CARBON, WATER AND LAND SAVINGS
from New York City Public Schools′ Plant-Powered Fridays Program

THE HUMANE SOCIETY
OF THE UNITED STATES

Michelle Riley/The HSUS

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In 2018, to further its goal of promoting the health and well-being of every school child, the New York City Department of Education's Office of Food and Nutrition services (OFNS) launched its Plant-Powered Meals program, which featured a nutritious plant-based dish as the primary menu item every Friday at its cafeterias.

In partnership with NYC OFNS, the Humane Society of the United States worked with sustainability consultants at WSP USA to analyze the environmental impacts of the Plant-Powered Fridays program. The study analyzes greenhouse gas, water and land savings from the Plant-Powered Fridays menus and recipes between 2018 and 2022.

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The study compared food purchasing data from October 2018 (before Plant-Powered Fridays was initiated) to purchases in October 2022 (after Plant-Powered Fridays was underway) and found a **42% reduction in overall carbon emissions per student** from the program. In addition, many other positive impacts on water and land use occurred.

Key findings include the following:

- NYC OFNS' menu changes between October 2018 and October 2022 reduced the carbon and water footprints from animal products by roughly 40%, and the land footprint from animal products by over 50%.
- NYC OFNS reduced the carbon footprint per student served between 2018 and 2022 by about 40%, the water footprint of student meals by about one-third, and the land footprint of students by about 50%.
- The carbon footprint of food purchases was about 30 pounds lower per student, or 16,000 tons lower overall, in October 2022 than in October 2018. This reduction is equivalent to the amount of carbon saved by planting 240,000 trees and growing them for 10 years, or by recycling 640,000 bags of waste (paper, metal, and plastic, instead of landfilling them).
- The water footprint of food purchases was about 300 gallons lower per student, or 320 million gallons lower overall, in October 2022 than in October 2018. That is enough drinking water for 3.5 million people for a year.
- The land footprint of food purchases was about 300 square feet smaller per student, or 7,200 acres smaller overall, in October 2022 than in October 2018. That is equivalent to the farmland needed to feed 14,000 people for a year.
- Plant foods represented a larger proportion of food purchases in October 2022 than in October 2018, increasing from 45% to 50%.

Results showed a 42% reduction in overall carbon emissions per student from the program.

STEP 1: ORGANIZING DATA

Food purchasing data from NYC OFNS was gathered for October 2018, before implementing Plant-Powered Fridays, and for October 2022, after Plant-Powered Fridays had been implemented. Food purchases were then grouped into approximately 40 categories of plant-based and animal-based products, and each food type was classified into GHG emissions categories.

STEP 2: NORMALIZE TO "EDIBLE WEIGHT"

Next, foods were categorized by processing (i.e., canned/dry, raw/cooked, etc.), then purchases were adjusted to edible weight to account for processing differences.
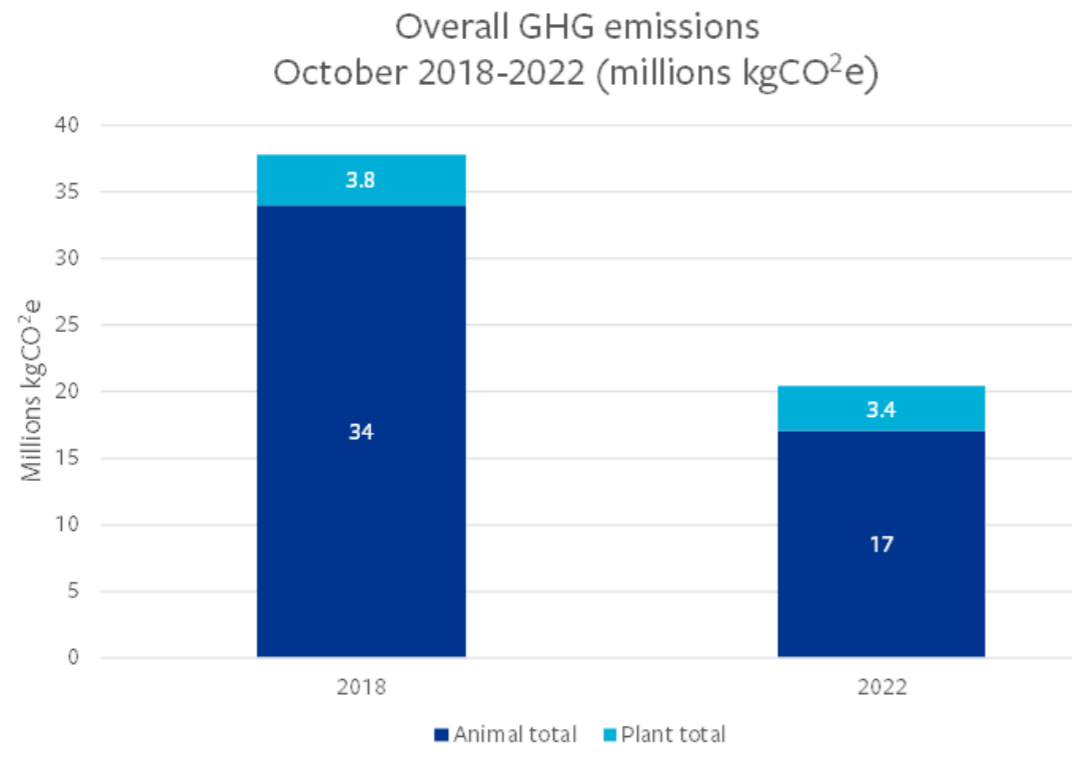
STEP 3: SPECIALTY ITEMS ASSIGNMENT

Composite or specialty items were identified, such as pizza or sandwiches, and recipes were used to assign ingredients' impacts to specialty items.

