

This book was originally published in 2024 via the Lund University Research Portal. At the time of publication, the series webpage was hosted by the Joint Faculties of Humanities and Theology at Lund University; it has since been transferred to Open Books Lund University, where the series is now available.

Publisher: *Department of Communication, Lund University*

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ISBN 978-91-89874-46-6 (Print)

ISBN 978-91-89874-47-3 (PDF)

This chapter: *Who Wants to be Blue? Aquaculture Expansion and the Concept of Blue Food*

DOI: <https://doi.org/10.37852/oblu.263.c676>

The Lund Critical Animal Studies Collection 1

ISSN: 2004-9609.

The Lund Critical Animal Studies Collection will be found here:

<https://books.lub.lu.se/>

Who Wants to be Blue?

Aquaculture Expansion and the Concept of Blue Food

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Introduction

A few months ago, I was selling a used bicycle to a person. As we small-talked he asked what I did, and I told him that I was taking a course in Critical Animal Studies. I said I am interested in human-animal relations, more specifically how humans relate to fishes¹. As coincidence would have it, he then told me he was a retired head of operations at a fishing company.

I think they are sensitive to sound, he said.

He accounted for his experience in the process of slaughtering them, how they, when being transported on the conveyor belt toward the machinery with two rotating blades that would kill them, would start to move their bodies vigorously attempting to escape. On occasions he said, their bodies would bounce up in the air and actually flap off the power switch of the machinery, causing it to stop.

Similarly to the fishes on the conveyor belt who were captured in the ocean off the west coast of Sweden, fishes around the world living their lives in oceans, lakes, rivers and other bodies of water, have historically been confronted with, and resisted, human tools and technologies. Designed to outsmart, capture and exploit them,

¹ When speaking of two or more individuals of fish in this chapter, “fishes” used as opposed to traditional language-use where the plural form for two or more individuals of fish remain “fish”. This is done to make visible when referring to a plurality of individuals.

such as different kinds of hooks and nets, and more recently aquaculture² constructions. Hooks, for example, have been found at excavation sites; sharp, carefully shaped pieces of bone splinters the size of tooth-picks. They were possibly baited and tied to lines with which to haul fishes in (Klein and Edgar 2002, p. 20). And the net, formed in a mesh pattern out of rope or twine, when thrown in the water allows for large fishes to be caught, while water and smaller creatures of lesser interest move through it. The hook and net however rely on capturing evasive animals³ in large open spaces. Aquaculture is a technological innovation that responds to this evasion by keeping fishes captive in enclosed spaces from birth to death (Wadiwel 2016). This furthermore involves human “interventions in the rearing process to enhance production” (FAO 2022). In marine aquaculture, fishes are captive in net pens in the water, or in tanks on land. And for freshwater aquaculture, fishes are kept in ponds or other systems made by humans (NOAA 2021). Contrary to what would be suggested by human language-use as in ‘cultivating’ or ‘harvesting’ fishes, the effort that humans put into the design of these tools, technologies and architectural solutions are proof of resistance among fishes. For if fishes gave themselves freely to humans, no tools or technologies for capture or for making evasion impossible would have been needed. As the anecdotal story about fishes fighting for survival on the conveyor belt highlights; far from passive, indifferent or insensitive to their lives and destinies, fishes are actively resisting human acts of domination (Wadiwel 2016).

