

Food Choices and the Environment

Problems and Solutions

Food. Agriculture. Garbage. Species extinction. Massive deforestation. Greenhouse gases. What we grow, manufacture and eat impacts the environment and can worsen climate change—or help our planet heal. Read more about problems in our food chain as well as creative solutions to protect the environment while we choose what to eat.

Problems in our Food Chain

Agricultural activity, including crop and livestock farming, threatens more animal species with extinction (5,407) than urban development (3,014), pollution (1,901) and climate change (1,688).¹ (see **Figure 1**) Causes and impacts are intertwined; for example, deforestation to create land for cattle grazing also increases pollution both directly (fire used to burn forests; methane from the cows; manure waste) and indirectly (removal of trees that hold carbon).

Figure 1



<https://www.nature.com/news/biodiversity-the-ravages-of-guns-nets-and-bulldozers-1.20381>

The biggest losses of forest have been in Brazil, Indonesia and Myanmar, where a total of 2.4 million hectares of forest are lost each year according to the United Nation's Food and Agriculture Organization (UNFAO)². That's an area of land equal to Rwanda or Djibouti.

To put the values into perspective: Each year, Indonesia loses tropical forest the size of the Swiss canton of Graubünden; Myanmar loses forest the size of the canton of Valais (Wallis); and Brazil loses enough rainforest to cover over a quarter of Switzerland (**Figures 2 and 3**).

Figure 2

BRAZIL: Area of rainforest lost each year is approximately ¼ of Switzerland
(Figure depicts forest loss after 5 years)



Map from CIA World Fact Book. Rainforest loss depiction by author.

¹ <https://www.nature.com/news/biodiversity-the-ravages-of-guns-nets-and-bulldozers-1.20381>

² <http://www.fao.org/faostat/en/#data/GF>

Figure 3
INDONESIA: Amount of rainforest lost each year is area the size of Canton Graubünden



Rainforest loss depiction by author.

In fact, between 1990 and 2016:

- Brazil’s forest area decreased as a percent of land area from 65% to 59%
- Indonesia’s forest area decreased from 65% to 50%
- Myanmar’s forest area decreased from 60% to 44%.³

That means Brazil lost 10% of its forest, and Myanmar and Indonesia each lost about a quarter of their forest cover^{4,5} (see **Figure 4**).

Problem Foods

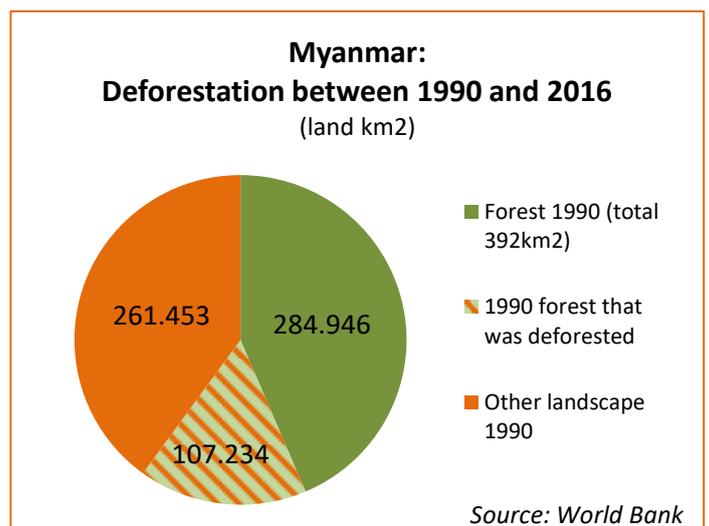
Certain types of food are more likely to be grown or bred using environmentally-unfriendly methods, starting when woodland is burnt or destroyed to create crop or cattle farms.

In Brazil, 80% of the Amazon rainforest that has been converted to agriculture has been for cattle ranches.⁶ **Beef** production uses 28 times more land, 11 times more irrigation water, produces 5 times more greenhouse gases and 6 times more reactive nitrogen (fertilizer) than the average production of dairy, poultry, pork or eggs.⁷

Soybeans are another problem. When 6,800 square miles of grassland in Brazil was converted to soybean farms, over 200 million tons of CO2 was released.⁸ Soybeans are primarily grown as feed for meat and dairy cattle—but they are also made into tofu and soymilk.

