
The State of School Lunch in California

Opportunities for Improving the Health and
Environmental Profile of School Food



— March 2021 —

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All the findings, recommendations and any errors in this report are solely the responsibility of Friends of the Earth.



Friends of the Earth
Climate-Friendly Food
For Healthy Kids and a Healthy Planet

Friends of the Earth's Climate-Friendly School Food Program helps school districts make the shift toward healthy, delicious, plant-forward menus. The program provides technical assistance and marketing materials, supports student and community engagement strategies, and links school districts with the resources they need in order to be successful. Friends of the Earth also partners with school districts and NGOs to advocate for state and federal policy change. For more information or to request support on implementing climate-friendly food strategies, email climatefriendlyfood@foe.org.

Introduction

As economic insecurity and the climate crisis intensify, and half of Americans suffer from diet-related diseases, the need to make school food healthier, climate-friendly and accessible to all families is more urgent than ever.^{1,2} In California, school districts spend more than \$1.5 billion dollars a year to provide 540 million school lunches to nearly four million students, most of whom are low-income and students of color.^{3,4,5} How these dollars are spent and the quality of meals offered has a profound and long-term impact on health and educational outcomes for students, as well as the health of the planet.

Food is at the heart of our public health and climate crises. Reams of scientific studies show that industrial animal agriculture plays a major role in driving climate change and diet-related disease. **The evidence is clear: eating less meat is vital to reducing greenhouse gas emissions and curbing the rates of chronic, costly diet-related disease.**⁶ The Intergovernmental Panel on Climate Change (IPCC) has found that we must dramatically reduce production and consumption of industrial animal products and **change how we grow food** to meet essential climate mitigation targets.⁷ At the same time, eating less meat—especially processed meat — and more plant-based foods has proven effective in strengthening immune systems and fighting obesity, heart disease, diabetes and some cancers. Virtually every public health organization, including the American Medical Association, the American Cancer Society and the Harvard T.H. Chan School of Public Health urge lower red and processed meat consumption for better health outcomes.^{8,9,10} The 2015-2020 Dietary Guidelines for Americans recommend teenage boys eat less meat and that all children increase their consumption of vegetables and plant-based proteins.¹¹ (See [this partial list](#) of public health organizations' statements on the need to eat more plant-based foods and less meat.)

Higher rates of COVID-related hospitalization and death are directly linked to diet-related cardiovascular disease and diabetes, conditions that are more common among people of color.^{12,13} Good nutrition starting at a young age is key to addressing racial health disparities.

Our research: To better understand the opportunities for improving the environmental and health profile of California's school meals, Friends of the Earth:

1. Analyzed the ten most widely offered items and the relative frequency of meat and dairy-centric vs. plant-based lunch entrées offered on the menu at the 25 largest K-12 public school districts in California;ⁱ
2. Examined California's bulk food spending through the USDA Foods program, including the companies that benefit most from this taxpayer-funded program;ⁱⁱ
3. Calculated the carbon footprints of top lunch entrées and estimated GHG emissions associated with California's USDA Foods bulk food purchasing; and
4. Makes policy recommendations to better align menus with public health recommendations and California's climate and sustainable food procurement goals.¹⁴

The Critical Role of School Food

School lunch can lay the foundation for a lifetime of healthy eating while also helping to mitigate climate change. Among California students participating in the National School Lunch Program, the majority (59%, or 3.65 million) are eligible for Free and Reduced-Price Meals (FRPM) and rely on school meals for up to half of their daily nutrition.¹⁵ For these students in particular, school food plays an important role in health and educational outcomes.¹⁶ Low-income students and students of color are at a higher risk for diabetes and obesity, and gain the most from healthy food in schools.¹⁷ **School meals are a critical intervention to address racial and socio-economic health disparities among children who lack access to healthy food at home.**

i We analyzed 1,356 entrées on publicly available lunch menus at elementary, middle and high schools in the state's 25 largest school districts during the month of October 2019. (See full [methodology](#).)

ii USDA Foods (sometimes referred to as commodity foods) are purchased in bulk by the federal government and distributed to schools at a low cost. While only 15-20% of total food purchased by public schools is sourced through this subsidized program, the majority of meat, poultry and cheese purchased by California schools is provided through USDA Foods.

In 2020, as California experienced unprecedented fires and smoke-choked skies, the existential threat of climate change became undeniable. With nearly a billion school meals served annually in California,¹⁸ shifting toward low-carbon plant-based foods is a high-impact, quantifiable, cost-effective strategy for schools to reduce their carbon footprint. Shifting food purchases can generate even larger climate benefits than installing solar panels, planting trees or using energy-efficient light bulbs, key actions schools take to reduce their climate impact. Beyond serving more plant-based foods, schools can also use their enormous purchasing power to influence how food is produced. **By prioritizing purchases from farms that use organic and regenerative practices, California schools can help advance the state's goals around climate-smart agriculture.**

“Balanced diets, featuring plant-based foods such as those based on coarse grains, legumes, fruits and vegetables, nuts and seeds, and animal-sourced food produced in resilient, sustainable and low-greenhouse gas emission systems, present major opportunities for adaptation and mitigation while generating significant co-benefits in terms of human health.”

- IPCC 2019 Summary for Policymakers

Rebalancing public school food to be plant-forward has dual benefits for health and climate justice. A [recent national study](#) found that redesigning school lunches in alignment with the [Eat-Lancet Healthy Diet Pattern](#) could provide high-quality nutrition while benefiting the environment and reducing food costs.” The report found “the planet and National School Lunch Program participants could most benefit from the consumption of fewer animal-based food items (for example, red meat and dairy) and more plant-based food items (for example, vegetables, and legumes).”¹⁹ The need for greater consumption of plant-based protein is backed by the 2020-2025 Dietary Guidelines for Americans, which found that beans, peas and lentils—a subgroup of both the vegetable and protein foods groups—are underconsumed by most adults, children and adolescents. They also found that “dietary patterns characterized by higher intake of red and processed meats, sugar-sweetened foods and beverages, and refined grains are, in and of themselves, associated with detrimental health outcomes.”²⁰

How Does Friends of the Earth Define Climate-friendly and Plant-forward School Food?

- Foods with low carbon and water footprints such as plant-based (e.g., beans, lentils, soy products and nuts) and plant-forward foods (e.g., bean and turkey chili, mushroom beef burgers, bean and cheese burritos).
- Foods produced using organic farming practices that reduce greenhouse gases (e.g., no synthetic fertilizers) and sequester carbon in the soil (e.g., cover cropping). Ideally, these are sourced from regional, small- and mid-scale diversified farms.
- Minimally packaged foods and food waste reduction strategies (e.g., serving sliced fruit, longer lunch periods, lunch after recess, nutrition education and “share tables” to share untouched food).



Great Progress Despite Structural Barriers

School foodservice programs face the monumental task of satisfying kids who are often accustomed to junk food while also meeting nutrition requirements, staying within tight food budgets and maintaining high participation rates.²¹ School nutrition leaders also confront many structural challenges to serving healthy, fresh and climate-friendly food, including short lunch periods, inadequate kitchen facilities and staffing, low federal meal reimbursement rates and a broader food paradigm of packaged, processed and meat-centric meals.

Despite these challenges, school food directors have made remarkable progress toward serving healthier food and we applaud foodservice professionals, who work tirelessly to feed our children. The 2010 Healthy Hungry Free Kids Act (HHFKA) improved the nutritional quality of school food and helped address obesity and other diet-related diseases, especially among low-income students by increasing consumption of whole grains, fruits and vegetables.²²

In addition, across the state and nation there is [growing momentum](#) among school districts that are implementing farm-to-school programs and featuring more plant-based, plant-forward options.²³ Sodexo, a leading foodservice provider that works with school districts, recently announced that roughly half of its carbon reduction target will be achieved through changes in its supply chain, including reducing meat and increasing [its menu mix target for plant-based meals to more than 30% globally](#).²⁴ Meanwhile, California districts are sourcing more local and organic ingredients as outlined in Friends of the Earth's recently published [Organic School Food Roadmap](#).

California's investment of \$10 million in the Farm to School Program in Governor Newsom's 2020-21 budget provides a boost to school foodservice departments to further improve the nutritional and environmental profile of school food.²⁵ This shift is bolstered by the broader market trend, especially among Millennials and Gen Z, toward plant-forward eating.²⁶ Yet, as this report shows, there is still much work to be done. **Our analysis is not intended to critique individuals or school districts, but instead to provide a compelling rationale and recommendations for the policy and structural changes needed to scale up healthy, climate-friendly food.** In order to achieve systemic reform and support foodservice directors, we must broaden the coalition of stakeholders involved in policy advocacy and collaboration at local, state and federal levels.

