



Animal Welfare NGOs Coalition Statement: BAP Farm Standard “Aquaculture Facility Certification” Issue 3.0

The [Aquatic Animal Alliance](#) is a coalition of animal welfare NGOs looking into how to best ensure aquatic animal welfare based on the best available scientific evidence. The reference and supporting materials used for this statement can be found at the end of this document.

We believe standards should recognize the welfare considerations of animals who are not used directly as food; this includes cleaner fish, feeder animals, broodstock, those used in fish stripping, and others who are not directly used for human consumption.¹ We believe standards should apply to all aquatic animals involved in the production of the final product and to the full lifecycle of these animals.

Within the aquaculture industry, the term “welfare” has historically been used to refer to animals’ physiological health and producers’ husbandry practices. However, the scientific animal welfare community has long known that welfare also encompasses psychological well-being and the ability to choose to engage in natural behaviors. We believe welfare standards should not only prevent the most harmful practices but also provide a positive environment where healthy aquatic animals can express their species-specific behavioral needs and preferences, and experience positive affect.² Species- and life stage-specific environmental enrichment shall be provided at all stages of life and production and the forms of enrichment shall be updated in response to new research.

¹ The best available evidence clearly establishes that many commonly farmed aquatic animals, which have been excluded historically from the animal welfare discourse have a capacity to suffer which is analogous to terrestrial animals see for example: **Pain in aquatic animals** Lynne U. Sneddon *Journal of Experimental Biology* 2015 218: 967-976; doi: 10.1242/jeb.088823

² Fife-Cook, I.; Franks, B. Positive Welfare for Fishes: Rationale and Areas for Future Study. *Fishes* **2019**, 4, 31.



We believe that to measurably improve welfare, aquatic animal welfare standards must be species- and life stage-specific.

We believe BAP should prioritize timely updating of standards in response to new research on species- and life stage-specific welfare.

We believe that BAP should enforce these standards with thorough record-keeping and record-publishing of implementation and quantification of all welfare standards, including consequent producer response and alterations to protocol when standards are not satisfied.



BAP Proposed Standards Compliance Requirements Outline

Pillar 1: Food Safety

- A. General Requirement: 1.1**
- B. Chemical and Drug Management: 1.2-1.14**
- C. Microbial Sanitation, Hygiene, Harvest and Transport: 1.15-1.20**

Pillar 2: Social Accountability

- A. Legal Rights and Regulatory Compliance: 2.1-2.3**
- B. Local Community Relations: 2.4-2.7**
- C. Worker Rights and Employee Relations: 2.8-2.57**

Pillar 3: Environmental Responsibility

General Implementation Guidance

- A. General Requirement: 3.1**
- B. Effluent Management for Ponds, Non-Coastal Flow-through Systems and Recirculating Aquaculture Systems: 3.2-3.10**
- C. Habitat Protection and Site Selection for Ponds and All Other Land-based Systems: 3.11-3.21**
- D. Water Quality and Sediment Monitoring for Cages or Net Pens in Fresh or Brackish Water: 3.22-3.26**
- E. Sediment Monitoring for Marine Net Pen and Coastal Flow-through Farms: 3.27-3.35**
- F. Efficient Use of Fishmeal and Fish Oil: 3.36-3.42**
- G. Stocking Sources and GMOs: 3.43-3.47**
- H. Control of Escapes: 3.48-3.57**
- I. Biodiversity and Wildlife Protection: 3.58-3.64**
- J. Storage and Disposal of Farm Supplies and Wastes: 3.65-3.76**



Pillar 4. Animal Health and Welfare
A. Health and Biosecurity: 4.1-4.5
B. Welfare: 4.6-4.12

Traceability T1-T13

Aquatic Animal Alliance Feedback:

Here is a list of items that should be incorporated into the BAP standards. This list is not exhaustive; it only represents certain minimum requirements and will be expanded in the future. Numbers represent the item position in proposed standards.

Legend:

- **Black text is BAP's language**
- **Purple text is Aquatic Animal Alliance additions and comments**

Pillar 1: Food Safety

A. General Requirement: 1.1

B. Chemical and Drug Management: 1.2-1.14

- B. 1.3: This standard should apply to all species and not exclusively tilapias.
- B. 1.8: Animals should spend their entire lifecycle in BAP-certified facilities, including fry, fingerlings, and postlarvae.



