

The Baltic Sea Project's

WEBQUIZ 2025

Debunking Sustainability Myths Around the Baltic Sea

February 10th - March 30th

17-19 year olds questions

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Take the quiz:
viktoriinid.ee



NO PRIOR-KNOWLEDGE NEEDED!

Quiz for 10-19 year olds, questions in three age groups

EDUCATIONAL PRIZES!



1.



Photo: Chiswick Chap. Adult Baltic herring. Older herrings move into deeper waters of the open sea during winter, whereas younger individuals tend to remain close to the coast.

Authors of a recent publication in Science journal “Loss of Earth’s old, wise, and large animals” draw attention to the fact that “humans have caused a decline in old age classes of wild animal populations, whereby many of Earth’s oldest, often largest, and most experienced individuals have been eliminated from ecosystems”. The authors argue that “longevity conservation is needed to protect the important ecological roles and ecosystem services provided by old animals”.

Source: <https://www.science.org/doi/10.1126/science.ado2705>

What is the type and methodology of this publication?

- A. This is a research article presenting conclusions from new findings based on authors’ original empirical research.
- B. This is a review in the form of a narrative drawn from text-mining and topic modelling of almost 10 000 peer-reviewed papers.
- C. This is a review using quantitative statistical methods to integrate results of 900 individual studies.

1.

The correct answer is B. When you look into the section **Supplementary Materials – Materials and methods (openly available though the article is not fully free)** document you can find the methodology used. Research synthesis may be defined as a review of primary research on a given topic with the purpose of integrating the findings. Without it, the evidence for various alternative hypotheses cannot be properly evaluated and generalizations cannot be reached. Thus **reviews are at the top of the scientific evidence hierarchy.**

NB! Research reviews in ecology and evolutionary biology have traditionally been carried out either in the form of narrative reviews, or by “vote counting,” where the number of statistically significant results for and against a hypothesis are counted and weighed against each other. Narrative reviewing offers expert interpretation and perspective, but it is inherently subjective and nonquantitative, which means it doesn’t provide information on the magnitude of the effects or the sources of variation in outcomes among studies.

2.



Photo: Rehman Abubakr

- The term “vibroacoustic disease” (VAD) was suggested by a Portuguese doctor Nuno A. Castelo Branco around 30 years ago and since then this term was used by a group of researchers led by Mariana Alves-Pereira (PhD in Environmental science).
- By 2013 the group had published 35 papers (with 75% rate of self-citation) on the appearance of VAD in aviation workers exposed to loud industrial aircraft noise, including sub-audible infrasound.
- In 2007 Alves-Pereira first linked VAD to exposure to wind turbines at a conference presenting evidence of case studies where two families living close to wind turbines reported symptoms of VAD.
- Wind energy opponents around Europe mostly use her work in their arguments against wind energy developments.

Why is Mariana Alves-Pereira and her research group’s work considered pseudoscience by the scientific community?

There is more than one correct answer.

- A. She is a fake expert in the field of medicine.
- B. Very high self-citation rate: citations are used to artificially increase the apparent scientific impact of a researcher's work (the papers cited are all by the authors from the same small group).
- C. They have small datasets and poorly controlled investigations.
- D. Their research papers are published in journals with high Impact Factor.

2.

Correct answers are A, B and C. Alvies-Pereira has degree in Environmental science, not Medicine, her research group has a high self-citation rate and poor quality datasets.

The infrasound amplitude of wind turbines is below the perceptual limit of a person. Scientific studies carried out over several decades **have not** found evidence that infrasound has a negative effect on human health (see this review <https://www.sciencedirect.com/science/article/abs/pii/0022460X78903541>). The infrasound produced by wind farms is not different from the natural infrasound produced by wind and waves. A negative health effect can come from the so-called placebo effect, i.e. a negative prejudice against wind farms, and not from the physical effects of wind turbines (see this study for example <https://julkaisut.valtioneuvosto.fi/handle/10024/162329>)

3.

Look at the sustainability claims of two companies producing materials for construction.

1. https://kronospan.com/en_EN/company/sustainability#!#sustainable-forestry-certification
2. <https://ecococon.eu/ee/about/company>

What is the difference between the two companies? Can you find any scientific sources backing their sustainability claims?

[CHECKBOX: A, D]

- A. One of them claims that using wood as material ensures removal of carbon dioxide from the atmosphere, while another argues that forests should be cut as little as possible to achieve climate neutrality.
- B. One of them actually has an FSC (Forest Stewardship Council) certificate for the wood they use, and the other doesn't.
- C. One of them claims that their product is the best you can find, and the other doesn't.
- D. One of them is trying to reduce transport-related emissions through local production, while other opted for replacing diesel trucks with train wagons (and there is no information how much energy the train wagons will save).

3.

Correct answers are A and D.

Both of the companies have FSC certificates (you can check that in FSC open database <https://connect.fsc.org/fsc-public-certificate-search>) and claim that their product is best and ideal, which is natural for a business.

