

# Climate-Friendly Food Guide

celebrating the joys and benefits of plant-based foods



A joint initiative brought to you by:





# Contents

## Welcome

We're Glad You're Here	1
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## Climate-Friendly

Feed the World Better	2
More Food - Less Waste	3
Curbing GHG Emissions	4
Minimizing Methane	5
Decreasing Deforestation	6
Rewilding and Reforestation	7
True Cost of Dairy	8
Dairy vs. Plant-Based Milks	9

## Nutrition

Health Benefits	12
Plenty of Protein	13

## Better Foods

Helpful Hints	14
Fun Food Swaps	15

## Recipes

Breakfast and Lunch	16
Dinner and Dessert	17

## More Info

Resources and References	18
About Us	19

**ClimateFoodGuide.org**





# Welcome

Many of the world's most pressing problems can leave us feeling helpless—like there's nothing we can do as individuals.

The climate crisis, however, is an issue where personal change is overwhelmingly urged by experts around the globe.

Among the actions that will have the biggest impact: **our food choices!**

Leading environmental organizations and international institutions are urging a shift toward plant-based diets as one of the most important actions the public can take to reduce climate destruction, deforestation, species extinction, and global hunger.

In a special report by the Intergovernmental Panel on Climate Change, **the United Nations recently declared that plant-based diets have the greatest and most immediate benefit to the climate.**<sup>1</sup>

Furthering the recommendation for climate-friendly food choices, 11,000 scientists signed a Climate Emergency Declaration imploring governments, policymakers, and consumers to take specific actions to reduce emissions.



**Most relevant to individuals, the scientists urged: “eating mostly plant-based foods while reducing the global consumption of animal products... to improve human health and significantly lower GHG emissions.”<sup>2</sup>**

## **That's why we created this guide...**

to encourage and empower caring people like you to embrace the joys and benefits of plant-based foods. In the following pages, you'll find important facts about how food choices impact the environment—plus recipes, tips, and resources to support you on your journey.

*Thank you for protecting our planet. We're glad you're here!*



## *Plant-Based Foods*

# Feed the World Better

Plant-based foods better feed the world by providing an abundance of nutritious food using far fewer natural resources and creating far less pollution and global warming.

According to the Intergovernmental Panel on Climate Change, **livestock consume 5x more food than the entire human population.**<sup>3</sup>

Feeding people plant-based foods directly (instead of cycling crops through animals first) would mean growing far fewer crops, which would conserve vast amounts of land, water, and energy.

As the Union of Concerned Scientists explains, “animal-sourced food represents an enormous loss to the potential global supply of food for people. The reasons have to do with ecology: when we eat one level higher on the food web we’re losing about 90% of the edible resources from the level below.”<sup>4</sup>

Indeed, the United Nations calculates that we could feed 3.5 billion more people by growing crops for human consumption on land currently used to grow animal feed.<sup>5</sup>

This greater food availability at lower ecological and economic cost is especially important as we attempt to feed our expanding population while managing the negative impacts of the climate crisis.







## *Plant-Based Foods*

# More Food Less Waste

Raising animals for food is inefficient and wasteful in large part because **animals eat much more food than they produce** (calories and protein).

Cows are the most wasteful, consuming 25 pounds of feed crops to produce one pound of beef.<sup>6</sup> To visualize this wastefulness, consider that a small, 100-calorie beef patty requires an input of 2,500 calories worth of feed crops—enough calories to feed an adult for an entire day.

Even chickens eat more than twice as much food as they produce—a loss/waste of at least 50% of the original calories and protein. In addition to the direct waste of crops, there is also the waste of all the additional land, water, and energy needed to produce those feed crops.

There are widespread global efforts to reduce food waste. In the U.S., 30% of food is wasted at the retail-to-consumer level. This is disturbingly high, yet still much less than the inherent waste in animal-sourced foods: eggs (40%), poultry (50%), dairy (75%), pork (90%), and beef (96%).<sup>7</sup>

In this light, meat, dairy and other animal-sourced foods can be seen as the ultimate form of food waste.

**The upside is that by choosing plant-based foods, we naturally decrease food waste and conserve scarce natural resources.**

# Curbing GHG Emissions

Another benefit of prioritizing plant-based foods is that animal farming is a top source of harmful greenhouse gases (GHGs), especially carbon dioxide, methane, and nitrous oxide.