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Treatments should not be withheld from aquatic animals to preserve certification. If treatments are required to maintain good welfare for farmed aquatic animals, these should be provided.

Antibiotics should not be used as a substitute for good animal welfare.

BAP must clarify what happens when a facility deems necessary use of treatment beyond the scope of treatment permitted by BAP. BAP must mandate assessment by a veterinarian and emphasize preference for preventative methods over allopathic and responsive treatments.

Recognizing that such expertise is not always available in farming areas, farm owners should endeavor to secure the services of experts or consultants with training, experience and expertise in aquatic animal health, *with full documentation of these efforts conforming to a BAP-established document format*. In any case, the aquatic animal health professional or consultant should be identified, with qualifications or certifications held on file for review.

Page 9 Prohibition on Use of Antimicrobial Agents or Hormones for Growth Promotion

For aquatic animal production under this BAP standard, the use of antimicrobial agents and hormones for growth promotion is prohibited. The use of antimicrobial agents should be reserved to treat specific diseases in sick aquatic animals. *Stocking density must be decreased as necessary to avoid any increase in disease after subtherapeutic antimicrobial agents are withdrawn.*

BAP must specify which treatments are preferred and which are prohibited and not simply leave this up to the host country, instead establishing BAP guidelines that have a consistent standard higher than the legal minimum.

Similarly, prophylactic use of antibiotics is prohibited. Prophylaxis is the treatment of healthy aquatic animals to prevent infection and disease. However, metaphylactic use of antibiotics is allowed.

A primary indicator of sickness in the aquaculture setting is mortality. From an animal welfare perspective, metaphylactic treatment will usually come too late to be effective. BAP standards should instead require routine testing for diseases to thereby establish appropriate metaphylactic treatment protocols. Disease testing should be conducted



weekly. Killing fish for sampling must be avoided, and species specific indicators should be identified.

C. Microbial Sanitation, Hygiene, Harvest and Transport:

1.15-1.20

Audit Clauses

C. 1.16: This clause must be extended to ban wild animal access to production ponds.

C. 1.21: When used prior to slaughter, this must extend to animal welfare hazards.

Microbial Sanitation, Hygiene, Harvest and Transport

Tanks and ponds must be drained and cleaned between fish batches. Cleaning must use either hydrogen peroxide or virkon aquatic disinfectant. Both these are scientifically proven to not harm aquatic animals, nor the environment. It is essential to follow the instructions provided by the disinfectant, which include cleaning the tank with clear water after usage of these disinfectants and before fish enter the tank.

Page 12 Exclusion of Livestock

In general, terrestrial livestock and domestic pets shall not be allowed free access to production ponds. Fences should be installed to prevent these animals from drinking, wading or swimming in ponds.

The words “in general” should be removed.

Page 13 “Harvest and Transport Equipment and containers used to harvest and transport fish or crustaceans shall be cleaned, sanitized, and free of lubricants, fuel, metal fragments and other foreign material that represent an injury risk to the fish or a potential food safety hazard.”



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Transport:

- Where possible: Slaughter shall be performed directly at the rearing facility to prevent additional handling and transport. New facilities will be required to have on-site slaughtering with effective stunning.
- The parameters set to assess health and welfare should not be set by the farmer individually, but must follow objective and well documented criteria. In addition, these parameters must be included in the pre-transport evaluation. Stressed, diseased, or injured animals who are unlikely to survive transport must not be transported and must either be effectively stunned and killed or transported at a later time after improvement to their condition
- Handling and transport shall be performed only by personnel trained in aquatic animal welfare. Training must be repeated annually. Stocking density should also be monitored and limited during transport based on species-specific welfare criteria. Water quality must be continuously monitored during transport and measures to ensure acceptable water quality such as addition of oxygen must be in place where necessary.

