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An unappreciated group of filter-feeding animals found around our coastlines could clean up our waters and nourish a billion people. Is it time we championed bivalves?

Simmering in pots around the world is a food that could spark a revolution. Most of us have probably eaten it at some point, but it's an overlooked part of our diet. This natural source of protein is laden with essential nutrients that could fulfil the dietary needs of nearly one billion people in the most vulnerable populations on the planet. It could be a viable alternative to intensively-farmed meats such as beef.

The animals that are the source of this food require no feeding, need no antibiotics or agrochemicals to farm. And they actively sequester carbon. They can even protect fragile ecosystems by cleaning the water they live in. Welcome to the remarkable and unglamorous world of the bivalve.

With a higher protein content than many meats and plant crops, and high levels of essential omega-3 fatty acids and micronutrients, like iron, zinc and magnesium, this specific group of shellfish has the potential to ameliorate many global food issues. This is particularly relevant to child malnutrition.

We know that meat and fish have a greater environmental impact than plant-based foods, but the environmental footprint of bivalve aquaculture is even lower than many arable crops in terms of greenhouse gas emissions, land and freshwater use. Given that animal protein production is so often cited as a significant carbon culprit down both to the carbon footprint of feed and fertilizer production, and the methane emissions of the animals themselves, this is forcing a shift in the landscape of environmentally friendly eating decisions.



And the numbers are there to back it up. We are looking at 340 tons of greenhouse gases produced per ton of edible beef, compared with just 11 tons of emissions per ton of bivalve protein.

Next up in our bingo of bivalve benefits come the Eutrophication Potential and Ecosystem Service Value of these filter feeders.

Eutrophication happens when nutrients washed into watercourses cause a sometimes toxic flush of algal growth, called “algal bloom”. If rain or groundwater washes excess fertilizers used on farmland away, or industrial and urban effluent leaches into the soil, it might find its way into waterways. Algae are better able to quickly capitalize on this phosphorus boom and soon spread over the surface of the water. In extreme cases, this impacts the aquatic ecosystem by blocking out sunlight so other plants die, and killing off wildlife as oxygen levels plummet.

As it’s a massive global problem, Eutrophication Potential is a standardized measure of how different activities harm watercourses. So how do bivalves score? Unlike farmed fish, they actually have a negative impact as they gobble up all that excess algae and other organic particulates cleaning up the waterways and oceans. Bivalves help to protect watercourses from the effects of eutrophication.

This is a great example of mussels providing ecosystem services.

Mussels are also hugely important to marine ecosystems because they increase biodiversity by acting as ecosystem engineers.

Yet here lies the double-edged sword of the ecological niche of bivalves. Because they are filter feeders, whatever is in the water – good or bad – ends up inside them, which is a problem due to the relatively unusual way in which we eat this food.



This can mean that they concentrate harmful micro-organisms, toxins and chemicals present in the water that can pose a human health risk especially as we often eat bivalves raw or lightly cooked and eat the whole animal including the gut. Because of this we need to understand the hazards, assess the harm and ensure that programmes are in place to manage any risks before the product reaches the consumer.

Yet if this risk is managed, bivalves have the potential to contribute to better nutrition and the improvement of the GDP in developing nations in a significant way, due to their high export value compared to traditional fish species. Bivalve farming can also contribute to gender equality in coastal communities, as women are able to work in aquaculture because the farms typically are located close to the coast. This means women can balance earning an income with childcare needs, which is not the case when it comes to offshore fishing.

Some might find bivalves an acquired taste and others might pale at the thought of cooking with them, but perhaps it's time to rethink the potential of these filter-feeding animals. Their environmental credentials alone are impressive – the fact they can be nourishing and even empowering is surely enough to give them another go. The bottom line is there is huge potential in this unassuming collection of creatures.