This report is comprised of three sections. **Section I** provides the results from Friends of the Earth's menu analysis and provides a baseline for typical lunch entrées in California. **Section II** analyzes California's USDA Foods bulk purchasing data, including the types and quantities of protein foods purchased and the companies that benefit most from this taxpayer-funded program. **Section III** projects the potential climate savings of shifting menus and bulk purchasing to be more plant-forward. **Section IV** substantiates the urgent need to transform California school food for the sake of our students' health, social equity and climate justice. We conclude with recommended policies and other actions that school food stakeholders can support to improve the health and environmental profile of California's school food.

With this report, we hope to inspire more policymakers and school food stakeholders to become advocates for healthier and more sustainable school food, for the benefit of our young people and the planet they will inherit.

Understanding Industrial Meat & Dairy

Animal products provided to the National School Lunch Program via USDA Foods come from companies that utilize industrial meat production practices.

Industrialized meat, sometimes referred to as factory-farmed meat, is damaging to the environment, drives climate change and harms public health. Animals are typically raised in concentrated animal feeding operations commonly called CAFOs. Both CAFOs and slaughterhouses are associated with inhumane practices, poor working conditions and substantial health and environmental impacts from toxic air emissions and water pollution, which disproportionately affect Black and Brown communities. The American Public Health Association recently adopted a policy urging federal, state and local governments and public health agencies to impose a moratorium on all new and expanding CAFOs.

Intensive animal agriculture relies on growth-promoting drugs and hormones, as well as routine antibiotics. The increase in antibiotic-resistant pathogens resulting from confined animal production is a major global public health crisis. Amid the COVID-19 pandemic, factory farms are also under increased scrutiny as a possible breeding ground for pathogens that may spark the next global pandemic.

In **Section IV**, we make the environmental, health and social equity case for school districts to reduce their industrial meat purchases and strive to offer more minimally processed plant-based proteins and locally sourced, organic and pasture-raised animal foods.



I. California K-12 Menu Analysis: Methodology and Findings

A. Methodology

To capture a snapshot of school menus in California, Friends of the Earth analyzed 1,356 entrées on publicly available lunch menus at elementary, middle and high schools in the state's 25 largest school districts during the month of October 2019 (see full methodology [here](#)). These districts collectively serve 28% of all school meals in California and based on an abridged analysis of 10 small and 10 mid-sized school districts, appear to be a good proxy for the entire state. Friends of the Earth also analyzed California's statewide USDA Foods 2018-19 purchasing data. Together, these data provide a fairly comprehensive picture of protein offerings in California schools.

Our analysis focused only on the protein, also known as the Meat/Meat Alternate (M/MA) category, within lunch entrées. This analysis does not include the grain, vegetables, fruit and milk that must accompany the M/MA to credit as a federally reimbursable meal.²⁷ It also did not assess a la carte items, school breakfast, dinner and snacks. This research also excludes salad bars due to methodological constraints; it is important to note that salad bars can allow districts to make minimally processed plant-based protein and other fresh healthy food available to children on a regular basis.

B. Findings






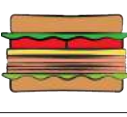



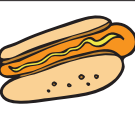
Animal Protein Dominates California Menus

Our analysis found that 94% of entrées in California's largest school districts feature animal proteins. Cheese dishes make up at least 25% of all entrées, while 16% of meals feature processed meats (e.g., pepperoni, hot dogs, deli meats), which are considered carcinogens by the World Health Organization.²⁸ Only 4% of the entrées are plant-based and include no animal products (see Figure 2).

"About three-quarters of Americans meet or exceed the recommendation for meats, poultry, and eggs. However ... more than half do not meet the recommendation for nuts, seeds, and soy products."

- 2020-2025 Dietary Guidelines for Americans

Figure 1. **Top 10 Entrées Offered at California's 25 Largest School Districts (2019)**

1		Chicken sandwich	6		Bean and cheese entrées
2		Chicken bowls	7		Ground beef dishes
3		Meat pizza ♦	8		Meat deli sandwich ♦
4		Cheeseburger	9		Chicken strips/tenders
5		Cheese pizza	10		Hot dog ♦

♦ Entrée contains processed meat

Chicken, Cheeseburgers and Meat Pizza Top School Food Menus

Chicken, beef and cheese entrées are the most frequently offered menu items while plant-based and fish proteins are notably limited. Red meat dishes make up four of the 10 most frequently offered entrées, with cheeseburgers, beef crumble dishes (i.e., tacos, burritos, nachos, etc.), hot dogs and meat pizzas offered most frequently (see Figure 1). **The bean and cheese meals are the only top entrée in which any part of the protein requirement is fulfilled by a plant protein.**

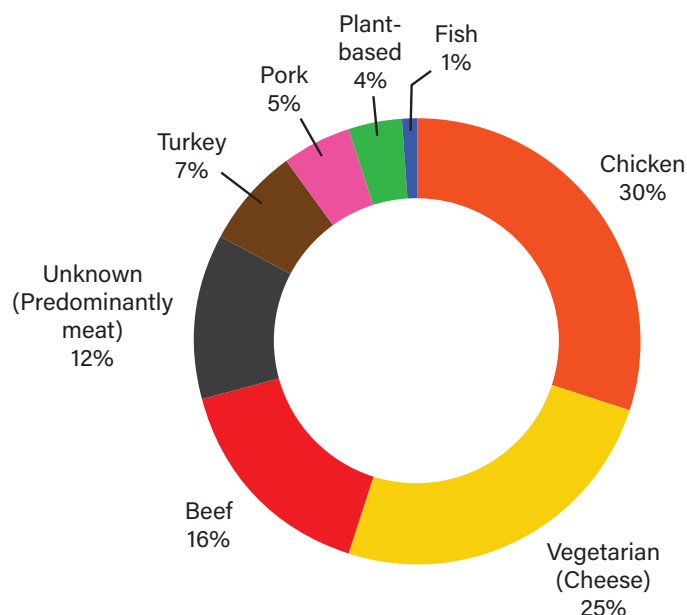
Processed Meat is Featured Heavily

Three of the most frequently offered menu items (meat pizza, hot dogs and deli meats) contain processed meats according to [World Health Organization definitions](#), while other entrées like chicken strips and sandwiches are often made with heavily processed chicken ingredients.²⁹ Meat pizza, a ubiquitous school lunch item, often has an endless list of ingredients revealing an abundance of fat, sodium, hydrogenated oils, synthetic additives and processed meat with nitrites (see ingredient list below for Big Daddy's Meat Pizza, an item served in several California school districts).

"Most intake of meats and poultry should be from fresh, frozen, or canned, and in lean forms (e.g., chicken breast or ground turkey) versus processed meats (e.g., hot dogs, sausages, ham, luncheon meats)."

- 2020-2025 Dietary Guidelines for Americans

Figure 2. **Protein Offerings on California School Menus (Fall 2019)***



*based on Friends of the Earth's menu analysis from the largest 25 school districts