Compared to the domestication⁴ of land-living animals, such as dogs, pigs, cows and bulls, and horses, which started about 12000 years ago, the domestication of fishes has a much shorter history (Teletchea 2015, p. 1228, Balon 2004, p. 1). The first practice of domestication in the form of aquaculture is believed to have taken place in China about 2500 years ago, as per documentation from 460 BCE. Indi-

2 In this text, “aquaculture” is used interchangeably with “farming of fishes”.

3 The term *anymal* – a contraction of ‘any’ and ‘animal’ – is used to denote “any animal who does not happen to be the species that I am” (Kemmerer 2006, p.10). Using *anymal* avoids alienating terms such as ‘non’ and ‘other’, as in ‘non-human animal’ or ‘other-than-human animal’, thus as well having the advantage of being a one-word term which is less cumbersome. Also, using *anymal* makes way for using the term ‘animal’ when actually referring to both animals and humans, which in turn eliminates a false and harmful understanding of ‘animal’ and ‘human’ as dichotomies. (ibid. pp. 10–11)

4 Adhering here to Clutton-Brock’s (1999) definition of a ‘domestic animal’ being “one that has been bred in captivity for purposes of economic profit to a human community that maintains total control over its breeding, organization of territory, and food supply.”

viduals of carp were most commonly the ones exploited. Goldfishes – probable descendants of Chinese gibel carp individuals – constitute one of the documented branches of this exploitation. Domesticated in China during 960-1278 CE, and from the 1200s and onwards all the more popular as ornamental animals, then introduced in Japan approximately 1500 CE and in Europe in the 17th century (Clutton-Brock 2012, pp. 96-97, Balon 2004). Romans in south-central Europe started domesticating individuals of carp about 2000 years ago (Balon 2004).

While the first domestication of individuals of fish species dates back at least about 2500 years, domestication of fishes is a development that really took off in the 20th century. In the late 1960's and early 1970's, international development agencies saw farming of fishes as a means to tackle problems pertaining to shortages of arable land and food. To the detriment of the individuals involved, the bodies they inhabited proved to perform well on metrics of importance to humans, such as 'grain feed conversion rates'. And after international aid agencies and resource planners in the early 1980's proclaimed that a 'Blue Revolution' was desired, funding of genetic modification projects followed. For example, in 1993 researchers in the Philippines engineered individuals of tilapia that outgrew their 'wild' counterparts by 60 percent. The 'aquatic chicken', World Bank officials called "it" (Platt McGinn 1998, p. 12), referring to the extreme and unprecedented rapid growth of chickens in animal agriculture post-intensive selective breeding (Chalmers 2021).

It is difficult to determine how many individuals of fish have, and do, live and die at aquaculture sites since fishes traditionally are not measured in number of individuals but in the aggregate weight of their bodies. However, in 2012 it was estimated that globally 37 to 120 billion individuals were killed at aquaculture sites – yearly – figures that in the case of land-living animals for human consumption in 2010 corresponded to 63 billion individuals (Mood and Brooke 2012, p. 1, Wadiwel 2016, pp. 196-197).⁵

Globally, from the 1960's to the 2010's, per capita consumption of fishes, by the weight of their bodies, increased from 9.9 kilograms to 19.2 kilograms per year – a near doubling. This despite that, since the 1980's the number of 'wild caught' fishes globally have stayed about the same, meaning that since the 1980's the in-

5 For 'wild caught' fishes, the yearly average estimate for 2007-2016 was 790 billion – 2.3 trillion individuals (See: fishcount.org.uk).

crease in human consumption has been contingent upon an intensified exploitation of fishes at aquaculture sites (Wadiwel 2016, pp. 197, 217).

In 2015, farmed fishes accounted for as much as 53 percent of allfishes killed for human consumption (FAO 2018). Two years prior, in 2013, the so-called Blue Growth Initiative was launched by FAO. ‘Blue Growth’ is defined as “sustainable growth and development emanating from economic activities using living aquatic resources of the oceans, inland waters and coastal zones, that minimizes environmental degradation and biodiversity loss and maximize economic and social benefits” (FAO 2020, p. 158). Other terminology used interchangeably with ‘blue growth’ are ‘blue economy’, ‘green economy in a blue world’, or ‘ocean economy’ – all stemming from ‘the green economy’ concept endorsed at the United Nations Conference on Sustainable Development⁶ (also known as “Rio+20”) in 2012 (FAO 2020, p.158).

