



# MILKFISH WELFARE IN THE PHILIPPINES

**AUTHOR: V. COX**

Review: S. Hilton, A. Bansal



**OCTOBER 2022**

**RECOMMENDED**

# Research Report:

## Animal Welfare – Milkfish welfare in the Philippines

**Author:** Vicky Cox

**Review:** Sam Hilton and Akhil Bansal

**Date of publication:** October 2022

**Research period:** 2022

Thanks to Kylie Abel and Urszula Zarosa for their contributions to this report. We are also grateful to Thomas Billington and Haven King-Nobles who took the time to offer their thoughts on this research.

For questions about the content of this research, please contact Vicky Cox at [vicky@charityentrepreneurship.com](mailto:vicky@charityentrepreneurship.com). For questions about the research process, please contact Sam Hilton at [sam@charityentrepreneurship.com](mailto:sam@charityentrepreneurship.com).

# Introduction and summary table

## The case for working on fish welfare

The scale of fish suffering is huge. While the FAO only reports fish in the rather detached measurement of tonnage, calculations suggest that there are a staggering 51 to 167 *billion* individual fish being farmed at any given point ([fishcount.org.uk](https://fishcount.org.uk/), 2019; [Open Philanthropy, n.d.](#)). This number is only projected to increase as aquaculture continues to grow rapidly across the globe, seen as a sustainable solution to overfishing ([FAO, 2020](#)).

Charity Entrepreneurship-incubated Fish Welfare Initiative (FWI) has inspired animal advocacy organizations to focus more on fish campaigns since its launch in 2019, but work on fish welfare is still relatively neglected- particularly in the most important regions. For example, Asia accounts for roughly 90% of the global tonnage of farmed fish produced ([Yan and van Beijnen, 2019](#)).

## Explore vs. exploit

We believe that work in the fish welfare space is still very much in the “explore” phase, rather than the “exploit” phase. By this we mean that we do not yet have an obvious, tested, and scalable ask and approach to improving fish welfare - we are still trying to work out what this could be, and should be open to exploring many different options for answering this question.

Though we do have some best guesses and recommendations for how to improve fish welfare and we think that providing these throughout the report is useful, co-founders shouldn't be surprised if this may change once they've done some in-country scoping and a needs assessment on the ground. That is, they should be open to and should expect to explore many options, rather than “exploiting” the recommendation in this report.

## What to work on and how to do it

Billions of fish are suffering in farms, exposed to constant pain, stress, and high mortality rates. They spend their entire lives struggling to breathe due to poor water quality, high stocking densities, and living in disease. The scale of the cruelty is unrivaled.

But so too is the scale of the potential. Fish Welfare Initiative has significantly improved the lives of nearly 2 million animals so far, and are confident in their ability to help millions more. We have plenty of reason to believe that a new intervention has similar potential, and we are excited to present our reasoning in this report.

Our research suggests that working in the Philippines could be particularly promising, and, in particular, we suspect that improving water quality and stocking densities could be highly tractable and scalable approaches. What's more, these solutions are a win-win, as fish with higher welfare have better survival rates and increase farm efficiency.

Working at the farmer-level to improve water quality and reduce stocking densities in the Philippines is the approach we have modeled in this report to improve fish welfare. However, we also consider alternative interventions, countries, and approaches; and the co-founders should be open-minded to pursuing any combination of these alternatives, or pivoting to them if our best guess doesn't work out. We have chosen the Philippines as the country we have modeled as we believe that the availability of talent is uniquely promising given the work of Animal Empathy Philippines and EA Philippines. Also, there is potential to learn from and maybe build off of the work that Fish Welfare Initiative has already done there. If working in the Philippines, then the most promising species to work with is the milkfish, as the most farmed species in the country.

Water quality and stocking densities on fish farms is our best guess of the problem that should be tackled by this charity - this is "what" the charity should be working on. However, we have found it quite difficult with our desk research to identify the "how", i.e., the best ways to address these problems. And so this will be the main question the co-founders of this charity will be trying to answer - the "how" of how to address these problems on the ground, and ultimately improve fish lives. We think a good starting point would be working at the farmer level for one-three years before pivoting to/exploring other approaches.

Ultimately, the endline goal of this intervention is to improve the lives of millions of farmed fish. We have done as much desk research as we can, but we are less certain that we have chosen and modeled the best approach to improve fish welfare than we would be in other cause areas with higher levels of evidence, or than we would be if we could have visited a few farms in the most promising countries. We are most certain that we want to see another organization working on improving fish



welfare, but less certain about what intervention this organization should work on, what approach they should take, and where this work should be done.

Component	Focus	Certainty level	Notes
Animal	Fish	Very high	This is the component of the intervention that we are most certain about: we would like to see another organization working to improve fish welfare. Fish suffering is high-scale, with 100m-1bn fish in farms in many countries. Work in this space is also highly neglected. We believe that it can be tractable to work on improving fish welfare with the interventions listed below.
Problem to address	Water quality	Medium high	Water quality is the most important component of ensuring good fish welfare. We think that it is likely that water quality will not be optimal on farms and so it may be a good bet that water quality will be part of your intervention. However, improving water quality can be quite difficult, and therefore there may be more tractable welfare improvements to make.
	Stocking density	High	Reducing stocking densities seems more robustly good, as it is a very simple ask that can greatly improve welfare. It may also have the benefit of reducing the total number of fish farmed, though we note that it could be the case that these fish are purchased by other farmers. It is worth noting, however, that it may be difficult to convince some farmers to reduce stocking densities.
Location	The Philippines	Medium high	The Philippines is promising for a new organization to work in given the number of fish produced, the availability of talent, and the potential to learn from and maybe build off of the work that Fish Welfare Initiative has already done there.
	Brazil	Medium high	Brazil seems promising due to its potential talent availability, and as a potential way to diversify your work from that of Fish Welfare Initiative (that is, focusing outside of Asia).
	Indonesia	Medium	Working in Indonesia could be promising given its higher fish production (compared to the Philippines and Brazil). However, we expect it to be more difficult to hire local talent and we also note that Sinergia Animal are likely to work on a fish welfare campaign in the future on the recommendation of Animal Ask, so work here might be less neglected.
	Country in the Global North eg., Norway, the UK, Canada or the EU	Medium low	Even in the Global North there has been little work done to improve fish welfare, and fish welfare legislation is still almost as rare as in the Global South. It could be promising to work in the Global North if the co-founders felt that they had a particular comparative advantage - especially in policy - but we note that other groups are already working here, and groups are more likely to work here in the future than in the Global South. It is also worth noting that we may expect fish welfare to be higher on farms in the Global North than in the Global South, as conditions would need to be better to facilitate more intensive production.

Intervention	Farmer-level direct work	Medium high	We think that farmer-level work is a very promising approach, especially at the beginning of your work; as it allows you to get a sense of what conditions are like on the ground, what welfare improvements are implementable on farms, what farmers are and are not willing and/or able to do, etc. Our main concerns with this approach is that it may not be very scalable and it is likely that the impact may not persist after the charity is operational, as farms will no longer be accountable to anyone.
	Corporate outreach	Medium	Corporate campaigns are the greatest tool that the animal movement has used to date. We think that corporate campaigns could also be promising for fish, but it is worth noting that the structure of the markets in some of the countries we are considering may not lend themselves as well to corporate campaigns, as we have seen in the Global North. You could take this into account during country selection if the corporate campaign approach is one that you want to explore.
	Government policy campaign	Medium	The main issue with governmental campaigns is the potential lack of enforcement, but if done well it has the potential to help the largest number of fish.

