⁷ KARI HAMERSCHLAG, ALICIA CULVER, CHLOË WATERMAN & BECCA BARTHOLOMEW, FRIENDS OF THE EARTH & RESPONSIBLE PURCHASING NETWORK, *MEAT OF THE MATTER: A MUNICIPAL GUIDE TO CLIMATE-FRIENDLY FOOD PURCHASING* (2017), available at foe.org/news/meat-matter-new-guide-equips-cities-counties-fight-climate-change-food-purchasing/.

⁶⁸ *Chicago Food Policy Action Council Secures Good Food Purchasing Program for City of Chicago*, CENTER FOR GOOD FOOD PURCHASING, goodfoodpurchasing.org/chicago-food-policy-action-council-secures-good-food-purchasing-program-for-city-of-chicago/ (last visited Mar. 11, 2018). A city's food policy council may be useful in developing recommendations for food procurement policies, as was also the case in 2012 when the Los Angeles Food Policy Council created the model for the Good Food Purchasing Program. *History*, CENTER FOR GOOD FOOD PURCHASING, goodfoodpurchasing.org/milestones/ (last visited Jul. 6, 2018).

⁶⁹ CENTER FOR GOOD FOOD PURCHASING, *GOOD FOOD PURCHASING STANDARDS 2.0* (2017).

⁷⁰ *Id.* at 23-39.

⁷¹ *Id.* at 35-39.

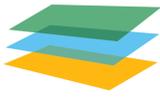
⁷² *Meatless Monday K-12*, MEATLESS MONDAY, www.meatlessmonday.com/meatless-monday-k-12/.

⁷³ HAMERSCHLAG & KRAUS-POLK, *supra* note 32.

⁷⁴ *Id.* at 8; Healthy, Hunger-Free Kids Act of 2010, Pub. L. No. 111-296, 124 Stat. 3183 (2010).

⁷⁵ HAMERSCHLAG & KRAUS-POLK, *supra* note 32, at 3.

⁷⁶ *Id.*



per meal.⁷⁷ The study also noted that the carbon footprint reduction could be significantly greater if the district reduced its purchasing of beef specifically.⁷⁸

Similar programs have been introduced in hospitals and prisons.⁷⁹ In a study of four hospitals in the **San Francisco** Bay area implementing the Health Care Without Harm program, the hospitals reduced their meat purchasing by 28% saving a total of \$402,000 in a year.⁸⁰ This was estimated to save 1,004 tons CO₂e per year.⁸¹

In **New York City**, the nonprofit Coalition for Healthy School Food (CHSF) has been working with New York City public schools to increase the plant-based options in school cafeterias, and, working with CHSF, New York City now has four fully vegetarian public schools.⁸² In addition, on October 23, 2017, Mayor de Blasio and Brooklyn Borough President Eric Adams announced a Meatless Mondays pilot program for fifteen Brooklyn public schools starting in the spring of 2018.⁸³

ECONOMIC INCENTIVES

On the far end of the intervention spectrum are policies to alter food prices in order to influence consumer choices. Such policies could take the form of taxes on undesirable products, the removal of existing subsidies for undesirable products, or the subsidization of desirable alternative products.⁸⁴

TAXES

At the city level, a tax on undesirable products may be the most effective option.⁸⁵ This would likely take the form of a tax on the purchase of meat or animal-based food products.⁸⁶ While such taxes have not yet been implemented, taxes on meat have been considered by the parliaments of several European countries.⁸⁷

To some, taxes on meat or animal products may be viewed as overly restrictive and may lead to concerns about “nanny-state-ism.”⁸⁸ In a focus group study, the proposal of a tax on meat was “the most controversial example of an intervention” with participants believing such a tax would be both unpopular and unfair.⁸⁹ In addition, concerns have been raised that taxes on food products may have a disproportionate effect on low-income

⁷⁷ *Id.*

⁷⁸ *Id.* at 9.

⁷⁹ *Id.* at 13.

⁸⁰ LISA LAGASSE & RONI NEFF, JOHNS HOPKINS CENTER FOR A LIVABLE FUTURE, *BALANCED MENUS: A PILOT EVALUATION OF IMPLEMENTATION IN FOUR SAN FRANCISCO BAY AREA HOSPITALS 2* (April 20, 2010).

⁸¹ *Id.*

⁸² COALITION FOR HEALTHY SCHOOL FOOD, www.healthyschoolfood.org/about.htm.

⁸³ Press Release, N.Y.C. Office of the Mayor, Mayor de Blasio, Chancellor Fariña and Borough President Adams Announce 15 Brooklyn Schools to Participate in Meatless Mondays (Oct. 23, 2017). *See infra* Annex I, recommendation 2.

