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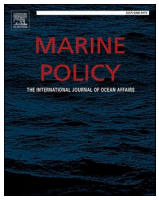

A balanced approach to the potential of octopus aquaculture

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Octopus aquaculture has become a subject of debate. Some critics have expressed the opinion that it raises significant ethical concerns regarding animal welfare and poses ecological risks [1]. This opinion has led to the prohibition of octopus aquaculture in the states of California and Washington during 2024, and there is currently a bill before the US Senate proposing to ban it across the United States [2]. An alternative view is here expressed by researchers specializing in cephalopods (octopus, squid, cuttlefish and nautilus) at 66 research institutions in 25 countries. In our opinion, a blanket ban disregards the potential benefits of octopus aquaculture, which is still at an experimental stage and could contribute to sustainable food systems and resource conservation if developed with robust scientific oversight. Concerns about the welfare and sustainability of animals raised as food for humans are important but both are being addressed proactively through scientific innovation, research and regulation [3], so outright prohibition of octopus aquaculture is unwarranted.

Global demand for meat products is predicted to increase to two billion t yr^{-1} by 2050 [4]. As terrestrial farming of livestock such as beef, pork or poultry struggles to meet this demand sustainably, aquaculture offers a viable alternative for dietary protein production. Aquatic foods, including cephalopods, are highly nutritious and benefit human health [5]. Also, in many tropical countries where cephalopods are distributed, their culture could be a productive alternative which, on a small scale, could contribute to local food security, improve the standard of living and reduce the vulnerability of economically depressed coastal communities [6].

The argument that octopus sentience renders farming them unsuitable [1] overlooks the fact that animals raised for human consumption for thousands of years—such as pigs, cows and chickens—are not less sentient, yet humane farming practices are still being developed, improved, refined and regulated to ensure their welfare [3]. Appropriate welfare standards should, of course, be applied also to octopuses in aquaculture, identifying and meeting their particular physical and cognitive needs [7].

Additionally, concerns regarding the carnivorous diet of octopuses, and its potential environmental impact, should not automatically disqualify octopus aquaculture. Ongoing research suggests that sustainable octopus aquaculture is feasible. For example, some carnivorous fish farms use >70 % plant-derived ingredients in their fish feed [8]. Proposals to ban octopus aquaculture [1,2] risk halting such progress, denying the contribution of octopus aquaculture to global food, nutrition and economic security without adding pressure to overfished wild octopus populations [9], which for millennia have been exploited by humans as a food source [9,10]. Given the forecasted rise in demand for animal-source protein, it is essential to explore all viable, sustainable and ethical food production systems rather than dismiss any prematurely.

CRediT authorship contribution statement

Ian Gleadall: Conceptualization, Writing – original draft. **Roger Villanueva:** Conceptualization, Writing - original draft. All authors: Writing – revision & editing.

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Declaration of Competing Interests

The authors declare that they are research scientists writing to express their opinion about the feasibility of octopus aquaculture and have no personal relationships or direct financial interests in any potential commercial octopus aquaculture industry. Ian G. Gleadall is Executive Director of AiCeph LLC and Consultant to Hotland plc, Tokyo (a fast-food franchise company specialising in octopus products).

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Data availability

No new data were used for the research described in this communication.

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