## Is this already covered by FWI?

We believe that FWI has shown that work to improve fish welfare is tractable, with their work in India potentially already helping improve the lives of 615,000 fish ([Fish Welfare Initiative, 2022a](#)). FWI is doing great work, but as it sees its work in India as its main focus in the short-term, there is still a lot that could be done to improve the lives of fishes elsewhere. We think that starting a new organization focused on doing this work in a country other than India would be very promising.

We favor starting a new organization over scaling FWI for the following reasons:

1. Even if FWI find a scalable ask and approach to improving fish welfare in India, it is not obvious that they would be able to easily apply the same ask and approach outside of India. The local context and conditions on farms, the species of fish being farmed, the type of farming system being used, the size of ponds, what farmers are willing to implement, whether you should even be working with farmers at all (or working at a different level such as with corporations or doing policy work), etc. will be completely different between different countries.
2. We see value in having new people working on this issue, such that they can innovate. Improving the lives of fish is a hard problem that should have more people trying to solve it.

3. There are just so many fish being farmed and comparatively little work is being done to improve their welfare, especially in the highest producing countries where the animal movement is smaller and newer and therefore less work is being done. This seems like an obvious gap that could be filled by a new organization.
4. Expanding FWI would stretch the directors' focus, shifting some attention away from their project in India, which they think should be getting all of their attention right now.

## Table of contents

1	How to improve fish welfare?	8
1.1	Interventions	8
1.2	Countries	11
1.3	Approaches	14
1.4	Life stage	20
2	Expert views	24
2.1	Fish Welfare Initiative	24
3	Cost-effectiveness analysis	25
3.1	Costs	26
3.2	Effects	26
4	Implementation	28
4.1	Talent	28
4.2	Funding	29
4.3	Scalability	29
4.4	Neglectedness	30
4.5	Externalities	30
5	Conclusion	30
	References	33

# 1 How to improve fish welfare?

In this section we will consider different interventions, countries, and approaches to improving fish welfare. Note that this section aims to be illustrative, not exhaustive.

We want to stress that the co-founders of this charity should be open-minded to pursuing any combination of these, rather than just replicating the approach taken by FWI in India.

## 1.1 Interventions

Farmed fish face both acute and chronic issues of pain and distress. We think that it is likely more promising to work to alleviate chronic welfare issues, as these affect fishes throughout their entire lives, resulting in a lifetime of suffering. Acute welfare issues such as inhumane slaughter, stressful handling and transportation, on the other hand, only last for a tiny fraction of a fish's life. Although these are obviously distressing, they do not necessarily account for most of the suffering in the lives of these fish.

### 1.1.1 Water quality

Water quality is commonly thought to be the most important aspect of maintaining good fish welfare ([Cooke, 2016](#); [Farm Animal Welfare Committee, 2014](#); [MacIntyre et al., 2008](#)).

The most important water quality parameters include dissolved oxygen, temperature, ammonia, nitrite, nitrate, pH, suspended solids, carbon dioxide, water flow, duration and intensity of light, noise, and vibration ([Cequeira and Billington, 2020](#)).

Interventions to improve water quality include, but are not limited to:

- Aerating the water using mechanical aerators or controlled water exchange
- Reducing stocking densities to reduce ammonia production and biological oxygen demand
- Avoiding overfeeding, as high levels of feces and uneaten feed can degrade water quality. Excess nutrients in the water from overfeeding can also lead to phytoplankton blooms which further degrade water quality.



- Pond preparation (eg., draining the pond between production cycles, demudding and drying the pond bottom) and treatment (eg., disinfecting/ liming the pond<sup>1</sup>)

### 1.1.2 Stocking density

High stocking densities are a welfare concern in themselves as they can lead to increased mortalities, high stress, higher rates of injuries, increased aggression, and changes in behavioral patterns such as reduced feed intake, but they also exacerbate other welfare issues including water quality deterioration and a greater susceptibility to diseases and parasites. High stocking densities can also be especially distressing for non-social fish species.

The obvious intervention in this case is to reduce stocking densities. This may seem like a hard sell to farmers, but it would have the benefits of increased survival and lower disease susceptibility- which can be seen as a win-win for farmers and fish. Moreover, FWI have successfully included a stocking density decrease in their welfare standards implemented on farms in India ([Fish Welfare Initiative - Alliance for Responsible Aquaculture, n.d.](#)).

### 1.1.3 Disease and parasite management

Disease and parasite management is very important for fish welfare; fish suffer immensely with disease and parasite infections, and these issues also greatly increase mortality.

Susceptibility to disease and parasite infection increases when fish are stressed; therefore, improving welfare using all of the interventions outlined above will also be beneficial to reducing disease and infections. However, there are also more specific steps that can be taken:

- Ensure welfare indicators (loss of balance, erratic swimming, reduced feeding, ulcerations, inflammation, marks on the body, color changes etc.) are used to avoid disease outbreaks by quarantining fish that exhibit these behaviors and treating them as soon as possible
- Preventative measures such as liming the pond, ensuring the maintenance of good water quality, vaccination, and the use of proper feeds and avoiding overfeeding

---

<sup>1</sup> Liming the pond is when limestone or other liming materials are applied to the pond bottom. This is done to kill germs, parasites, and bacteria and to improve water quality, specifically pH and alkalinity.

- Develop and follow appropriate biosecurity plans (eg., see [Fish Welfare Initiative's field booklet](#))

#### 1.1.4 Slaughter

Many fishes are slaughtered without prior stunning, and in the worst cases they are left to die through the long, stressful process of asphyxiation. The slaughter process also includes a series of stressful procedures in handling and transportation.

Making the slaughter process more humane involves interventions such as adopting stunning and slaughter methods suitable to each species, ideally with this pre-stunning and slaughter done *in-situ* on the farm<sup>2</sup> to avoid the transport of live fish which is very stressful.

#### 1.1.5 Handling and transport

Handling and transport are very stressful for fish and involve many other stressful practices, including crowding and netting.

The general best practice to decrease this stress is to minimize the frequency and time spent being handled and transported as much as possible, and avoid any unnecessary handling. More specific improvements include the following:

- Only crowd fish during cooler temperatures (early morning or late evening) and when the water quality is good
- Do not feed fish 24-48 hours before crowding
- Use gloves when handling fish
- Use small-mesh rubber nets when catching fish
- Avoid crowding too many fish at once, attract only a few with feed
- Keep fish in water as much as possible
- Ensure that transport containers are insulated, have no sharp edges, and do not leak
- Monitor water quality and fish welfare during transportation

---

<sup>2</sup> We note, however, that *in-situ* slaughter may be difficult for lower-income farmers who don't want to pay, or perhaps can't pay, for the equipment to electrically stun fish, or the workforce to percussively stun fish.

### 1.1.6 Other

You should work with farmers to identify the welfare issues on their farms and be open to working on these issues if they seem more important than any of the other welfare issues listed here.

### 1.1.7 Our recommendation

Water quality, in particular dissolved oxygen, and stocking densities seem like the most important welfare issues based on our desk research.