Despite the already steep and extreme growth of industries involved in the exploitation of fishes, global demands for human consumption of marine and freshwater fishes, crustaceans, and molluscs is projected to double until 2050 as a consequence of human population growth as well as endeavours to meet human development goals (Naylor et al. 2021).

Most recently, in 2021, a new conceptualisation has been launched, of both animal and plant aquatic species for human consumption grouped together under the name ‘Blue Food’, which is defined as “foods derived from aquatic animals, plants and algae cultivated and captured in freshwater and marine environments” (Leape and DeClerk 2021, p. 6). The blue food concept appears to enjoy broad support, ranging from UN initiatives⁷ for meeting sustainable development goals (UNDESA 2021), to research performed at many universities in for example Sweden (Blue Food – Centre for future seafood 2022). Seemingly at the centre of advocacy for the global conceptualisation of blue food is the Blue Food Assessment (2022a), which is “an international joint initiative that brings together over 100 scientists from more than 25 institutions around the world. The Stockholm Resilience Centre at Stockholm University and Stanford University’s Center for Ocean Solutions and Center

⁶ Please keep in mind that sustainable development is a very anthropocentric concept, not least as evidenced by the lack of consideration for anyimals in the 17 Sustainable Development Goals. (Visseren-Hamakers 2020)

⁷ e.g. the Aquatic Blue Food Coalition; a multi-sectoral coalition consisting of nation states, NGOs, academic institutions, consumer groups, financial institutions and more, launched at the United Nations Ocean Conference in Lisbon 2022. (EDF 2022)

on Food Security and the Environment are lead science partners and EAT is the lead impact partner” (Blue Food Assessment 2022b).

A scan of literature on ‘blue food’ reveals lacking anymal-ethical deliberations and problematisations in the sector, suggesting anthropocentric and speciesist norms at the core of policy and research pertaining to ‘blue food’. Given this, as well as issues regarding aquaculture provided above, this chapter aims to explore how developments concerning aquaculture and the conceptualisation of fishes as ‘blue food’ may be understood from a CAS perspective. How do these developments affect individuals of fish? And, how may policy and research on ‘blue food’ be influenced by CAS perspectives?

The method used for this chapter consisted of text analysis, focusing on documents such as UN publications and research articles on aquaculture and ‘blue food’ as well as websites such as the Blue Food Assessment website. Considering the short history of the ‘blue food’ concept and only a small number of relevant findings during the literature review, the total data on ‘blue foods’ is limited. This was one reason for deciding to opt for a strategic selection: to focus mainly on the Blue Food Assessment Initiative – their website and publications. Another reason was that the initiative represents 100 scientists and 25 institutions around the world, which thus was estimated to imply that perspectives and rationales put forward on their website reflect common views among a considerable group of parties. The data gathered was then analysed using concepts and theory building from the CAS research field. Given time and space constraints this chapter is limited in scope and is of explorative character. While recognising additional important areas that could have benefited the chapter, delimitation choices were made⁸, resulting in the chapter in its current form.

8 One excluded area is the relatively recent research pertaining to sentience among individuals of aquatic species, and its possible implications (Birch et al., 2021). On the one hand, there are possible implications for protection in legislation of members of those species, as well as possible implications for human perceptions of their ontologies, and perhaps in turn perceptions of for example edibility. On the other hand, these research findings imply the possibility for aquaculture industries to – through innovation – capitalise on adapting to anymal sentience in order to make operations more efficient and profitable, as exemplified by Temple Grandin’s construction of “stairway to heaven” – an innovation that resulted in lesser stress among cows and bulls on their way to slaughter, while simultaneously reducing resistance and thus making possible for exploiters to slaughter an even greater number of individuals than before (Williams 2004).

