

The most damaging farm products?

Organic, pasture-fed beef and lamb



Some 28% of the world's land is used for grazing. Photograph: Anadolu Agency/Getty Images

Analysis: You may be amazed by that answer, but the area of land used for grazing is vast compared with the meat and milk produced

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[George Monbiot](#)

[@GeorgeMonbiot](#)

Tue 16 Aug 2022 13.26 BST

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Perhaps the most important of all environmental issues is land use. Every hectare of land we use for extractive industries is a hectare that can't support

wild forests, savannahs, wetlands, natural grasslands and other crucial ecosystems. And farming swallows far more land than any other human activity.

What are the world's most damaging farm products? You might be amazed by the answer: organic, pasture-fed beef and lamb. I realise this is a shocking claim. Of all the statements in my new book, *Regeneration*, it has triggered the greatest rage. But I'm not trying to wind people up. I'm trying to represent the facts. Let me explain.

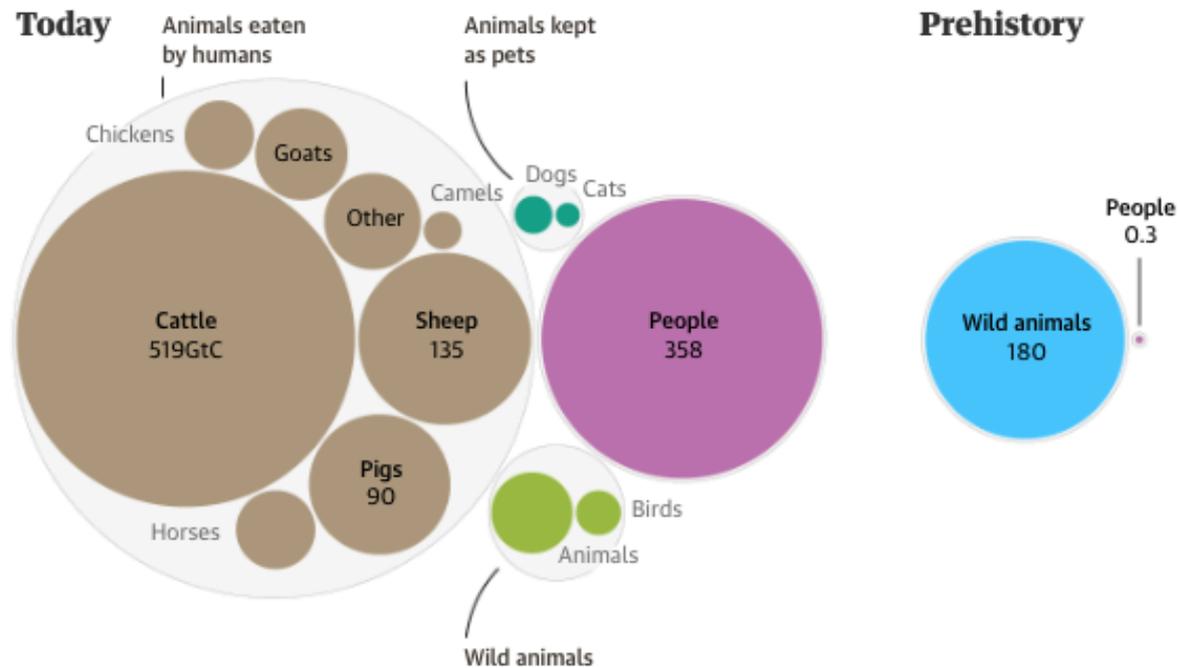
Arable crops, some of which are fed to farm animals, occupy 12% of the planet's land surface. But **far more land (28%)** is used for grazing: in other words, for pasture-fed meat and milk. Yet, across this vast area, farm animals that are entirely pasture-fed **produce just 1% of the world's protein**.

Livestock farmers often claim that their grazing systems "mimic nature". If so, the mimicry is a crude caricature. **A review of evidence from over 100 studies** found that when livestock are removed from the land, the abundance and diversity of almost all groups of wild animals increases. The only category in which numbers fall when grazing by cattle or sheep ceases are those that eat dung. Where there are cattle, there are **fewer wild mammals, birds, reptiles and insects on the land, and fewer fish in the rivers**. Perhaps most importantly – because of their crucial role in regulating living systems – there tend to be no large predators.

We don't think about large predators in the UK, because we've exterminated them. Efforts to bring back lynx and wolves have so far been thwarted by the objections of livestock farmers. In the United States, where big carnivores still exist, federal and state agencies wage war against them on behalf of cattle and sheep farmers, often with astonishing brutality. A federal body called Wildlife Services uses poisoned baits, snares and leghold traps and shooting from planes and helicopters to kill wolves, coyotes, bears and bobcats. Its agents have incinerated pups in their dens, or dragged them out and clubbed them to death.