⁸⁴ For a discussion of U.S. agricultural subsidies, *see* William S. Eubanks, *A Rotten System: Subsidizing Environmental Degradation and Poor Public Health With Our Nation's Tax Dollars*, 28 *STA. ENV. L.J.* 213 (2009).

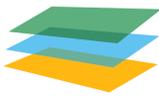
⁸⁵ While many cities have existing programs to incentivize the purchasing of fruits and vegetables, it is unclear whether these programs impact meat and dairy consumption. *See* Rachel Sacks et al., *Increasing Access to Fruits and Vegetables: Perspectives from the New York City Experience*, 105 *AM. J. PUB. HEALTH* e29 (2015). In addition, while these programs may increase purchases of fruits and vegetables, this has not necessarily led to increased consumption of fruits and vegetables. Lauren EW Olsho et al., *Impacts of a Farmers' Market Incentive Programme on Fruit and Vegetable Access, Purchase and Consumption*, 18 *PUB. HEALTH NUTRITION* 2712 (2015).

⁸⁶ Such taxes may be considered, at least in part, Pigovian taxes, or taxes that address negative externalities such as climate change. *See* Erin Adele Scharff, *Powerful Cities?: Limits on Municipal Taxing Authority and What To Do About Them*, 91 *N.Y.U. L. REV.* 292, 318 (2016). These taxes are meant to make people consider the costs that their choices impose on others. *Id.* “[L]ocally imposed Pigovian taxes are the most efficient ways to price the cost.” *Id.* at 321.

⁸⁷ Damian Carrington, *Meat Tax 'Inevitable' To Beat Climate And Health Crises, Says Report*, *GUARDIAN*, Dec. 11, 2017, www.theguardian.com/environment/2017/dec/11/meat-tax-inevitable-to-beat-climate-and-health-crises-says-report.

⁸⁸ WELLESLEY ET AL., *supra* note 12, at 15.

⁸⁹ *Id.* at 40.



residents.⁹⁰ But other studies have suggested that public acceptance of specific taxes could be increased by using the revenues from the taxes for public health measures.⁹¹ In addition, taxes themselves may reinforce awareness and education and ultimately encourage voluntary positive change.⁹²

While there are no current examples of meat taxes, one interesting parallel may be the recent implementation of soda taxes. In 2014, Mexico began implementing a nation-wide tax on non-alcoholic sugar-sweetened beverages.⁹³ One study monitored household consumption before the tax compared to the first two years of the tax's implementation and found an average decline of 7.6% in purchases of taxed beverages.⁹⁴ The reduction rose from 5.5% in the first year of the tax to 9.7% in the second year.⁹⁵

At the beginning of 2017, Philadelphia implemented a tax of \$0.015 per fluid ounce on sugar-sweetened beverages.⁹⁶ Five months after the implementation of the new tax, one study by a market research group indicated that, while sales of sweetened beverages inside the city decreased, consumers might be going outside of the city to purchase soda, thus avoiding the tax.⁹⁷ This may illustrate the concern that a tax on a relatively small geographic area could simply shift purchases of the taxed product and therefore have a more limited impact on the actual consumption rate.⁹⁸ However, another study indicates that, after implementation of the tax, Philadelphia residents consumed soda at a rate 40% lower than residents of cities with no soda tax.⁹⁹ Philadelphia's soda tax is currently under litigation by businesses and industry groups, led by the American Beverage Association, who argue that the tax is preempted by State law.¹⁰⁰

Similar to labeling policies, taxes are difficult to implement and can face consumer as well as industry resistance. For example, in 2010, the American Beverage Association spent \$9.4 million in just four months lobbying against a proposed soda tax in New York State.¹⁰¹ In addition, many local governments may lack the authority to impose such as tax without State consent.¹⁰² With the growing number of implemented or attempted soda taxes in U.S. cities, industry groups have worked to secure express preemption statutes within states in order to limit the authority of local governments to regulate on food and nutrition.¹⁰³ These statutes are often broad enough to impact all local food regulations, including potential future taxes on meat or animal products.¹⁰⁴

⁹⁰ *Id.* at 15. In the case of a tax on meat, consumers may switch to cheaper, lower quality meat in response to the increase in price. *Id.*

⁹¹ TARA GARNETT ET AL., FOOD & CLIMATE RESEARCH NETWORK, POLICIES AND ACTIONS TO SHIFT EATING PATTERNS: WHAT WORKS? 38 (2015), available at www.fcrrn.org.uk/sites/default/files/fcrn_chatham_house_0.pdf.

