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**Guardian sustainable business** Why oysters, mussels and clams could hold the key to more ethical fish farming  
**Jennifer Jacquet**

Aquaculture is fast becoming unsustainable and unnecessarily cruel. It's time to look to bivalves, the most environmentally sound animal species to farm



Bivalves – a group that includes oysters, mussels and clams – are the best option for farming. They, of all animals, appear to have the most minimal ecological impact, as well as minimizing welfare concerns that come about as the result of captivity. Photograph: Alamy

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**Aquaculture – the farming of aquatic animals – is [one of the fastest growing food production industries in the world](#). But it's growing the wrong way.**

Similar to factory farming, aquaculture is becoming an industrialized food system that is unsustainable and unnecessarily cruel. It doesn't have to be this way. When it comes to aquaculture, we can avoid making the same mistakes that we made on land.

To reduce the problems in the rapidly growing aquaculture sector, government policies, investors, and farmers should encourage the production of bivalves – a group that includes oysters, mussels and clams. In [a recent article in the journal Solutions](#), my co-authors and I argue that bivalves are the most environmentally sound animal species group, and the least worrying when it comes to welfare.

Bivalves are the best option for farming if one chooses to farm and/or eat animals at all. They appear to have minimal ecological impact while minimizing concerns around welfare in captivity. In fact, bivalves may not just be the best option in the ocean, but the best choice if one chooses to eat animals, period.

Without taking into account food that is wasted, scientists predict [we will need 70-100% more food](#) to feed an estimated 9 billion people by 2050. In the past, we would put more land under agriculture and expand our hunt for fish: over the last 50 years, [we have expanded fisheries further offshore](#). But today we are reaching the limits of that kind of expansion.

Instead, we have started farming animals we once used to catch in the wild. For some species – like shrimp – farming, rather than fishing, [now provides the majority of animals on the market](#).

Aquaculture could provide food for the growing human population as well as reduce overfishing, but right now it's doing neither. Instead of alleviating pressure on wild systems, aquaculture has put added pressure on wild fish. Nearly [one-third of the global marine fish catch each year goes to feed other animals](#), in part because those wild fish can be purchased inexpensively [from developing countries, such as Peru](#). Fisheries biologist Daniel Pauly, with whom I did my graduate work, refers to this as “robbing Pedro to pay Paul”. It would be wise to leave these small fish in the water [for the seabirds, marine mammals, and larger fish that depend on them](#) for their primary source of food.

Aquaculture must reduce its pressure on wild-caught fish for feed. One way to do this is to farm animals lower on the food web that require little to no feed, such as freshwater carps, tilapia, and bivalves.

But this recommendation to increase production of herbivorous fish ignores animal welfare as a growing concern. Over the past 15 years, scientific evidence has revealed that vertebrate species, including fish, [indeed experience pain and suffering](#). There is less certainty about pain and suffering in invertebrate aquatic species, such as octopus, lobsters, shrimp, and bivalves. However, a growing body of research shows not all invertebrates are created equal.

Consider octopus. Researchers are now working out [how to farm octopus](#). While scientists like José Iglesias Estévez from the Spanish Institute of Oceanography refer to octopus “an ideal mass-produced food”, farming octopus and their close relatives would be a big mistake. These are exceptional animals with highly developed brains and nervous systems, and some people even refer to them as “honorary vertebrates” (octopus were the only invertebrates included in the [2012 Cambridge Declaration on Consciousness](#)). It is reasonable to debate [whether we should be eating octopus at all](#), let alone farming them.

That said, in some sort of evolutionary fluke, mollusks, the large taxonomic invertebrate group that includes octopus, also includes bivalves. This group of animals, protected by a hinged shell and largely sedentary, seems to be considerably less complex. There are fewer welfare concerns about these species groups than about others, especially in captivity.

Ignoring welfare in the water would go against the trends we are seeing on land, where concerns about animal wellbeing are growing. Groups are now lobbying investors to divest from both animal meat as well as factory farming. Some speculate that [divestment from factory farming will be the next big divestment movement](#), because factory farming is too risky financially and in terms of reputation. Last year, the meat company Tyson Foods, [bought 5% of the plant-based protein company Beyond Meat](#).

Fish are also finally getting mainstream attention. In 2016, the [United Nations report on the State of World Fisheries and Aquaculture](#) mentioned animal welfare for the first time as something that “adds to uncertainties in the fish sector” and added “consumers are increasingly requiring high standards of quality assurance and demanding guarantees that the fish they purchase are produced sustainably”.

As consumers concerned about health and the environment, we need diets that are more plant-based and fewer animals, but food production trends are not up to consumer demand alone. Consumers did not demand farmed

salmon. There were major investments in the production of farmed salmon and creating markets for it. Farmed salmon [now represents an overwhelming portion of Atlantic salmon for sale.](#)

If we continue to mass produce animals, it would be best to mass produce animals that are as plant-like as possible. They should not require fish feed, should not require conversion of habitat, and should minimize pollution. They should experience the least amount of pain and suffering in captivity as possible. These criteria cannot be met with farmed salmon.

Of all the aquatic animal species groups that we farm for food, bivalves appear to be the most promising in terms of meeting these goals. Given the market growth in the food sector, many investors are looking to exciting new opportunities. For the future of aquaculture, we should look toward the half-shell.

Link: [https://www.theguardian.com/sustainable-business/2017/jan/23/aquaculture-bivalves-oysters-factory-farming-environment?CMP=share\\_btn\\_tw](https://www.theguardian.com/sustainable-business/2017/jan/23/aquaculture-bivalves-oysters-factory-farming-environment?CMP=share_btn_tw)