Pillar 2: Social Accountability

A. Legal Rights and Regulatory Compliance: 2.1-2.3

B. Local Community Relations: 2.4-2.7

C. Worker Rights and Employee Relations: 2.8-2.57



Pillar 3. Environmental Responsibility

General Implementation Guidance

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- The EIAMP should require a risk assessment for each of these areas, not suggest them.
- The farm should record and publish disease rates, treatments, and mortality rates, of all animals in their care. BAP audit should include mortality and disease and there should be an identified limit on how much disease and mortality requires intervention from BAP.

Page 21 Environmental Impact Assessment and Management Plan

Fishmeal should be identified and quantified by the number of individual animals per individual farmed aquatic animal. The animals used in fishmeal should be recorded by species and sourcing.

A. General Requirement: 3.1

B. Effluent Management for Ponds, Non-Coastal Flow-through Systems and Recirculating Aquaculture Systems: 3.2-3.10

Page 24: At least three months of effluent data are required for initial farm certification. Initially, for each variable measured monthly, at least 10 values obtained during a 12-month period shall comply with the criteria. After five years, the target is no more than one annual case of non-compliance for each variable. For variables measured quarterly, one non-compliance is initially permitted for each variable during a 12-month period. The target after five years is no more than one case of non-compliance for each variable during a 24-month period. When non-compliances occur, farms should make



every effort to correct the problems within 90 days.

BAP must incorporate a parallel standard for mortality rates, e.g. above 10% of batch.

C. Habitat Protection and Site Selection for Ponds and All Other Land-based Systems: 3.11-3.21

C. 3.12: New farms shall not result in the loss of habitat for critically endangered, endangered, and/or vulnerable species.

D. Water Quality and Sediment Monitoring for Cages or Net Pens in Fresh or Brackish Water: 3.22-3.26

E. Sediment Monitoring for Marine Net Pen and Coastal Flow-through Farms: 3.27-3.35

F. Efficient Use of Fishmeal and Fish Oil: 3.36-3.42

The number of animals killed throughout each stage of the supply chain should be kept to a minimum, including a reduction in the use of wild-caught and farmed aquatic animals for fishmeal and fish oil (FMFO) as farmed aquatic animal feed and use of other animal-derived ingredients, including ingredients derived from insects. This should be done by (1) prohibiting the use of FMFO in the feed of herbivorous aquatic species/life stages, (2) using the lowest amount of FMFO possible in feeds for carnivorous and omnivorous aquatic animals while still ensuring good health (based on scientific evidence), (3) by maximising the use of trimmings and alternative feed ingredients such as algal oils, while still ensuring good health (based on scientific evidence). Efforts to minimize should be quantified and reported. The average number of animals killed to feed each aquatic animal should be quantified and reported. The only meal products



used should be byproducts of human consumption, as is the case in the SA aquaculture standard. Wherever possible, BAP should encourage the use of herbivorous or extractive species over carnivorous species in BAP-certified facilities.

Although BAP criteria for FCR have not been established, producers should always strive to reduce FCR because it is among the best indicators of potential profitability and is direct evidence of efficient use of marine feed ingredients. Farms should always attempt to demonstrate continuous improvement after initial certification...

The FCR calculation should include the number of animals, rather than simply the mass of the animals.

G. Stocking Sources and GMOs: 3.43-3.47

Genetically Modified or Bioengineered Organisms

BAP must incorporate a welfare benchmark specifying that use of genetically modified or bioengineered organisms is prohibited where there is an adverse impact on fish welfare, including but not limited to consequent deformities or a weakened immune system.

H. Control of Escapes: 3.48-3.57

H. Control of Escapes

The motivation for this section is “economic interest of producers” and “minimizing environmental interactions between farmed and wild organisms, such as disease transfer and changes in gene frequency in wild populations.” Biosecurity and risk of disease transfer is moot when there is shared water, and barriers are such that animals cannot pass through but can still come into contact with each other. BAP should update this language to recognize the persisting risk.



I. Biodiversity and Wildlife Protection: 3.58-3.64

I. Biodiversity and Wildlife Protection

Lethal predator control techniques should not be used on any species, not only on endangered species. Harmful or lethal measures to control predators should be banned and the use of preventative measures like double netting to ensure wild animals cannot get into the farms should be promoted. Therefore, shooting predators, such as seals, and the use of Acoustic Deterrent Devices (ADD) should be prohibited.