- Water quality – We recommend that you do scoping visits of farms in your top countries to determine whether this is actually the case on the ground, and if so then focus on trying to answer the question of how to improve water quality in practice (and note that this could be completely different to the suggested interventions in the [section above](#)).
- Stocking density – This seems more robustly good as too high stocking densities exacerbate any welfare issue, and therefore reducing these stocking densities would be very beneficial in almost all cases. Reduced stocking densities may also have the benefit of reducing the total number of fish farmed, though we note that it could be the case that fish not purchased by the farms that you are working with are just purchased by other farmers.

## 1.2 Countries

We note that when doing your geographic assessment you should aim to visit farms and stakeholders in the top countries that you are considering. Doing these scoping visits will enable you to make a more informed decision as you will have a better sense of the conditions on farms, how willing farmers are to meet/talk with you, the existing animal advocacy movement in the country, the talent availability in the country etc.

### 1.2.1 Asian countries

Asia accounts for roughly ~90% of the global tonnage of farmed fish produced ([McCarthy, 2020](#)), with eight of the top 10 fish-producing countries being in Asia.

Country	Total tonnage - 2016 FAO data (M tons)	Number of individuals alive at any point in time
China	49,529	49,539,116,569
Indonesia	7,419	7,419,424,440
India	7,310	7,309,799,942
Bangladesh	3,797	3,796,535,401
Egypt	2,490	2,489,892,286
Vietnam	2,021	2,021,312,963
Myanmar	1,898	1,898,104,597
Philippines	1,430	1,430,312,180
Norway	803	803,137,310
Thailand	723	723,107,020

Therefore, it seems likely that a new organization may choose to work in Asia given the scale of the production in this region.

If considering working in Asia, we would encourage co-founders to keep the following in mind:

- We would recommend against working in India, as this is where Fish Welfare Initiative are working as their main focus
- You will want to consider the availability of local talent when doing your geographic assessment
  - The animal advocacy movement is less developed in Asia so the availability of talent is lower
  - Given the experience of FWI and Shrimp Welfare Project (SWP) we may expect it to be more difficult to find talent in Vietnam, and easier to find talent in The Philippines (in particular given the movement and capacity building of [Animal Empathy Philippines](#) and the general strength of the Effective Altruism movement thanks to [EA Philippines](#))
- You may want to prioritize countries that are seen as more diverse to countries where FWI are working, to differentiate yourself in the eyes of funders and the movement – therefore you may decide to deprioritize neighboring countries such as Pakistan, for example, in favor of e.g., The Philippines

Based on our quick and rough [geographic assessment](#), countries in Asia that you may wish to prioritize, therefore, are the Philippines and Indonesia.

### 1.2.2 Non-Asian countries

There are also many top fish producing countries outside of Asia, for example:

- Egypt – 2,489,892,286 fishes farmed (5th highest producer)
- The EU – 954,075,793 fishes farmed
- Norway – 803,137,310 fishes farmed (9th highest producer)
- Chile – 706,139,069 fishes farmed (11th highest producer)
- Turkey – 683,420,877 fishes farmed (12th highest producer)
- USA – 537,996,310 fishes farmed (14th highest producer)
- Greece – 442,347,167 fishes farmed (15th highest producer)
- Nigeria – 420,360,381 fishes farmed (16th highest producer)
- Brazil – 369,551,791 fishes farmed (18th highest producer)

An advantage of working in a non-Asian country would be the differentiation from the work that FWI is doing – both in the eyes of funders, and in terms of learning value.

We would recommend working in a developing country rather than a developed country, as work in these countries is more neglected. Moreover, more fishes are being farmed in developing countries than in developed countries, but we know a lot less about what interventions and approaches work in these countries. There is therefore much higher exploration and learning value from working here.

However, if you wanted to pursue a corporation level or government level approach, this will likely be much more difficult when working in a developing country and so you may decide to prioritize a developed country such as Norway, the UK, Canada, or work at the EU level. We will outline the pros and cons of these approaches in the section below, but one additional consideration that should be kept in mind when doing your geographic assessment is that there are many more organizations working in the Global North, and it is more likely that organizations in this country will start working on fish welfare than is the case in the Global South. For example, Eurogroup for Animals is lobbying the EU for general and species-specific welfare provisions for fish in EU animal welfare legislation during farming, transport and slaughter ([Eurogroup for Animals, n.d.](#)).



Based on our quick and rough [geographic assessment](#), non-Asian developing countries that you may wish to prioritize are Brazil, Egypt, and Chile.

### 1.2.3 Our recommendation

Our top recommendation would be to work in the Philippines as the highest fish producing country with strong talent availability. Fish Welfare Initiative have also done work here in the past which you could learn from.<sup>3</sup> If working in the Philippines, the species that you should likely focus on is milkfish as they are the most farmed species in the country.

Indonesia could be another promising Asian country to work in. However, we may expect it to be more difficult to find local talent in Indonesia. It is also worth noting that Sinergia Animal have expanded to Indonesia and are planning to do fish welfare work in ~one year following recommendations made by Animal Ask, so perhaps this work is less neglected.

Moreover, based on our [geographic assessment](#), work in Brazil also seems very promising and could be more attractive to co-founders who wanted to diversify their work more from FWI, as working outside of Asia could be a good way to do this.

## 1.3 Approaches

### 1.3.1 Farmer level – direct implementation

This approach involves working directly with farmers on their farms; helping them to implement improved welfare standards, training them on how to improve welfare, make corrective actions, monitor welfare and welfare parameters such as water quality levels, and granting them access to markets to sell their higher welfare products.

This is the main approach that Fish Welfare Initiative are taking with their Alliance for Responsible Aquaculture ([Alliance for Responsible Aquaculture, n.d.](#)). If a new charity wants to diversify itself as much as possible from FWI, then they may decide to de-prioritize this approach. However, even in this case we believe that it would still be important to visit farms and work with farmers to get a sense of what the

---

<sup>3</sup> Fish Welfare Initiative have paused their work in the Philippines as the person leading this project has now moved out of the Philippines. They are shifting all of their focus to their work in India and therefore have not spent time trying to find someone else to take over this work.

biggest welfare issues are on farms, what is implementable on farms and what welfare improvements farmers are willing and able to do. This would aid you in making the welfare standards that you may be asking corporations and/or governments to implement.

The pros and cons of this approach are as follows:

- Pros
  - You will have more control over what happens on farms as you will be working with farmers directly and overseeing what they do
  - Really great information value from seeing what farms are like, what the welfare concerns on these farms are, what welfare improvements are implementable, what farmers are concerned about, what farmers are willing and able to do to improve welfare etc.
  - Fish Welfare Initiative have proven that this is a tractable and cost-effective approach to improving fish welfare
- Cons
  - Likely to be less cost-effective than corporation or government level work as you have to work with farms one by one, rather than working with multiple farms when working with one corporation
  - Less scalable as the number of farms you can work with will be determined by how many staff and resources you have to work with them
  - May have to be more in the farmer's own interest than with other approaches to be able to convince them to implement which could have more risk of industry proliferation
  - Impact may not persist after the charity is operational as farms will no longer be accountable to anyone<sup>4</sup>

### 1.3.2 Corporation level

Corporate outreach is likely the approach that has been most well-utilized by the animal advocacy movement to date, given the success of the cage-free campaign for egg-laying hens and the Better Chicken Commitment/European Chicken Commitment for broiler chickens.