STEP 4: CARBON, LAND AND WATER FOOTPRINTS

Estimated carbon footprints from food production, as well as land and water use associated with growing food in all ~40 food categories were analyzed.

STEP 5: ASSESS FOOTPRINTS

Next, GHG, Land and Water Footprints of each food purchase from October 2018 and October 2022 were calculated. All results were grouped into 16 food categories, such as poultry, cheese, grains and vegetables, to provide a detailed and accessible summary of environmental impacts.

Carbon Footprint: GHG emissions were assessed using the IPCC AR5 GWP100 methodology, representing the global warming potential of carbon dioxide, methane and nitrous oxide over 100 years.

Water Footprint: Water footprint was assessed as blue water use, representing the surface water and groundwater withdrawals for irrigation and processing.

Land Footprint: Land footprint was assessed using the total land occupation needed to produce each food, based on crop yields and pasture needed for grazing,

Meredith Lee/The HSUS

Overall GHG emissions
October 2018-2022 (millions kgCO^{2}e)

WATER FOOTPRINT

From October 2018 to October 2022, the water footprint for food purchased declined by about 35%, and the water footprint of animal foods declined by about 50%.

Cheese purchases had a high environmental impact, contributing 30% of total carbon footprint and 20% of total water footprint in both 2018 and 2022. However, average cheese purchases dropped from 32 to 19 oz/student served from October 2018 to October 2022, helping to reduce carbon, water and land footprints.

LAND FOOTPRINT

Between October 2018 and October 2022, the land footprint of food purchases decreased by about 40% due to reductions in beef and other purchases.

Animal products require the most land: In 2022, dairy products represented over 40% of the total land footprint, while beef used about 20% and poultry used about 15% of land.

GHG EMISSIONS

Carbon emissions decreased from 38,000 MTCO$_2$e in October 2018 to 21,000 MTCO$_2$e in October 2022, representing a reduction of approximately 45%.

GHG emissions from animal-based products declined from 34,000 MTCO$_2$e to 17,000 MTCO$_2$e. The proportion of animal-based emissions dropped from 90% to 85%, but emissions from animal foods are still a target for improvement.

Between 2018 and 2022, NYC OFNS' GHG emissions per student served dropped from roughly 34 kg CO_2e to 20 kg CO_2e, or a roughly 40% reduction in the carbon foodprint per student served. Specifically, its carbon foodprint from animal products served was reduced by roughly one-third with minimal changes to the carbon footprint of plant foods.

Between 2018 and 2022, NYC OFNS' water footprint per student served dropped from roughly 970 gallons to 670 gallons, or a roughly one-third reduction in the water footprint of student meals. Notably, the water footprint from animal products was reduced by about 50%, without increasing the water footprint of plant foods.

Between 2018 and 2022, NYC OFNS' reduced the land footprint of students by about 50%. The land footprint from animal products was reduced by about 60%.

Further improvements in the environmental performance of food service at NYC OFNS is feasible by :

- Reducing the amount of cheese served (cheese represents 30% of the carbon footprint and 20% of the water footprint).
- Improving access to plant-based milk products.
- Increasing the proportion of beans, nuts, seeds and other plant proteins in student meals.

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There were certain limitations to the study that should be considered when reviewing the results.

RESULTS REFLECT AVERAGE FARMING PRACTICES

GHG emissions, water footprint and land footprint factors for foods represent average values for food production in the United States (animal products and some fruits, vegetables and grains) and global food production (other crops not widely grown in the U.S.). Differences between farms can lead to large variation in the GHG emissions and water footprints of foods, so these results should be considered estimates, not absolute values.

PREPARED FOOD SIMPLIFIED OR EXCLUDED

Some prepared or multi-ingredient foods were mapped to a single primary ingredient, such as omelets to eggs and beef ravioli to beef, which may not perfectly represent the environmental impacts of the dish.
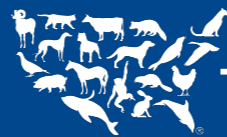
Sauces, salad dressings and some prepared or processed foods were excluded from the assessment because carbon, water and land impact data was not available; these represent no more than 3% of food purchases by weight.

Our mission

We fight the big fights to end suffering for all animals.

Together with millions of supporters, the Humane Society of the United States takes on puppy mills, factory farms, the fur trade, trophy hunting, animal cosmetics testing and other cruel industries. Through our rescue, response and sanctuary work, as well as other direct services, we help thousands of animals in need every year.

We fight all forms of animal cruelty to achieve the vision behind our name: a humane society.

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