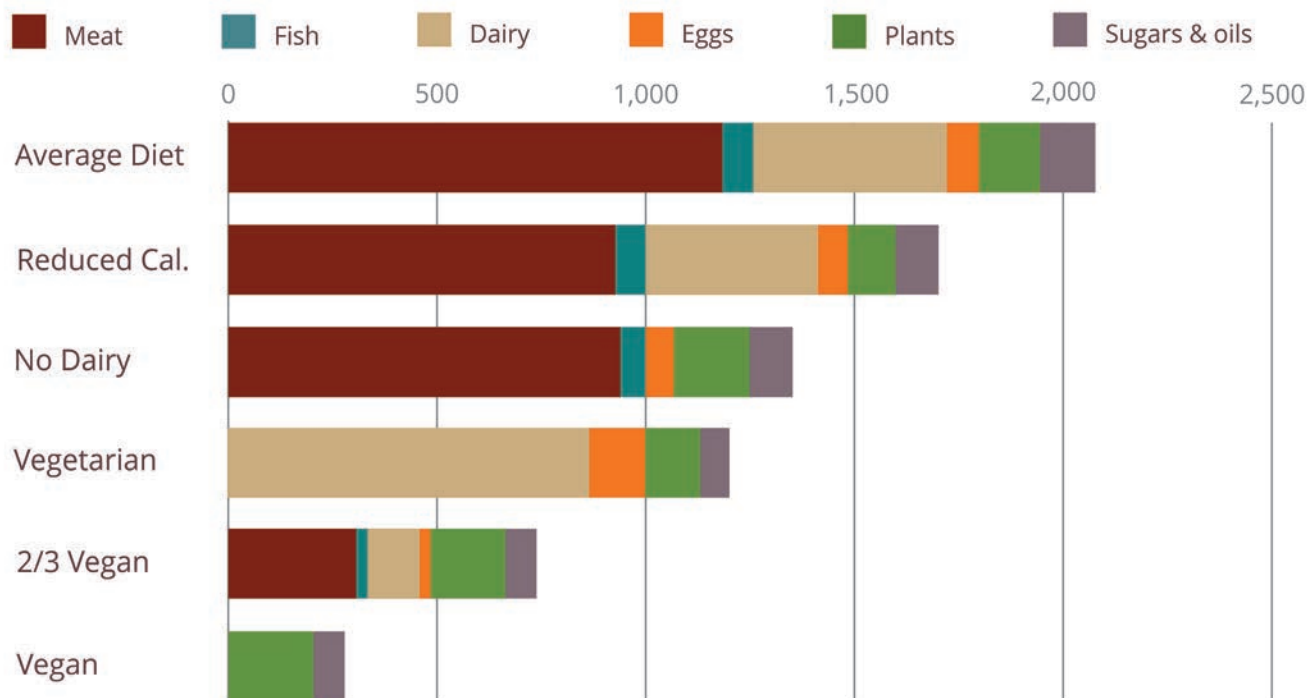
Researchers at Johns Hopkins University modeled the climate impacts of different dietary choices. They concluded that a plant-based (vegan) diet is the most beneficial, noting 87% fewer greenhouse gas emissions compared to the average American diet that is heavy in meat and dairy (see *Economist* graph below).<sup>8</sup>

One reason animal-sourced foods cause so much damage is that in addition to the carbon dioxide emitted by the livestock industry (growing feed, housing and processing animals, transportation, and refrigeration), rearing animals for food produces an immense amount of methane (which is 86-87x more potent than CO<sub>2</sub>) and 67% of human-related nitrous oxide (which is almost 300x more potent).

[read more about methane on the next page →](#)

## Greenhouse Gas Footprint of Various U.S. Diets

kg of CO<sub>2</sub> equivalent per person per year



Kim et al (2019) Country-specific dietary shifts to mitigate climate and water crises. *Global Environmental Change*



# Minimizing Methane

A plant-based diet is key to minimizing methane. Here's why it matters...

## **Methane is a much stronger greenhouse gas than carbon dioxide.**

While there is about 4x more carbon dioxide emitted into the atmosphere, methane is 20-25x more potent when using a conservative 100-year timeframe, and up to 86-87x more potent over a 20-year timeframe.<sup>9</sup>

## **Methane has a more immediate impact than carbon dioxide.**

Carbon dioxide generally remains in the atmosphere 100+ years, while methane dissipates in 9-12 years.<sup>10</sup> The benefit is that methane reductions stemming from decreases in meat and dairy intake will have a dramatic and immediate climate impact. Decreasing methane emissions can delay (hopefully prevent) us from reaching deadly climate-related tipping points.

