



Blame it on the bovines

Links between the meat and livestock industry and leather is one of the themes we have set out to cover in depth in the course of 2019. Part of the ongoing debate is the contribution livestock herds make to greenhouse gas emissions. The statistics are frequently misunderstood and sometimes deliberately exaggerated to paint agriculture, meat and (by extension) leather in a bad light. No one is doing more to present accurate figures and the science behind them to the wider public than Professor Frank Mitloehner.

It's been a busy year so far for animal science and air-quality expert Professor Frank Mitloehner. Originally from Germany, the professor has lived and worked in the US for 20 years and is now air quality extension specialist in the department of animal science at the University of California, Davis.

He began 2019 with a run-in with the EAT-Lancet Commission on Food, Planet and Health, which is made up of scientists and campaigners from across the globe. EAT is a non-profit organisation dedicated to "transforming our global food system to benefit people and the environment". The Lancet is a London-based medical journal. At an official launch event in Oslo in January, EAT-Lancet unveiled to the world a new diet it has come up with to make it clear what we should and should not be eating. Its insistence on more fruits, vegetables, nuts, legumes and whole grains, and less than 50 grammes of beef per person per week, captured many headlines. The commission said: "While meat is an important source of key nutrients including protein, iron and vitamin B12, excess meat consumption can harm our health

and the planet."

It said food items sourced from animals, especially red meat, have "relatively high environmental footprints per serving compared to other food groups" in terms of greenhouse gas emissions, land use and biodiversity loss. Following the Oslo event, the commission embarked on a tour to present its report and recommendations at events in 20 cities around the world.

An admission from the commission

Frank Mitloehner has blasted the environmental part of this claim to pieces. And this is something he has done before. A famously inaccurate report called 'Livestock's Long Shadow', published by the United Nations' Food and Agriculture Organisation in 2006, sometimes still rears its head in studies, campaigns and even product promotions. In 2010, a team led by Professor Mitloehner showed that the figures in the report were flawed because its authors applied a different methodology when measuring the

CREDIT: ROBERT CROW/SHUTTERSTOCK





impact of livestock from the one it used to calculate the impact of transportation. This led the authors to draw what Professor Mitloehner calls “a startling conclusion”: that livestock was emitting more greenhouse gas than all modes of transportation combined. Not only did the FAO accept that its report was inaccurate, in 2012 it asked Professor Mitloehner to become the chair of a committee to assess the environmental impact of the livestock industry.

He welcomes one aspect of the EAT-Lancet commission’s 2019 recommendations: increased efforts to tackle food waste. However, he was immediately critical of its conclusions regarding livestock farming and greenhouse gas emissions. Professor Mitloehner said that, although EAT and The Lancet have been “promoting a groundbreaking report” for years, its scientific analysis presents “almost no environmental benefit over business-as-usual scenarios”. He added that he found this “shocking”. He said the details in the report concerning greenhouse gas emissions are “fundamentally flawed” because they fail to account for methane reduction that occurs naturally through oxidation, a message the professor has found himself repeating at event after event throughout 2019. “Methane remains in the atmosphere for only 10 years,” he says. “The carbon emissions from all the flights required for the commission’s global launch tour will have a much longer impact than that of methane from livestock animals.”