The increased usage of wood in construction is debated in the scientific community. According to this study by Finnish forestry researchers (<https://www.sciencedirect.com/science/article/pii/S1364032123000084>), “the substitution impacts of wood use are not large enough to compensate for the reduction in forest carbon sinks in the short and medium term”. Forest carbon sink means the ability of forests to absorb CO₂ as part of photosynthesis and to store carbon – both below ground in the soil and roots – and above ground in the tree’s trunk and branches. To protect the carbon sink, land management policies are needed to limit deforestation, promote forest restoration and improve timber-harvesting practices (<https://www.nature.com/articles/s41586-024-07602-x>).

NB! The FSC certificate is one of the paths to a more sustainable forestry, but the requirements to get this certificate are quite loose – they are not as strict as Estonian national forestry regulations, for example, which are highly criticised for neglect.

4.

In 2024, the Danish government introduced Europe's first carbon tax on agriculture with the aim to cut 70 percent of its total greenhouse gases emissions by 2030. Agriculture largely contributes to strengthening the Earth's greenhouse effect, especially through the greenhouse gas **methane** that comes from the digestive processes in ruminant animals (cows, sheep). Methane has a shorter atmospheric lifespan than carbon dioxide, and cutting methane emissions can relatively quickly lower atmospheric concentrations and slow global warming.

However, authors of the book "Sacred Cow: The Case for (Better) Meat" Diana Rodgers and Robb Wolf argue that eating more meat is better for the planet and for the health.

Read the advertisement of the book below carefully and find the techniques the text uses to make authors appear more reliable. Use the FLICC method to help you:

<https://drive.google.com/file/d/1WTVMOztMUAINI-T2c7ZBNQEscopyBm6H6/view>.

- A. They are presented as experts in the field and bestselling authors.
- B. The purpose of this book description is to inform the reader and the tone is neutral and professional.
- C. The argument of the authors is claimed to be well-proven and certain.
- D. Authors are claimed to use scientific methods, while their opponents are accused of spreading misinformation.
- E. The authors are not advertising any of their services through this book, which shows their neutrality.

4.

PUBLISHERS WEEKLY BESTSELLER

We're told that if we care about our health—or our planet—eliminating red meat from our diets is crucial. That beef is bad for us and cattle farming is horrible for the environment. But science says otherwise.

Beef is framed as the most environmentally destructive and least healthy of meats. We're often told that the only solution is to reduce or quit red meat entirely. But despite what anti-meat groups, vegan celebrities, and some health experts say, plant-based agriculture is far from a perfect solution. In *Sacred Cow*, registered dietitian Diana Rodgers and former research biochemist and *New York Times* bestselling author Robb Wolf explore the quandaries we face in raising and eating animals—focusing on the largest (and most maligned) of farmed animals, the cow.

Taking a critical look at the assumptions and misinformation about meat, *Sacred Cow* points out the flaws in our current food system *and* in the proposed "solutions." Inside, Rodgers and Wolf reveal contrarian but science-based findings, such as:

- Meat and animal fat are essential for our bodies.
- A sustainable food system cannot exist without animals.
- A vegan diet may destroy more life than sustainable cattle farming.
- Regenerative cattle ranching is one of our best tools at mitigating climate change.

You'll also find practical guidance on how to support sustainable farms and a 30-day challenge to help you transition to a healthful and conscientious diet. With scientific rigor, deep compassion, and wit, Rodgers and Wolf argue unequivocally that meat (done right) should have a place on the table. It's not the *cow*, it's the *how*!

4.

The correct answers A, C and D.

The incorrect answer is B – this text was made not to inform, but to sell the book and thus you should be critical about it. The authors are presented as experts with “scientific rigor”, but the arguments in the book have many logical fallacies and jumping to conclusions – they simultaneously advocate for low-intensity regenerative farming and eating 450 g of meat per day (this amount of meat cannot physically be produced by low-intensity farming). It is very typical for science denial to have impossible expectations of certainty in science, and that is why their argument is presented as “unequivocal” (having no doubts) to be more likable for people who want certain answers. The text is also full of words marking opposition of authors with the rest of the public (“some health experts say”, “misinformation about meat”, “cows are most maligned animals”, “Rodgers and Wolf reveal contrarian but science-based findings”), which is a typical method of science denial, also used in conspiracy theories. They also included a diet recommending challenge, which is directly related to nutritionist services (incorrect answer E) that Rogers used to provide for money and thus can be considered as a promotion of her business through this book, which makes the book more biased.

6.



Every summer in Finland, a few thousand wild-berry pickers, many of them from Thailand, apply to fly to the Nordic nation in order to pick wild berries found in the woodlands and tundra in the region. From 2024 onwards, all wild-berry pickers are required to apply for a residence permit for an employed person. Until 2023, pickers came to Finland on a Schengen tourist visa, which allowed them to enter Finland and pick berries for a maximum of three months. Source:

<https://www.infomigrants.net/en/post/58510/finland-new-rules-for-wildberry-pickers>

Read the following statements regarding this news and chose the ones that are TRUE:

- A. Contracts between employers and employees prevent labor exploitation.
- B. When Thai workers go to Nordic countries voluntarily and with consent, there is no danger of human trafficking.
- C. With only tourist visas people can be forcefully transported without trace to other countries in the Schengen zone after arriving in Finland.
- D. Residence permit and contract will guarantee the workers' right for minimum wage.