## **Methane resulting from animal agriculture is immense.**

Animal agriculture is responsible for more than one-third of human-caused methane emissions.<sup>11</sup> So minimizing (ideally eliminating) consumption of animal-sourced foods is the best personal action to reduce methane in particular, and greenhouse gas emissions more broadly.

## *Did you know?*

While grazing is less polluting, Harvard researchers found that a shift to all grass-fed beef in the United States would increase beef's methane emissions by a whopping 43%.<sup>12</sup>

To make matters worse, when grazing on their natural diets of grass and other forage, ruminant animals (cows, sheep, goats) emit 3-4x more methane than grain-fed, feedlot animals,<sup>13</sup> which far exceeds estimated carbon sequestration benefits.

**GrazingFacts.org**





# Decreasing Deforestation

The livestock sector is annihilating forest regions. Around the world, forests are cleared through fires and cutting to (1) make pasture to graze cattle and (2) grow monocultures of GMO feed crops for factory farmed animals. Most dramatically, cattle ranching is responsible for an astounding 80% of current deforestation rates in the Amazon.<sup>14</sup>

## Forest Fires

Setting fires to clear forests for cattle grazing and livestock feed is a common and ongoing industry practice. Many of the 85,000+ fires in the Amazon rainforest that shocked and stunned the world in 2019 were intentionally set as a slash-and-burn standard operating procedure.<sup>15</sup>

On the one hand, it was a drastic increase of 30% more forest fires than in 2018. On the other hand, it's unconscionable that it's "only" a 30% increase over the 68,000+ fires in 2018.<sup>16</sup>

In addition to the tens of thousands of fires that are intentionally set every year, global warming creates conditions for fires that are much more intense, frequent, and devastating.


## Soy for Livestock Feed

Soy used for livestock feed is the second largest driver of deforestation after beef.

While soy is often associated with plant-based diets, only a very small percentage of the world's soy crop is used for human-grade food—and much of that is organic, mostly grown in North America, Europe, and Asia.<sup>17</sup>

The vast majority of the world's soy crop is produced for livestock feed using pesticide-laden, GMO monocultures in Central and South America.<sup>18</sup> This is not only bad for the Earth, but also bad for our health as pesticides (similar to the hormones and antibiotics in conventional livestock feed) concentrate in animals' flesh and their products (meat, dairy and eggs), and are then consumed by people.

In the United States, the poultry industry (including eggs) consumes more than half of all soymeal fed to livestock;<sup>19</sup> followed by pigs, cattle, and even fish. Indeed, more than half of global salmon producers use soy sourced from Brazilian rainforest.<sup>20</sup>



For decades, the U.S. government's Bureau of Land Management (which critics call the Bureau of Livestock and Mining) have been cutting down huge tracts of forest in the West to create pasture for cattle and to grow feed crops for livestock. Now the government is planning to clear more than seven million acres of old growth pinyon-juniper forest in Nevada, Utah, and Idaho, as part of a massive deforestation project on behalf of the cattle industry.<sup>21</sup>



# Rewilding and Reforestation

Saving and replanting forests is imperative in our efforts to reverse the climate crisis.

**Trees not only sequester carbon, they also remove existing carbon dioxide from the atmosphere through the natural process of photosynthesis.**

Climate scientists have noted that conserving forests, along with large-scale planting of more trees globally, could provide about one-third of the climate mitigation that is urgently needed in the next ten years.<sup>22</sup>

But where could we get that much land? Better food and farming practices, for starters.

According to Oxford researchers, a global shift to plant-based diets could free up 75% of agricultural land and still plentifully feed the world.<sup>23</sup>

This shift toward plant-based diets is a critical step in our efforts to keep global temperatures below catastrophic levels as it allows us to conserve, reforest, and rewild immense tracts of land.

As an international consortium of scientists recently noted:

“Restoring natural vegetation, such as forest, is currently the best option at scale for removing CO<sub>2</sub> from the atmosphere, and must begin immediately to be effective within the required timescale of reaching net zero emissions by 2050. The livestock sector, having largely displaced natural carbon sinks, continues to occupy much of the land that must be restored. Without such land restoration, CO<sub>2</sub> removal from the atmosphere relies on methods currently unproven at scale, increasing the risk of temperatures rising high enough to tip various Earth systems into unstable states.”<sup>24</sup>

*Reforestation is great.*

*Preventing deforestation is better!*

Reforestation is an incredibly powerful tool we have to proactively reverse some of the harm that has already been caused. But it's important to understand that **preventing deforestation is far better than replanting trees** after the forests have been destroyed.