Should you worry about your tofuburger? No. While 100 grams of tofu produces an average of 2 kg of CO2

Figure 4



³ <https://data.worldbank.org/indicator/AG.LND.FRST.ZS>

⁴ <https://data.worldbank.org/indicator/AG.LND.FRST.K2>

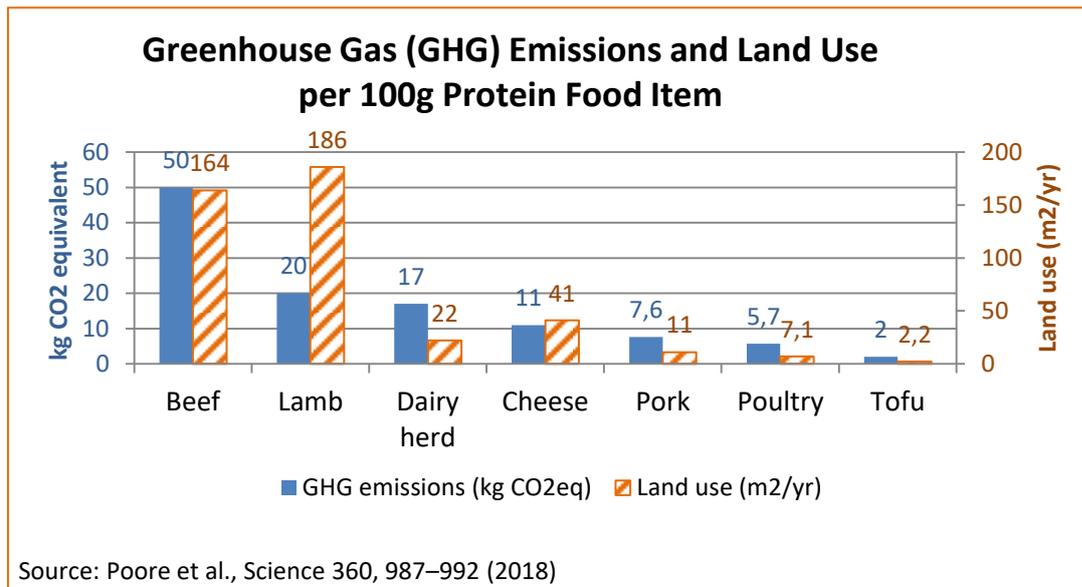
⁵ [Global Forest Watch](#)’s satellite data calculations lists different values for amount of deforested and reforested land; their maps show the amount of tree cover and tree cover loss around the world

⁶ <https://engagethechain.org/> (Ceres)

⁷ <https://www.pnas.org/content/111/33/11996>

⁸ <https://engagethechain.org/> (Ceres)

equivalent greenhouse gas emissions (GHG), 100g of beef causes 50 kg of GHGs⁹—so the damage comes mostly from feeding soybeans to livestock, not from growing the beans themselves.



Palm oil is also an environmental hazard, for reasons similar to beef in South America. Indonesia is now a major source of greenhouse gases, due to its tropical forests being burned and carbon-rich peat swamps being drained (releasing the CO₂) in order to create palm oil plantations. Palm oil is popular because it is solid at room temperature, versatile in manufacturing, and very cheap. Palm oil is used in everything from food such as crackers, chips, chocolate, and ice cream to household products including toothpaste, shampoo, makeup, and detergent.

While some people argue that palm oil is a more efficient crop, that is, more oil can be produced per hectare of land than other vegetable oils,¹⁰ those calculations often ignore that it takes seven years for a tree to begin yielding fruit and years more until it produces the maximum yield. In addition, the trees need to be replaced every 30 years, beginning the growing cycle again. On the other hand, rapeseed oil, common in Switzerland, and sunflower oil can both be grown sustainably, without destruction of rainforest, and with yields more similar to palm oil's when the palm tree lifecycle is taken into consideration.

Don't make the solution a new problem

Some answers are obvious. Eating less meat and dairy, in particular from corn or grain-fed cattle, will be better for the environment. Sometimes solutions are more complex, such as when reducing environmental harm in one area increases it in other ways.

Food waste is an enormous problem. Supermarkets reject produce that isn't "pretty" (i.e., has cosmetic blemishes or isn't perfectly shaped) because it won't appeal to consumers; also, households don't use all of the groceries they buy. In Switzerland 52kg of food per person is thrown out each year, most often fruits and vegetables, bread, and meat.¹¹ Of the 2.6 million tons of food wasted each year in Switzerland, 39%

⁹ <https://science.sciencemag.org/content/360/6392/987/tab-pdf>

¹⁰ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4834613/pdf/LITE-28-65.pdf>

¹¹ <https://foodwaste.ch/was-ist-food-waste/>

comes from consumers and 37% is wasted by food manufacturers.¹²

Startups in various countries try to reduce food waste by diverting and using food that would otherwise be thrown out. However, some of these companies ship the fruits, vegetables, nuts and other goods (such as boxes of pasta with an old design after a new packaging style has been launched) to customers' doors. While these services prevent the food from being thrown away, the mail delivery and individual packaging increases carbon dioxide.

Food Solutions

Creative programs exist that both promote fruit, vegetables, and more natural food while simultaneously helping the environment. I highlight a few here, without endorsing any specific commercial products.