Big Daddy's Meat Pizza Ingredient List

INGREDIENTS: CRUST: WHOLE GRAIN BLEND (WHITE WHOLE WHEAT FLOUR, WHOLE GRAIN YELLOW CORN FLOUR, BROWN RICE FLOUR, WHOLE GRAIN OAT FLOUR), NONFAT MILK, ENRICHED FLOUR (WHEAT FLOUR, MALTED BARLEY FLOUR, NIACIN, REDUCED IRON, THIAMINE MONONITRATE, RIBOFLAVIN, FOLIC ACID), WATER, YEAST, VEGETABLE OIL (SOYBEAN AND/OR CANOLA OIL), SUGAR, WHEAT GLUTEN, CONTAINS 2% OR LESS OF: HYDROGENATED SOYBEAN OIL, PARMESAN CHEESE (CULTURED PASTEURIZED PART SKIM MILK, SALT, ENZYMES), SEA SALT, DATEM, DEXTROSE, GUAR GUM, SPICE, SALT, SOY LECITHIN, NATURAL FLAVOR, ASCORBIC ACID, WHEAT STARCH, ENZYMES. TOPPINGS: LOW MOISTURE PART SKIM MOZZARELLA CHEESE (CULTURED PASTEURIZED PART SKIM MILK, SALT, ENZYMES), FAT REDUCED PEPPERONI (PORK, BEEF, WATER, TEXTURED VEGETABLE PROTEIN PRODUCT* (SOY PROTEIN CONCENTRATE, ZINC OXIDE, NIACINAMIDE, FERROUS SULFATE, COPPER GLUCONATE, VITAMIN A PALMITATE, CALCIUM PANTOTHENATE, THIAMINE MONONITRATE [B1], PYRIDOXINE HYDROCHLORIDE [B6], RIBOFLAVIN [B2], AND CYANOCOBALAMIN [B12]), SALT, LESS THAN 2% OF SPICES, DEXTROSE, LACTIC ACID STARTER CULTURE, OLEORESIN OF PAPRIKA, FLAVORING, SODIUM NITRITE, BHA, BHT, CITRIC ACID. *INGREDIENT NOT IN REGULAR PEPPERONI), COOKED BEEF PATTY TOPPING (HAMBURGER [GROUND BEEF (NOT MORE THAN 30% FAT)], SEASONING (SALT, GROUND BLACK PEPPER, WHOLE ANISE)), WATER, SOY PROTEIN CONCENTRATE, TEXTURED VEGETABLE PROTEIN [SOY FLOUR, SALT], FULLY COOKED DICED SMOKED HAM WITH NATURAL JUICES (CURED WITH WATER, SALT, DEXTROSE, SODIUM PHOSPHATE, SODIUM SEYTHORBATE, SODIUM NITRITE), COOKED TURKEY PIZZA TOPPING (TURKEY BREAKFAST SAUSAGE [MECHANICALLY SEPARATED TURKEY, SEASONING (SALT, NATURAL FLAVOR, DEXTROSE, SUGAR, CITRIC ACID, BHA, BHT), WATER], TEXTURED VEGETABLE PROTEIN [SOY FLOUR, CARAMEL COLOR, ZINC OXIDE, NIACINAMIDE, FERROUS SULFATE, COPPER GLUCONATE, VITAMIN A PALMITATE, CALCIUM PANTOTHENATE, THIAMINE MONONITRATE, PYRIDOXINE HYDROCHLORIDE, RIBOFLAVIN, CYANOCOBALAMIN], WATER). SAUCE: TOMATOES (WATER, TOMATO PASTE [NOT LESS THAN 28% SOLUBLE SOLIDS]), CONTAINS 2% OR LESS OF: MODIFIED FOOD STARCH, PARMESAN CHEESE (CULTURED PASTEURIZED PART SKIM MILK, SALT, ENZYMES), SUGAR, DEXTROSE, SALT, DRIED GARLIC, SPICE, DRIED ONION, DEHYDRATED ROMANO CHEESE (CULTURED PASTEURIZED SHEEP'S AND COW'S MILK, SALT, ENZYMES), PAPRIKA, CITRIC ACID.



Plant-based Entrées Rarely Appear on California Menus

Plant-based foods are gaining popularity among students,³⁰ but they still represent only a small portion (4%) of total entrées on California school menus. Of the 25 large districts analyzed, 11 districts offered a plant-based option every day, three districts offered plant-based options once a week, seven districts offered them 1-2 times per month and four districts never offered plant-based options. However, nearly half of all plant-based options offered at high schools and one third of the plant-based options in elementary schools are nut butter and jelly sandwiches, which are typically processed and less wholesome than warm, hearty meals.

Based on our secondary review of school food menus from 21 small and mid-sized districts, smaller districts tend to offer even fewer plant-based options: only 19% offered plant-based options every day (mostly nut butter and jelly sandwiches); 33% offered plant-based options one to four times per month; and nearly half (43%) of these small and mid-sized districts never offered plant-based entrées.

Whole Food Plant-based vs. Processed Plant-based

The most widely offered plant-based entrées on California menus represent a spectrum of minimally to ultra-processed pre-made products to whole ingredient, scratch-cooked dishes. There is an ongoing debate among foodservice professionals about using pre-made, processed plant-based products versus whole ingredient, freshly prepared options (including beans at the salad bar).

For school districts with cooking capabilities, salad bars and enough staffing, scratch-cooked meals or salad bar ingredients using whole and minimally processed foods can be a healthier, more affordable alternative to processed plant-based protein options that may include unhealthy additives and unnecessary fillers. Whole plant-based ingredients such as beans, lentils, chickpeas and other legumes tend to cost much less per serving than pre-made plant-based items. However, for districts with limited staffing, cooking or salad bar facilities, using whole/minimally processed ingredients may not be a viable option. In addition, students may be more likely to accept pre-made products/ingredients (e.g., veggie burgers or soy crumbles) that mimic the meat proteins to which they are accustomed.

“Shifts are needed within the protein foods groups... Selecting from the seafood group or beans, peas, and lentils subgroup more often could help meet recommendations while still ensuring adequate protein consumption. Replacing processed or high-fat meats (e.g., hot dogs, sausages, bacon) with seafood could help lower intake of saturated fat and sodium, nutrients that are often consumed in excess of recommended limits. Replacing processed or high-fat meats with beans, peas, and lentils would have similar benefits, as well as increasing dietary fiber, a dietary component of public health concern.”

- 2020-2025 Dietary Guidelines for Americans

Figure 3. **Common Plant-Based Options on California School Menus***

Plant-Based Entrées	Top 25 CA Districts Currently Serving
Plant-Based Pasta 	Capistrano, Fremont, San Diego
Veggie Burger** 	Elk Grove, Irvine, Long Beach, Los Angeles, Moreno Valley, Oakland, Riverside, San Diego, San Jose, San Juan, San Ramon Valley
Three-Bean Chili 	Capistrano, Corona-Norco, San Diego
Bean Burrito 	Capistrano, Fremont, Los Angeles, San Francisco
Plant-Based Salad 	Capistrano, Elk Grove, Fresno, Moreno Valley, Poway
Specialty Option (e.g., grain bowl, hummus wrap) 	Capistrano, Elk Grove, Fresno, Riverside, San Jose

*This list excludes nut- and seed-butter sandwiches, which is the most common plant-based entrée on California menus.
 **Some veggie burgers may contain egg.

Depending on kitchen facilities, staff limitations, student acceptance and other factors, schools must do what is feasible for them; and both freshly prepared and pre-made plant-based products are a positive alternative to industrially produced meat. For a deeper dive into the nutrition and processing considerations associated with plant-based foods, Eat REAL has developed a [guidance document](#) for K-12 school foodservice professionals.

II. California Purchases from USDA Foods

A. Background

The USDA Foods program was created to help stabilize the American farm economy by purchasing surplus commodities to offer to public schools at a low cost. USDA purchases commodity foods in large volumes at a lower unit cost than individual districts could purchase on their own. States then receive a USDA Foods entitlement allocation based on the number of lunches served in the previous year.³¹ In California, USDA Foods is split into four categories: Processed/Bulk USDA Foods (52%) and Direct Deliveryⁱⁱⁱ USDA Foods (33%); Department of Defense (DoD) Fresh Fruits and Vegetables Program (12%); and an Unprocessed Fruits and Vegetables Pilot (2%).³² Given our focus on protein, we only analyzed the two largest categories—Processed/Bulk USDA Foods and Direct Delivery USDA Foods—since neither of the other two programs contain M/MA protein foods. Reference to USDA Foods from this point on refers solely to foods in the Bulk and Direct Delivery categories.

B. Methodology

Friends of the Earth analyzed 2018-19 USDA Foods purchasing data by sorting the product type (e.g., beef, cheese, misc. veg) then breaking it down by annual spending, poundage and vendor. Corporate consolidation (Figure 5) was calculated by summing the dollar value of each vendor's sales, then translated into a percent share of total USDA Foods and percent share of each product category (beef, poultry, cheese, misc. veg, etc.). See full methodology [here](#).

