Recommendations for Revised ASC Indicators on Fish Welfare

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CONSULTATION DOCUMENT

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on Fish Welfare

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Background

Animal welfare (including farmed aquatic animals) is increasingly considered as a key factor in defining 'responsible' production and determining the social acceptability of an animal production system. In line with this consideration, ASC is revising its current requirements on fish welfare.

The main objective of this ASC Fish Welfare Project is to expand the current indicators on animal welfare in the existing standards, ensuring that they reflect latest knowledge and best practices within the global aquaculture industry. A Technical Working Group (TWG) of experts has been formed to support this development. It is expected that the revised set of welfare requirements for farmed aquatic animals will be included into the aligned ASC Farm Standard.

The scope of this revision currently includes six specific aspects of animal welfare**.** Table 1 shows these aspects (A-F) and the individual elements considered within them. All elements named in Table 1 are subject to TWG assessment on whether, and in what manner, these issues should be addressed within the ASC Farm Standard. The table below is not necessarily exhaustive, as other issues may be raised during the TWG assessment.

A. Good Management Practices				
- Animal Welfare Management Plan				
B. Housing	**C. Feeding**	**D. Health**	**E. Behaviour**	**F. Others**
- Water quality - Environmental enrichment - Stocking density - Tank/pen design - Lighting/sound	- Feed quality - Feeding system - Feed withdrawal	- Scoring body condition/lesions	- Behavioural indicators	- Handling - Slaughter and related processes - Cleaner fish - Shrimp specific: eyestalk ablation

Table 1. Scope of the ASC Fish Welfare Project including the aspects to be covered and the specific elements within them.

ASC will apply a phased approach to introducing some of the welfare issues addressed. Table 2 below summarises the phased approach proposed for the aspects and elements (including scope), addressed so far by the TWG.

Aspect	Phase 1	Phase 2
Scope	Include specific requirements for finfish species only	Include specific requirements for shrimp
Good management practices	Require good management practices applicable to all species	
Housing – water quality	Require best practice	
Housing – environmental enrichment	Collect knowledge and feedback to inform future development of requirements	Include environmental enrichment requirements
Housing – Stocking density	Require best practice	
Slaughter	Exclude the use of practices where evidence is strong regarding their impact on fish welfare	Require best practice Exclude the use of ice slurry as a means of slaughter

Table 2: Proposed phased approach to fish welfare requirements development

Recommendations

1. On the scope of the revision

Farmed animals welfare issues linked to particular aquaculture practices have been known for several years (Huntingford et al. 2006[1]; Ahsley 2007[2]), but the translation of these issues into best-practice indicator requirements that are practical, auditable and above all, meaningful to farmed aquatic animals' welfare is not straightforward. To ensure that ASC identifies the key issues across the species within ASC's scope, the TWG discussions have been structured by categorising farmed aquatic animal welfare issues. The following welfare categories (or very similar ones) are frequently used in animal welfare science[3]:

- Good Feeding;
- Good Housing;
- Good Health;
- Appropriate behaviour.

These aspects cover most of the issues and processes related to animal welfare in animal production systems and apply to aquaculture practices as well. Within its deliberations, the TWG decided to add an overarching aspect to the scope: Good Management Practices related to welfare as these can address and/or impact welfare greatly. The TWG also considered that there are other relevant elements to welfare not included in these specific categories and decided to group them under "others".

During the revision, ASC has prioritised focusing on finfish species due to the availability of relevant knowledge, whereas the level of available and applicable research on the specific invertebrate species is less developed on this issue at the current time.

With this in mind, the TWG recommends that:

- All species covered by ASC certification scheme (excluding seaweed) will be subject to the Good Management Practices aspect.
- Welfare indicators with species-specific requirements will only be developed for finfish species.

[1] F. A. Huntingford, C. Adams, V. A. Braithwaite, S. Kadri, T. G. Pottinger, P. Sandøe, J. F. Turnbull. 2006. Current issues in fish welfare. Journal of Fish Biology (2006) 68, 332–372.

[2] P.J. Ashley. 2007. Fish welfare: Current issues in aquaculture. Applied Animal Behaviour Science 104 (2007) 199–235.

