ASC White Paper
on Fish Welfare – A Summary

Introduction

The ASC is developing a White Paper which will outline the various views and approaches to defining and approaching 'fish welfare' in standard-setting terms. The primary purpose of this White paper is to assist the Fish Welfare Technical Working Group (*yet to be established*) for it to have an informed and constructive dialogue prior to drafting 'fish welfare'-relevant indicators. The full version of this White Paper will be made public during the Public Consultation of the first Draft.

Prior to this, the summary below has been prepared to inform ASC stakeholders on the various elements which will come under consideration within the White Paper. This document is publicly available on the ASC website. Comments are welcome and appreciated. The form for submitting comments can be found on the ASC website / Fish Welfare (Project) webpage and/or by clicking **Here**.

Document history

Version	Effective date	Description of amendment	Affected section/page
V 1.0	September 20, 2019	*ASC White Paper (Summary)* for consultation	N/A

ASC White Paper summary

Fish welfare is receiving an increasing amount of attention in scientific research, industry and retail initiatives, NGO campaigns and certification schemes. The fact that fish are sentient beings has become widely accepted and the timing seems appropriate to address fish welfare issues in aquaculture practices.

There is no universally agreed upon definition of 'animal welfare' by scientists. However, when addressing animal welfare, it is crucial to choose a well-defined working definition of to set clear objectives. Any chosen definition will inevitably limit what can qualify as 'good welfare'.

The following factors should be considered in any definition of animal welfare:

- Animal welfare science is driven by societal ethical concerns[1];
- The welfare of an animal is determined by its individual and subjective perception[2];
- Animal welfare status includes the physical and emotional state of the animal[2];
- Welfare experience requires conscious perception of and behavioural responses to sensory inputs[3];
- Animal welfare is a multidimensional concept[4].

[1] Duncan, 2005
[2] Webster, 2016
[3] Mellor, 2016
[4] Huntingford & Kadri, 2008

Fish welfare is in most ways no different from general animal welfare (commonly aimed at mammals), there are however some differences which should be kept in mind. Aquaculture does not only include many more species (from different phyla) than terrestrial livestock farming, but also produces a manifold of individual animals, affecting the welfare status of each. Whereas domestication of terrestrial species and adaptation to farming conditions has been a long process (often spanning over centuries), the domestication of fish is still in its early stage or, for many potential novel aquaculture species, hasn't yet taken place at all. This means that there are many differences in how species are able to cope with farming conditions; and this also implies that caution is needed when extrapolating knowledge or experience from terrestrial animal welfare science.

Assessment methodology of animal welfare relies on input or measurements from various disciplines, given the multidimensional aspect of welfare. Furthermore, any form of assurance-based certification has to be based on basic indicators principles as validity, repeatability and feasibility.

Other requirements for the assessment and certification to be successful are: producer support, the consideration of public expectations[5], and aiming for improvement[6]. Assessment of welfare status is only possible through indirect measurements with either resource-based indicators, which describe a requirement focused on system inputs (like temperature or water quality); or animal-based indicators which measure an attribute of the animal itself. Although animal-based indicators require more specific information on actual welfare status, these measurements can be potentially invasive and time-consuming for assessors.

Certification schemes are usually shaped as 1) resource-based; 2) outcome-based; 3) continuous improvement driven, but these three approaches can be used complementarily to include several aspects and benefits of indicators[7].

Other factors in developing a welfare assessment methodology are: species, life-stage appropriateness of indicators, production system, interrelation of indicators, and potential effects on production costs. Interrelatedness and the proposed indicators' relative importance as regards to 'welfare' considerations can be addressed through a model approach, of which Welfare Quality®[7] and the SWIM[8] models are examples.

Assessment of fish welfare is not straightforward and comes with many challenges. These challenges include (*but are not limited to*):

- Conflicting requirements for indicators;
- Production cost effects;
- Lack of scientific information on certain species;
- Defining appropriate sample sizes;
- Consumer knowledge and perceptions;
- Measuring subjective states of animals;
- Interrelation of indicators;
- Inclusion of positive welfare;
- Avoiding snapshot monitoring;
- Production systems with different baselines and technical development.

[5] Rushen *et al.,* 2011
[6] Main *et al.,* 2014
[7] Botreau *et al.,* 2009
[8] Stien *et al.,* 2013

ASC will kick-off the multi-stakeholder technical working group (TWG) with the following recommendations:

- Consider a broad range of welfare indicators to provide an overall judgement of welfare;
- Take into account interrelatedness and the proposed indicators' relative importance as regards to 'welfare' considerations, for example through model approach;
- Inclusion of both resource-based as animal-based indicators;
- Consider complementary types of certification, including recourse- and output-based indicators, as well as continuous improvement;
- Emphasise on the overlapping principles animal welfare, with species-specific metrics/requirements;
- Keep practical implementation in mind, as well as effects on auditing time and production costs.

References

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2) Webster, J. 2016. Animal Welfare: freedoms, dominions and "a life worth living". Animals 35
3) Mellor, D.J. 2016. Updating animal welfare thinking: moving beyond the "Five Freedoms" towards "a life worth living". Animals
4) Huntingford, F.A., Kadri, S. 2008. Welfare and fish, In Branson, E.J (Ed.). *Fish Welfare* (pp. 7-18). Oxford: Blackwell Publishing Ltd.
5) Rushen, J., Butterworth, A., Swanson, J.C. 2011. Farm animal welfare assurance: science and application. Journal of Animal Sciences 89: 1219-1228.
6) Main, D.C.J., Mullan, S., Atkinson, C., Cooper, M., Wrathall, J.H.M., Blokhuis, H.J. 2014. Best practice framework for animal welfare certification schemes. Trends in Food Science & Technology 37: 127-136.
7) Botreau, R., Veissier, I., Perny, P. 2009. Overall assessment of animal welfare: strategy adopted in Welfare Quality®. Animal Welfare 18: 363-370.
8) Stien, L.H., Bracke, M.B.M., Folkedal, O., Nilsson, J., Oppedal, F., Torgersen, T., Kittilsen, S., Midtlyng, P.J. Vindas, M.A., Øverli, Ø., Kristiansen, T.S. 2013. Salmon Welfare Index Model (SWIM 1.0): a semantic model for overall welfare assessment of caged Atlantic Salmon: review of the selected welfare indicators and model presentation. Reviews in Aquaculture 5: 33-57.