# Vegan environmentalism: Mitigating climate change through diet change

**Alexandra Meregildo-Santos**
Department of Communication, Universitat Pompeu Fabra

**ammsantos92@gmail.com**



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## Abstract

Is eliminating meat and dairy from your diet the best way to reduce your impact on Earth? Research shows that, without meat and dairy consumption, global farmland use could be reduced by more than 75%, an area equivalent to the size of the United States, China, the European Union, and Australia combined, and *still* feed the world. In 2018, Joseph Poore, an Environmental Researcher at Oxford University, and Thomas Nemecek, the Deputy Leader of Life Cycle Assessment Research Group at Agroscope, conducted a study examining the global impacts of food production. Poore and Nemecek's study also considered how a vegan diet can deliver transformative benefits for the environment. Modeled off a global transition to see the numbers to scale (if 7.7 billion people became vegan), this would require 3.1 billion hectares less land to produce our food. This is the same as the entirety of Africa that we would no longer need to farm. This article discusses these results.

**Keywords:**

*Environmental footprint, veganism, plant-based diet, climate change.*

## 1. Introduction

*The global food system is damaging our planet. It is one of the leading causes of climate change, land use, freshwater use and pollution through fertilisers and pesticides, and this is only expected to get worse — unless we take action* (BBC Food 2019).

Is eliminating meat and dairy from your diet the best way to reduce your impact on Earth? Research shows that, without meat and dairy consumption, global farmland use could be reduced by more than 75%, an area equivalent to the size of the United States, China, the European Union and Australia combined and *still* feed the world.

In 2018, Joseph Poore, an Environmental Researcher at Oxford University, and Thomas Nemecek, the Deputy Leader of Life Cycle Assessment Research Group at Agroscope, conducted a study examining the global impacts of food production. Using data from nearly 40 thousand farms across the world and in almost every country, the study surveyed the environmental impact of 40 foods that represent about 90% of what we humans eat in terms of protein and calories. Assessing the full food supply chain from the deforestation and clearing of land for agriculture, right through processing, packaging, transport and retail. With a goal of understanding not just the average impacts of different products, but the range (i.e., if you produce a product in a slightly different way, what is the

impact?), Poore and Nemecek's study (2018) examined five environmental implications as part of a value chain:

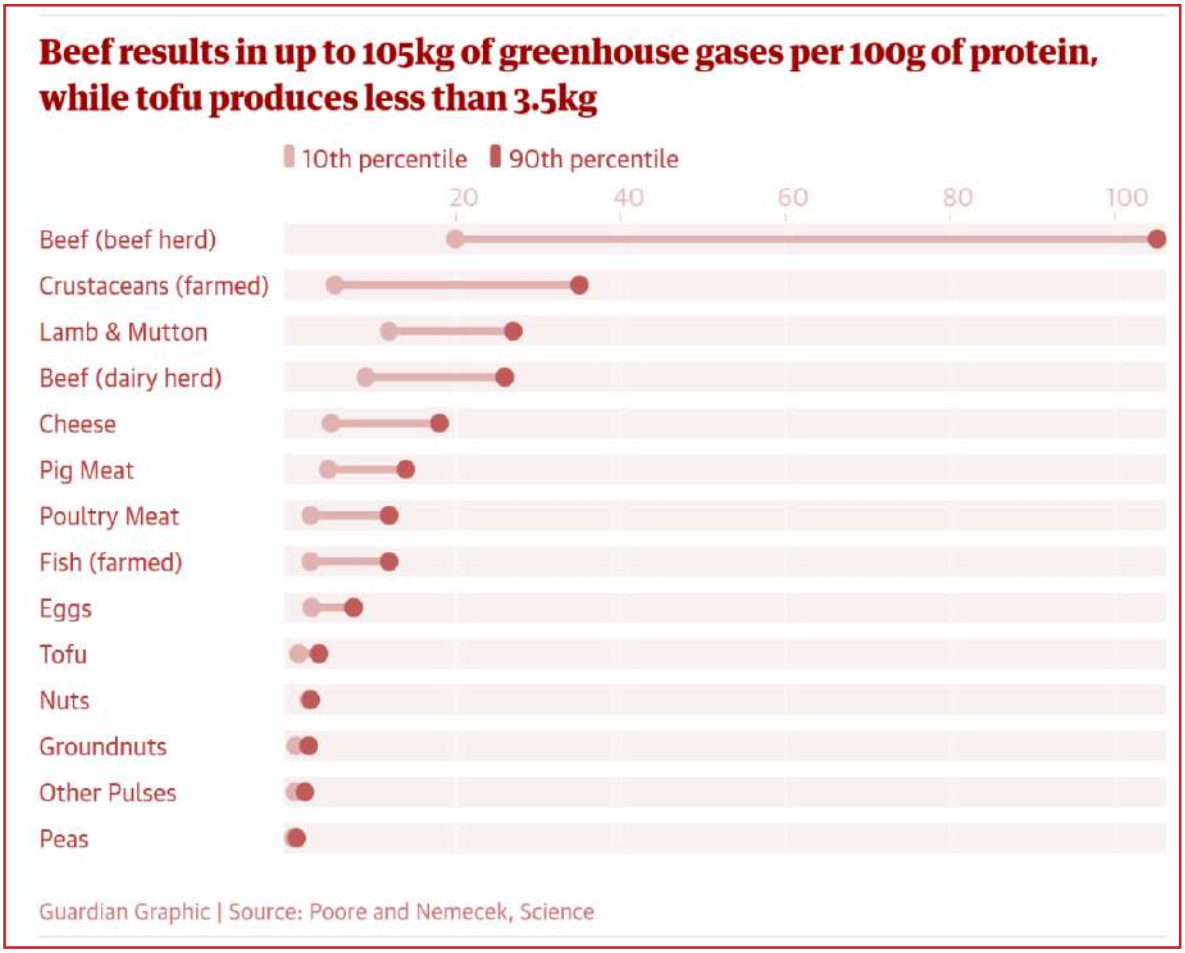
1. How much land is needed to make the food
2. The greenhouse gas emissions that are created
3. The amount of water used
4. The two indicators representing the degradation of terrestrial land and water ecosystems
    a. Acidification
    b. Eutrophication