3.62: This should be expanded to all species, not just those who are endangered.

J. Storage and Disposal of Farm Supplies and Wastes: 3.65-3.76

Mortality Disposal

All mortalities should be tracked and records kept, including number of individuals and cause of death. To promote consumer and industry transparency, these records should be published.

Pillar 4. Animal Health and Welfare

- The parameters set to assess health and welfare should not be set by the farmer individually, but must follow objective and well documented criteria. In addition, these parameters must be included in the pre-transport evaluation. Stressed, diseased, or injured animals who are unlikely to survive transport must not be transported and must either be effectively stunned and killed or transported at a later time after improvement to their condition.
- Welfare indicators should also be included in the registration system.



- Any animal welfare risk assessment shall also be coupled with an action plan once poor welfare is detected (e.g. treat animals immediately and alleviate the risk).
- Water quality should be assessed at least once a day and additional assessments through water samples should be taken at least twice a week. The water quality risk assessment must be coupled with an action plan once poor water quality is detected. Records of each inspection must be kept and published.
- Hatchery records must include welfare assessments.
- Any mortality event which produces more than 3% mortality must be reported to BAP. Any more than 5 of these in a year will be grounds for immediate review.

A. Health and Biosecurity: 4.1-4.5

B. Welfare: 4.6-4.12

4.6: Mortalities; body condition factor; lesions, abrasions or fin damage; and gill damage or condition shall be measured in each production unit as individual-based welfare indicators of physical health and full records should be kept and published.

Farms should have a contingency plan ready in case of technical failure or other emergency event, including alarms to alert available, trained personnel outside of regular working hours.

Implementation Group – Water Quality

Water quality should be assessed at least once a day and additional assessments through water samples should be taken at least twice a week. At a monthly interval, water should be sampled at a gradient across the breadth and depth of the enclosure to identify quality cold spots. The water quality risk assessment must be coupled with an action plan once poor water quality is detected. This action plan shall require immediate action to improve water quality. Oxygen levels should be monitored and



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adjusted to species-specific optimal levels. A full accounting of water quality records is required to pass an inspection.

Implementation Training:

Training shall be required for farmworkers at all stages, not just at slaughter. Workers need to be able to identify indicators of poor health and welfare including but not limited to: diseases, parasites, physical damage, behavioral abnormalities, morphological abnormalities, and altered production parameters. Workers should be trained upon hire and re-trained annually, and also after any and all updates to applicable BAP standards.

Implementation Live Transport:

Handling and transport shall be performed only by personnel trained in aquatic animal welfare.

Training must be repeated annually. Stocking density should also be monitored and limited during transport based on species-specific welfare criteria. Water quality must be continuously monitored during transport and measures to ensure acceptable water quality such as addition of oxygen must be in place where necessary. Once inadequate conditions (e.g. poor water quality or inappropriate stocking density) are registered, workers need to address these issues immediately to ensure animal welfare.

Where possible: Slaughter shall be performed directly at the rearing facility to prevent additional handling and transport. New facilities will be required to have on-site slaughtering with effective stunning.

All cases of handling and transport should be minimized. Sufficient anaesthetic must be applied when removing aquatic animals from the water for more than fifteen seconds.

Post-transport mortality must be recorded and reported if in excess of 1%.

Implementation On-farm Processing:

Effective stunning prior to slaughter is required. The method used for stunning shall render the aquatic animal immediately and fully unconscious (i.e. within one second by a scientifically validated method), and not just immobilize the animal. Death must be induced without consciousness recovery, and ideally onsite. In particular, the use of ice slurry without prior stunning is not an acceptable form of slaughter because it has been shown that animals remain conscious for 15-20 minutes after immersion in ice slurries (Giuffrida et al. 2007). Literature shows that there are no significant product quality differences between percussive/electrically stunned animals and animals killed in ice



slurries (e.g. Özogul & Özogul 2004; Tejada & Huidobro 2002). Unconsciousness must persist up to the point of death. (For further information on assessing unconsciousness, see p.157-159 of Lines & Spence 2011).