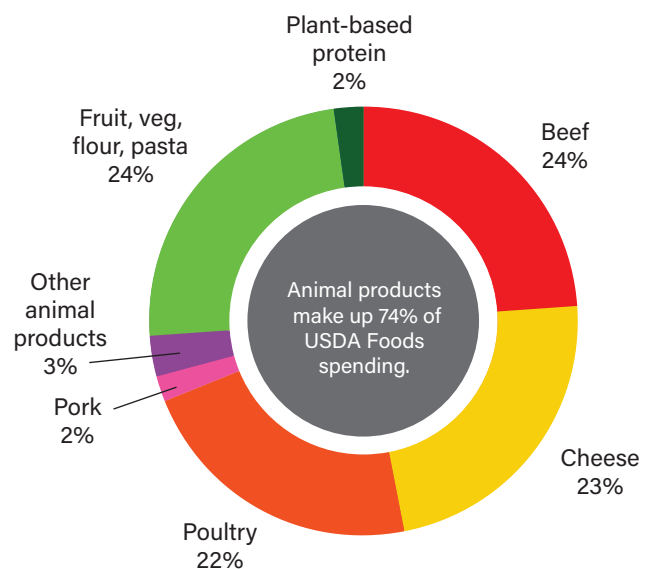
C. Findings

Meat and Dairy Dominate USDA Foods Purchases

USDA Foods purchasing data mirrors the protein breakdown observed on California school lunch menus. According to 2018-2019 data, California school districts spent the vast majority (74%) of their USDA Foods entitlement dollars—\$115 million annually—on industrially produced animal products.³³ This includes 30 million pounds of poultry, 21 million pounds of cheese, 17 million pounds of beef and 2.5 million pounds of pork. Beef accounted for 24%, cheese 23% and chicken 22% of purchased products (see Figure 4). Beans and nut butter, the only plant-based sources of protein available through USDA Foods, make up a meager 2% of statewide USDA Foods' school purchases.

In 2014, 70% of USDA commodity funds nationally were spent on just four foods—raw beef, mozzarella cheese, cheddar cheese and chicken—that made up 88% of the USDA Foods sent for processing. These were then primarily converted to three entrées that appear frequently on California school menus: hamburgers, pizza and chicken nuggets.³⁴

Figure 4. **USDA Foods Spending by California School Districts: 2018-19**



Source: California Department of Education













USDA Purchases Industrial Meat and Cheese From Just a Few Large Companies

The data show that the largest meat and dairy conglomerates have monopolized the USDA Foods market, which supplies the majority of animal products served in California schools.^{iv} For example, Tyson Foods, the biggest poultry producer in the United States, supplies 44% of all poultry purchased in California schools through USDA Foods. Nationally, 15 companies receive nearly 60% of the \$1.3 billion annual USDA Foods spending—and 13 of these are meat or dairy companies.³⁵

iii Direct Delivery, in California, is also known as Brown Box Foods (see [this link](#) for more information).

iv We estimate that the vast majority of meat and cheese in California schools comes from the USDA Foods program based on: a) interviews with 10 foodservice directors, who on average estimated that 80% of the meat and cheese they served came from USDA Foods; and b), estimates of the total poundage of animal products served by California schools (based on the number of California school breakfasts and lunches) compared with the total poundage purchased through USDA Foods: that calculation is 69%.

Figure 5. **A Handful of Large Companies Dominate USDA Meat and Dairy Annual Sales to California Schools: 2018-19**

BEEF	POULTRY	CHEESE	PORK
3 companies account for 70% of all beef sales	3 companies account for 74% of all poultry sales	3 companies account for 64% of all cheese sales	3 companies account for 73% of all pork sales
 29% of sales \$11 million	 44% of sales \$15 million	 28% of sales \$10 million	 40% of sales \$1.3 million
 29% of sales \$11 million	 18% of sales \$6 million	 19% of sales \$6.8 million	 21% of sales \$700 K
 12% of sales \$4.7 million	 12% of sales \$5 million	 17% of sales \$6 million	 12% of sales \$400 K

Source: California Department of Education

The USDA Foods program favors the biggest meat and poultry companies that can provide products at the lowest unit price. Rather than supporting independent, local or organic producers, the tax-funded program locks school districts into supporting corporate-controlled and highly concentrated animal agriculture.

The availability of heavily subsidized animal foods leaves budget-strapped school districts with little choice but to support this environmentally damaging industry that runs counter to student health, equity and sustainability goals (see Section IV). According to a 2019 USDA study, the average School Food Authority (SFA)^v operates at a slight deficit, with revenues covering about 95% of their operational costs.³⁶ When SFAs are given entitlement dollars that they can only use for USDA Foods, it is impossible to resist the allure of spending this “free money” on animal products offered through USDA Foods at prices significantly below market rates.

As Chef Vince Caguin of Natomas Unified School District expressed, “I would rather buy Mary’s Free-Range Organic Chicken, but it is \$40-50 per 20-pound box compared with \$5 per 20-pound box through USDA Foods.” It is easy to see how USDA Foods undercuts local and independent producers and pushes schools to serve industrially produced meat and dairy. One exception is the San Francisco Unified School District (SFUSD). The district’s [nutrition guidelines](#) prevent it from purchasing meat from USDA Foods because inadequate ingredient labeling makes it impossible to verify whether the meat contains additives, hormones or artificial colors. **Based on our conversations with foodservice directors across the state, many districts share concerns about the lack of transparency and higher levels of processing and additives associated with USDA Foods meat products.** To create purchasing shifts that prioritize students’ health and the environment, USDA Foods must be reformed to support more plant-based protein as well as organic and regenerative meat from regional and independent family farmers (see policy recommendations below).

“I am pulling my hair out every single day because I am trapped in feeding Big Ag products to children. This is exactly how the federal funds allocated to each school food authority operating the federal meal programs are designed to be spent. All the ‘commodity’ products—including beef, chicken, cheese, pork—the high-ticket items that schools cannot easily afford to buy out of pocket—are supplied by companies with strong ties to Big Ag.”

- Anonymous School Food Dietitian

v The School Food Authority is responsible for administering the NSLP and other nutrition programs.

III. Carbon Footprint of California's School Lunch and USDA Foods Purchases

The abundance of meat and cheese in school foodservice generates significant climate-harming impacts. Animal foods typically account for a large portion of a foodservice operation's overall carbon footprint. **According to a recent analysis by Sodexo, one of the world's leading foodservice operators, roughly 70% of its supply chain carbon emissions comes from the purchases of animal foods.**³⁷ A Friends of the Earth analysis of Oakland Unified School District foodservice similarly found that 70% of the district's food carbon footprint came from animal products.

Beef and Cheese Dominate Climate Impacts

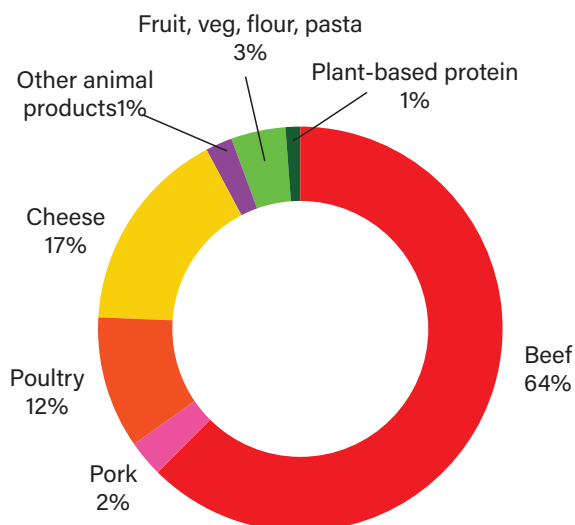
Although beef represents only 16% of total menu offerings, it accounts for nearly 60% of the carbon footprint of lunches offered in California's top 25 school districts (see [methodology](#)). Meanwhile, plant-based proteins (such as beans, tofu and lentils), which make up 4% of the entrées offered, represent only 1% of the carbon footprint (see Figure 6). Many districts provide vegetarian options by using cheese to fulfill the meat/meat alternate requirement. However, these cheese dishes are neither low-carbon nor particularly healthy.³⁸ Figure 7 compares the relative carbon footprint (CO₂-eq) per serving of the top ten entrées. Beef entrées, which are typically 15 times more carbon intensive than bean and cheese entrées, carry by far the largest carbon footprint.