Ontological implications of aquaculture, and the power of naming

In the 19th century, abattoirs for land-living anymals were optimised for the disassembly of anymal bodies. The modern abattoir was made possible through many different modern technologies such as railways for transport, architectural solutions with specialised spaces for different purposes such as cooling, and machinery that enabled anymal bodies to be transported to different stations of a disassembly line. The effectivisation, mechanisation, division of labour at the different disassembly stations, as well as the detailed usage of every part of the anymals' bodies, altered the ontological perception of the anymals exploited – from individuals and subjects to commodities and objects (Pick 1993).

The recent, ongoing and projected future, massive expansion of farming of fishes provides for an unsettling resemblance, and invokes thoughts on implications for human-fish relations. Whereas before, fishes caught for food were thought of as free until the moment of capture, now, with the aquaculture industry in 2015 having expanded to represent 53 percent of total “seafood production from fisheries and aquaculture” (FAO 2018, Oddsson 2020, p. 1), what ontological alterations may follow in human perceptions of fishes, and of most concern, what will it imply for fishes? While responding to these questions with any degree of embellishment, depth or certainty is beyond the scope of this chapter, is it not reasonable to assume that fishes – at least members of the most exploited species at aquaculture sites, such as salmon, tilapia and carp – have already started to, and increasingly will be ontologically understood as ‘farm animals’⁹, leading to normalisation of captivity and domination of fishes from birth to death?

Continuously bi-constructing fishes at aquaculture sites

On the question of perceptions and constructions of anymals, from a realist-Cartesian perspective anymals are fixed in different ways, determined by their history and genetics, and thereby predictable in their reaction to stimuli. A bi-constructivist approach on the other hand centres anymal individuality, creativity and ability for anticipation, and furthermore acknowledges the subjective human ob-

⁹ I am aware of alternate language-use such as “farmed anymals” that better reflects a CAS perspective, but am using “farm animals” here to refer to common language-use.

server as significant when constructing perceptions of anymals, as opposed to anymals being available to humans for objective observation (Lestel 2011).

In adhering to a bi-constructivist approach, there is an openness to what fishes will become when interacting with the circumstances that the aquaculture sites and systems, and the conditions of living and dying there, entail. Fishes, innovative and creative agents in these new environments compared to those in which their ancestors spent their lives, will undoubtedly engage in new ways with humans and their technologies for domination, dialectically subjecting each other to challenges and adaptations (Wadiwel 2016, Hribal 2007). Moreover, as stated earlier, another way in which the human aquaculture project has imposed ontological changes on fishes has been through genetic modification.¹⁰

Last but not least, from the perspective of fishes, what is a being to think about their place in the world, to think about themselves as a being – what they are – when born into confinement, and with restrictions of movement, variety, opportunities for spontaneity, expression of personality and desires? Restrictions through meticulously controlled terms of the environment in which their existence plays out in its entirety?

Naming

The practice of naming anymals – be it on an individual or species level – has consequences for the one(s) named, as well as for human-animal relationships at large. For example, perceptions of what constitutes ethical treatment toward one and the same rabbit is likely to differ majorly depending on the rabbit being labelled as ‘pet’, ‘food’, ‘research subject’, or ‘vermin’ (Borkfelt 2011).

In China, in 618 CE a change in dynasties occurred, and the name of the new lineage of emperors - Lee - happened to be very similar to the word for carp in Chinese. With this event, some 1078 years of domination and killing of carp individuals came to a stop due to human exploiters’ anxiety regarding eating that

¹⁰ It should be noted that according to Lestel (2011) – philosopher and associate professor in the Department of Cognitive Science at the École Normale Supérieure, Paris – we ought not to ask the ontological question what an anymal is, but rather what anymals are capable of, which cannot be fully known a priori, but is something that continuously is subject to surprise. Therefore, it may be more fruitful to speak of ontologies in plural, and to thereby mirror both plurality in anymal individuality as well as the continuous transformation of beings becoming.

which sounded like the name of the Emperor. Instead, in their place, individuals of numerous other species with less sensitive names filled the spaces of confinement (Platt McGinn 1998, p. 12). This example of future generations of individuals of carp avoiding an existence of subjugation and exploitation due to naming, is telling of the power of language and symbols in human webs of meaning. Labels, names and their connotations can and does mean the difference between freedom and captivity, life and death.