---

<sup>4</sup> However, we note that there are potential scale up strategies for the farmer-level approach which could be operational after a charity shuts down. For example:

- Rule of thumb training for farmers
- An app which could give tailored advice given various inputs from farmers eg., different water quality measurements, mortality rates etc.
- Model farms that other farmers should try to replicate
- Setting up welfare officers in local regions and training them to give out advice

However, we note that we might need to take a slightly different approach to corporate work than what we are used to in the Global North, as corporate structures in the Global South are very different.<sup>5</sup> Moreover, corporate campaigns often utilize consumer support to aid them in making their case to corporations, but the same level of consumer support likely doesn't currently exist for fish welfare, especially in the Global South.

We imagine corporate level work for this intervention looking like the following:

- Getting corporations to commit to improving the production practices of farmers in their supply chain
- Getting commitments from corporations to transition their procurement to high-welfare farms – such as the farms that this organization has already worked with and implemented improved welfare standards on
  - This seems promising to do alongside farmer level work. Being partnered with corporations may increase farmer interest and strengthen the case for implementing improved welfare standards for farmers; as you are ensuring that they will have a market to sell their higher welfare products, maybe even for a price premium.
- Getting corporations to commit to only purchasing fish that have been certified by the best certifiers that include animal welfare as determined by the Aquatic Animal Alliance and Animal Ask eg., RSPCA Assured or Global Animal Partnership (G.A.P.) (Level 3)
  - This is a way of asking for a combination of welfare improvements, that is everything from specific dissolved oxygen levels and stocking density limits, to humane slaughter, in a simple way – corporations and consumers understand what certification is and what to look out for (like with cage-free labeling)

---

<sup>5</sup> We mean two things here:

1. In developing countries there is much more informal/traditional commerce and as a result it is more common for farmers to sell to local markets, rather than to supermarkets, for example.
2. It seems more common for there to be layers of middlemen between corporations and farmers in developing countries and therefore corporations have less influence over what happens on farms.

The pros and cons of this approach are as follows:

- Pros
  - Likely to have a higher cost-effectiveness as it has the potential to affect many more individuals, as you can impact the standards on a number of farms by working with one corporation
  - Impact is more likely to persist after the charity is operational, as farms will be accountable to the corporations they are supplying to, rather than just the charity
  - Could raise the profile of fish welfare
- Cons
  - Existing organizations will likely be concerned about new corporate campaigns potentially hindering the progress of existing campaigns (the cage-free and Better Chicken/European Chicken commitments), as they will likely be targeting the same companies
  - Unclear probability of success, as this approach has been explored much less for improving fish welfare
  - Likely lower probability of success given the market/corporate structure, or perhaps just a lower likelihood that this approach would be viable
  - There will likely be fewer appropriate corporations to work with than we are used to in developed countries, as middlemen are much more common in developing countries which degrades the influence that corporations can have on the practices on farms
  - You have less control over the standards that are implemented on farms – for example, you may sell the corporation on improving water quality and they ask their farmers to improve dissolved oxygen levels on their farms without a stocking density limit. As improving water quality can increase the carrying capacity of ponds, this may lead to an increase in the number of fish produced.

We note that Fish Welfare Initiative are also exploring the corporate outreach approach and have secured two commitments: one commitment from SAGE Organics and another from Fipola ([Fish Welfare Initiative, 2021b](#); [Fish Welfare Initiative, 2022b](#)).

### 1.3.3 Government level

Work at the government level would ultimately aim to see (mandatory) welfare standards passed in legislation.

We know that a lot of work will need to be done to get to this point, including a lot of relationship building and meeting with government officials and creating various policy outputs that can be used by decision-makers in government, such as evidence papers, research, showing public and farmer support for welfare improvements etc.

The pros and cons of this approach are as follows:

- Pros
  - Higher cost-effectiveness, as this has the potential to affect many more fishes
  - Having legislation specifically focused on fish welfare could have an important precedent-setting affect as fish specific legislation is even lacking in the Global North
  - Impact is more likely to persist after the charity is operational
- Cons
  - Lack of enforcement of legislation in some LMICs may mean that although legislation is passed, this legislation is not enforced and therefore welfare improvements are not implemented on farms, and as a result there is no actual improvement to fish welfare
  - Likely a lower probability of success than farmer or corporate level work

Fish Welfare Initiative are also exploring this approach, but it is likely the most under-explored of the three approaches evaluated here. They have detailed their strategy and approach to policy work in a [recent blog post](#).

### 1.3.4 Our recommendation

We think that it is important to start your work at the farmer level to understand what conditions are like on the ground, what welfare standards are implementable on farms, what farmers are and are not willing and/or able to do and to just generally get a strong understanding of the systems that you are trying to affect.



We think that co-founders should be open to pivoting to other approaches and should be exploring these other approaches as much as possible as they work with farmers. We also think that there are a few country-specific considerations to keep in mind:

- The Philippines
  - Corporate outreach – it seems like the corporate outreach approach is quite new in the Philippines, only starting to be used recently by Animal Friends Jogja – an Open Wing Alliance member group – and Global Food Partners. We note that both of these groups use the “good cop” approach to corporate outreach, as advocates believe that corporations would not be susceptible to “bad cop” tactics.
  - Government level work – it seems like the government could be open to dialogue on fish welfare, as they are currently conducting a policy review of their “Good Aquaculture Practice” which seems to involve some welfare parameters
    - For example the [2017 Code of Good Aquaculture Practices \(GAqP\) for Milkfish and Tilapia](#) outlines recommended stocking densities for different culture systems and water quality parameters. You could work with the government to improve these standards.
- Brazil
  - Corporate outreach – the corporate outreach approach seems to be a lot more utilized in Brazil than in the Philippines. This could be seen as a positive or a negative:
    - Positive: You can more so utilize the traditional and most used approach of the animal movement and learn from existing organizations on how to do this type of work. There is more proof of concept that this approach works in Brazil.
    - Negative: This approach is currently being used in Brazil for cage-free and the Better Chicken Commitment and you would likely be campaigning the same corporations as the organizations working on these existing campaigns. This may hinder the progress of these campaigns as well as your campaign.
  - Government level work – it seems like the government doesn’t have any fish welfare legislation or recommended standards in place currently. You could work with the government to draft these standards.

## 1.4 Life stage

### 1.4.1 Juvenile fish vs adult fish

As there is not a lot of evidence for welfare improvements specific to juvenile fish welfare, it seems like the best welfare improvements that are implementable now are the same as those we recommend for adult fish (eg., water quality improvements, reduced stocking densities etc.) and therefore the question becomes whether we have sufficient reason to prioritize juvenile fish over adult fish. We will explore this in the table below.