⁹² *Id.* at 39.

⁹³ M. Arantxa Colchero et al., *In Mexico, Evidence of Sustained Consumer Response Two Years After Implementing a Sugar-Sweetened Beverage Tax*, 36 HEALTH AFFAIRS 564 (2017). See also M. Arantxa Colchero et al., *Beverage Purchases From Stores In Mexico Under The Excise Tax On Sugar Sweetened Beverages: Observational Study*, 352 BMJ 6704 (2016), available at www.bmj.com/content/352/bmj.h6704.

⁹⁴ Colchero et al. (2017), *supra* note 93.

⁹⁵ *Id.*

⁹⁶ PHILA., PA., CODE ch. 19-4100 (2016).

⁹⁷ Fabiola Cineas, *People Are Still Traveling Outside Philly to Avoid Soda Tax, Study Says*, PHILA. MAG., Aug. 29, 2017, www.phillymag.com/business/2017/08/29/soda-tax-philadelphia-study/. However, City of Philadelphia officials have noted the limited scope of this study. *Id.*

⁹⁸ RANGANATHAN ET AL., *supra* note 37, at 57.

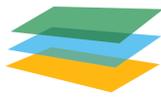
⁹⁹ Yichen Zhong et al., *The Short-term Impacts of the Philadelphia Beverage Tax on Beverage Consumption*, AM. J. PREVENTIVE MED. (2018 in press).

¹⁰⁰ *Williams v. City of Phila.*, 180 A.3d 365 (Pa. Jan. 30, 2018)(order granting petition for allowance to appeal).

¹⁰¹ Anemona Hartocollis, *Failure of State Soda Tax Plan Reflects Power of an Antitax Message*, N.Y. TIMES, July 2, 2010, www.nytimes.com/2010/07/03/nyregion/03sodatax.html?mtref=www.google.com.

¹⁰² In New York, the state constitution constrains the authority of local governments to impose taxes without authorization from the state. N.Y. CONST. art. XVI, § 1. See *supra* note 2.

¹⁰³ Soda taxes have been implemented in at least eight U.S. municipalities, including Seattle, San Francisco, and Cook County, Illinois, which includes Chicago. Julia Belluz, *The US Had No Soda Taxes in 2013. Now Nearly 9 Million Americans Live With Them.*, VOX, June 8, 2017, www.vox.com/science-and-health/2017/6/6/15745908/soda-tax-seattle-philadelphia-sugar-drinks. States may preempt the authority of local governments to legislate through state statutes or through the state's constitution. See David A. Dana & Janice Nadler,



PART III. IMPLEMENTATION AND MEASUREMENT

Many of the above policies and programs lack concrete data to demonstrate their impact on consumption rates and emissions savings. Quantitative data must be gathered as policies are implemented in order to measure their effectiveness. For example, a Meatless Monday program in public schools should collect data on the amount, type, and cost of food traditionally purchased in comparison to that purchased under the program. This will allow for calculation of emissions, water, and cost savings. The study conducted in the Oakland Unified School District could provide a useful model for such an analysis.¹⁰⁵ Similar data should be collected for other procurement-related policies to build an understanding of best practices and encourage others to adopt similar measures.

The effectiveness of informational policies, including Meatless Monday resolutions and public-awareness campaigns, could be measured by gathering data on the size of the audience reached, increases in public awareness, and the impact on consumption rates. For example, through surveying city residents and quantifying the impacts of individual behaviors, New York City's sustainability awareness program, GreeNYC, assesses both campaign recognition and environmental impact of specific campaign initiatives, such as the number of plastic bags saved by GreeNYC's reusable bag campaign.¹⁰⁶

Ideally, this examination of policy options would culminate in a comprehensive roadmap for cities interested in reducing meat and dairy consumption and their associated GHG emissions. However, given the lack of available data, it is difficult to evaluate the effectiveness of the above options against the city-specific costs (whether financial, political, or administrative) for implementing each. This reiterates the need for quantitative studies alongside the implementation of these policies and programs. In general, for those cities just beginning to address the climate impact of their city's meat and dairy consumption, informational policies—including Meatless Monday resolutions, public awareness campaigns, and recognition in city climate action plans—provide a relatively simple starting point. Such policies should pave the way for additional measures, such as procurement policies and institutional programs.

PART IV. CONCLUSION

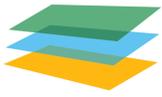
Cities are powerful drivers of public opinion and political change. After the Trump administration announced its intention to withdraw from the Paris Agreement, numerous cities responded by pledging to increase their climate action. But in a world where livestock alone accounts for 14.5% of global GHG emissions, it is hard to see how cities can live up to these promises without addressing meat and dairy consumption. Cities must utilize the wide range of policy options that can help deliver meaningful emissions reductions in the food sector and enhance the U.S. contribution to the global climate effort.