Once deforestation has released the stored carbon of a mature forest, it takes decades for a replanted forest to sequester the same amount of carbon back from the atmosphere. Fortunately, shifts to plant-based foods help on both fronts.







# True Cost of Dairy

The dairy industry is also a major contributor to climate change and environmental degradation. One gallon of cow's milk emits 3x more greenhouse gases than one gallon of soy milk, and requires 22x more water and 12x more land.<sup>25</sup>

## *Global Warming*

Like cattle used for beef, dairy cows emit immense amounts of methane.

A single dairy cow can produce between 250-500 liters of methane per day.<sup>26</sup> This doesn't include their manure, which releases sufficiently high quantities of methane for the EPA to classify "manure management" as a separate category of methane emissions.

To illustrate the scope of the problem, consider that one mid-sized dairy cow has a similar climate impact to driving from Los Angeles to New York—three times! Now multiply that by almost 10 million dairy cows in the U.S. alone.<sup>27</sup>

**Dairy-based cheese is actually the third most climate-harming of all foods** (after beef and lamb) because it is concentrated dairy, requiring about 10 pounds of milk to produce just one pound of cheese.<sup>28</sup>

## *Water Depletion & Pollution*

While dairy cows are fed some soy, their biggest feed crop in the United States is alfalfa, an extremely water-intensive crop. Though prone to prolonged droughts, California is both the biggest dairy producer and the biggest alfalfa producer in the U.S., with 75% of all alfalfa grown in the state used for dairy cattle feed.<sup>29</sup>

Dairy cattle also have the highest daily drinking water requirement per unit of body weight. Between water for their hydration and irrigation for their feed crops and pasture, dairy farming uses more water than any other activity in California (much more than almond producers).<sup>30</sup>

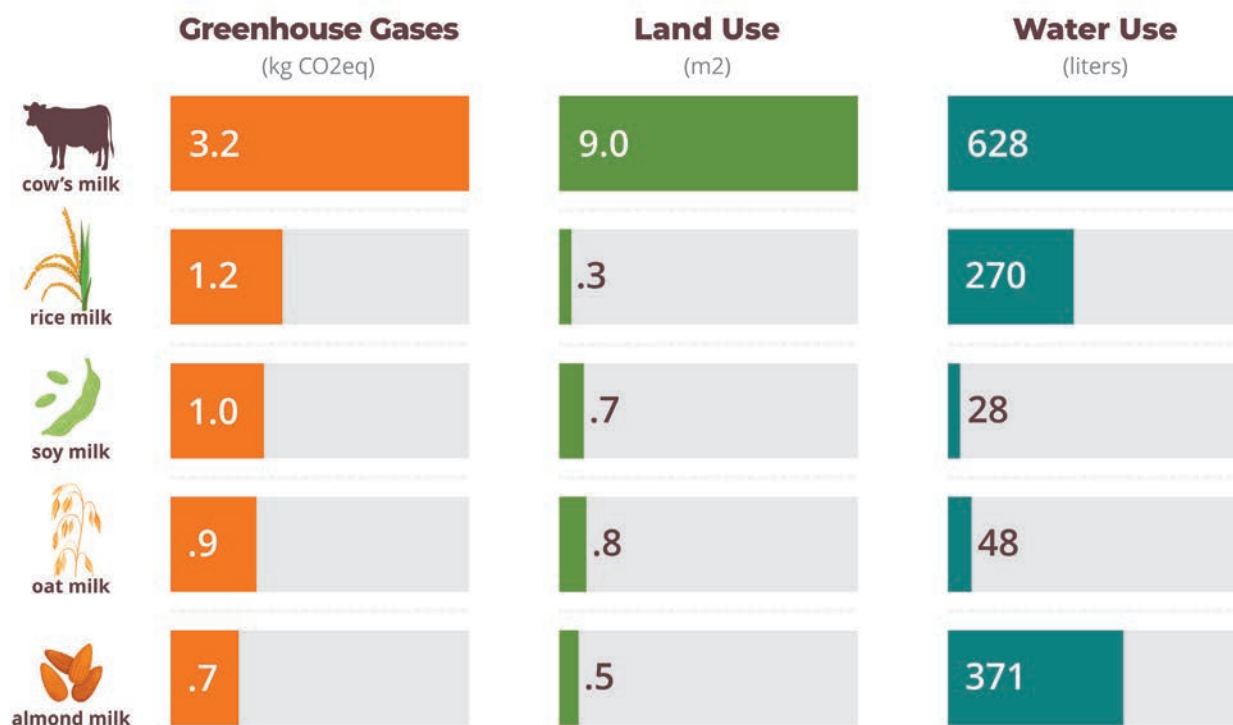
Dairy farms are also poisoning America's rivers. Manure from dairy farms seeps into aquifers and elevates nitrogen levels to the point of creating toxic "dead zones" that kill huge fish populations en masse, and contaminate drinking water for humans and wildlife alike.<sup>31</sup>