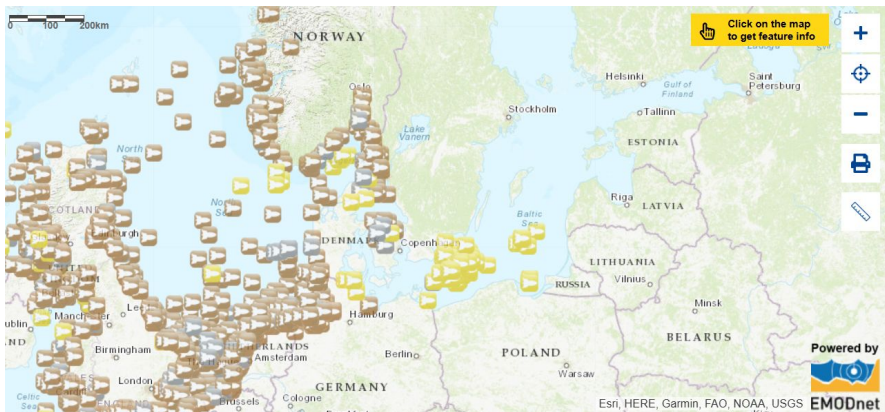
6.

Correct answers are C and D

Comment: Unfortunately contracts do not prevent labor exploitation as in reality people may work voluntarily for more hours and get paid by kilogram of berries. According to Palermo Protocol, “(b) The consent of a victim of trafficking in persons to the intended exploitation set forth in subparagraph (a) of this article shall be irrelevant where any of the means set forth in subparagraph (a) have been used;” meaning that if the conditions of human trafficking are in place, it is criminalized even if the victim agreed to job voluntarily in the first place.

(<https://www.ohchr.org/en/instruments-mechanisms/instruments/protocol-prevent-suppress-and-punish-trafficking-persons>). See also this documentary about berry pickers in Sweden: <https://www.youtube.com/watch?v=vW1QWG3xSNg>.

6.



https://ec.europa.eu/maritimeaffairs/atlas/maritime_atlas/#lang=EN;p=w;bkgd=15;theme=935:0.75;c=1209838.4892952377,7489488.403052814;z=4

More than 1.6 million tonnes of unexploded weapons from WWII litter the North Sea and Baltic Sea, with addition of about 40,000 tonnes of chemical munitions in the Baltic Sea.

Both release toxic chemicals to the sea environment.

Which of the following is NOT TRUE regarding removal of the weapons from the Baltic Sea?

- A. It requires large investments and removal of munitions has mostly been done for the purpose of construction (for wind farms, cables, a harbour expansion).
- B. Blasting is the conventional way to destroy weapons, but it is dangerous for the sea animals and whenever possible it is avoided.
- C. Methods of using remotely operated vehicles to remove weapons from the sea are currently slow, but there is hope that they will become more effective soon.
- D. Germany is using robots to remove and destroy chemical weapons as a part of a recent pilot project.

6.

Correct answer is D. Robots are not used yet to collect chemical weapons as this is a more complicated job. Read this article for more info:

<https://www.bbc.com/future/article/20240621-the-robots-hunting-ww2-bombs-in-the-sea>

7.



Origin by Ocean is a Finnish biochemistry start-up founded in 2019. The company run by organic chemists has a vision to create an algae-based business ecosystem that would help to solve crucial environmental challenges in the seas and the ocean, such as invasive algae and eutrophication. The company has secured initial funding for the development of algae processing technology and is looking for more investors and collaborators.

Look at the page <https://www.originbyocean.com/choose-the-blue-planet> and scroll to the part of Blue industries with examples of using algae in different economic sectors. Are those working and existing solutions, so that investors can be sure of their success? Why?

[CHECKBOX: D, E, F]

- A. Yes, because Origin by Ocean has an already patented biorefining process to extract bio-based chemicals from harvested harmful algae and ecologically farmed seaweed.
- B. Yes, because bio-based economy is the global priority.
- C. Yes, because the company's business model is circular, which means that it is sustainable and robust.
- D. No, because science progresses by trial and error and requires R&D processes.
- E. No, because science always occurs in a social-economic-technological context and its future is affected by that context.
- F. No, because science is falsifiable and algae-based products can be proven environmentally harmful in the far future as it happened with the plastics.

7.

Correct answers are D, E, F: science has main principles that we need to understand - 1) it progresses by trial and error, 2) occurs within the social-economic-technological context and is affected by it, 3) science is always falsifiable and can be tested and peer-reviewed by other researchers in the scientific community. All of this doesn't mean that nothing is certain - there are many scientific truths tested by scientific community over centuries and decades and that scientific community agrees on (for example that current climate change is human-made). Thus Origin by Ocean gives us the best answer it can give at the moment, but we never know what is next and this is an exciting thing for more discoveries!

Read more about science, non-science and pseudoscience from the book [Busting Post-truth in the Science Classroom](#), chapter I.