

Vegetable oil emissions study reveals urgent need for greener growing solutions

March 21 2022



Credit: CC0 Public Domain

A new global study has revealed the extent of greenhouse gas (GHG) emissions caused by vegetable oil production, highlighting the need for more sustainable growing solutions.

Scientists from the University of Nottingham's Future Food Beacon

carried out the first analysis to consider GHG emissions from almost all possible systems that are currently used to produce palm, soybean, rapeseed and sunflower oil around the world. The study was a [meta-analysis](#), that incorporated all relevant studies concerning the environmental impact of oil production published between 2000 and 2020. The findings have been published today in *Science of the Total Environment*.

This new study reflects almost 6,000 producers in 38 countries, and is representative of over 71% of global vegetable oil production. Across all oil crop systems, median GHG emissions were 3.81 kg CO_{2e} per kg refined oil. Crop specific median emissions ranged from 2.49 kg CO_{2e} for rapeseed oil to 4.25 kg CO_{2e} for soybean oil per kg refined oil.

Median emissions from soybean oil were higher than for palm oil, despite palm oil getting more negative attention. However, median rapeseed and [sunflower oil](#) systems had fewer emissions than both palm and soybean oil, so appear to be more sustainable choices.

When a forest is cut down to make space for agriculture, the [carbon](#) stored in the trees and vegetation is released to the atmosphere as CO₂. A lot of the carbon stored in the soil is often also released. The researchers analyzed the impact of this type of deforestation on crop sustainability. They also considered the carbon costs of agricultural land occupation even in cases where deforestation happened more than 100 years ago (as is likely the case for most of Europe). This is because even though there may be no [land-use](#) change carbon being released through using the land for agriculture today, the opportunity to store carbon, such as through re-growing trees, is lost. The researchers showed that land use made a significant contribution to GHG emissions, generally making up half of the total overall emissions.

Dr. Thomas Alcock, Future Food Beacon research fellow and

Postdoctoral Researcher at the Technical University of Munich led the research. He says that "the strength of having lots of different production systems included in this study is that we can identify the most sustainable systems for each crop type, and push for these to be adopted more widely. The results, particularly around land use, show that we should target production on low carbon storage potential land, although we also need to consider other sustainability indicators such as biodiversity. Most previous studies only considered recent land use change, but in this study we considered the impacts of continuing to grow crops on an area of land as well, instead of setting it aside for regeneration of forests."

The study highlights the need and scope to improve sustainability within current production systems, including through increasing yields whilst limiting application of inputs with high carbon footprints, and in the case of palm oil through more widespread adoption of methane capture technologies in processing stages.

More information: Thomas D. Alcock et al, More sustainable vegetable oil: Balancing productivity with carbon storage opportunities, *Science of The Total Environment* (2022). [DOI: 10.1016/j.scitotenv.2022.154539](https://doi.org/10.1016/j.scitotenv.2022.154539)

Provided by University of Nottingham

Citation: Vegetable oil emissions study reveals urgent need for greener growing solutions (2022, March 21) retrieved 9 April 2024 from <https://phys.org/news/2022-03-vegetable-oil-emissions-reveals-urgent.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--