# Dairy vs. Plant-Based Milks

Whatever your motivation, choosing plant-based milk is a win-win. In fact, nearly half of U.S. and European consumers are purchasing plant-based milk. In Asian and Latin American countries, the figure jumps to more than two-thirds, making plant-based milk the top-selling product of all meat and dairy alternatives.<sup>32</sup>

## Which milk is best for the planet?



Poore & Nemecek (2018) Reducing Food's Environmental Impacts Through Producers and Consumers. *Science*



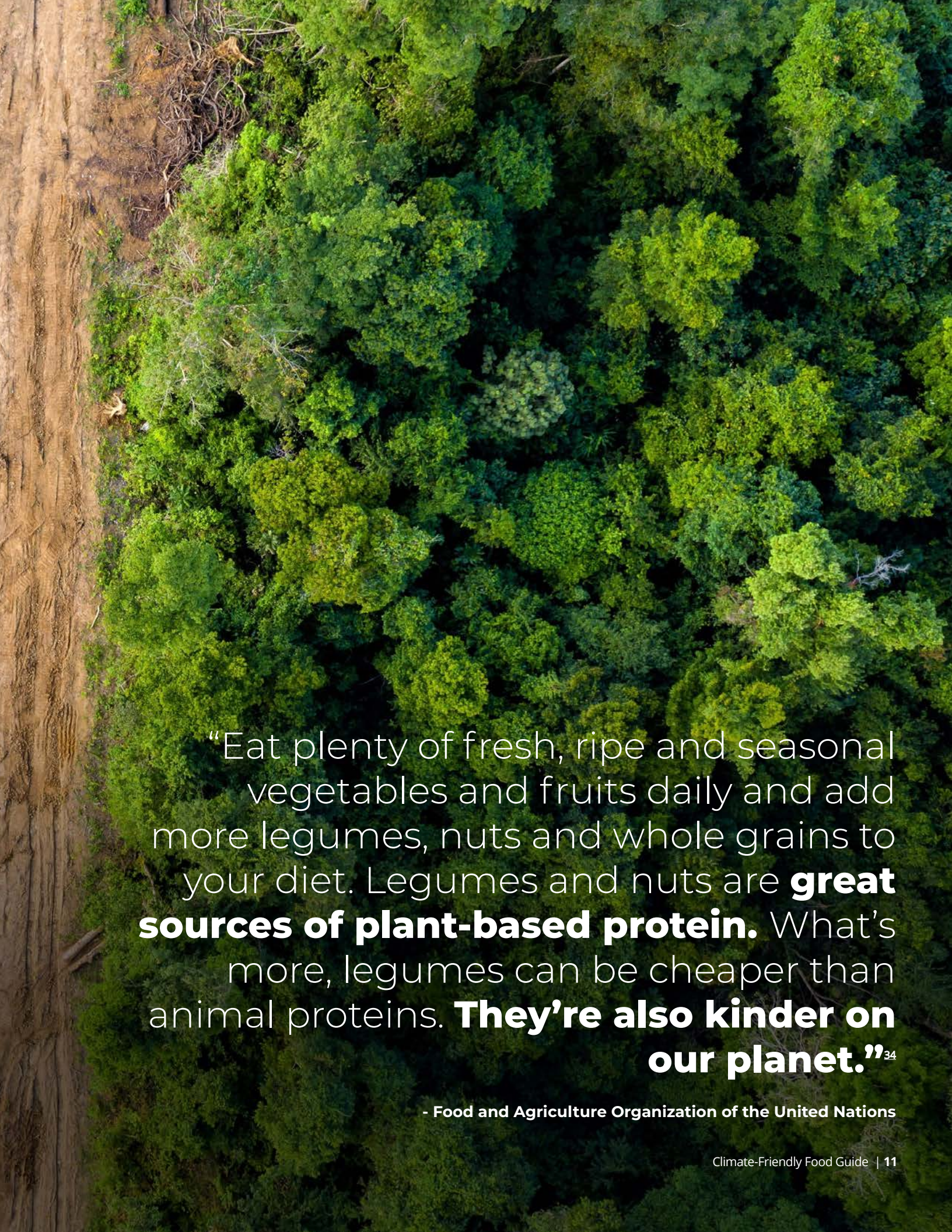
An aerial photograph showing a large area of land with extensive, parallel, wavy tracks from heavy machinery, likely a bulldozer, indicating recent clearing of vegetation. The ground is a mix of brown soil and some sparse green grass. In the upper right quadrant, a small blue and black piece of equipment, possibly a chainsaw or a small tractor, is visible. The overall scene depicts active deforestation.