Soda Taxes as a Legal and Social Movement, 13 Nw. J.L. & Soc. POL'Y 84, 88, 96 (2018); Jennifer L. Pomeranz & Mark Pertschuk, *State Preemption: A Significant and Quiet Threat to Public Health in the United States*, 107 Am. J. Pub. Health 900 (2017).

¹⁰⁴ For example, the American Legislative Exchange Council (ALEC), supported by industry groups, drafted a model state "Food and Nutrition Act," which has been adopted by several states. *Food and Nutrition Act*, AM. LEGIS. EXCHANGE COUNCIL, www.alec.org/model-policy/food-and-nutrition-act/ (last visited Apr. 16, 2018). This model law preempts local governments from "enacting regulation in regards to food service establishments based upon or regarding food nutrition information." *Id.* See Dana & Nadler, *supra* note 103, at 96.

¹⁰⁵ See *supra* text accompanying notes 32 and 73-78.

¹⁰⁶ N.Y.C. MAYOR'S OFFICE OF SUSTAINABILITY, *supra* note 47.



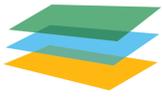
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Energy, and Land Use Law
at NYU School of Law

*Climate-Friendly Diets: How Cities Can
Cut Emissions and Improve Public Health*

ACKNOWLEDGMENTS

The author wishes to thank Danielle Spiegel-Feld, Richard Stewart, Jeff Sebo, Bryce Rudyk, Karmjit Sangha, Michael Crocker, Erin Biehl, Lauren Wolahan, Amie Hamlin, and Mia MacDonald for their comments and assistance with this paper.



ANNEX I. RECOMMENDATIONS FOR NEW YORK CITY

Immediately following President Trump’s June 1, 2017 announcement of his intention to withdraw the United States from the Paris Agreement, many U.S. cities came forward to reaffirm their commitment to the global climate agreement.¹⁰⁷ On June 2, 2017, New York City Mayor Bill de Blasio signed Executive Order 26, which reiterated New York City’s support of the Paris Agreement and committed the city to new efforts towards achieving the goals set in the Paris Agreement.¹⁰⁸ On top of New York City’s goal of reducing GHG emissions 80% by 2050, Executive Order 26 commits New York City to “acting locally and globally” to meet the United States’ existing commitment under the Paris Agreement and to “make even more ambitious future commitments to emissions reductions.”¹⁰⁹

However, New York City currently has very few policies in place to address emissions embedded in meat and dairy products. The below suite of recommendations have been specifically tailored to New York City as an initial step for the city to address these emissions.

1. **Highlight reducing meat and dairy consumption as a climate action in the GreeNYC program.** The GreeNYC program would be a simple way for New York City to emphasize reducing meat and dairy consumption as an action individual New Yorkers can take to reduce GHG emissions.¹¹⁰ While GreeNYC’s website lists “Green Your Diet” as one of sixteen “At Home Tips,” very little information is provided about what greening your diet means or how food choice relates to sustainability.¹¹¹ In addition, diet is not mentioned among the GreeNYC climate actions listed in New York’s Roadmap to 80x50.¹¹² More information should be provided in all GreeNYC materials about the climate impact of meat and dairy consumption, and diet should be included as part of GreeNYC’s contribution to Roadmap 80x50. As has been done with other GreeNYC campaigns, the impacts of the Green Your Diet campaign should be studied.
2. **Study, enhance, and expand existing programs in public schools, such as the vegetarian menu and the Meatless Monday pilot program.** First, robust studies should be conducted to measure the specific impacts of these two existing programs.¹¹³ Such studies should measure student participation, cost savings, emissions savings, water savings, and health benefits. Without such studies, it would be difficult to know whether these programs have been successful or whether they could be modified to become more effective.

Second, these existing programs should be enhanced by educational programming covering the many benefits of reducing meat and dairy consumption, including health, climate, water, pollution, and animal welfare benefits.

Finally, such programs should be expanded to all New York City public schools and similar programs should also be considered for other city institutions, such as city hospitals and jails.