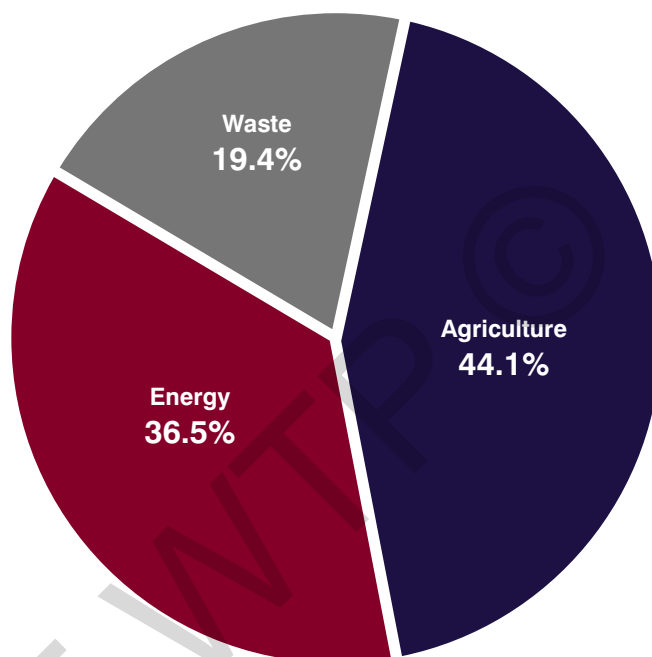
The professor followed up with the commission to express his concerns. He received a response by email from the science director of the EAT-Lancet Commission, Dr Fabrice De Clerck, admitting environmental considerations had nothing to do with the meat consumption limits proposed by the commission. Dr De Clerck said: “The dietary guidelines only refer to healthy eating.” Professor Mitloehner has applauded Dr De Clerck’s honesty, but points out the inconsistencies between this and the original claims the commission made in Oslo. The professor said EAT-Lancet was encouraging consumers to think that they can help halt climate change by refraining from eating meat.

A huge voice

Many commentators, especially in Europe, North America and Australia, propagate the same message now. Promotional body Meat and Livestock Australia (MLA) has carried out research over the last three years and has consistently found that 93% of Australians eat meat regularly while the numbers who self-identify as vegetarian or vegan remain steady at 7%. MLA says it is happy to keep addressing its message to the remaining 93% of the Australian population, but it acknowledges that anti-meat campaigns have been successful in attracting “celebrity influence” and media attention, giving small interest groups “a huge voice”. Perhaps the 7% will grow; current high levels of interest in plant-based and lab-grown meat-like products suggest an increase is likely.

In late June in the UK, Business Green, an information source for the green economy, held an awards ceremony. Editor, James Murray tweeted that the event would be “veggie as default”, with guests able to request a meat option if they wanted it. This prompted an immediate response from BBC environment correspondent Roger Harrabin, who wondered if “a green organisation” should offer beef or lamb at all. “Scientists are concerned about the impact of eating beef and lamb,” Mr Harrabin said.

Figure 1: Methane emissions by sector in 2012.



CREDIT: FOOD CLIMATE RESEARCH NETWORK

Senate committee hearing

Scientists he has been listening to are unlikely to include Frank Mitloehner, but the same cannot be said of the US Senate committee on agriculture, nutrition and forestry. Prof Mitloehner contributed to a hearing before the committee in May on the subject of the contribution to climate change of livestock farming.

The professor told the politicians on the committee that while those sectors of the US economy that consume fossil fuels contribute 80% of all of the country’s greenhouse gas emissions, the share of all animal agriculture combined is 3.9%. In spite of this, he said livestock farming bore an unfair share of criticism for global warming.

He explained that, of the three main greenhouse gases, methane, which cattle emit, is very different from carbon dioxide and nitrous oxide. “Methane has a lifespan of only ten years,” the professor said in response to a question from one of the senators on the committee. “And it is not just emitted; methane is also destroyed by hydroxyl oxidation. A lot of the discussions [about livestock and greenhouse gas emissions] leave this part out and it should not be left out because it’s critical.” He made it clear that methane is “an important climate pollutant”, one that is almost 30 times more potent than carbon dioxide. But he said that if farmers maintain herds at their current size, there will be no increase in emissions from livestock; all of the methane a herd emits in the coming ten years will equate to the volume of methane that will break down over that time. “And if we can mitigate methane emissions from cattle herds today, we will reduce global warming,” he said.

Oxford explanation

He likes the explanation of this that the Food Climate Research Network (FCRN) at the University of Oxford gives. FCRN acknowledges methane’s significance as a greenhouse gas and the contribution to methane emissions



that the food system makes, particularly the food we produce from ruminant livestock (cattle, sheep and goats) and rice production. However, it also says there is “considerable confusion” over how we should quantify the climate impacts of methane emissions. It explains: “To understand how emissions will impact the climate, we also need to know how long these emissions will last in the atmosphere. This is particularly important for methane, as it is a relatively short-lived greenhouse gas. In contrast, a significant proportion of our carbon dioxide emissions are expected to persist in the atmosphere for centuries, or even longer.”