Aerial photo of deforestation in progress.

**“That vast expanse of pastureland,** from which we obtain so little at such great environmental cost, **would be better used for rewilding... the returning forests,** wetlands and savannahs are likely to **absorb far more carbon** than even the most sophisticated forms of grazing.”<sup>33</sup>

- George Monbiot, journalist and recipient of the United Nations Global 500 Award for Outstanding Environmental Achievement.



An aerial photograph of a dense, lush green forest. The trees are thick and vibrant, filling most of the frame. On the left side, there is a narrow, light-colored sandy path or clearing that runs vertically. The overall scene is a healthy, thriving natural environment.

“Eat plenty of fresh, ripe and seasonal vegetables and fruits daily and add more legumes, nuts and whole grains to your diet. Legumes and nuts are **great sources of plant-based protein.** What’s more, legumes can be cheaper than animal proteins. **They’re also kinder on our planet.**”<sup>34</sup>

- Food and Agriculture Organization of the United Nations



# Health Benefits

Government health boards around the world support whole foods plant-based diets as healthful at all stages of life and useful in the prevention of numerous diseases.<sup>35</sup>

A 2019 study published in the *Proceedings of the National Academy of Sciences* modeled the health, environmental, and economic impacts of four different diets and found that **a plant-based diet by far had the most benefits**. They noted that a global shift to plant-based diets could prevent 8.1 million premature deaths by 2050, cut food related GHG emissions by 70%, and save as much as one trillion U.S. dollars (\$1,000 billion) per year on healthcare and lost work due to sick days.<sup>36</sup>

Additionally, in one of the largest multi-year studies of its kind, which looked at more than 81,000 participants, researchers found that people who consumed large amounts of protein from meat experienced a 60% *increase* in cardiovascular disease (CVD), while people who consumed large amounts of protein from nuts and seeds experienced a 40% *decrease* in CVD.<sup>37</sup>

Leading U.S. health care provider Kaiser Permanente, with more than nine million health insurance subscribers, has urged physicians to recommend a plant-based diet to all their patients. They note, "Healthy eating may be best achieved with a plant-based diet..." and **"Physicians should consider recommending a plant-based diet to all their patients**, especially those with high blood pressure, diabetes, cardiovascular disease, or obesity."<sup>38</sup>







# Plenty of Protein

## *Healthy People*

It's easy to get enough protein from plant-based foods. According to Harvard researchers, Americans consume nearly twice the recommended daily allowance of protein.

The researchers further note that “extra protein is not used efficiently by the body and may impose a metabolic burden on the bones, kidneys, and liver. Moreover, high-protein/ high-meat diets may also be associated with increased risk for coronary heart disease due to intakes of saturated fat and cholesterol or even cancer.”<sup>39</sup>

## *Healthy Planet*

Compared to plant proteins such as beans, peas and lentils, beef requires 6x more water, 20x more land, and emits 20x more GHG emissions per gram of edible protein.<sup>40</sup>

In fact, Oxford researchers found that even the least sustainably grown plant-based proteins overwhelmingly have a much smaller carbon footprint than the most sustainably produced animal-based foods.<sup>41</sup> They conclude:

**“Avoiding consumption of animal products delivers far better environmental benefits than trying to purchase sustainable meat and dairy.”<sup>42</sup>**





# Helpful Hints

## *Find Your Pace*

Some people make big changes with ease. For those who prefer to transition in increments, here are a few ideas. Start with particular days to go plant-based (weekdays or weekends)—or particular meals—or particular places (home vs out). Another option is picking a percentage. For example, begin by adopting a 50% plant-based diet and work your way up. The more plant-based the better.