Conceptualising fishes as blue food

A first recognition when confronted with the term ‘blue food’ is that it functions as a mass term. Regardless of how much blue you add to blue, the result is ‘blue’, the same way that adding food to food results in ‘food’. This mass term language-use suggests an interchangeability and a de-ontologisation of the individuals who make up the ‘blue food’. Another way of putting it is that the individuality of fishes is removed, and those who the term ‘blue food’ refers to become ‘absent referents’ (Adams 2009). This way, the ‘blue food’ conceptualisation functions as an *Oppressive conceptual framework* as it “explains, justifies, and maintains relationships of domination and subordination” (Warren 1990, p. 127).

Provided below are bits of two answered questions on the website of the Blue Food Assessment in the FAQ section (Blue Food Assessment. 2022b) (bold style added), followed by analysis:

“What does the Blue Food Assessment mean by ‘blue food’?

Blue foods, also known as aquatic foods, are foods that are captured or cultivated from the ocean, rivers, lakes, ponds, raceways and tanks. **Blue foods can derive from aquatic animals, plants, or algae.** They support hundreds of millions of livelihoods and are a **critical source of nutrition for several billion people around the world.**

/.../

For example, **food system policies and analyses have often considered blue food as a homogenous “fish” category, overlooking the vast diversity of animals, plants and algae that are produced or harvested for food.** The Blue Food Assessment begins the **critical work of moving beyond “fish” as one category.** For example, the **nutrition paper** offers the most comprehensive database of

blue food nutrition ever assembled, mapping **nutrient content across more than 3,750 aquatic species**. Other papers highlight the need to analyze data across various regions (**demand**) and production systems (**environmental performance**). /.../ ”

As stated earlier, and as reiterated above, ‘blue food’ does not only refer to fishes, but reflects a recognition of members of thousands of both plant and animal species. From a CAS perspective, arguably it is a welcome development to move away from ‘*a homogenous “fish” category*’. However, at a closer look, even though there is greater attention to detail, the metrics highlighted as important are not recognition of individuality, moral worth or the likes, but *nutrient content*, human *demand* and *environmental performance*. Thus, from a CAS perspective, this recognition of diversity seems to be something like what Syl Ko (2017) calls “cosmetic diversity”, when talking about black bodies being present in white spaces, rather than black Life actually being acknowledged – “Life” meaning “those activities that make life worth living and valuable” (Ko 2017, p. 5). Put differently, while those behind the Blue Food Assessment website recognise the diversity of the members of species making up ‘blue food’, they omit crucial aspects of that diversity – factors that bear ethical implications with them. That is highly problematic.

“Does the Blue Food Assessment recommend expanding aquaculture?”

The Blue Food Assessment’s **demand** paper projects that demand for blue food is expected to **roughly double by 2050**. This **demand** will likely be met principally by **aquaculture expansion**. /.../

As noted in our environmental performance paper, progress in recent years has demonstrated the potential for substantial gains in both **efficiency** and **sustainability** through **better management and reduced reliance on wild fish for feed**. Between 1997 and 2017, for example, the amount of wild fish used to produce a kilogram of farmed fish declined by 85%. /.../

/.../ The Blue Food Assessment supports **sustainable aquaculture** operations that actively **mitigate environmental risks and optimize for sustainable feeds**, as indicated in our **environmental performance** paper.”

The focus on human demand while neglecting ethical considerations and individuality among anymals is anthropocentric and speciesist. Furthermore, while the

85 percent reduction in wild fish exploitation as feed to the aquaculture production is of great importance from a CAS perspective, we are soon again reminded that it was not the spared lives of individuals that mattered, but sustainability and *environmental performance*. Thus, the answer from the Blue Food Assessment seems to imply an indifference to the scale of domination and neglect of desires among the individuals whose bodies make up the end product of what is produced. What seems to be expressed in this answer is an interchangeability between anymals and plants, implying a de-animalisation¹¹ of those anymals.