Reasons in favor of working on juvenile fish	Reasons against working on juvenile fish
<b>Days of suffering averted</b>	
<ul style="list-style-type: none"> <li>Based on data from the EU, we have found that there are ~15 times more juvenile fish than adult fish produced per year (<a href="#">Cox, 2022</a>).</li> </ul>	<ul style="list-style-type: none"> <li>Based on FAO data, we have found that fish are in the grow-out stage (adult fish) for ~10 times longer than in the juvenile stage (<a href="#">Cox, 2022</a>).</li> <li>It seems that a lot of the mortality at the juvenile stage happens when fishes are &lt;3 grams, which suggests that it happens very early on in the production, when the fishes are especially young (<a href="#">Tørud et al., 2019</a>; <a href="#">Gåsnes et al., 2021</a>). <ul style="list-style-type: none"> <li>This could mean that the above estimate that the grow-out stage is ~10 times longer than the juvenile stage could be an underestimate if most juvenile fish die in their first few days, rather than at the end of the juvenile stage. Therefore, the estimated days of suffering between juvenile and adult fish seem like they could be equal.</li> </ul> </li> </ul>
<b>High mortality rates</b>	
<ul style="list-style-type: none"> <li>Mortality rates for juvenile fish are higher than for adult fish – 22–24% for juveniles vs. 15–18% for Norwegian farmed Atlantic salmon, for example (<a href="#">The Norwegian Animal Protection Alliance, 2019</a>; Unpublished FWI report).</li> </ul>	<ul style="list-style-type: none"> <li>As <a href="#">r-selectors</a>, fish naturally have very high mortality rates. It is unclear how much this contributes to the high mortality rates we see in aquaculture (<a href="#">Kloosterman, 2014</a>; Unpublished FWI report).</li> </ul>

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Mortality data from the Norwegian Food Safety Authority analyzed by the Norwegian Animal Protection Alliance revealed differences in mortality rates between hatcheries. Moreover, not only is there variation in mortality between different hatcheries, but some hatcheries report consistently high, or consistently low mortality over several years (<a href="#">Tørud et al., 2019</a>).             <ul style="list-style-type: none"> <li>◦ The fact that some hatcheries manage to operate with significantly lower mortality than others suggests that these high mortality rates is not biology/is not natural, but rather caused by poor production methods and routines.</li> <li>◦ This variation between producers also suggests that mortality rates can be improved.</li> </ul> </li> <li>• The Norwegian Animal Protection Alliance found that some facilities incubate 25% more juvenile fish than they have capacity for at the smolt stage with the expectation of high mortality rates (<a href="#">The Norwegian Animal Protection Alliance, 2020</a>).</li> </ul> | <ul style="list-style-type: none"> <li>• The cause of the high mortality rates as found by the Norwegian Animal Protection Alliance are unknown (<a href="#">Tørud et al., 2019</a>).             <ul style="list-style-type: none"> <li>◦ Analysis by the Norwegian Animal Protection Alliance couldn't find any correlation between welfare parameters and mortality rates.</li> <li>◦ It is unknown whether these mortalities are a result of poor welfare, or whether these fish have been removed from production and destroyed for having external flaws, deformities, shortened operculums, or for being undersized.</li> <li>◦ Analysis from the Norwegian Animal Protection Alliance found that mortality is greatest in fish weighing &lt;3 grams where mortality due to destruction or selective grading may be of particular importance and therefore could be more common - it is unclear how much of this destruction/selective grading would happen anyway, even with improved welfare (though some factors such as deformities and being undersized could be affected by welfare improvements).</li> </ul> </li> </ul> |
|--|--|

#### Evidence base

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• It is taken as a given that mortality rates and welfare are correlated/inter-related as mortality rates are used as a secondary indicator of welfare. Therefore, if there are higher mortality rates at the juvenile stage than at the adult stage, this should update us that welfare is worse at the juvenile stage.             <ul style="list-style-type: none"> <li>◦ In fact, mortality rates are probably the most commonly used welfare indicator.</li> </ul> </li> <li>• We have evidence from the Norwegian study that mortality rates differ between farms, so there seems to be some way to reduce mortality rates (even if we're not sure what they are).</li> </ul> | <ul style="list-style-type: none"> <li>• Analysis by the Norwegian Animal Protection Alliance couldn't find any correlation between welfare parameters and mortality rates.             <ul style="list-style-type: none"> <li>◦ This doesn't mean that mortality and welfare aren't correlated - they are; in general, higher mortality = lower welfare - it's just that it wasn't clear between farms which welfare improvements reduced mortality (thereby improving welfare) and so there needs to be more research done in this space before we reliably know how to improve the welfare of these fishes.</li> </ul> </li> </ul> |
|---|---|

Neglectedness	
<ul style="list-style-type: none"> <li>The only group that we are aware of that are working to improve the welfare of juvenile fish are the Norwegian Animal Protection Alliance, so this space is very neglected.</li> </ul>	
Tractability	
<ul style="list-style-type: none"> <li>The Norwegian Animal Protection Alliance have successfully managed to help one company reduce mortality, though they didn't go into the specifics of how they achieved these reductions in mortality rates (<i>Source: Expert interview 29th March 2022</i>).</li> <li>Providing and changing floor substrate is something that the Norwegian Animal Protection Alliance has successfully been able to change on hatcheries, though they didn't mention how many hatcheries they have been able to do this on (<i>Source: Expert interview 29th March 2022</i>).</li> <li>Susanna Lybek who has basically specialized in juvenile fish welfare said that it might be fairly cheap and easy to improve the welfare of juvenile fish compared to fish at other life stages.</li> </ul>	<ul style="list-style-type: none"> <li>We have been unable to find a lot of data or information on the practices of hatcheries nor how to improve them.</li> <li>Efforts have been made to work with companies in Iceland, Canada, and Scotland, but it was difficult to find cooperative hatcheries (<i>Source: Expert interview 29th March 2022</i>).</li> </ul>
Externalities	
<ul style="list-style-type: none"> <li>Decreasing mortality rates could mean that farmers stock fewer individuals (as they no longer need to account for such high mortality rates), thus reducing the number of net-negative lives brought into existence</li> <li>Experts have suggested that improving welfare at the juvenile stage will improve the development and welfare of adult fish, however this mostly seems to be anecdotal evidence rather than having much supporting literature.</li> </ul>	<ul style="list-style-type: none"> <li>Decreasing mortality rates could make aquaculture more efficient and more profitable, which could help to proliferate the industry, leading to an increase in the number of net-negative lives brought into existence.</li> </ul>

### 1.4.2 Our recommendation

There doesn't seem to be a particularly strong reason to prioritize juvenile fish over adult fish. Instead, we would make this decision based on the reality of what is happening on the ground. For example, if choosing to work at the farmer level then we would suggest visiting and talking with farmers on both hatcheries and grow-out ponds. If it seems like working on hatcheries could be more tractable; for example, if grow-out ponds are already using aeration equipment but hatcheries aren't, then this may be a good reason to prioritize work on juvenile fishes.

If choosing to work at the corporation or government level, we would suggest that you do not need to focus on a specific life stage, instead you should be trying to implement standards for both life stages as, in most cases, standards for both juvenile and adult fish are lacking.

We also encourage more research into juvenile fish welfare that may help make this issue more tractable. We would be keen to revisit the idea of a specific focus on juvenile fish welfare and welfare improvements specific to the hatchery stage in the future when more research has been done in the space.

These recommendations are summarized in the table below:

Theory of change	Recommendation	Reasoning
Farmer level work	Neutral between work on juveniles and adults; this decision should be made based on tractability and neglectedness on the ground	Number of days of suffering is likely similar
Corporate campaigns and welfare commitments	Ensure hatcheries are not neglected from any commitments made, but can treat as a single topic	In most cases nothing for either. No reason not to do both at once.
Policy change	Ensure hatcheries are not neglected from any policy made, but can treat as a single topic	In most cases nothing for either. No reason not to do both at once.
Welfare research (Note: We would not want to see this new incubated charity working on this themselves, we are just generally supportive of this work)	Probably focus on hatcheries, but moderate-high uncertainty	A lot less evidence about hatcheries, and current evidence is weak, but there is evidence that different hatcheries achieve very different standards.



## 2. Expert views

### 2.1 Fish Welfare Initiative

We spoke with Fish Welfare Initiative (FWI) about the possibility of Charity Entrepreneurship recommending another organization focused on fish welfare, whether they thought that this would be promising, and how they would want a new organization to interact with FWI.