## *Be Prepared*

Keep your pantry, fridge, and freezer stocked with a few staples that make it easy to throw together a satisfying meal even in a pinch. Pasta, rice, and quinoa all make a great base for whatever beans and vegetables you have available. Keep peanut butter, hummus, or your other favorite spreads handy for sandwiches or dips. Don't forget seasonings and other flavor enhancers like sriracha, soy sauce, and nutritional yeast.

## *Pack on Protein*

High-protein foods leave you feeling fuller longer, so it's important to include some in your daily meals. Legumes (beans, peanuts, peas, lentils, and soy), nuts, seeds, and whole grains are all great sources of protein. Nut butters and hummus are easy spreads to keep on hand for a quick meal or snack.

## *Add B12*

Vitamin B12 is the only nutrient essential to human health that cannot be obtained from plants or sunlight. Since modern food sanitation practices largely eliminate soil as a source of B12 for humans, many people (especially those eating plant-based) should take a B12 supplement. Check the vitamin section of grocery stores or online for easily available and inexpensive options.



# Fun Food Swaps\*

Check out the many plant-based versions of popular foods at your local grocery store. You can also search for great recipes online. Just add the word “vegan” to your dish.

## Meat



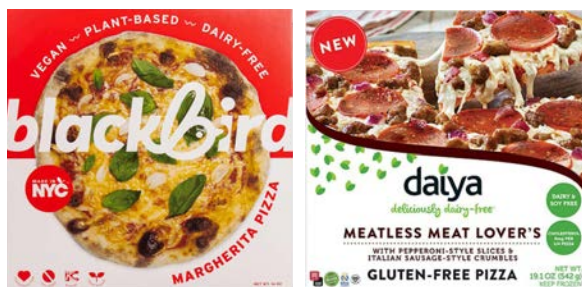
## Eggs



## Dairy



## ... Pizza



## ... and more



The products shown are examples of common plant-based alternatives to popular animal-based foods. This list is not comprehensive and not based on perceived superiority to other products. It is for illustrative purposes only and no compensation was received for product listings.

\*These are great transition and fun foods. To maximize health benefits, it's unprocessed, whole plant foods for the win.





# tofu scramble

Here's a hearty, protein-packed way to start your day. Instead of eggs, use this very simple recipe as a base, then customize your morning (or anytime) scramble.

Sauté onion and/or garlic (oil optional), crumble in block of extra firm tofu (water can be pressed out first), and add in turmeric (for color, taste, and nutrition). Cook until tofu and toppings reach desired consistency. Can also be paired with plant-based meats and cheeses.

## *Popular Add-Ins:*

- ◆ Peppers
- ◆ Tomatoes
- ◆ Spinach
- ◆ Mushrooms
- ◆ Scallions
- ◆ Nutritional Yeast

## *Popular Seasonings:*

- ◆ Black Salt
- ◆ Turmeric
- ◆ Paprika
- ◆ Mustard
- ◆ Pepper



# chickpea salad

Keep chickpeas whole for a salad (on its own or with lettuce)—or—mash together for a delicious alternative to tuna, chicken, and egg salad. Either variety is great on its own or on top of lettuce, crackers, or bread. Stir with mustard and plant-based mayo (ex: Just Mayo, Veganaise, etc). Another fun variation is to use a creamy salad dressing. There are lots of delicious plant-based dressings: Ranch, Caesar, Thousand Island, Goddess, and more.

## *Popular Add-Ins:*

- ◆ Celery
- ◆ Carrots
- ◆ Peppers
- ◆ Scallions
- ◆ Relish (Dill or Sweet)

## *Popular Bases:*

- ◆ Lettuce
- ◆ Crackers
- ◆ Bread





# power bowl

Cook whole grains such as rice or quinoa according to package directions (usually simmering two parts water to one part dry grain, or try a 90-second microwave packet). For extra flavor, use vegetable broth instead of water.

Pair with a colorful variety of nutrient-dense vegetables, legumes, and seeds. Serve separated or mixed together... hot or cold. Add a squeeze of lemon or lime juice, olive oil, sea salt, and/or ground black pepper to taste.