According to the Poore and Nemecek study (2018), the lowest impact beef is using 36 times more land and creating 6 times more greenhouse gas emissions than peas and beans which are some of the lowest impact plant foods (see Figure 1). Even compared to some of the higher greenhouse gas emissions that come from producing plant foods that may have to travel a very long way and have a lot of food miles and packaging associated with them before reaching consumers such as tofu (Poore and Nemecek 2018). This, however, is not new information as a similar study from 2014 at the University of Minnesota examined, "almost 50 years' worth of data from the world's 100 most populous countries… illustrates how current diet trends are contributing to ever-rising agricultural greenhouse gas emissions and habitat degradation" (Smith 2014).

When people are thinking about making changes or modifications to the way they are living in order to have a more positive effect on the environment, they are slow to think about food. Rather they will say: "Oh let's be more conscious about recycling more or invest in an electric car!" But studies (Poore & Nemecek 2018, Smith 2014, Carrington 2018) suggest that changing one's diet is a far better option than cutting down on flights or buying an electric car.

In 2017, sustainability experts Seth Wynes and Kimberly Nicholas from Lund University released a study examining the climate mitigation gap. Their findings suggested that of four high-impact/low emission actions, "with the potential to contribute to systemic change and substantially reduce annual personal emissions: having one fewer child, living car-free, avoiding airplane travel and eating a plant-based diet. These actions have much greater potential to reduce emissions than commonly promoted strategies like comprehensive recycling (four times less effective than a plant-based diet) or changing household light bulbs (eight times less)" (Wynes and Nicholas 2017). As an individual, a change to a vegan diet can cut personal emissions by two to four tons per year of carbon dioxide emissions. That is about the same as 13 return flights from London to Copenhagen.

Figure 1. Greenhouse gases emissions according to different types of food




Source: Carrington 2018

Poore and Nemecek's study (2018) also considered how a vegan diet can deliver transformative benefits for the environment. Modeled off a global transition to see the numbers to scale (if 7.7 billion people became vegan), this would require 3.1 billion hectares less land to produce our food which is the same as the entirety of Africa that we would no longer need to farm (Poore and Nemecek 2018): Meaning that this land could be returned to nature or reforested. So, a vegan diet change would cut land use significantly. It would also cut global water use by about a quarter *and* cut greenhouse gas emissions globally by nearly 23%, and half of that is just the difference between animal products and vegetable products — the other half is the potential carbon that would be stored when trees have the chance to grow on all this land that has been saved. Additionally, the diet cuts water pollution by about 80% of pollution caused by food (nitrogen phosphorus going into ecosystems) and our acidification which is a measure of pollution of land (Poore and Nemecek 2018). So, this has a big effect, not just on greenhouse gas emissions, but on a wide range of other environmental implications.

