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## Level 1 Science RAS 2023

**91923 Demonstrate understanding of science-related claims in communicated information**

# EXEMPLAR

**Merit**

**TOTAL 05**

## Organic Meat

In this article by Dr Amber Sciglio and Dr Jessica Shade, they make the claim that "Organic meat benefits" and that organic meat is much healthier and better for the environment than non-organic meat.

One of the first things I noticed was that this article was published only 3 years ago, in 2020, so this article is relatively current which is good for them because it helps with their validity. But as I read through the article I found that, other than informative pieces within the article, there is no real evidence I found to back it up and the only places that have any evidence or statistics, have a link that doesn't work. Majority of the information in this article is just descriptions of what could possibly happen to you if you do / don't eat organic meat without any evidence of it happening before. They haven't provided a sample size that they have gathered their information on, they could have done a study with people's blood after eating organic meat, non-organic meat and see what it looks like but they didn't, this could've been a blind test or not, they don't provide any charts, graphs or diagrams. But we do know that this article is relevant to the topic they are trying to discuss, they haven't made any simple mistakes like inaccuracies in punctuation or spelling and they cover the same ideas throughout the article. They also have an seemingly unbiased report and it doesn't look like they have a strong opinion throughout the article.

Both of the authors of this article have legitimate PHD's. Dr Shade being national program leader at USDA NIFA (United States Department of Agriculture, National Institute of Food and Agriculture) which works to helping US citizens and to "ensure a safe, nutritious, and secure food supply while also developing, delivering, and disseminating evidence-based nutrition education and promotion to prevent chronic diseases, improve health, and prioritise nutrition security.", she was given her PHD at the university of California in Berkeley. Dr Sciglio on the other hand was awarded her PHD at Lincoln university in New Zealand for her study in "ecology and evolution with a specialty in plant/insect interactions.", so both have definitive and authentic backgrounds that are based in this field of research.

But it says that both of our authors, Dr Shade and Dr Sciglio, were paid to write this, which could show a bias towards the ideas of the companies who published the article, these companies are The Organic Center and Applegate. Both companies originate from the United States, The Organic Center is a not for profit organisation with the aim to educate the public. Applegate in comparison is a company which has been "producing a range of organic meat products for over 30 years", this does show there could be a bias. Firstly, Hormel Foods (the company which owns Applegate), states on their website that Applegate is the No.1 natural and organic meat producer, now if this fact is actually true then it can show a bias towards Applegate as it is not only a

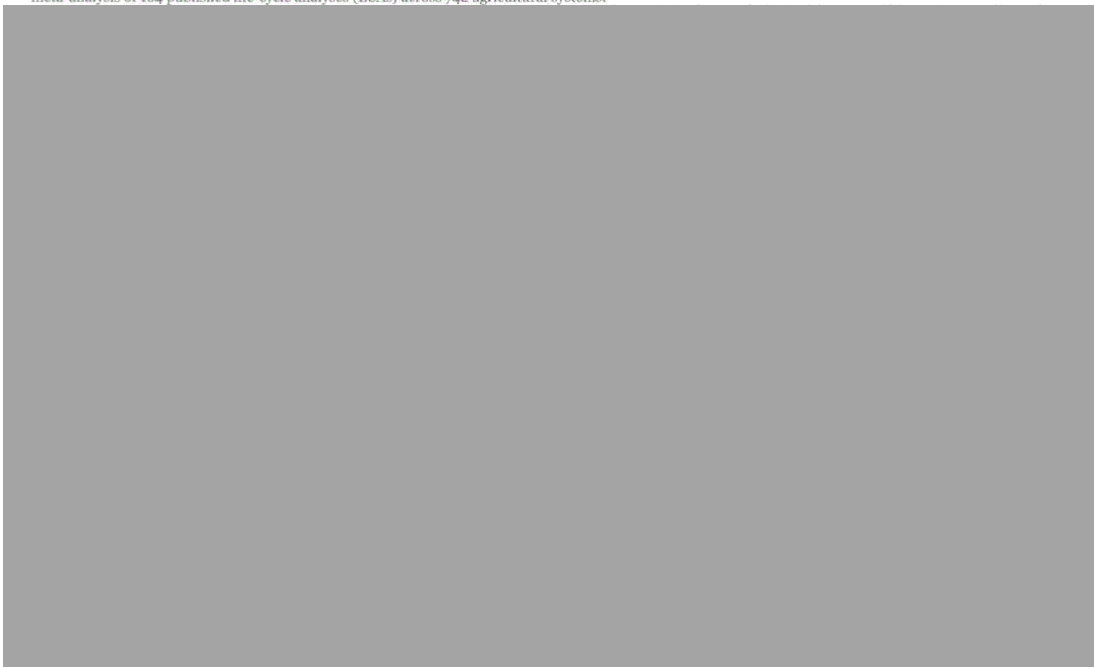
informative article but it presents organic food in a very good light and advertises Applegate. On top of this, they don't mention any organic meat producer throughout this article and the only one you see is Applegate, this would have been vested interest apart from the fact that they aren't rating 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](https://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:** 05

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.