## Popular Add-Ins:

- ◆ Black Beans
- ◆ Chickpeas
- ◆ Broccoli
- ◆ Cauliflower
- ◆ Spinach/Kale
- ◆ Mushrooms
- ◆ Tomatoes
- ◆ Peppers
- ◆ Onions/Scallions
- ◆ Carrots
- ◆ Corn
- ◆ Dried Fruit
- ◆ Chia Seeds
- ◆ Sesame Seeds



# fruit ice cream

Blend a frozen banana with a small amount of non-dairy milk and your favorite frozen berries (pro tip: add half a packet of frozen acai to supercharge it). Blend on high, pausing to scrape the sides as needed since it will be thick. While blending, add in other delicious fruits, greens, and/or nut butters.

Scoop into a chilled bowl, add your favorite toppings, and enjoy! Short on time? Add more non-dairy milk to make it an easy-to-drink smoothie or shake.

## Popular Add-Ins

- ◆ Fruit (frozen)
- ◆ Spinach/Kale (frozen)
- ◆ Walnut/Flax Powder
- ◆ Protein Powder
- ◆ Nut Butters

## Popular Toppings:

- ◆ Fruit (fresh)
- ◆ Chocolate Chips
- ◆ Coconut Shreds
- ◆ Nuts/Seeds
- ◆ Granola





## Not sure where to start?

Check out ProVeg International's **FREE 30-Day Veggie Challenge** at:

**VeggieChallenge.net**

Join the Veggie Challenge to enjoy delicious plant-based foods for 30 days (or more). It's better for your health, better for the planet, and better for animals.

Get a healthy start with your personal challenge. ProVeg's online community will help you along the way with shared recipes, tips, and inspiration.

## References

Click the linked reference number in the PDF or view the list online at **ClimateFoodGuide.org/NewRoots**.

To cite this guide as a reference, please list **A Well-Fed World** as the source/author.

# Resources

### *Personal Health*

NutritionFacts.org | VeganHealth.org  
PCRM.org | PAN-Int.org

### *Global Hunger*

A Well-Fed World | AFWF.org  
Plants4Hunger | Plants4Hunger.org

### *Environment*

A Well-Fed World | AFWF.org/Climate  
Brighter Green | BrighterGreen.org  
Center for a Livable Future | CLF.jhsph.edu  
Center for Biological Diversity | BiologicalDiversity.org  
Food and Climate Alliance | FoodClimate.org  
World Resources Institute | CoolFoodPledge.org

### *Veg Guides and Recipes*

ChooseVeg.org | TryVeg.com | Veganuary.org  
AfricanAmericanVeganStarterGuide.com

### *Restaurants/Travel*

HappyCow.org (free app also available)

### *Films*

Game Changers | PlantPure Nation | Forks Over Knives

### *Books*

How Not to Die | How Not to Diet (Dr. Michael Greger)  
Your Body in Balance | The Cheese Trap (Dr. Neil Barnard)  
Eat For Life | Super Immunity (Dr. Joel Furman)  
By Any Greens Necessary | Ageless Vegan (Tracye McQuirter)  
The Inspired Vegan (Bryant Terry)  
No Meat Athlete (Matt Frazier and Matt Ruscigno)  
The Plant-Based Diet for Beginners (Gabriel Neller)



# New Roots Institute

[New Roots Institute](#) empowers students to move beyond eco-anxiety and become active participants in climate solutions by working together to transform factory farming into more sustainable food system.

Our [interactive high school and college lessons](#) inspire critical thinking and dynamic discussions about our food system, while our [leadership development programs](#) train students to become tomorrow's leaders in the movement to end factory farming.

Take action by [scheduling a lesson](#) or [applying to become a fellow](#) to help build a more just and sustainable future.



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## A Well-Fed World

[A Well-Fed World](#) is a global food security, hunger relief and climate advocacy organization advancing plant-based foods and farming to create a world that is healthy, well-fed, and kind... all at the same time.

Our plant-based hunger relief and disaster relief programs provide immediate assistance nourishing people in need, while our [research and advocacy programs](#) accelerate structural change to maximize the well-being of people, animals, and the planet.

Check out our [Plants-4-Hunger](#) gift-giving campaign, perfect to give AND receive! Plants-4-Hunger provides a compassionate, climate-friendly alternative to Heifer International and other holiday livestock donations.





**“I am a vegan for ethical,  
environmental and climate reasons.”**

~ Greta Thunberg



Save for gift-donations or share by leaving a copy at a coffee shop, doctor's office, or with a friend.  
Visit us online to order copies and for more resources and recipes.

**ClimateFoodGuide.org**