[3] H.J. Blokhuis. 2008. International cooperation in animal welfare: the Welfare Quality® project. Acta Veterinaria Scandinavica 2008, 50(Suppl 1):S10

Note:

There is considerably less scientific information available on how to address welfare issues for crustaceans and bivalves. However, the TWG does agree that there is a need to discuss a number of high-priority welfare issues related to shrimp production in a future revision of the fish welfare indicators (Phase 2).

2. Aspect A: Good Management Practices

Farms should have a clear understanding and overview of processes or events where the welfare of the farmed animals is potentially impaired. They should recognise that welfare risks can occur at all stages of production. These risks should be identified, and mitigation actions should be established. Not only can this prevent problems from occurring, but it will also create awareness of potential welfare issues amongst staff. Even when welfare is impaired due to unforeseen or exceptional events, farms should have a process in place to investigate, identify root causes and define preventative actions from such events. Staff awareness of potential welfare issues should be strengthened by having a basic understanding in place of welfare for all staff. Basic knowledge of farmed aquatic animal welfare will potentially prevent problems from occurring. Moreover, having good farmed aquatic animal welfare in place will benefit production goals.

Based on these guiding ideas, the TWG is recommending a revision that includes:

- A requirement to implement a site-specific Animal Welfare Management Plan (AWMP).
    - The AWMP shall outline site-specific provisions for:
        - Risk assessment
        - Mitigation strategies
        - Monitoring
        - Contingency plans
        - Records and administration
        - Staff training

Notes:

- The TWG's recommended approach is to have animal welfare training as a requirement for all relevant staff, with a priority for those handling the animals. Preferably, there should be basic training with refresher modules that can be reviewed when certain events/procedures have to be carried out.

- The TWG recommends ASC develop guidance for such AWMP to ensure a uniform approach across farms and sites.
- Indicators related to Good Management Practices will apply to all species covered by the ASC certification scheme.

3. Aspect B: Housing

3.1 Housing - Water Quality

Farmed aquatic animals are in direct contact with their environment. Changes in water quality can have detrimental effects on health and welfare. Water quality is affected by, and interrelated with, many other aspects such as density, feeding management, health status and natural environment (for relevant systems).

Frequent monitoring of water quality parameters enables farmers to detect potential welfare issues quickly and prevent problems from occurring or expanding.

The TWG believes that at least a number of water quality parameters should be monitored frequently to assure welfare. The obvious ones that apply to all species are dissolved oxygen and temperature, but others might be more specific to species and aquaculture systems. The TWG will consider which water quality parameters are crucial to monitor to assure appropriate levels for farmed aquatic animals welfare.

Based on these guiding ideas, the TWG is recommending a revision that includes the following elements:

- Water quality related to farmed aquatic animals welfare should be assessed on both system-specific and species-specific levels.
- Indicators on water quality to be based on a 3-tier system (good – take action - problem) to allow corrective action.
- Key indicator parameters should be used that are a proxy for several welfare aspects.

Note:

- A separate designated TWG is reviewing the water quality indicators and requirements (addressing environmental impacts) within the scope of the forthcoming aligned ASC Farm Standard. The recommendations from the Fish Welfare TWG on water quality will feed into this TWG to ensure that these aspects are taken into account and to prevent conflicts or overlaps within the aligned ASC Farm Standard.

3.2 Housing - Environmental Enrichment

Environmental enrichment is a term that describes modifications that act to enhance the level of physical and social stimulation provided in the captive environment. The term is often used for the introduction of physical objects that captive animals can play with or make use of, but the concept is much broader than that. Applying variation in daily practices or providing the power of choice to the animals also fall under this concept. Producers may be applying enrichment or be able to easily apply it without being aware of it. Providing this stimulation decreases stress and has the potential to have positive welfare experiences for the animals[4]. The TWG considered that the current state of scientific information available on environmental enrichment in aquaculture is insufficient for practical implementation as studies are often done on laboratory scale and/or only for a specific type of environmental enrichment. The TWG concluded that caution is needed when considering implementation of environmental enrichment requirements on an industrial scale. This is because it is felt there are potential adverse risks associated with implementation. For example, physical enrichment may cause aggression or come with hygiene risks for the animals.