In the 2018-19 school year, California's USDA Foods purchasing had an embedded carbon footprint of 1.1 billion pounds of CO₂-eq—equivalent to the emissions of 110,000 passenger vehicles driving for a year. **The vast majority (96%) of USDA Foods purchasing emissions come from animal products, 64% from beef alone.**

Switching to Chicken is Not the Answer

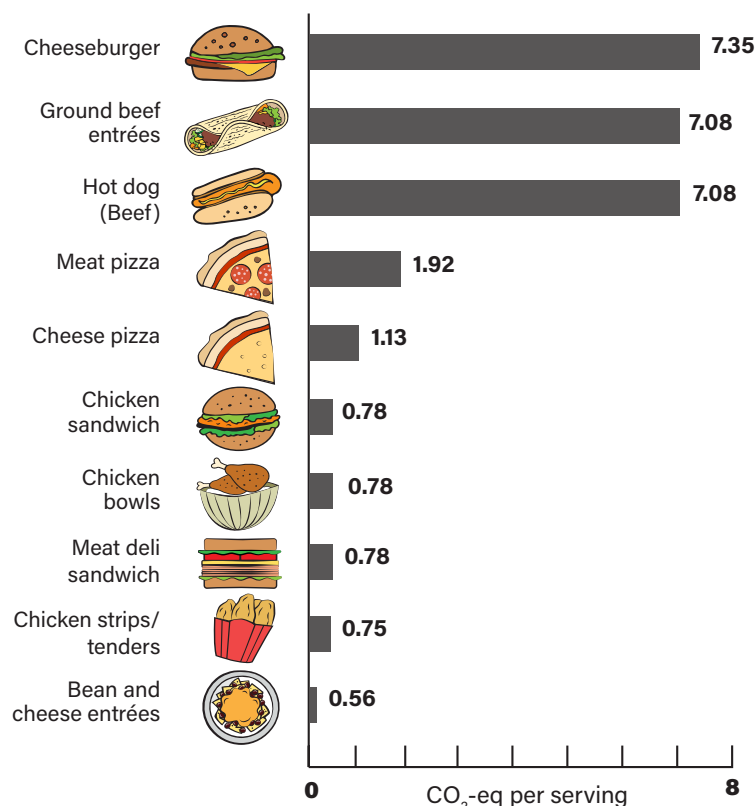
Considering the outsized climate impact of beef, some districts may be inclined to switch from beef to chicken. Switching from industrially produced beef to industrially produced chicken is **not the best solution**. While chicken's carbon footprint is lower than beef's, industrial chicken production is problematic in other ways. Large chicken production and processing operations are water-intensive and pollute local water resources, and their manure runoff is causing ecological dead zones.³⁹ Chicken production is more harmful than beef production from an animal welfare perspective, too, because far more chickens are slaughtered for food production. Further, the chicken industry has become highly consolidated, with a history of exploiting contract farmers and workers and engaging in anticompetitive practices.⁴⁰

Figure 6. **Meat and Cheese Account for 95% of California School Lunch Entrées' Carbon Footprint***



*Based on Friends of the Earth's menu analysis from the largest 25 school districts in California.

Figure 7. **Carbon Footprint of Top 10 Entrées on CA School Food Menus**



Source: Friends of the Earth menu analysis from the largest 25 school districts in California, using conversion factors from Poore and Nemecek 2018.

Shifts toward Plant-Based Foods Can Generate Major Climate Benefits

With 540 million school lunches served every year in California, even modest menu shifts to low-carbon plant-based foods or blended entrées (e.g., turkey bean chile or blended burgers) can help mitigate climate change.⁴¹ If California school districts reduced animal food purchases from USDA Foods by 25% and replaced them with plant-based protein-rich foods, it would save 230 million pounds of CO₂ a year—equivalent to eliminating 23,000 passenger vehicles for one year or planting 1.7 million sapling trees and letting them grow for 10 years.⁴² Over five years, that would amount to 1.3 billion fewer miles driven or nearly 10 million trees planted (see Figure 8). These shifts would generate a double win: generating significant carbon savings with little to no additional cost, while providing students with wholesome, plant-based foods.

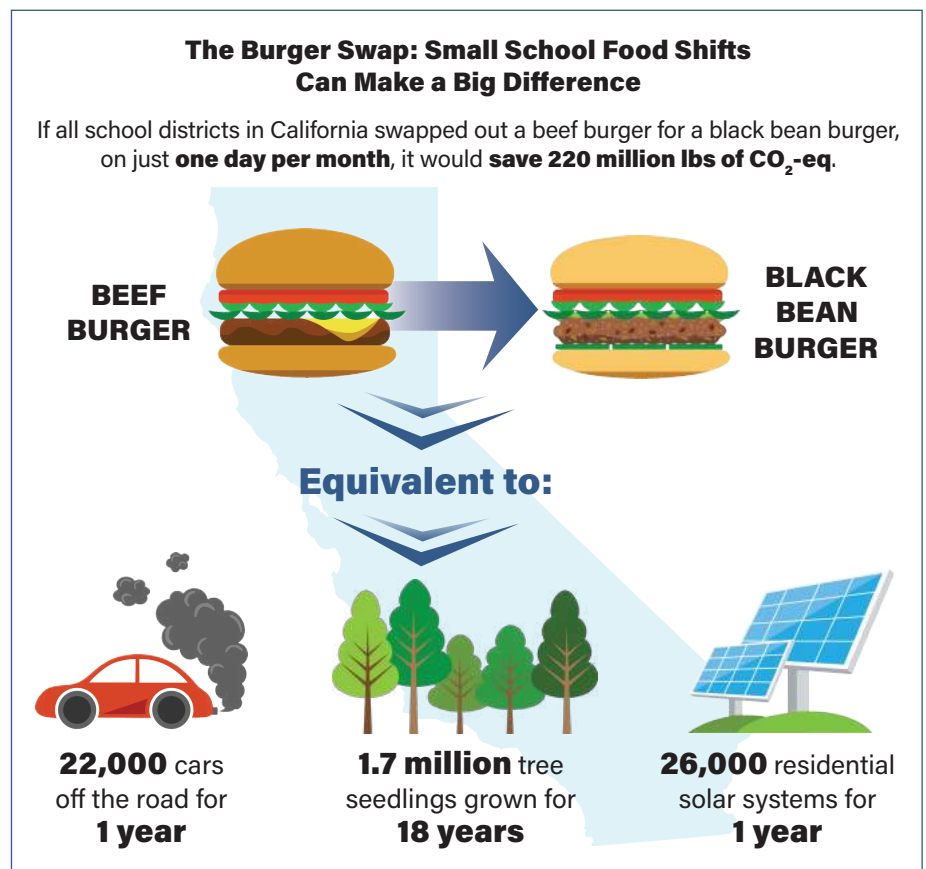
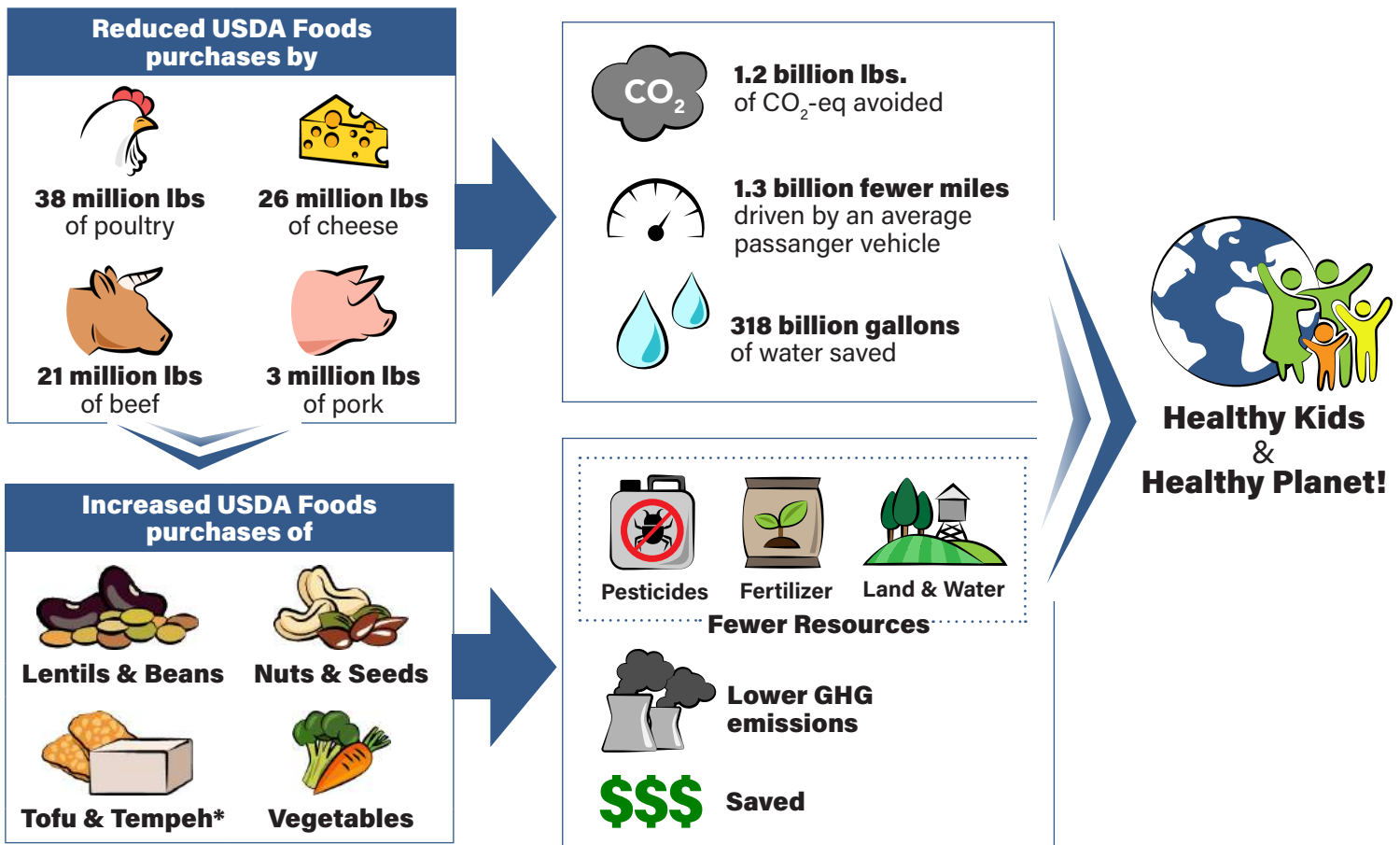


Figure 8. **Benefits of Reducing California School Purchases of Animal Products from USDA Foods by 25% Every Year for 5 Years**



*Not currently available through USDA Foods.