- 26.1 Casualty slaughter: Animals shall be effectively stunned and killed to limit their suffering.
- For example animals accidentally dropped shall not be left in the air to die.
- Sick and injured animals need to be effectively stunned and killed without delay.
 - Fish must be anaesthetized or killed with effective stunning before stripping and sperm collection.

Implementation

For aquatic animals in aquaculture, welfare can be defined simply as an animal that is healthy and whose needs are met by the farmer.

Within the aquaculture industry, the term “welfare” has historically been used to refer to animals’ physiological health and producers’ husbandry practices. However, the scientific animal welfare community has long known that welfare also encompasses psychological well-being and the ability to choose to engage in natural behaviors. We believe welfare standards should not only prevent the most harmful practices but also provide a positive environment where healthy aquatic animals can express their species-specific behavioral needs and preferences, and experience positive affect.

- These standards must apply to both the animals directly used for human consumption and those animals not directly used for human consumption, including but not limited to broodstock, those used in fish stripping, cleaner fish, feeder animals, and others.
- B.A.P must prioritize timely updating of standards in response to new research on species- and life stage-specific welfare.
- We believe that B.A.P should enforce these standards with thorough record-keeping of implementation and quantification of all welfare standards, including consequent producer response and alterations to protocol when standards are not satisfied.
- No surgical mutilations (including ablation) or invasive marking: Fin clipping and other mutilations must not be allowed.



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- Aquatic animals must have the opportunity to express their behavioral needs and preferences in captivity (e.g. water currents and opportunities to hide, where they do not increase territoriality or competition).
- Species, context and life stage-specific environmental enrichment shall be provided at all stages of life and production and the forms of enrichment shall be updated in response to new research. Welfare training both upon hire and as continuing training must include up-to-date information on environmental enrichment. These selected forms of environmental enrichment must not result in increased territoriality and competition. Environmental enrichment can reduce stress levels, which can lead to improved resistance to infections and lowered metabolism, as well as lowered aggression levels, and thus reduced incidence of fin damage. In addition, environmental enrichment affects the development of the brain and improves the ability to learn in salmon (Näslund et al. 2013, Rosengren et al. 2017, Karvonen et al. 2016, Millidine et al. 2006, Arndt et al. 2001, Salvanes et al. 2013, Kihlslinger et al. 2006).
- Steps shall be taken to ensure adequate enrichment in the following five categories:
 1. Social enrichment.
 2. Occupational enrichment (which can encompass psychological enrichment such as devices that provide animals with control or challenges, as well as enrichment encouraging exercise such as mechanical devices)
 3. Physical enrichment (which can imply an alteration of the size or the complexity of the animal's enclosure. This includes the addition of objects, substrate etc. -)
 4. Sensory enrichment (which could include visual, auditory, olfactory, tactile or taste stimuli)
 5. Nutritional enrichment (involving the type, frequency and delivery of food. The type of food can be varied or novel, etc.)

Where concrete and demonstrable steps to provide enrichment in each of these 5 areas have not been taken, the producer must provide adequate justification to B.A.P and report their plan to address environmental enrichment. Such reports



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must include specific steps they will take in each category (e.g. consulting with a veterinarian or of their implementation timeline).

For species in which there is strong scientific consensus around environmental enrichment, the burden of proof to explain why the farm has not provided adequate environmental enrichment shall be higher.

Cost/and or convenience alone are not sufficient justifications.

Precautions must be taken to ensure selected forms of environmental enrichment do not result in increased territoriality and competition.

- The number of animals killed throughout each stage of the supply chain should be kept to a minimum, including a reduction in the use of wild-caught and farmed aquatic animals for fishmeal and fish oil (FMFO) as farmed aquatic animal feed and use of other animal-derived ingredients, including ingredients derived from insects. This should be done by (1) prohibiting the use of FMFO in the feed of herbivorous aquatic species/life stages, (2) using the lowest amount of FMFO possible in feeds for carnivorous and omnivorous aquatic animals while still ensuring good health (based on scientific evidence), (3) maximising the use of trimmings and alternative feed ingredients such as algal oils, while still ensuring good health (based on scientific evidence; e.g. see (Hodar et al. 2020) (Hua et al. 2019)³. Efforts to minimize should be quantified and reported. The average number of animals killed to feed each aquatic animal should be quantified and reported.