FWI would welcome a new organization working on fish welfare as they by no means have fish covered. There are billions of individuals farmed and slaughtered for food each year, and FWI is mainly focused on work in one state of India – there is still a lot of work to be done. Moreover, it is somewhat ridiculous that we would even consider not having multiple charities working on fish welfare as, for example, we have many different organizations all working on cage-free and broiler welfare campaigns.

They are not concerned about charities “replicating work”. In fact, they would welcome another Effective Altruism-aligned, Charity Entrepreneurship incubated charity working on fish welfare, as they think that we should be using a diversity of approaches in order to test multiple streams and theories of change of how to improve the lives of fish, especially in countries with high production and a lack of existing animal advocacy.

They stressed that this new organization likely shouldn’t be trying to replicate what FWI is doing in India, as 1) as an animal movement we should be exploring different interventions and approaches to try and find the best one, and it is unlikely that FWI has found the best version of this – we still need to innovate; and 2) the local context and conditions on farms, the species of fish being farmed, the type of farming system being used, the size of ponds, what farmers are willing to implement, whether you should even be working with farmers at all (or working at a different level such as with corporations or doing policy work), etc. will be completely different between different countries.

When asked why we shouldn’t just give FWI more resources to scale and expand and hire more people, they were partly compelled by this argument but also saw the value in having new people working on this issue such that they can innovate. Expanding FWI would also stretch the team’s focus, shifting some attention away

from their project in India, which they think should be getting all of their attention right now. Therefore, expanding may not be feasible or the best use of FWI's resources right now. However, they would be open to the co-founders of this new organization starting a new branch of FWI and using FWI's existing charity registration and existing fundraising base, but operating fairly independently. They note, however, that the co-founders may want to set up their own projects rather than just operating as a branch of an existing organization. In general, they would be flexible on how this new organization would interact with FWI as it currently stands; and whether they were a branch or a separate organization, they would want to support them in any way that they can, eg., talking with them fairly regularly, bouncing ideas off them, and having them learn from FWI and FWI learn from them.

### 3. Cost-effectiveness analysis

Our [cost-effectiveness analysis](#) models the impact of improving water quality on farms in the Philippines through direct work with farmers. Our endline metric is the total number of welfare points<sup>6</sup> (WPs) affected, and the number of welfare points affected per dollar by this intervention.

Note that we have only modeled the farmer-level approach, as this is the approach we are most certain about. Moreover, if the intervention still looks cost-effective under this approach (where the costs are expected to be the highest and the number of fish affected the lowest of the other approaches), then we can conclude that this intervention is likely to be cost-effective under any approach. Moreover, we can conclude that if the intervention still looks cost-effective under this approach then even if this new charity fails to find a scalable intervention, or doesn't successfully explore other approaches, then this charity could still be cost-effective.

We summarize the main end-line metrics of this cost-effectiveness analysis in the table below:

Interventions	Total WPs affected (if successful)	Total WPs affected (expected)	WPs affected/\$ (Charity costs)
<a href="#">Improving water quality on farms in the Philippines</a>	591,501,411	295,750,706	24.39

<sup>6</sup> Welfare points are a metric created by Charity Entrepreneurship to evaluate the impact of animal welfare interventions. You can find out more about how this metric was created on [the EA forum](#) as well as an example of how we have used welfare points in the past [to compare the lifetime welfare of different animals](#).

In the following sections we will discuss the inputs used in this model, how they were estimated, why we used them, and how they are used together to calculate the end-line metric of the number of welfare points affected per dollar.

### 3.1 Costs

The charity costs were estimated by the Charity Entrepreneurship team and were held constant throughout all of the cost-effectiveness analysis models made during this research round. These costs were estimated based on the country that the intervention was being implemented in (developed or developing) and whether the intervention was policy change or direct implementation (e.g., working with farmers directly).

The following costs will be modeled:

	Developed country (Policy)	Developing country (Policy)	Developing country (Direct implementation)
Year one	\$100,000	\$100,000	\$100,000
Year two	\$200,000	\$165,000	\$250,000
Year three and beyond (Operating at scale)	\$300,000	\$225,000	\$400,000

In this specific model, the costs scale each year as the costs are correlated with the number of farms worked with – that is, the more farms worked with, the higher we expect costs to be as you need, e.g., more staff to do water quality measurements on each of the farms, more training costs for training farmers how to identify and treat water quality issues, etc.

### 3.2 Effects

The overall impact of this intervention is defined in terms of the total number of welfare points affected per dollar. To calculate this we used the cost estimates outlined above and the following inputs:

- Number of farms worked with per year when scale reached: We estimated that we could have 70 farms signed up to agree to work with us by year three.

This is similar to the number of farmers that FWI have been able to work with so far.

- Additional number of farms gained per year: Our best guess at this was 30 additional farms per year.
- Average number of fish per farm worked with: We have assumed that this charity will work with semi-intensive farms, similar to FWI. Assuming a 70% survival rate and an average stocking density of 2,000–3,000 fish/hectare in 1–10 hectare farms in the Philippines, we get an average of ~19,643 fish per farm.
- Lifespan: our welfare point estimates are estimates of the average well-being of an animal across its lifetime, but it doesn't account for the lifespan of an animal. Therefore, we account for this as a separate input in our cost-effectiveness analysis models. This is important as, for example, although broiler chickens and battery-caged laying hens have very similar welfare point scores, we may prefer to avert the suffering of a laying hen as their life is longer (0.1 years for a broiler chicken vs. 1.38 years for a laying hen).
- Sentience: our welfare point estimates also do not account for the estimated sentience of an animal, so we also account for this as a separate input in our cost-effectiveness analysis models. We think that this is an important parameter to include to compare across interventions that are evaluating working on different species as, for example, you may think that it is more important to work to improve chicken welfare than to improve fish welfare, as you are more confident that chickens can suffer – we use estimated sentience to capture this. Our sentience estimates are informed by work from [Open Philanthropy](#) and [Rethink Priorities](#).
- Probability of success: we used an average probability of success of 50% as our best guess.

Using these inputs, we calculated an estimate for the total number of welfare points that could potentially be averted at the farmer level each year. Then, to estimate the overall impact of the charity over its lifetime, we also considered the following inputs:

- Years until scale reached: We assumed that scale would be reached at year three. We used estimates; for example, for the number of farms worked with, we used Fish Welfare Initiative's figures who were in their third year at the time. We then modeled impact as starting in year four.
- A discount rate of 4%, as we were evaluating impact in the future and we wanted to evaluate impact in present value terms.

## 4 Implementation

### 4.1 Talent

We believe that it will not be especially difficult to find co-founders for this organization, though we think that it is important to highlight to potential founders that this work will be difficult as this kind of work is unprecedented. Therefore, we think that founders will have to be very resilient and impact-focused. There are a lot of questions that will need to be answered on the ground in terms of what the local context is and what will work there, and why farmers do things the way they do and what they would be willing to implement, etc. You will have to be able to run appropriate surveys and tests to answer these questions, as well as being mindful of all the things you don't know and how to identify and answer them. Because of this, we would also recommend that going into the project, this organization has strong monitoring and evaluation so that they can properly assess the progress they are making.

We think that finding local talent could be a barrier. It may be the case that the co-founders of this charity end up choosing their country of operations based on their background and prior experience, as well as talent availability, as we expect local talent to be quite important in determining the success of this charity. Therefore, we would suggest that when deciding between countries, you could put a job ad up for a country director in all the countries you are considering and then make the final decision on which country to work in based on the most promising applicant to this role. Moreover, when doing your initial scoping visits to your top countries, you will also want to be scoping out the local talent.