Source: Friends of the Earth USDA Foods purchasing analysis, using conversion factors from Poore and Nemecek 2018.

IV. The Health Equity and Climate Imperative for More Plants and Less and Better Meat and Dairy

Below, we outline the health equity and climate rationale for why schools should increase choices for *healthy, climate-friendly, plant-forward meals*—and why the USDA Foods program should reduce purchases of industrial meat and dairy products and offer more minimally processed plant-based proteins and regionally sourced, organic and pasture-based animal foods.

Health Equity

Promoting minimally processed, plant-forward meals in schools is a key strategy to reduce racial health disparities and diet-related health problems that emerge early in life.⁴³ Excessive consumption of red meat is linked to higher rates of obesity, diabetes, heart disease and some forms of cancer, which are experienced at higher rates among people of color. In California, 18% of Black and Latinx adolescents experience obesity, a rate three times higher than their white classmates.⁴⁴ Obesity is a precursor for many other diet-related chronic diseases. **Leading public health organizations urge people to eat less red and processed meat and more plant-based foods to boost immune systems and reduce the rates of chronic and costly diet-related diseases.**^{45,46} Diet shifts can also boost academic performance and address educational inequities.⁴⁷ Nearly 60,000 global deaths annually are linked to the overconsumption of processed meats, classified by the World Health Organization as carcinogenic to humans.⁴⁸

All meat is not created equal when it comes to health. Organic meat and dairy is produced without toxic pesticides, antibiotics, growth hormones or arsenic-based drugs, whereas over 450 drugs and 17,000 pesticides are allowed in non-organic production.⁴⁹ The use of growth hormones is common in pork and beef production, and the overuse of antibiotics in conventional animal agriculture is a major driver of antibiotic-resistant “superbugs” that threaten public health.⁵⁰ For more on the health benefits of organic food, please see [Friends of the Earth’s fact sheet: Why Serve Organic School Food](#).

Culturally Appropriate

Students who rely on school meals have the right to food that comports with their cultural, philosophical, religious, health or social preferences. Plant-based options are encouraged by many religious and cultural traditions. The prevalence of cheese entrées and the milk offering at every meal (a mandatory component of a reimbursable school meal) is insensitive to students who are “lactose normal” or unable to process lactose.⁵¹ **The National Institutes of Health estimates that 95% of Asian Americans, 60 to 80% of African Americans, 80 to 100% of American Indians and 50 to 80% of Hispanic people are unable to process lactose.**⁵² Given that students of color make up the vast majority of those eligible for Free and Reduced-Price Meals in California, defaulting to dairy-free entrées is more culturally appropriate and can better accommodate a wide variety of food preferences within a student body.^{53,54} They will also better meet the demand for plant-based foods that is growing among younger generations. According to a 2019 study, 79% of Gen Zs are looking to go meatless a few times a week, with 65% finding plant-forward eating “appealing.”⁵⁵

Climate-Smart and Resilient

After fossil fuels, animal agriculture is the second largest global contributor to greenhouse gas emissions.⁵⁶ More than half of California’s methane emissions come from the dairy and livestock sector alone.⁵⁷ However, organic farming practices like cover cropping and composting sequester carbon in the soil, and long-term studies have shown that organic production emits 18% fewer greenhouse gases than other farming systems.⁵⁸ Organic farming protects pollinators and helps farms and ranches adapt to climate change by promoting soil health, biodiversity and water conservation.⁵⁹ By reducing meat entrées on the menu and purchasing animal products from small and mid-scale farms that raise animals on pasture with organic, regenerative practices, schools in California can help bolster a more resilient and climate-friendly food system.



V. Conclusion and Recommendations

When Congress created the National School Lunch Program (NSLP) in 1946, its first legislative purpose was to “safeguard the health and well-being of the nation’s children.”⁶⁰ **While the school food program has been crucial to fighting food insecurity and meal quality has improved in recent decades, our analysis finds significant opportunity for better aligning school lunch entrées with the scientific evidence on climate change and leading public health recommendations about healthy eating.** Childhood obesity rates are soaring, particularly among low-income adolescents and children of color.⁶¹ Frequent servings of cheeseburgers, pizza, chicken fingers and hot dogs do not help our children establish a lifetime of healthy eating. Instead, these meals deepen our nation’s nutritional divide, putting millions of low-income children and children of color at a profound nutritional disadvantage.

While supporting our nation’s farmers through our school lunch program is important, the USDA Foods approach of procuring mass quantities of heavily subsidized commodity foods means that only the biggest agribusiness companies can participate, and school districts get locked into serving industrial meat and dairy products that fuel climate change and cause public health and environmental harm. **Shifting California’s school lunch menus toward more regionally and sustainably produced plant and animal proteins will improve student health, mitigate climate change, promote environmental justice and create new markets for smaller-scale farmers.** California’s recent approval of a new \$10 million Farm to School Program is a good start for helping school districts source healthier and more sustainable plant- and animal-based products. The advocacy that helped generate resources for that program must intensify and continue.^{vi} Making California school lunch more nourishing and balanced will require a significant increase in funding and sustained effort, education, cultural shifts and policy changes at the district level, in Sacramento, in Congress and at the USDA (see below for recommended policy interventions).



We recognize that making these changes, especially during a pandemic, will be hard. Yet, as a result of the injustices laid bare by the coronavirus pandemic, we are witnessing a powerful movement and increasing political urgency to address food insecurity, poor nutrition, environmental justice and racial disparities across our society.⁶² **Improving access to high-quality school food is a powerful intervention that is foundational to addressing these injustices.** We face a massive climate crisis that Congress could not contemplate when it created the National School Lunch Program. According to the United Nations, we have less than ten years to avoid irreparable damage from climate change.⁶³ Now—seventy-five years past the creation of NSLP—we must acknowledge that an overreliance on industrial animal foods in the school meal program is fueling the climate catastrophe that threatens the future of the children it is supposed to serve. To safeguard student health and well-being for this and future generations, now is the time to reorient school meals toward healthy, climate-friendly foodservice. Below, we outline key policies that will help foster healthier, climate-friendly school food.

vi These funds result from concerted advocacy over the past few years—including the introduction of three school food bills in 2019 aimed at increasing [plant-based and organic food](#) and expanding universal access to school meals. For more information, see [California Budget Boosts Healthy Food for Kids and Markets for Farmers](#).

Key Policy Recommendations for Healthy, Climate-Friendly School Foodservice

CONGRESS

- Expand and establish new grant programs and/or reimbursement incentives that help schools serve plant-based meals and locally and sustainably produced foods; provide nutrition education and school garden support; and fund improved kitchen facilities, equipment and staff training to facilitate scratch-cooking and plant-based food preparation.
- Increase meal reimbursement rates and establish universal free meals.
- Direct USDA Foods to offer more plant-based proteins foods and restructure its purchasing to better support regional small- and medium-scale independent producers and to enable access to certified organic, grass-fed and other animal products raised without the use of routine antibiotics and hormones.
- Ensure that school meal nutrition standards and meal patterns adequately incentivize plant-based entrées and reflect the updated recommendations in the 2020-2025 Dietary Guidelines for Americans regarding minimizing

USDA FOODS PROGRAM

- Expand minimally processed and organic plant-based protein offerings (e.g., tofu, lentils and black bean burgers).
- Offer meat raised without hormones and routine use of antibiotics, especially certified grass-fed and organic meats.
- Eliminate processed lunch meats and pepperoni from USDA Foods due to their limited nutritional value and negative health impacts.
- Include a preference for organic produce in bids with DoD Fresh contractors.
- Disclose comprehensive ingredient lists and sourcing information for USDA Foods products.
- Require USDA Foods vendors to disclose their supply chain GHG emissions and disqualify USDA Foods vendors with repeated violations of labor and environmental laws.

