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Level 1 Science RAS 2023

91923 Demonstrate understanding of science-related claims in communicated information

EXEMPLAR

Merit

TOTAL M5

informative article but it presents organic food in a very good light and advertises Applegate. On top of this, they don't mention any organic meat producer throughout this article and the only one you see is Applegate, this would have been vested interest apart from the fact that they aren't rating Applegate or other companies. The purpose of this article as stated is to inform people about the benefits of organic meat, but the underlying purpose could be for Applegate to gain coverage, popularity, money, etc.

This graph below, created by Michael Clark and David Tillman in 2017, is a combination of information provided by 164 different results “across 742 agricultural systems”, each colour representing a different organic industry, each line representing the impacts. The definitive lines are the lines which have a clear impact area e.g whether or not the organic method is better or worse than the non-organic method. The more faded lines mean that information provided shows less of a clear answer on whether the organic method is better or worse and it usually doesn't differ too much from the non-organic method. If the line is bold and higher than 1, the organic method has a worse environmental impact, if it is bold and lower than 1, it has a smaller environmental impact. The colour line we are focusing on is the more turquoise/light blue colour as this represents the organic meat industry.

Environmental impacts of organic vs. conventional agriculture



Shown is the relative environmental impact of organic and conventional agriculture across various ecological and resource indicators based on a meta-analysis of 164 published life-cycle analyses (LCAs) across 742 agricultural systems.



Data source: Clark & Tillman (2017) – Comparative analysis of environmental impacts of agricultural production systems, agricultural input efficiency, and food choice. In *Environmental Research Letters*. The data visualization is available at OurWorldinData.org. There you find research and more visualizations on this topic. Licensed under CC-BY-SA by the authors Hannah Ritchie and Max Roser.

In this graph it shows that for each individual category, organic meat is either worse or similar to the impact that non-organic meat has on the environment. For both 'Land use' and 'Eutrophication Potential', the organic meat ratio ranks higher than the non-organic meat, meaning that organic meat uses much more land and it has the potential to over-fertilise the water and land around the organic meat farms than non-organic meat farms, with this ratio we can see that this is the case for all of the organic meat farms whose information was recorded in this study. For 'greenhouse gas emissions', 'acidification potential' and 'energy use' all of the recorded information on the organic farms, have all similar results, the ratio is in between better and worse than, meaning that it is a bit of a mixed bag and some organic farms in the ratio have a worse environmental impact and some have a better impact but the overall is not clear. Overall from this study we can conclude that (at least in 2017) organic meat farming has worse environmental impacts than non-organic meat farming, this may not still be the case as the study was conducted 6 years ago. But both Clark and Tillman have strong backgrounds, Michael Clark focusing on "the impact that food systems have on environmental sustainability and human health." at the University of Oxford and David Tillman who is "Regents' Professor and McKnight Presidential Chair in Ecology at the University of Minnesota, where he also serves as Director of the Cedar Creek Ecosystem Science Reserve.". This graph gives us a different view on organic meat because this is not about how it benefits us, but how it benefits the environment and it shows that organic farming in meat does not benefit the environment.

Other Sources:

<https://www.nifa.usda.gov/topics/food-nutrition-security#:~:text=NIFA%20works%20to%20ensure%20a,health%2C%20and%20prioritize%20nutrition%20security.>

<https://www.organic-center.org/meet-our-scientists>

<https://www.ox.ac.uk>

<https://cbs.umn.edu/tilman-lab/people/david-tilman>

Merit

Subject: Science

Standard: 91923

Total score: M5

Q	Grade score	Marker commentary
1	M5	The candidate has explained how there is potential for bias in the science-related claim that organic meat is better for the environment. To gain an excellence, the candidate needed to examine how science language or conventions impacted the support for the claim.