In this context, the TWG is recommending:

- To address this element of environmental enrichment in a future revision of the fish welfare indicators (phase 2) but to collect early stakeholder feedback on this element to inform this future development.

Note:

- The TWG did ask ASC to play an active role in gathering knowledge on practical implementation of environmental enrichment and ASC is currently exploring options to do so. ASC is keen to hear about initiatives and efforts on this topic.

3.3 Housing - Stocking Density

Inappropriate stocking densities can impair farmed aquatic animals welfare, but the use of stocking density as a welfare indicator is not straightforward. Density needs for farmed fish vary by species and farming system and have a dynamic relationship to other indicators of welfare, such as water quality, CO_2/oxygenation levels, behaviour, and other issues. Variability, even between individual tanks or cages, makes it difficult to generalise from one situation to another. It is a task of considerable

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

complexity to model the multiple interacting and confounding influences of stocking density on welfare and the many measurable aspects of welfare.

For this reason, the TWG does not think it is meaningful to just set a numerical limit to stocking density. An approach where conclusions are taken from how the fish are performing is more meaningful to assess welfare in relation to stocking density.

Based on these guiding ideas, the TWG is recommending a revision that includes the following elements:

- Outer boundaries for stocking densities should be defined.
- Optimum stocking density should be assessed through interrelated indicator parameters such as FCR/growth, skin/eye/gill damage, aggression, oxygen levels, water flow, ammonia levels and swimming behaviour.
- Stocking densities should be evaluated at the end of each production cycle.

4 Aspect F: Others

4.1 Others - Slaughter

Appropriate stunning and slaughter are key welfare issues. These processes affect all farmed animals and suffering will be severe if stunning is not carried out or is carried out inadequately.
Appropriate stunning before slaughter was therefore identified as a priority by the TWG to address. For most farmed species best stunning practices have been researched and identified, but there are still some knowledge gaps on practical implementations for certain species.
Stunning before slaughter is common in salmon production, where the majority of fish are stunned prior to slaughter. For other species, this percentage is much lower and it is believed that only a small percentage of fish are stunned before slaughter in global aquaculture. Therefore, requiring stunning across all relevant ASC species will have considerable consequences, as well as driving change in the industry. Various practical aspects need to be considered for the successful implementation of humane slaughter.

Given the current reality of aquaculture practices, the TWG believes that the implementation of requirements addressing appropriate stunning before slaughter within the ASC Farm Standard should be done using a stepwise approach, with the first step being exclude practices where no action is taken to actively kill the fish or procedures where the act of killing causes extremely impaired welfare.

Based on these guiding ideas, the TWG is recommending a revision that includes the following elements:

- Address slaughter using a stepwise approach:
    - The first step is to exclude slaughter practices where no active action is performed to slaughter fish or where methods used have proven to be highly aversive to fish. The TWG defines these practices as the use of:
        - Asphyxia.
        - CO_2.
        - Salt baths/ammonia.

    - The second step is to exclude the use of ice slurry in the next revision of the fish welfare indicators (phase 2) but to collect stakeholder feedback on this recommendation to inform this future revision. (Note: one can distinguish between the use of ice slurry and live chilling,

whereas live chilling has been shown not to cause elevated stress levels in Atlantic Salmon when performed adequately[5]).

Note:

Practices where stunning and slaughter takes place off-farm would usually fall outside of ASC Farm Standards' scope. As this element was identified as a key welfare issue and a top priority to be addressed, an internal decision was taken to also address slaughter in other parts of the ASC certification programme, outside the scope of the ASC Farm Standard. ASC is currently exploring the option of addressing the issue within the ASC CoC Module (currently in development), making it possible to audit all slaughtering practices.

[5] A. Foss, E. Grimsbø, E. Vikingstad, R. Nortvedt, E. Slinde, B. Roth. 2012. Live chilling of Atlantic salmon: physiological response to handling and temperature decrease on welfareFoss, A., Grimsbø, E., Vikingstad, E. et al. Live chilling of Atlantic salmon: physiological response to handling and temperature decrease on welfare. Fish Physiol Biochem 38, 565–571 (2012). https://doi.org/10.1007/s10695-011-9536-6