In sum, in regards to the question of expanding aquaculture, the Blue Food Assessment is passive, even supportive. Thereby it's supporters are complicit in the ongoing increase in exploitation of aquatic anymals and furthermore contribute to what Zygmunt Bauman calls adiaphorisation; "making certain actions, or certain objects of action, morally neutral or irrelevant – exempt from the category of phenomena suitable for moral evaluation." (Emel and Wolch 1998, p. 22).

Discussion and conclusions

From a CAS perspective, recalling that the Blue Food Assessment is "an international joint initiative that brings together over 100 scientists from more than 25 institutions around the world." (Blue Food Assessment 2022b), it is very frightening to take part of anthropocentrist and speciesist narratives and discourses expressed on their website, as it serves as a platform for proliferation of their recommendations. Their narratives are not surprising however, considering the seemingly strong historic ties to human and sustainable development agendas, including the different variations of growth promotion framings. These frames, be they coloured in green or blue, their commonality is their commodification and exploitation of nonhuman "resources" that humans claim ownership over. This makes the task of CAS scholars all the more vital – to make up a counter weight by engaging in a discursive battle – which not least, as this chapter has indicated, has to do with deconstructing normalised perceptions and constructions of what

¹¹ De-animalisation is an act in which the characteristics of anymals are represented in non-anymal terms, often by reference to characteristics of plants or vegetables, or in terms of human purpose. These representations serve as euphemisms for a reality that is too harsh to be faced directly, and thus facilitates anymal exploitation. (Vialles 1994).

anymals are, to recognise that they are continuously becoming, what they are capable of, including to recognise their resistance to domination.

One possible explanation for a lacking perception among humans of anymals as sovereign subjects may be found in humans learning to adopt a Cartesian logic of relating to anymals, deeming them guilty of being mindless, non-sentient and thus not deserving of moral consideration until proven otherwise. (Aaltola 2013) However, given the astronomical aggregated exploitation of anymals – fishes most represented – and all indications of mindedness and sentience, it is hard to conceive of a more suitable situation in which to adhere to a precautionary principle and to reverse the burden of proof, as Dinesh Wadiwel (2016, p. 204) has argued. In other words, it might be helpful for policy-makers and researchers to ask themselves, as Wadiwel has posed the question: ‘why is it we can justify using animals in the way we do when there is the possibility, every possibility, that they think, reason and suffer as we do?’ (Wadiwel 2016, p 227). The Blue Food Assessment, through the adiaphorising narrative on their website – of fishes as instruments for meeting human development goals rather than as subjects with inherent worth – fails to address this important question. I urge researchers and policy-makers on blue food and related fields to apply CAS perspectives when formulating research questions and policy. How may food-systems of the future refrain from exploiting and dominating anymals?

To conclude, my argument is that fishes – at least members of species most exploited at aquaculture sites, such as salmon, tilapia and carp – have begun to, and given projected developments increasingly will be ontologically understood as “farm animals”, leading to normalisation of captivity and domination of fishes, from birth to death. I deem it an important scholarly task to keep track of developments in this domain. I furthermore argue that the ontological implications of categorising fishes as “blue food”, the stereotyping rather than recognition of individuality, as well as the anthropocentrist and speciesist language-use found at the Blue Food Assessment website, reinforces and legitimises an extreme increase in exploitation and domination of fishes at aquaculture sites around the world. Conceptualising individuals of aquatic species as “blue food” seems to be yet another anthropocentric practice of naming that facilitates and promotes further exploitation of those assigned this label. Under this paradigm, and in general, who wants to be blue?

Acknowledgements

Thank you so much Gina Song Lopez (宋芝蘭 Song Chih Lan) and Tobias Linné for your very generous help and for your invaluable support.

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