## 2. Are initiatives like "Meatless Mondays" enough?

Sometimes, it feels like we are having the wrong conversations if you want to look after the planet, if you want to save the world, which it appears we have decided collectively that we do. At the moment, the way the media is talking about things and the way conversations are going is that, to save the planet, what we really need to do is point fingers, for example, at restaurants or businesses which continue using plastic straws. In reality, plastic straws are only a fraction of the plastic found in the ocean and in the pacific patch alone 46% of plastic found is strictly from fishing nets (Lebreton et al. 2018). So, would not "if you want to save the fish and the planet, don't focus on plastic straws, but simply don't eat the fish" be a better argument?"

When discussing the countless initiatives gaining traction at the moment, such as "Meatless Mondays", one should ask: Is it enough people not eating meat on Mondays? Or is this something that needs to be a huge, systemic change to actually fix this enormous issue we are facing? Well, here are some numbers for you — according to Poore (2020), by 2050, we are going to be consuming 1.4 trillion liters of milk and 500 billion kilograms of meat a year. That is a 60% increase from today, and with that increasing burdens will occur on not only the environment, but also on all the animals and the industry that is producing them. With all this demand largely coming from intensive animal production, that is a huge challenge for our society. From an animal welfare and animal suffering perspective, it is incredibly important that we do not let this happen. That we stop this dramatic transformation of not just the environment but of our treatment of other species driven by our taste preference largely for animal products.

So, what would be the impact of this? We have already cleared about 40% of the world for farming. According to Poore (2020), since 2000, an area of tropical forest — the most biodiverse forests in the world — the size of the United Kingdom, France, Germany, Spain and Portugal has been cut down or burned largely for grazing and livestock feed. And we have done this largely just because people prefer the taste of animal products to vegetable products. It is hard to see any scenario where we are not going to keep clearing land at this rate.

There are all sorts of things we can do to change and make our lifestyles lower impact. Avoiding things that have been transported a very long way for example, but all of these things avoid the very large elephant in the room and that is meat and animal products. The real environmental problems regarding the over exploitation of fish populations for example — some fish are virtually completely depleted. But they can come back — If we stop. We have to make the decisions now in ourselves, in our communities and with our friends and families that we are going to change our diets.

It is difficult to create policy changes for something that is not visually in front of us. How can we encourage our policy makers to combat this? One of the most powerful options we have is reducing farming impacts by creating and

implementing digital monitoring tools and food labeling to give consumers a more conscious choice. Communicating information to consumers could tip the entire food system towards sustainability and accountability. Discussing this in an interview with *The Independent*, Poore said, "Reminding consumers of the environmental impacts of their purchases by means of labeling could be an extremely powerful tool" (Petter 2018). Additionally, if food products were labeled by carbon footprint, producers around the world would have to monitor their impacts and understand what they are doing to the environment when they produce this food.

In short, consumer change really matters. It has immediate impacts on the environment and it also sets an example and shows what is possible to people. As a collective, knowing our effects is a great start, and that is basically creating information that does not exist. Information that would allow consumers to reduce their impacts. So, if we require producers around the world to measure their effects, that is certainly a smart way of expanding the benefits of our desire to do good for the planet.