CALIFORNIA POLICYMAKERS

- Provide continued funding for California's new Farm to School Program, prioritizing sourcing from farms that use organic practices; culinary training for plant-based food preparation; and marketing and education for students and families on climate-friendly farming and culturally appropriate plant-based foods.
- Provide financial incentives to schools for offering plant-based entrées and organic food options.
- Track and reduce greenhouse gas emissions from California USDA Foods purchases by 25% by 2025.
- Allocate more of California's \$22 million Specialty Crop Block Grant Program for projects that will directly benefit schools and producers who want to sell to schools (e.g., regional distribution hubs).

SCHOOL DISTRICTS

- Expand choices for plant-based and plant-forward (combined meat/dairy and plant protein) offerings on school food menus so that at least one plant-based entrée is featured every week (excluding PB&Js).
- Pass wellness and/or nutrition policies that eliminate or significantly reduce processed meat on school food menus and encourage serving organic and plant-based food.
- Advocate for more plant-based sources of protein and higher quality animal products in USDA Foods.
- Expand sourcing of higher quality animal products from local and sustainable farms, with support from the California Farm to School Program and other federal programs.
- Adopt a [climate action resolution](#) that commits to pursue climate-friendly foodservice and set a district-wide goal for reducing the carbon footprint of school food.
- Work with NGOs and certification programs like the [Good Food Purchasing Program](#) and [Eat Real](#) that provide tools, standards and support for improving nutrition and sustainability sourcing.
- Take advantage of culinary training opportunities, kitchen equipment grants and farm to school programs to procure and serve scratch-cooked plant-based and plant-forward entrées (find [resources here](#)).

1. U.S. Department of Health and Human Services and U.S. Department of Agriculture. (2015). 2015 – 2020 Dietary Guidelines for Americans. 8th Edition. Retrieved from <https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines/guidelines/introduction/nutrition-and-health-are-closely-related/>
2. Center for Disease Control and Prevention. (June 2020). Adult Obesity Facts. Retrieved from <https://www.cdc.gov/obesity/data/adult.html>
3. California Department of Education (2020). 2019-20 California Enrollment by School [Data file]. Data posted April 13, 2020 by the CDE – Data Reporting Office at <https://www.cde.ca.gov/ds/sd/sd/filesenr.asp>
4. California Department of Education. (2020). School Nutrition Program. Retrieved from <https://www.cde.ca.gov/fg/aa/nt/>
5. California Department of Education (2020). School Nutrition Program 2018-19 County Profile. Retrieved from <https://www.cde.ca.gov/ds/sh/sn/>
6. Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S. et al. (2019) Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*. DOI: [https://doi.org/10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)
7. P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.) (2019). Summary for Policymakers. 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*. IPCC. Retrieved from <https://www.ipcc.ch/srcccl/chapter/summary-for-policymakers/>
8. American Medical Association on Meat Reduction. Accessed December 2020. Retrieved from <https://www.pcrn.org/news/blog/american-medical-association-says-dietary-guidelines-americans-should-indicate-meat-and> and from <https://www.ama-assn.org/delivering-care/diabetes/skip-diet-labels-help-patients-make-real-changes-last>
9. American Cancer Society stance on Meat Reduction. Accessed December 2020. Retrieved from <https://www.cancer.org/healthy/eat-healthy-get-active/acs-guidelines-nutrition-physical-activity-cancer-prevention/guidelines.html>
10. Harvard T.H. Chan School of Public Health. More Evidence for Replacing Red Meat with Other Protein Sources. Accessed December 2020. Retrieved from <https://www.hsph.harvard.edu/news/hsph-in-the-news/replacing-red-meat-with-other-protein/>
11. U.S. Department of Health and Human Services and U.S. Department of Agriculture. (2015). 2015 – 2020 Dietary Guidelines for Americans. 8th Edition. Retrieved from <https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines/guidelines/introduction/nutrition-and-health-are-closely-related/>
12. Center for Disease Control and Prevention. (2020). Certain Medical Conditions and Risk for Severe COVID-19 Illness. Retrieved from <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>
13. Center for Disease Control and Prevention. (2020). Health Equity Considerations and Racial and Ethnic Minority Groups. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/race-ethnicity.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fneed-extra-precautions%2Fracial-ethnic-minorities.html#anchor_1595551025605
14. Executive Department State of California. (September 2019). Executive Order N-19-19. Retrieved from <https://www.gov.ca.gov/wp-content/uploads/2019/09/2019-Climate-EO-N-19-19.pdf>
15. California Department of Education (2020). California Unduplicated Student Poverty – Free or Reduced-Price Meals Data 2019-20 [Data file]. Data posted April 13, 2020 by the CDE – Data Reporting Office at <https://www.cde.ca.gov/ds/sd/sd/filespp.asp>
16. Fleischhacker, S. et al. (2020). Strengthening national nutrition research: rationale and options for a new coordinated federal research effort and authority. *The American Journal of Clinical Nutrition*, nqaa179. <https://doi.org/10.1093/ajcn/nqaa179>
17. Centers for Disease Control and Prevention (2019). Prevalence of Childhood Obesity in the United States, Childhood Obesity Facts. Retrieved from <https://www.cdc.gov/obesity/childhood/index.html>
18. California Department of Education (2020). School Nutrition Program 2018-19 County Profile. Retrieved from <https://www.cde.ca.gov/ds/sh/sn/>
19. Mary Kathryn Poole, Aviva A. Musicus, and Erica L. Kenney (2020). *Alignment Of US School Lunches With The EAT-Lancet Healthy Reference Diet's Standards For Planetary Health*. Health Affairs. <https://doi.org/10.1377/hlthaff.2020.01102>
20. U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2020-2025. 9th Edition. December 2020. Retrieved from https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf
21. Siegel, Bettina Elias. (2019). *Kid Food: the Challenge of Feeding Children in a Highly-Processed World*. Oxford University Press.
22. Kenney, E. et al. (2020). *Impact Of The Healthy, Hunger-Free Kids Act On Obesity Trends*, Health Affairs 39:7, 1122-1129. <https://doi.org/10.1377/hlthaff.2020.00133>
23. Hamerschlag, K., Dalton, J., and Kraus-Polk, J. (2018). *Scaling Up Healthy, Climate-Friendly School Food*. Friends of the Earth. Retrieved from <https://foe.org/resources/scaling-healthy-climate-friendly-school-food/>
24. Sodexo press release (2020, December 10). “Sodexo joins CDP’s A List of global climate change leaders with key progress on its carbon strategy.” Retrieved from <https://www.globenewswire.com/news-release/2020/12/10/2143053/0/en/Sodexo-joins-CDP-s-A-List-of-global-climate-change-leaders-with-key-progress-on-its-carbon-strategy.html>
25. California State Budget 2020-21. Farm to School Program, page 107. Retrieved from <http://www.ebudget.ca.gov/FullBudgetSummary.pdf>
26. Jed, E. (2018, August 13). Aramark Brings Gen Z Food Trends To Life On College Campuses Nationwide. Retrieved August 25, 2020, from <https://www.vendingtimes.com/news/aramark-brings-gen-z-food-trends-to-life-on-college-campuses-nationwide/>
27. U.S. Department of Agriculture, Food and Nutrition Service. (2019) National School Lunch Program Meal Pattern Chart. Retrieved from <https://www.fns.usda.gov/nslp/national-school-lunch-program-meal-pattern-chart>
28. American Institute for Cancer Research. (January 2020). The continuous update project, meat, fish and dairy. Retrieved from <https://www.aicr.org/research/the-continuous-update-project/meat-fish-dairy/>
29. World Health Organization (2015) IARC Monographs evaluate consumption of red meat and processed meat. International Association for Research on Cancer. Retrieved from https://www.iarc.fr/wp-content/uploads/2018/07/pr240_E.pdf
30. Jed, E. (2018, August 13). Aramark Brings Gen Z Food Trends to Life On College Campuses Nationwide. Retrieved August 25, 2020, from <https://www.vendingtimes.com/news/aramark-brings-gen-z-food-trends-to-life-on-college-campuses-nationwide/>
31. United States Department of Agriculture (2016). USDA Foods in the National School Lunch Program. Retrieved from https://government.report/Resources/Whitepapers/50fe5f56-3535-4ec1-ad2b-c1898ba77837_NSLP-White-Paper1.pdf
32. 2018-19 school year data collated and sent by the California Department of Education, 2020.
33. California Department of Education (2020). 2018-19 School Nutrition Program (SNP) National School Lunch Program (NSLP) Meal Count Numbers [Data file]. Retrieved July 13, 2020 from the CDE – Data Reporting Office. (see [methodology](#))
34. Scratch-Cooking a Cost-Effective Way to Prepare Healthy School Meals with US Department of Agriculture Foods? Retrieved from the Journal of the Academy of Nutrition and Dietetics at [https://jandonline.org/article/S2212-2672\(14\)00498-5/abstract](https://jandonline.org/article/S2212-2672(14)00498-5/abstract)
35. Original analysis of USDA Foods data by Julian Kraus-Polk (2020). Data received from the United States Department of Agriculture via email.
36. United States Department of Agriculture (2019). School Nutrition and Meal Cost Study Summary of Findings. Retrieved from https://fns-prod.azureedge.net/sites/default/files/resource-files/SNMCS_Summary-Findings.pdf