Much of the methane breaks down into carbon dioxide in the lower atmosphere (the troposphere) as a result of a reaction with hydroxyl radicals. When the methane comes from agriculture, this resultant carbon dioxide replaces carbon dioxide that was first fixed as plant biomass and consumed by the animals. Energy comes from the sun, plants grow (some of which we cannot eat), cattle eat these plants and convert them into extremely nutrient-rich protein that we can eat.

According to FCRN’s explanation, the CO₂ that comes from this breakdown of methane in the atmosphere “does not need to be considered as an additional source of CO₂”, for the same reason as we do not consider CO₂ from livestock (or human) respiration an extra greenhouse gas emission. It goes on to explain that all agriculture with 44.1%, energy with 36.5% and waste with 19.4% were the causes of anthropogenic (induced by us and our way of life) methane in 2012. But not all methane is the same. The methane that we emit as a result of consuming fossil fuels also breaks down into CO₂, but in this case it does constitute an additional input to the levels in the atmosphere because this CO₂ had been “locked away underground” for millions of years.

Over the last decade, the Oxford-based body points out, methane concentrations have increased rapidly. It is difficult to confirm exactly how much of this increase is due to agriculture, to other anthropogenic sources, to increases in natural methane emissions or to “more complex changes in the atmospheric chemistry of methane” that could be slowing down the rate at which it is broken down. More research is required.

More for less

In the meantime, Frank Mitloehner says that increased efficiencies that farmers are working on all the time can make a big difference in the here and now. He points out that animal herds are at historically low levels in the US today, even though US agriculture is producing more. In 1950, there were 25 million dairy cows across the country, the professor informed the US senate committee, whereas the total today is 9 million. However, today’s herd produces 60% more milk than its 1950 counterpart, making the carbon footprint of milk much smaller today than it used to be. Beef herds have also become more efficient. In June 2019, the average live weight of cattle coming to slaughter was around 595 kilos. Even ten years ago (a relatively short timeframe in this discussion), the corresponding figure was closer to 575 kilos. That’s why, Professor Mitloehner told the committee, today’s US beef cattle herd of 90 million head can produce the same amount of beef (24 million tonnes per year) as a herd of 140 million head did in 1970. “US agriculture is today the envy of the world,” he said, “having improved the outputs while holding inputs steady. It’s staggering how many people continue to



Myth-buster general, Professor Frank Mitloehner, at a hearing of the US Senate committee on agriculture, nutrition and forestry. CREDIT: TWITTER

think that merely giving up meat, even once a week, will make a significant impact on their individual carbon footprints.”

Of much greater concern to Professor Mitloehner, as mentioned, is food waste, which he says is the largest contributor to agriculture’s carbon footprint. He says 40% of all the food produced in the US goes into landfill and that more than 50% of the food that goes to waste is fruit and vegetables, while 20% (which is still far too much, of course) of the waste is meat or dairy. “If we could tackle the enormous problem of food waste, we would see much lower greenhouse gas numbers for agriculture and our overall food supply chain,” he says.

Leather in his sights

Professor Mitloehner has said he is currently working on a consequential lifecycle assessment of cattle farming as part of his response to the ever-louder opposition to this part of the agricultural economy from groups who want to promote some of the other types of protein as mentioned. The professor has said he supports the most natural, most ethical and least environmentally harmful food supply chain possible, but warns that demands for high prices on animal-based proteins to encourage consumers to choose non-animal alternatives could have important unintended consequences.

He says: “Beef cattle are about a whole lot more than just producing meat. There are 400 different products that we can take from those animals. Leather, for example, for shoes and clothes. If you were to forgo the use of beef cattle [and choose plant-based or lab-made proteins instead], you would have to replace 400 other products with some kind of plastic alternative.”

Professor Mitloehner argues that looking at the whole picture, including leather and other by-products from the livestock and meat sector, means a consequential lifecycle assessment is needed. “That has never been done before,” he said, “but it will be done, by me, soon. And I think it’s very important because we need to look at all the intended and unintended consequences of producing food.”

He is not tired of explaining that making meat and cattle the main bearers of the blame for greenhouse gas emissions is unfair. 🌱