³ Hodar, A R, R J Vasava, D R Mahavadiya, and N H Joshi. 2020. "Fish Meal and Fish Oil Replacement for Aqua Feed Formulation By Using Alternative Sources : A Review." *J. Exp. Zool. India* 23 (1): 13–21. www.connectjournals.com/jez.

Hua, Katheline, Jennifer M. Cobcroft, Andrew Cole, Kelly Condon, Dean R. Jerry, Arnold Mangott, Christina Praeger, et al. 2019. "The Future of Aquatic Protein: Implications for Protein Sources in Aquaculture Diets." *One Earth* 1 (3): 316–29. <https://doi.org/10.1016/j.oneear.2019.10.018>.



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- The Standard Operating Procedures shall include frequency and methods of welfare assessment. Welfare indicators shall be assessed weekly during regular production and more often before, during, and after procedures involving stress, disturbance, and/or handling for all species kept, including cleaner fish. Where possible, continual assessment should be used. Welfare indicators shall be specific to species and life-stage. There should be a distinction between mere health indicators and welfare indicators, with the latter also assessing the psychological health of the animal.
 - Examples of methods for assessing aquatic animal health (additional methods should be incorporated to create a full welfare assessment that includes psychological aspects of welfare):
 - [Welfare indicators for Atlantic Salmon](#)
 - [Welfare indicators for Rainbow Trout](#)
 - [Welfare indicators for Lumpfish](#)
 - [Welfare indicators for Ballan Wrasse](#)
- On-farm protocols also evaluating the psychological aspects of welfare must be required as soon as they become available through scientific validation.
- Underwater cameras should be installed on-farm to allow for accurate and comprehensive welfare assessment.
- The parameters set to assess health and welfare should not be set by the farmer individually, but must follow objective and well-documented criteria. In addition, these parameters must be included in the pre-transport evaluation. Stressed, diseased, or injured animals who are unlikely to survive transport must not be transported and must either be effectively stunned and killed or transported at a later time after improvement to their condition.
- Implementation: Feeding should be managed to avoid stress caused by under- or over-feeding. Administration of feed needs to avoid competition and aggression. Feeding operators need to ensure that all aquatic animals obtain equal amounts of feed.
- Any animal welfare risk assessment shall also be coupled with an action plan to implement upon detection of poor welfare (e.g. treat animals immediately and alleviate the risk).



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- Fasting shall not exceed 72 hours. Records must be kept about why, when, and for how long aquatic animals were fasted. Seventy-two hours is an absolute maximum and should be adjusted down per species. Fasting should only be allowed for animal welfare purposes, and not due to e.g. logistical concerns or off-flavor issues.
 - There is no scientific evidence that for example fasting salmon longer than 72 hours has any additional benefits (Robb 2008; Lines & Spence 2012).
- Parasite management including sea lice:
 - Ensure adequate monitoring and preventative measures to limit sea lice and the subsequent use of parasite management methods that are harmful to the aquatic animal or to the cleaner fish.
 - The use of cleaner fish shall be banned, given the welfare considerations of the cleaner fish themselves. The use of cleaner fish has not been found to be an efficient method of removing sea lice (Barrett et al 2020), and cleaner fish face poor welfare, high disease rates, deformities, predation by salmon, and very high mortality rates (Fjellidal et al 2020, Hjeltnes et al 2019). Until a ban on cleaner fish is implemented, there must be appropriate enrichment, shelters, and feed for the cleaner fish, and the cleaner fish must be effectively stunned immediately prior to slaughter.
 - Methods used for removal of parasites, such as sea lice, must provide rigorous, scientific documentation and reduce the adverse effects on the welfare of the fish; until the ban on cleaner fish is implemented, this must also apply to any cleaner fish present. Any adverse effects caused by delicing methods or other parasite management must be reported, as must steps taken to keep these adverse effects to a minimum.
 - For new facilities, the farming location shall be chosen so as to minimize parasite (such as sea lice) presence and spread.

Handling Operations: Handling and transport shall be performed only by personnel trained in aquatic animal welfare. Training must be repeated annually. Stocking density should also be monitored and limited during transport based on species-specific welfare criteria. Water quality must be continuously monitored during transport and



measures to ensure acceptable water quality such as addition of oxygen must be in place where necessary.