¹⁰⁷White House, Statement by President Trump on the Paris Climate Accord (June 1, 2017) *available at* www.whitehouse.gov/briefings-statements/statement-president-trump-paris-climate-accord/; Press Release, We Are Still In, Leaders in U.S. Economy Say “We Are Still In” on Paris Climate Agreement (June 1, 2017), *available at* www.wearestillin.com/news/leaders-us-economy-say-we-are-still-paris-climate-agreement. This coalition, now known as We Are Still In, comprises U.S. leaders not only from cities but also from counties, states, universities, and businesses that have pledged to take ambitious climate action in response to the inaction of the Trump administration. *Id.*

¹⁰⁸ N.Y.C. Exec. Order No. 2017-26 (June 2, 2017).

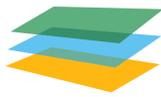
¹⁰⁹ *Id.*

¹¹⁰ See *supra* text accompanying notes 47-49.

¹¹¹ N.Y.C. MAYOR’S OFFICE OF SUSTAINABILITY, *supra* note 49. This tip encourages individuals to eat more fruits and vegetables and less red meat, but fails to mention the link between meat and GHG emissions.

¹¹² N.Y.C. MAYOR’S OFFICE OF SUSTAINABILITY, N.Y.C.’S ROADMAP TO 80 X 50 (2016), *available at* www1.nyc.gov/assets/sustainability/downloads/pdf/publications/New%20York%20City's%20Roadmap%20to%2080%20x%2050_20160926_FOR%20WEB.pdf.

¹¹³ See *supra* text accompanying notes 82-83.



3. **Support and pass a City Council Meatless Monday resolution.** In 2015, New York City Council Member Helen Rosenthal introduced a resolution to recognize Meatless Monday in New York City.¹¹⁴ The proposed resolution acknowledged the health and climate benefits of going meatless one day a week, and also recognized the existing efforts of many schools and restaurants in New York City.¹¹⁵ While nineteen City Council Members sponsored the resolution, the resolution was referred to the Committee on Health and was not passed. New York City should follow the lead of cities such as Los Angeles, Philadelphia, and Washington, D.C. and pass a Meatless Mondays resolution.
4. **Revise New York City’s food procurement standards to include consideration of the climate impacts of food and to encourage reduced purchasing of meat and dairy products.** The New York City Food Standards were originally enacted in 2008 and were last updated in 2014.¹¹⁶ The standards for Meals/Snacks Purchased and Served apply to approximately 245 million meals and snacks per year.¹¹⁷ While the Standards do include a section entitled “Sustainability Recommendations,” this section does not define sustainability or provide sustainability criteria.¹¹⁸ Instead it encourages agencies to generally “support reductions to the overall environmental impact of the food system” and includes prioritizing local produce and dairy products.¹¹⁹ The sustainability section does not include consideration of the climate change impacts of food purchases.

New York City should revise its Food Standards to require consideration of the climate impact of purchased foods and to encourage reduced purchasing of meat and dairy products. The city could also consider adopting the Good Food Purchasing Program for a more holistic improvement of the city’s food procurement policies.¹²⁰

5. **Include all meat and dairy reduction policies and programs in the city’s next climate action plan or revised Roadmap.** In 2016, the New York City Mayor’s Office of Sustainability released Roadmap 80x50, New York’s climate action plan to reach the city’s goal of reducing GHG emissions 80% by 2050.¹²¹ The Roadmap (and the 80x50 goal) is based on the city’s production-based GHG inventory and includes strategies to reduce emissions in four sectors—energy, buildings, transportation, and waste. It does not include strategies to address emissions from the consumption of meat and dairy. The Roadmap does include a chapter entitled “Actions New Yorkers Can Do.”¹²² Unfortunately, reducing the consumption of meat and dairy is not among the actions included in this or any other section of the Roadmap.

New York City should include actions to reduce meat and dairy consumption as part of the city’s next (or updated) climate action plan—both as a recommended individual action and to highlight policies and programs the city has implemented (or plans to implement) to reduce meat and dairy consumption.

¹¹⁴N.Y.C., Proposed Res. 0551-2015 (Jan. 22, 2015).

¹¹⁵ *Id.*

¹¹⁶ *N.Y.C. Food Standards*, N.Y.C. HEALTH, www1.nyc.gov/site/doh/health/health-topics/nyc-food-standards.page (last visited Mar. 11, 2018).

¹¹⁷ *Id.*

¹¹⁸ N.Y.C. HEALTH, N.Y.C. FOOD STANDARDS 9, www1.nyc.gov/assets/doh/downloads/pdf/cardio/cardio-meals-snacks-standards.pdf.

¹¹⁹ *Id.*

¹²⁰ *See supra* text accompanying notes 68-71.

¹²¹ N.Y.C. MAYOR’S OFFICE OF SUSTAINABILITY, *supra* note 112.

¹²² *Id.* at 110.