- **Organic produce** is grown by [Brooklyn Grange Farm](#) on the roofs of three large buildings in New York City. The soil on these roofs absorbs more than 2 million liters of rain every year, reducing the Combined Sewage Overflow that inundates water treatment plants after heavy rainfalls. The green roofs also reduce the heat absorbed during hot summer days and reflected back into the city at night.¹³ [Swissponic](#) meanwhile developed a hydroponic farming system people can have in their homes, saving transportation costs and reducing water usage in addition to CO₂.



Brooklyn Grange Farm – rooftop farm

France went even further, passing a law in 2015 requiring roofs of new commercial buildings be partially covered with plants or have solar panels.

- Creative consumer products are being made out of **manufacturing and agricultural food waste**, known as **upcycling**, part of the **circular economy**. A few examples of entrepreneurial creativity: American company [Regrained](#) takes the leftover grains from making beer and turns them into snack bars, Kenya-based [Azuri](#) buys excess mangos from farmers and turns them into dried fruit and flour, and the Dutch company [Kromkommer](#) turns “wonky” produce into soup.
- **Avoid palm oil (unless it's organic*)**. Scientists are trying to find alternatives to palm oil, including using algae, [yeast](#), and [coffee grounds](#), but it's been challenging developing an environmentally sustainable and affordable substance that has palm oil's advantages.

Other products can also be made out of food byproducts. For example, [Agralooop](#) converts pineapple leaves, banana tree trunks, sugar cane bark, and rice straw (see photo) into a natural fiber that is then made into clothes, while [AlgiKnit](#) makes biodegradable yarn from kelp and [Aeropowder](#) turns feathers from the poultry industry into packaging material. One very exciting new discovery is a biodegradable, organic plastic made from fish skins and scales, made by [Marinatex](#).



Another option is to use a website such as [Umweltblick](#), that lists products made without palm oil.

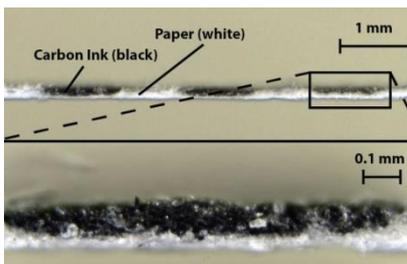
¹² <https://www.bafu.admin.ch/bafu/en/home/topics/waste/guide-to-waste-a-z/biodegradable-waste/types-of-waste/lebensmittelabfaelle.html>

¹³ <https://www.brooklyngrangefarm.com/sustainability1>

*In actuality, palm oil itself isn't the problem, the trouble lies in how it's mass-produced at the cost of tropical rain forests. Some organizations (such as Rapunzel.de and BioSuisse) certify their palm oil as being sustainable, that is, made without cutting down original forests, destroying peat bogs, or harming wildlife. The Roundtable on Sustainable Palm Oil (RSPO) and the Palm Oil Innovation Group (POIG) work throughout the food supply chain to improve the environmental practices of palm oil growers and manufacturers, though RSPO is not without critics who say its standards are too low.

- Consumers can **choose products with more environmentally-friendly ingredients and manufacturing**. Voting with your wallet is a good way to tell stores what products you want them to carry. Personally, I won't buy produce that is wrapped in plastic or packaged with styrofoam; if that means I can't buy an important ingredient, then I cook something else for dinner.
- Preventing **grocery waste** is also important. In the Netherlands, supermarket Jumbo has a shelf stocked with items made from food that would have been discarded or used for animal feed. The store sells soup from non-perfect vegetables, granola, beer, soap, ketchup and tea. The program is part of an initiative by Dutch verspillingsverrukkelijk (Waste is Delicious).

On the technical end, researchers at Imperial College in England have developed a very cheap [prototype sensor](#) made out of non-toxic, biodegradable paper (see photo) that can detect gases such as ammonia that are emitted when food starts to spoil; customers can read the sensor data via smartphones before buying the item. The



results are more

accurate than

existing sensors and cost only USD 0.02 (2 cents) to make.

Replacing less-accurate "use by" dates with actual information about each package means retailers will be able to sell food longer and consumers will have a bigger window in which to eat the food—which will result in less food being thrown out.

Another way to reduce food waste is to prevent food in stores from being thrown away. Too Good Too Go connects consumers in Europe (including Switzerland) with bakeries, restaurants, supermarkets and hotels; customers order leftover or unsold food available at the end of the day at a discount via app and pick up food that otherwise would have been thrown out. Stores reduce their waste and customers save money. Food Sharing Schweiz collects food from restaurants in major cities and regions and offers it for free to the public, with the help of local organizers. Yes, free food.

We have serious challenges ahead of us to create an environmentally sustainable society, including bringing food production and lifestyle choices into a healthier balance. When we choose what we eat, it's easy to ignore the unseen consequences. Instead, we should take advantage of the increasing opportunities we have to make positive, environmentally-friendly food choices.