## 3. Alternative options

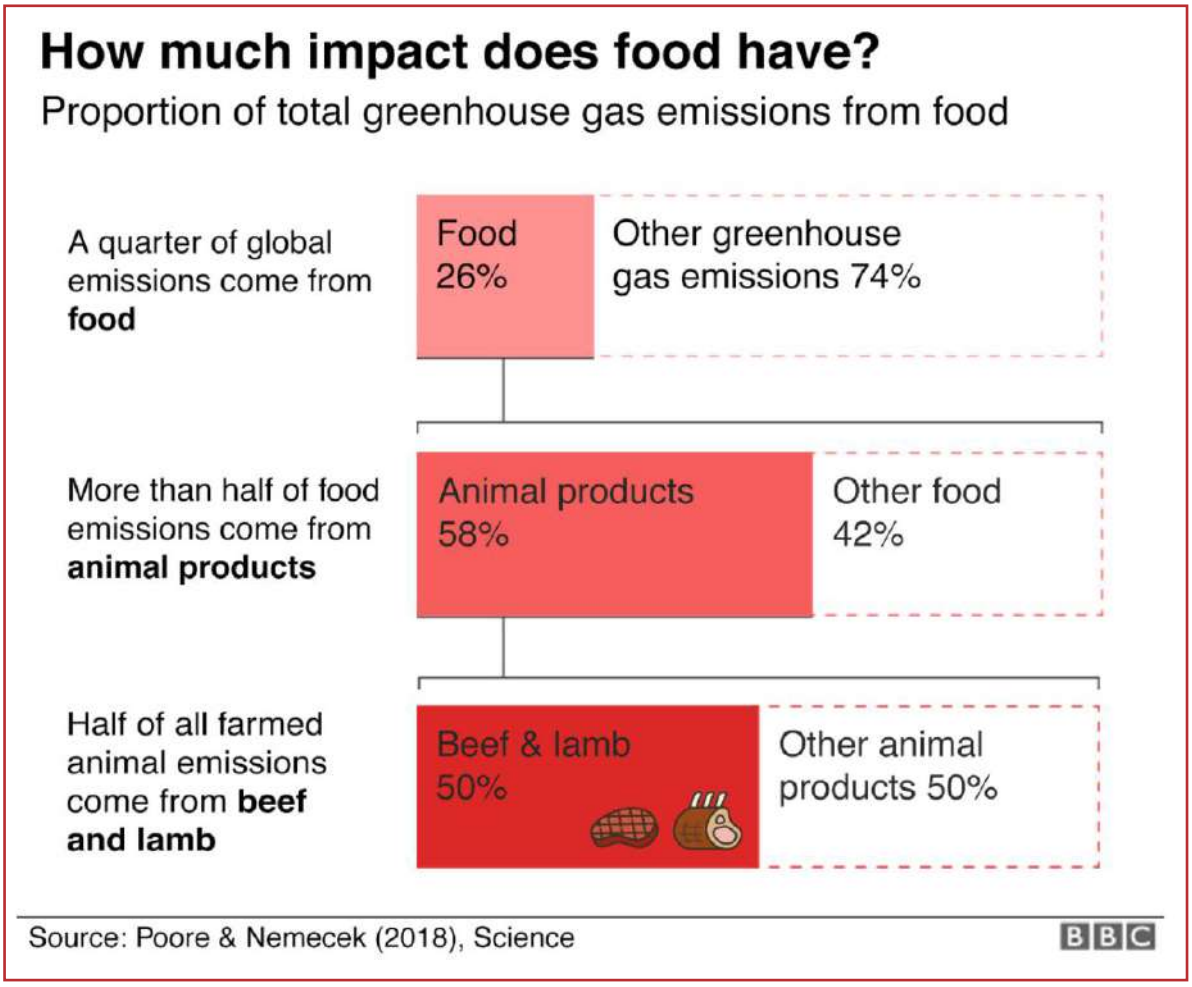
People need to become aware of this. How do we share this? How do we get people talking about these issues in a way that does not terrify them or turn them off from the conversation? The truth is, it *is* terrifying. There is not any way of considering the stark reality of what we are looking at and have it not be frightening, but the way through is by creating positive messages of excitement. So, what are some exciting innovations or new technologies being developed that might allow us to work towards fixing this *ginormous* issue? Or is it something where the only thing that is going to change it, is by human beings changing (for starters) their eating habits?

An interesting option is lab grown meat. Plant-based meats made in a lab that even bleed, allowing the consumer all of the appearances of eating a burger made of cow. However, we do not know enough yet about the consumer demand for lab grown meat, nor do we know enough about its environmental impact. According to Poore (2020), there are studies contradicting the benefits/costs of lab grown meat. We need to know more. They would be great things to have in our bag of ammunition to understand these different approaches. The trick, though, is to change consumers into consuming a more environmentally friendly option.

So, for someone who eats what is considered a "normal" omnivorous diet, what can they do if they cannot go cold turkey vegan overnight, but they want to start making positive changes? What is a practice that people can try and do each week that would really move the needle and improve these issues that we are facing? Firstly, cut out the beef — that in and of itself is going to have a really big impact. Secondly, try different products, there are dozens of different types of plant milk out there (the lowest impact is probably somewhere between soy and oat milk — even the soy milk with the highest impact uses less land and creates fewer emissions than the least impactful cow's milk), try them. Work on

a gradual transition to develop discipline before noticing that it is a minimal taste difference (see Figure 2).