Note that we have recommended work in the Philippines, as we think that this is likely the easiest country to find talent in given the work of Animal Empathy Philippines and the strong EA presence due to the work of EA Philippines.



## 4.2 Funding

We do not expect funding to be a limiting factor for this organization, at least in their first few years of operation, as Fish Welfare Initiative has not had any funding issues. FWI currently get most of their funding from EA sources such as the EA Animal Welfare Fund.

It may be beneficial for fundraising purposes to work somewhere as geographically diverse from India as possible and to choose a different approach to the farmer level, direct implementation approach that FWI has chosen. However, it is important to note that historically the animal advocacy movement as a whole have mostly all focused on two campaigns – the cage-free campaign and the Better Chicken Commitment/European Chicken Commitment – with many organizations taking similar tactics and even campaigning against the same organizations, and these have still been funded. Either way, we don't think that this new organization would be competing with Fish Welfare Initiative for funding.

## 4.3 Scalability

There are 181 fish-producing countries across the globe, with 107 of these having more than 1 million individuals alive on farms at any one point ([Open Philanthropy, n.d.](#)). Work focused on improving the welfare of these fishes is only being done in a handful of countries, and in most cases this work is being done by animal advocacy organizations where this is just one of many campaigns being run by them, rather than being their sole focus (as is the case for Fish Welfare Initiative or the Aquatic Life Institute, for example). Therefore there is a lot of work that needs to be done on this issue.

However, this intervention might not be the easiest to scale, as there will be a lot of diversity between countries. The local context and conditions on farms, the species of fish being farmed, the type of farming system being used, the size of ponds, what farmers are willing to implement, whether you should even be working with farmers at all (or working at a different level such as with corporations or doing policy work), etc. will be quite different between countries. Therefore it is not the case that you could find a welfare standard that works in one country and cross-apply it in another country.

## 4.4 Neglectedness

Work in this space is very neglected. Only a handful of organizations work on fish welfare campaigns, with only a small fraction of these having it as their sole focus.

## 4.5 Externalities

There will likely be positive externalities as a result of this intervention: moral circle expansion to fish, more stable profits for farmers, environmental benefits from improving water quality, information value from working in developing countries, and further showing the feasibility of working to improve fish welfare in an effort to encourage more organizations to work on this issue.

However, there are some risks in interventions in this space, in particular to work on improving water quality, as this may allow farmers to increase stocking densities and therefore may help to proliferate the industry. Steps can be taken to minimize these risks, such as including stocking density limits in any welfare standards that are created.

# 5 Conclusion

Overall we would rank these potential intervention, country, approach, and life stage combinations in the following priority order:

1. Farmer level direct implementation work in the Philippines, Indonesia, or Brazil. Corporation-level and government level could follow this farmer level work, or be explored alongside this work, but we think that it is especially important to work at the farmer level to begin. This would give a sense of what fish production is like, what welfare conditions are like, what farmers are and are not willing to do and why etc.
  - Promising welfare improvements include water quality improvements and stocking density limits
  - We are neutral between work on juvenile and adult fish, and think that this decision should be made based on tractability on the ground

2. Government-level work, perhaps in the Philippines, Indonesia, or Brazil
  - It is likely most promising for these standards to cover all welfare issues discussed above, but if you believe that there is a maximum number of asks that you can advocate for then we would suggest prioritizing the chronic welfare issues (poor water quality, high stocking densities, and high disease and parasite prevalence).
    - Note that although it is an acute welfare issue, it may be promising to also include humane slaughter in your ask. This is likely to be an issue that other animal organizations would campaign for, and it would be beneficial to all ask for the same things to avoid confusion and/or hindering each others campaigns
  - Work to include welfare standards and provisions for both juvenile and adult fish, and make these species and life-stage specific, not just general standards.
3. Government level work in a developing country, perhaps Norway, the UK, Canada, or at the EU-level.
  - We note that there are other organizations working in these countries – Eurogroup for Animals, Norwegian Animal Protection Alliance etc. – and therefore work here is not as neglected.
    - If you did decide that there was space for a new organization in these countries, you will have to coordinate with these existing organizations to ensure you don't hinder their progress by asking for different things, using different tactics etc.
  - Again, we suggest that advocacy should include welfare standards and provisions focused on both juvenile and adult fish, and that these should be species and life-stage specific, not just general standards.

We have prioritized government level work in developing countries over work in developed countries for two key reasons: 1) the much larger scale of farming in developing countries, and 2) there is already work being done in the highest producing developed countries (Norway and at the EU-level) and therefore this work is less neglected.

#### 4. Corporation level work

- We are unsure whether corporate work would be more promising in developed or developing countries, as each have their pros and cons.
  - Developed countries – may hinder the progress of ongoing campaigns for chickens if we target the same corporations as the cage-free and Better Chicken commitments.
  - Developing countries – corporate structures are different and the point on hindering progress may also apply in developing countries as the Open Wing Alliance continues to expand and cage-free campaigning takes off in more developing countries.
- Similar to government level work, it is likely most promising for these standards to cover all welfare issues discussed above, but if you believe that there is a maximum number of asks that you can include in a campaign (e.g., the Better Chicken Commitment only has 5 asks in it<sup>7</sup>), then we would suggest prioritizing the chronic welfare issues (poor water quality, high stocking densities, and high disease and parasite prevalence)<sup>8</sup>.
  - Alternatively, you could take the same approach as the Aquatic Animal Alliance and campaign for corporations to only purchase fish that are certified by the best certifier for animal welfare (e.g., RSPCA Assured or Global Animal Partnership (G.A.P.) (Level 3))

---

<sup>7</sup> The 5 asks included in the Better Chicken Commitment are as follows:

By 2024, we will require our chicken suppliers to meet the following requirements for 100% of our products:

1. Maximum stocking density of 6.0 lbs./sq. foot and prohibit all forms of broiler cages.
2. Provide birds an improved baseline environment, including:
  - a. At least 3 inches of friable litter covering the whole floor of the house, managed to maintain dry, friable condition and prevent caked or wet areas.
  - b. At minimum 8 hours of continuous light ( $\geq 50$  lux) and 6 hours of continuous darkness daily ( $< 1$  lux).
  - c. One or more types of functional enrichment (such as perches, platforms, or straw bales) that multiple birds can use at any time. The enrichments must be available by 10 days old and maintained thereafter, dispersed throughout the house and available to the entire flock with 1 enrichment for every 1,000 sq. ft or 1 enrichment per 1000 birds, at a minimum
3. Process chickens in a manner that avoids pre-stun handling and instead utilizes a multi-step controlled-atmosphere processing system that induces an irreversible stun.
4. Demonstrate compliance with all standards via third-party auditing and annual public reporting on progress toward this commitment.

And by 2026:

5. Use only BCC-approved breeds that demonstrate higher welfare outcomes.

(BETTER CHICKEN COMMITMENT – United States and Canada, 2019)

<sup>8</sup> Note that although it is an acute welfare issue, it may be promising to also include humane slaughter in your ask as this is likely to be the issue that other animal orgs would want to campaign for and it would be beneficial to all ask for the same things to avoid confusion and/or hindering each others campaigns.