- Handling: Animals must not be out of water for more than 15 seconds if conscious and not anesthetized (consistent with RSPCA standard).
- Vaccination: Shall be done with minimal distress, with the animal anesthetized, and only by certified veterinarians or aquatic animal health professionals (consistent with RSPCA standards).

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Appendixes

Appendix D

This standard should include monthly measures of cortisol level in the water.

Appendix E

This standard should include outbreak mortality.



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Signatories:

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Aquatic Animal Alliance

- The Aquatic Life Institute
- The Humane League UK
- Compassion in World Farming
- Animal Equality
- Mercy for Animals
- Fish Welfare Initiative
- Essere Animali
- Dyrevern



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Supporting literature:

- Arndt, R. E., Routledge, M. D., Wagner, E. J. and Mellenthin, R. F., "Influence of Raceway Substrate and Design on Fin Erosion and Hatchery Performance of Rainbow Trout," *North American Journal of Aquaculture* 63(4): 312-320, 2001.
- Barrett, L. T., Overton, K., Stien, L. H., Oppedal, F. and Dempster, T. Effect of cleaner fish on sea lice in Norwegian salmon aquaculture: a national scale data analysis, *International Journal for Parasitology*, 2020.
- Fjellidal, P. G., Madaro, A., Hvas, M., Stien, L. H., Oppedal, F. and Fraser, T. WK., Skeletal deformities in wild and farmed cleaner fish species used in Atlantic salmon *Salmo salar* aquaculture, *Journal of Fish Biology*, 2020.
- Giuffrida, A., Pennisi, L., Ziino, G., Fortino, L., Valvo, G., Marino, S., & Panebianco, A. (2007). Influence of slaughtering method on some aspects of quality of gilthead seabream and smoked rainbow trout. *Veterinary research communications*, 31(4), 437-446.
- Hjeltnes, B., Bang-Jensen, B., Bornø, G., Haukaas, A., Walde, C. S. (Eds), *The Health Situation in Norwegian Aquaculture 2018*, Norwegian Veterinary Institute, 2019.
- Karvonen, A., Aalto-Araneda, M., Virtala, A. et al., "Enriched rearing environment and wild genetic background can enhance survival and disease resistance of salmonid fishes during parasite epidemics," *Journal of Applied Ecology* 53(1): 213-221, 2016.
- Kihlslinger, R. L. and Nevitt, G. A., "Early rearing environment impacts cerebellar growth in juvenile salmon," *Journal of Experimental Biology* 209(3): 504-509, 2006.
- Millidine, K. J., Armstrong, J. D. and Metcalfe, N. B., "Presence of shelter reduces maintenance metabolism of juvenile salmon," *Functional Ecology* 20(5): 839-845, 2006.
- Näslund, J., Rosengren, M., Del Villar, D. et al., "Hatchery tank enrichment affects cortisol levels and shelter-seeking in Atlantic salmon (*Salmo salar*)," *Canadian Journal of Fisheries and Aquatic Sciences* 70(4): 585-590, 2013.



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- Özogul, Y., & Özogul, F. (2004). Effects of slaughtering methods on sensory, chemical and microbiological quality of rainbow trout (*Onchorynchus mykiss*) stored in ice and MAP. *European Food Research and Technology*, 219(3), 211-216.
- Rosengren, M., Kvingedal, E., Näslund, J. et al., "Born to be wild: Effects of rearing density and environmental enrichment on stress, welfare, and smolt migration in hatchery-reared Atlantic salmon," *Canadian Journal of Fisheries and Aquatic Sciences* 74(3): 396-405, 2017.
- Salvanes, A., Moberg, O., Ebbesson, L. et al., "Environmental enrichment promotes neural plasticity and cognitive ability in fish," *Proceedings of the Royal Society B: Biological Sciences* 280(1767): 20131331, 2013.
- Tejada, M., & Huidobro, A. (2002). Quality of farmed gilthead seabream (*Sparus aurata*) during ice storage related to the slaughter method and gutting. *European Food Research and Technology*, 215(1), 1-7.