Figure 2. Proportion of total greenhouse gas emissions from food




Source: Harrabin 2019

When discussing veganism and how animal agriculture is impacting the planet, people will often retort that they contribute to the cause by eating only grass-fed beef or free-range eggs/poultry. What then is the difference between that and "regular" meat? Poore says, "You can think of it in terms of a few different ways. Firstly, all land that you convert to farmland with some very few exceptions reduces biodiversity and takes habitats away from other species that could be using that land. Secondly, cows create a lot of methane and feeding them grass is basically equivalent to burning coal to create energy" (2020). No matter how you do it, eating meat is almost always going to have an impact. While it might be grass-fed and maybe that has some benefits in terms of how a product tastes or appears, it is certainly not an environmental solution.

Without a doubt, going vegetarian, or reducing your meat consumption, is a good first step towards helping the planet. But this fails to consider that half of our beef production comes from dairy cows (see Figure 3). And the dairy

industry has really intensified because of high demand and wanting to mass produce at the lowest possible costs. The surplus cows, the male cows, that can not be used to produce milk are sent to slaughter. So we are left with this industry that is trying to produce thousands of liters each year from a single cow to try to get maximum money value and then produce loads of beef for extra revenue. And all of this comes together to tie into this wildly intensified and exploitative industry that is also having really high environmental impacts.