## References

- Bureau of Agriculture and Fisheries Standards (2017). Code of Good Aquaculture Practices (GAqP) for Milkfish and Tilapia. Available at: [https://bafs.da.gov.ph/bafs\\_admin/admin\\_page/pns\\_file/PNS%20BAFS%20196\\_2017%20-%20Code%20of%20Good%20Aquaculture%20Practices%20for%20Milkfish%20and%20Tilapia.pdf](https://bafs.da.gov.ph/bafs_admin/admin_page/pns_file/PNS%20BAFS%20196_2017%20-%20Code%20of%20Good%20Aquaculture%20Practices%20for%20Milkfish%20and%20Tilapia.pdf) (Accessed 4 October 2022).
- Cequeira and Billington (2020). Fish Welfare Improvements in Aquaculture. Fish Welfare Initiative. Available at: <https://www.fishwelfareinitiative.org/fish-welfare-improvements> (Accessed 4 October 2022).
- Charity Entrepreneurship (2018a). Is it better to be a wild rat or a factory farmed cow? A systematic method for comparing animal welfare. Available at: <https://forum.effectivealtruism.org/posts/cimFBQbpjntoBAKCq/is-it-better-to-be-a-wild-rat-or-a-factory-farmed-cow-a-1> (Accessed 4 October 2022).
- Charity Entrepreneurship (2018b). From humans in Canada to battery caged chickens in the United States, which animals have the hardest lives: results. Available at: <https://forum.effectivealtruism.org/posts/g57AjP4HqTmfFTAd/from-humans-in-canada-to-battery-caged-chickens-in-the> (Accessed 4 October 2022).
- Cooke (2016). Animal Welfare in Farmed Fish. Business Benchmark on Farm Animal Welfare. Available at: <https://www.bbfaw.com/media/1432/investor-briefing-no-23-animal-welfare-in-farmed-fish.pdf> (Accessed 4 October 2022).
- Cox (2022). Days of suffering – Juvenile vs adult fish. Charity Entrepreneurship. Available at: [https://docs.google.com/spreadsheets/d/1Q29s39W6vpFJKEuC27LRKG1HpNlYMk\\_XZ5InHnti2E0/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1Q29s39W6vpFJKEuC27LRKG1HpNlYMk_XZ5InHnti2E0/edit?usp=sharing) (Accessed 4 October 2022).
- Eurogroup for Animals (n.d.). Fish Welfare | Eurogroup for Animals. Available at: <https://www.eurogroupforanimals.org/what-we-do/policy-areas/fish-welfare#:~:text=Eurogroup%20for%20Animals%20believes%20that,fish%20in%20the%20aquaculture%20industry>. (Accessed 4 October 2022).
- Farm Animal Welfare Committee (2014). Opinion on the Welfare of Farmed Fish. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/319323/Opinion\\_on\\_the\\_welfare\\_of\\_farmed\\_fish.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/319323/Opinion_on_the_welfare_of_farmed_fish.pdf) (Accessed 4 October 2022).
- fishcount.org.uk (2019). Numbers of farmed fish slaughtered each year. Available at:

- <http://fishcount.org.uk/fish-count-estimates-2/numbers-of-farmed-fish-slaughtered-each-year> (Accessed 4 October 2022).
- Fish Welfare Initiative (2021a). Biosecurity Field Booklet. Available at: [https://drive.google.com/file/d/1\\_OeVPUFJNHNDfwhVBmQ27QNN82yoM61M/view](https://drive.google.com/file/d/1_OeVPUFJNHNDfwhVBmQ27QNN82yoM61M/view) (Accessed 4 October 2022).
- Fish Welfare Initiative (2021b). Announcing FWI's First Corporate Partner. Available at: [https://www.fishwelfareinitiative.org/post/\\_sage](https://www.fishwelfareinitiative.org/post/_sage) (Accessed 4 October 2022).
- Fish Welfare Initiative (2022a). Our Impact | Fish Welfare Initiative. Available at: <https://www.fishwelfareinitiative.org/impact> (Accessed 4 October 2022).
- Fish Welfare Initiative (2022b). New Collaboration: Fipola to Introduce Higher Welfare Fish for the first time in India. Available at: <https://www.fishwelfareinitiative.org/post/fipola> (Accessed 4 October 2022).
- Fish Welfare Initiative (2022c). Advancing Fish Welfare Policy Change in India. Available at: <https://www.fishwelfareinitiative.org/post/policy-change> (Accessed 4 October 2022).
- Fish Welfare Initiative - Alliance for Responsible Aquaculture (n.d.). Alliance for Responsible Aquaculture | FWI India. Available at: <https://www.fishwelfareinitiative.in/ara> (Accessed 4 October 2022).
- Gåsnes et al. (2021). Mortality patterns during the freshwater production phase of salmonids in Norway. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1111/jfd.13522> (Accessed 4 October 2022).
- Kloosterman (2014). Why do 90% of baby fish die? Available at: <https://www.israel21c.org/why-do-90-of-baby-fish-die/> (Accessed 4 October 2022).
- MacIntyre et al. (2008). The Influences of Water Quality on the Welfare of Farmed Rainbow Trout: A Review. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/9780470697610.ch10> (Accessed 4 October 2022).
- McCarthy (2020). Almost Half of World Fish Supply Now Comes From Aquaculture. Statista. Available at: <https://www.statista.com/chart/2280/the-global-fish-farming-industry-is-booming/> (Accessed 4 October 2022).
- Muehlhauser (2017). 2017 Report on Consciousness and Moral Patienthood. Open Philanthropy. Available at: <https://www.openphilanthropy.org/research/2017-report-on-consciousness-and-moral-patienthood/> (Accessed 4 October 2022).
- The Norwegian Animal Protection Alliance (2019). New report reveals high



mortality in hatchery fish. Available at:

<https://dyrevern.no/oppdrettsfisk/ny-rapport-avslorer-hoy-dodelighet-hos-settefisk/> (Accessed 4 October 2022).

The Norwegian Animal Protection Alliance (2020). Important insight about the welfare of juvenile farmed salmon. Available at:

<https://dyrevern.no/landbruksdyr/important-insight-about-the-welfare-of-jvenile-farmed-salmon/> (Accessed 4 October 2022).

Open Philanthropy (n.d.). Finfish numbers. Available at:

<https://docs.google.com/spreadsheets/d/12pA0UxIbRDcfY5g25XZ7na4duhj6411l-1-3tRH48k/edit#gid=1419062790> (Accessed 4 October 2022).

Schukraft (2019). Opinion: estimating invertebrate sentience. Rethink Priorities. Available at:

<https://rethinkpriorities.org/publications/opinion-estimating-invertebrate-sentience> (Accessed 4 October 2022).

Tørud et al. (2019). Animal welfare in fish hatcheries – SMÅFISKVEL. Norwegian Veterinary Institute and The Norwegian Animal Protection Alliance (Dyrevernalliansen). Available at:

<https://dyrevern.no/app/uploads/2019/12/Animal-welfare-in-fish-hatcheries-SMAFISKVEL.pdf> (Accessed 4 October 2022).

Wikipedia Contributors (2022). r/K selection theory. Available at:

[https://en.wikipedia.org/wiki/R/K\\_selection\\_theory](https://en.wikipedia.org/wiki/R/K_selection_theory) (Accessed 4 October 2022).

Yan and van Beijnen (2019). Asian aquaculture: trends for 2019. The Fish Site Limited. Available at:

<https://thefishsite.com/articles/asian-aquaculture-trends-for-2019> (Accessed 4 October 2022).