The global mass of farm animals is now 22 times the weight of all wild animals

Terrestrial-vertebrate-weight, gigatonnes of carbon



Guardian graphic. Source: National Food Strategy analysis based on: Bar-On, Y. M., Phillips, R., & Milo, R. (2018). The biomass distribution on Earth, Proceedings of the National Academy of Sciences

Perhaps its most controversial killing tools are **cyanide landmines**: spring-loaded canisters of sodium cyanide planted in the ground, that spray the poison into the faces of animals that trip them. They've killed a wide range of endangered species, dozens of domestic dogs **and at least one person**. There are very few places – mostly parts of eastern and southern Africa – in which livestock farmers tolerate large predators, generally where tourism revenues are high.

Even if we manage to ignore this crucial ecological issue, there's still a massive problem. Many livestock farmers now claim to practise "regenerative grazing". The minimum definition of ecological regeneration is permitting trees to return to formerly wooded lands. In the uplands of Britain, to judge by **the experience of deer managers**, this means a maximum of about one sheep for every 20 hectares (50 acres). They might as well not be kept at all. In the lowlands, the **Knepp rewilding project** in Sussex **shows how far production has to fall** to permit the return of trees and other wildlife: it generates just 54kg of meat a hectare. If, as many chefs and foodies and some environmentalists propose,

meat were to come only from regenerative farms, it would be so scarce that only millionaires would eat it.

In reality, the great majority of “regenerative” pasture-fed meat is nothing of the kind. It’s rebranded ranching, arguably the most destructive industry on Earth. In the US, livestock grazing is the **primary reason for land degradation**. It has caused an invasive species called cheatgrass to sweep across North America, **devastating ecosystems**. Cattle fencing excludes wild herbivores and stops migration. The supposedly-greener methods some ranchers call “**holistic management**” or “planned grazing” are **just as bad** for wildlife as **conventional ranching**.

In the UK, **my estimates** suggest that some 4m hectares of hill and mountain are used for sheep farming. Almost all this land, much of which would otherwise **support temperate rainforest**, is treeless, as tree seedlings are highly nutritious and selectively eaten by sheep. There are more trees for each hectare **in some parts of inner London** than there are in the “wild” British hills where sheep graze. The remaining vegetation is **badly degraded**.

Four million hectares is 22% of the entire farmed area. It’s roughly equivalent to **all the land used** to grow grain in this country, and 23 times the area used for growing fruit and vegetables. But, in terms of calories, lamb and mutton supply **just over 1% of the UK’s food**.

Animal Rebellion staged a protest in London’s Smithfield meat market in 2019. Photograph: Ollie Millington/Getty Images

Pasture-fed meat production, in other words, is the major cause of **agricultural sprawl**. People rail against urban sprawl: the profligate use of land for housing and infrastructure. But the world’s urban areas occupy **just 1% of the planet’s land surface**, in comparison with the 28% used for grazing. Agricultural sprawl inflicts a very high ecological opportunity cost: the missing ecosystems that would otherwise exist.

This is matched by the carbon opportunity cost of pasture-fed beef and lamb. Meat production has two kinds of global heating impact: its climate current account, which means the gases released by farming animals; and its climate capital account, which means the carbon dioxide the land could absorb if it were rewilded. The current account is dominated by the powerful greenhouse gases

methane and nitrous oxide. Organic beef farms, whose animals take longer to raise and **need even more land**, lose twice as **much nitrogen** for each kilo of meat as conventional beef farms. In most cases, their current account emissions are astonishingly high, even in comparison with conventional beef farming, though some organic experiments, such as **FAI Farms at Wytham in Oxfordshire**, have found ways to reduce the time it takes for cattle to fatten.

Ranching's capital account is always in debt, because **wild ecosystems store more carbon** than the fields and pastures that have taken their place. These debts can be enormous. A **study of carbon opportunity costs** published in Nature found that, while the global average cost of soybeans is 17kg of carbon dioxide for each kilogram of protein, the average carbon opportunity cost of a kilogram of beef protein is an astounding 1,250kg. **Another paper** calculates that if we all shifted to a plant-based diet, the carbon drawn down from the atmosphere by recovering ecosystems would be equivalent to the world's fossil fuel emissions from the previous 16 years.

The livestock industry **has fought back** with a massive public relations campaign, seeking to persuade people that pasture-fed meat helps reduce global heating by storing carbon in the soil. Yet, despite **the many claims**, there is **no empirical evidence** that carbon storage in pastures can even compensate for **grazing's current account emissions**, let alone address the capital debt. Just as the oil industry **tried to convince us** that CO₂ was good for the planet on the grounds that it's "plant food", the ranching industry has **sought to sow doubt and confusion** about its vast environmental impacts.

We live in a bubble of delusion about where our food comes from and how it is produced. We've been dealing in stories when we should be dealing in numbers. Our gastroporn aesthetics, embedded in bucolic fantasy, are among the greatest threats to life on Earth.

*George Monbiot's book **Regenesis: Feeding the World Without Devouring the Planet**, is published by Penguin.*