Figure 3. Environmental impact of milks according to types

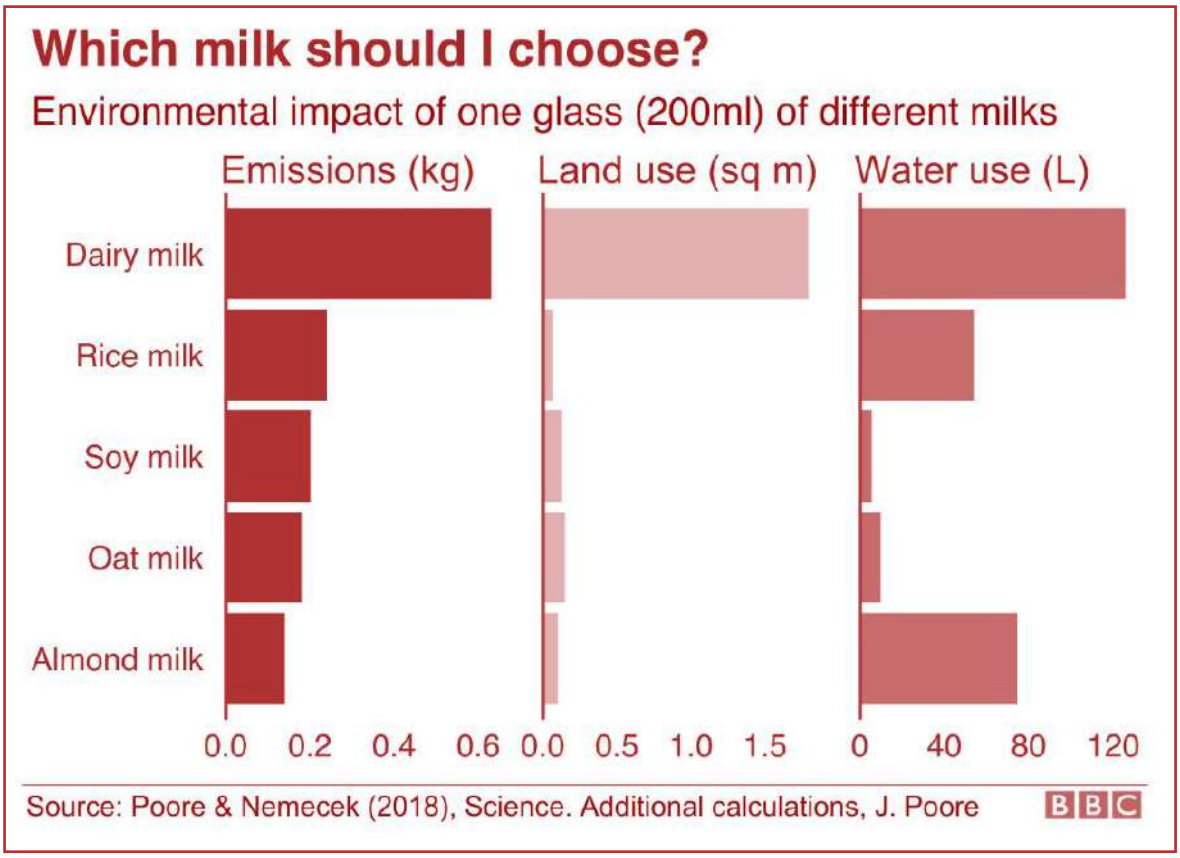



Figure 3. Source: Allen and Grisco 2020

In an interview, Poore (2020) said that during their research they "looked at data from 40 thousand farms and basically every country in the world. What we wanted to understand was, is there such a thing as sustainable meat and dairy? Is it possible to produce animal products with lower impacts than vegetable proteins?" Even the lowest impact animal products are typically creating more emissions and using more land than vegetable proteins. The graph above shows an example with cow's milk vs plant-based milks, and Poore and Nemecek's study (2018) explains that even the least sustainable soy milk is still better for the planet than the most sustainable cow's milk. So that is a really important result that suggests it is always going to be better to make a dietary change.

## 4. Conclusions

Globally, across all countries, we are seeing a trend towards intensification of the additional food demand that we are going to require by 2050 (Springman et al. 2018). About 80-90% of that will come from highly intensive systems and most pork and poultry around the world is already intensively produced. So here we move back into the grey areas of an environmental issue as well as an ethical issue. What this is becoming is the shortening of farmed animals' life cycle (by two thirds or so) for human consumption. That in itself is quite frightening because, the truth is, people do not want to see what is happening behind closed doors. We do not want to see what is happening, because as individuals, we are blinded by our privilege and do not want to make the necessary changes. But, if we do not change our diets, agriculture is going to become an increasingly large share of our greenhouse gas emissions. So, if we address all these other sectors, without addressing agriculture, it could be by 20, 30 years' time instead of a quarter of our emissions, it could reach as high as 50, or 60% (Poore and Nemecek 2018).

Some already acknowledge that beef production and consumption is especially harmful to the environment. Yet when beginning to move towards more of a pescatarian diet, they are quite surprised to learn that fishing (and specifically fish farming) is in itself harmful to the planet as well. Poore and Nemecek's study considered the emissions of fish farming, which accounts for about 50% of global fish consumption (Poore and Nemecek 2018), in a model that looked at what happened to the excretor of fish, the unconsumed feed, creating this perfect environment for bacteria and microorganisms to convert this carbon into methane (which is also what is involved in cow farming). While the biggest contributor to global temperature rise is carbon dioxide, and the biggest contributor to carbon dioxide has been the fossil fuels industry (which today accounts for about 61% of our emissions) it is very important to not lose focus of these other gases: methane, nitrous oxide (and hydrofluoric carbons). These are the gases that come directly from human agriculture and, with fish farming, methane (which traps heat in the atmosphere and is more potent and powerful at doing so than carbon dioxide) can be produced to a greater extent and even more rapidly than with cow farming.

There are two things we need to do. We need to globally reduce our consumption of animal products (and this is not limited strictly to the food industry but also includes the fashion industry as well). Secondly, we need labels and environmental information on our food products so instead of having wild debates in the media, or people being uncertain — the facts are just there, provided to the consumer. But it can not just be greenhouse gas emissions, it needs to include all five factors of Poore and Nemecek's value chain to avoid getting skewed labeling (2018).

Consumers have to change their demands and expectations before the world can be saved. We are all stakeholders in this, this is not something that can be fixed by one person or one group, it ultimately comes down to the collective humanity. We all eat, and it has a significant contribution globally. We

have to do something about it. It will not be easy, and it will not be popular, but it is difficult to see any scenario where greenhouse gas emissions from the agricultural production stage do not increase, and our other impacts on our really precious planet do not keep increasing. Luckily, Poore and Nemecek's study does highlight that there is this alternative — a vegan diet — and it not only changes the impacts but potentially reverses them: Meaning, we can avert the worst of climate change tomorrow, if we make some drastic changes today.

We cannot beat climate change until there is a big drop on the meat and dairy that is eaten all around the world. It is so important to start including *how* and *what* we eat as part of the conversation on climate change. One of the most powerful things that we can do today is to change our diets. It is no secret that climate change is being caused in large part by human behavior and animal agriculture. Science has shown pretty dramatically how it has both an impact on emissions, greenhouse gasses methane and CO2, but also polluting the oceans and devastating our natural treasures. It is debatable whether our small planet can provide decent living standards for 7.7 billion humans. But it is indisputable that, as things are currently, our planet cannot provide for billions of humans while enabling other species to flourish.

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