37. Sodexo press release (2020, December 7). "Sodexo Recognized for its Leadership on Climate Change by Natural Resources Defense Council and the Humane Society of the United States." Retrieved from <https://us.sodexo.com/media/news-releases/reduction-carbon-footprint-2025.html>
38. Hamerschlag, K. & Kraus-Polk, J. (2017). Shrinking the Carbon and Water Footprint of School Food: A Recipe for Combating Climate Change: A Pilot Analysis of Oakland Unified School District's Food Programs. Friends of the Earth. Retrieved from <https://foe.org/resources/shrinking-carbon-water-footprint-school-food/>
39. Physicians Committee for Responsible Medicine, Health Concerns about Dairy. Retrieved from <https://www.pcrm.org/good-nutrition/nutrition-information/health-concerns-about-dairy>
40. Rumpel, J., Corporate Agribusiness and the Fouling of America's Waterways: The Role of Large Agribusiness Companies in Polluting our Rivers, Lakes and Coastal Waters. Environment America Research & Policy Center (2016). Retrieved from <https://environmentamerica.org/sites/environment/files/reports/CorpAgFoulingWaterways2016-web.pdf>
41. Moddie, A. Fowl play: the chicken farmers being bullied by big poultry. The Guardian (2017 April). Retrieved from <https://www.theguardian.com/sustainable-business/2017/apr/22/chicken-farmers-big-poultry-rules>
42. Hamerschlag, K. & Kraus-Polk, J. (2017). Shrinking the Carbon and Water Footprint of School Food: A Recipe for Combating Climate Change: A Pilot Analysis of Oakland Unified School District's Food Programs. Friends of the Earth. Retrieved from <https://foe.org/resources/shrinking-carbon-water-footprintschool-food/>
43. Friends of the Earth Analysis, data available upon request.
44. Lustig, R. H., Mulligan, K., Noworolski, S. M., Tai, V. W., Wen, M. J., Erkin-Cakmak, A., Gugliucci, A., & Schwarz, J. M. (2016). Isocaloric fructose restriction and metabolic improvement in children with obesity and metabolic syndrome. *Obesity (Silver Spring, Md.)*, 24(2), 453–460. <https://doi.org/10.1002/oby.21371>
45. Centers for Disease Control and Prevention (2019). Prevalence of Childhood Obesity in the United States, Childhood Obesity Facts. Retrieved from <https://www.cdc.gov/obesity/childhood/index.html>
46. Harvard University Blog (2020, March 10). More evidence for replacing red meat with other protein sources. Retrieved August 25, 2020, from <https://www.hsph.harvard.edu/news/hsph-in-the-news/replacing-red-meat-with-other-protein/>
47. Wang Y, Beydoun MA. Meat consumption is associated with obesity and central obesity among US adults. *Int J Obes (Lond)*. 2009 Jun;33(6):621-8. doi: 10.1038/ijo.2009.45. Epub 2009 Mar 24. PMID: 19308071; PMCID: PMC2697260.
48. Fleischhacker, S. et al. (2020). Strengthening national nutrition research: rationale and options for a new coordinated federal research effort and authority. *The American Journal of Clinical Nutrition*, nqaa179. <https://doi.org/10.1093/ajcn/nqaa179>
49. World Health Organization (2015). IARC Monographs evaluate consumption of red meat and processed meat. International Association for Research on Cancer. Retrieved from https://www.iarc.fr/wp-content/uploads/2018/07/pr240_E.pdf
50. Center for Food Safety (2015). America's Secret Animal Drug Problem: How Lack of Transparency is Endangering Human Health and Animal Welfare. Retrieved from https://www.centerforfoodsafety.org/files/animal_drug_es_10_26_77814.pdf
51. Martin, Michael J., Sapna E Thottathil, and Thomas B. Newman. "Antibiotics Overuse in Animal Agriculture: A Call to Action for Health Care Providers." *American Journal of Public Health* 105, no. 12 (December 2015): 2409–2410. <https://ajph.aphapublications.org/doi/10.2105/AJPH.2015.302870>
52. Food Empowerment Project. *Lactose Intolerance*. Retrieved from <https://foodispower.org/access-health/lactose-intolerance/>
53. National Institute of Child Health and Human Development, National Institutes of Health (January 2006). Lactose Intolerance: Information for Health Care Providers. Retrieved from https://www.nichd.nih.gov/sites/default/files/publications/pubs/documents/NICHD_MM_Lactose_FS_rev.pdf
54. Sparling, N. (2017, November 08). From Phở to Fajitas, School Lunches Feed a Diverse Nation. Retrieved August 25, 2020, from <https://civileats.com/2017/11/02/why-culturally-relevant-food-matters-in-school-lunch/>
55. Kuehn BM. Heritage Diets and Culturally Appropriate Dietary Advice May Help Combat Chronic Diseases. *JAMA*. 2019;322(23):2271–2273. doi:10.1001/jama.2019.18431
56. Jed, E. (2018, August 13). Aramark Brings Gen Z Food Trends To Life On College Campuses Nationwide. Retrieved August 25, 2020, from <https://www.vendingtimes.com/news/aramark-brings-gen-z-food-trends-to-life-on-college-campuses-nationwide/>
57. Gerber, P. J., H.Steinfeld, B.Henderson, A.Mottet, C.Opio, J.Dijkman, A.Falcucci, and G.Tempio. (2013). Tackling climate change through livestock: a global assessment of emissions and mitigation opportunities. Rome: FAO. <http://www.fao.org/3/a-i3437e.pdf> (Pg. 14)
58. California Air Resources Board. GHG Short-Lived Climate Pollutant Inventory (Accessed December, 2020). Retrieved from <https://ww2.arb.ca.gov/ghg-slcip-inventory>
59. Goh, Kuan M. (2010). Greater Mitigation of Climate Change by Organic than Conventional Agriculture: A Review. *Biological Agriculture & Horticulture* 27(2): 205–29.
60. Knuth, B., DeBates, M., Mirenda, J., & Shade, J. (2020). Advancing Organic to Mitigate Climate Change. Washington, DC: Organic Trade Association. Retrieved from https://ota.com/sites/default/files/indexed_files/OrganicTradeAssociation_ClimateChange_WhitePaper_PlanetOrganic.pdf
61. United States Department of Agriculture, Economic Research Service (July 2008). The National School Lunch Program: Background, Trends, and Issues. Report Number 61. Retrieved from [https://www.ers.usda.gov/webdocs/publications/46043/12051_err61_1.pdf?v=0#:~:text=The%20National%20School%20Lunch%20Program%20\(NSLP\)%20was%20established%20under%20the,and%20other%20foods.%E2%80%9D%20The%20NSLP](https://www.ers.usda.gov/webdocs/publications/46043/12051_err61_1.pdf?v=0#:~:text=The%20National%20School%20Lunch%20Program%20(NSLP)%20was%20established%20under%20the,and%20other%20foods.%E2%80%9D%20The%20NSLP)
62. Centers for Disease Control and Prevention (2019). Prevalence of Childhood Obesity in the United States, Childhood Obesity Facts. Retrieved from <https://www.cdc.gov/obesity/data/childhood.html#Prevalence>
63. Liasson, M. (2020, April 22). Coronavirus Response Shows How A National Crisis Can Again Transform Politics. Retrieved August 25, 2020, from <https://www.npr.org/2020/04/22/839965140/coronavirus-response-shows-how-a-national-crisis-can-again-transform-politics>
64. Intergovernmental Panel on Climate Change (2018). Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C. Retrieved from <https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>