



SALMON WELFARE SCORECARD

METHODOLOGY



The Salmon Welfare Scorecard (SWS) aims to clearly present the policies and practices published by the producers. It assesses producers across thirteen different parameters that aim to describe and classify salmon welfare practices that are shared to the public in a clear and understandable manner. Although any assessment is implicitly subjective, SWS was designed to assess and compare each participant as objectively as possible.

The methodology to achieve the comparison that is the SWS is disclosed in this document.

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Assessment

Documents evaluated

Each producer was evaluated on their published content related to salmon welfare.

As published content we are including reports and policies that are publicly accessible. We also are including websites as documents in the assessment. Only websites that were owned by the company were included in the assessment, as CIWF considers that companies should facilitate the data they report without taking one step further from their official communications.

Assessment form

An assessment form was designed to register the documents and the information found for each producer.

The documents were registered and the date when they were accessed was saved for future reference. To facilitate the reference to the documents through the form, each document was assigned a code: a letter indicating the type of document (W: Website; P: Policy; R: Report) and a number to identify it.

The assessment form is divided into thirteen parameters. The information found was classified into the relevant parameter by copying the sentence from the original document in an empty field besides the relevant answer. The copied sentence is accompanied by the document code and the page where it can be found.

Parameter structure

Each parameter includes several related topics. In order to include them, the parameters are further subdivided into:

- Subparameters or topics
- Statements or questions

Each subdivision is used to further classify the information from the documents assessed and create a higher degree of granularity when scoring each parameter.

Types of answers

One the main objective for the SWS is to standardize the information that producers are publishing. Each parameter subdivision is paired with answers that aim to describe the related topic. When assessing the information found the closest to describing the practice was chosen.

There are two types of answers:

- **Single choice:** A drop-down list. Only one answer can be chosen. They are used when it was possible to describe practices with enough detail with only one choice.
- **Multiple choice:** A list of answers. Several answers can be marked. These types of answers were used when the topic has multiple answers but not necessarily including all of them.

Not scored topics

The SWS includes subdivisions that are not scored. These are topics that CIWF considers relevant to welfare and that we consider that will be relevant in the future or practices we had like to promote but are not a current practice.

They introduce topics that might be part of the score structure in future editions or to promote discussion.

Parameters

Parameters were organized to reflect and classify practices and ensure that the scores would reflect producers performance adequately.

Enclosure

Enclosure includes the information relative to the system where the salmon grows out. These systems should create an environment to the salmon that provides them with their natural needs and avoid injuries.

Recently there is an increasing interest in the use of Recirculating Aquaculture Systems to grow out salmon. These systems lead to an undesired intensification of aquaculture and have important welfare issues such as extreme high density, water quality, technology failure and barren environments.

Enclosure	
Environmental enrichment	Provision
	Type (not scored)
	Species-specific
Recirculating Aquaculture System	
Design of the enclosure	Design to not cause injury
	Mimics natural environment

Feed and Feeding

Feed and Feeding	
Feeding method	
Fasting	When it is used
	Repeated fasting
	Registration
	Duration
Fish Meal and Fish Oil conten	Use
	Origin of fish ingredients
	Reduction plan

This section collects information related with the salmon feeding practices which should ensure that every salmon is fed adequately and avoids starvation. Fasting periods can induce stress to the fish and therefore they need to be carried only when necessary and for fish welfare purposes.

Fish Meal and Fish Oil nowadays are essential ingredients of salmon diets that create an impact to sustainability of fisheries and extend the welfare issues of the industry. This section assesses if there is a plan to reduce its use and from where it is originated.

Genetics

This section covers the use of animals that have been genetic engineered, cloned or that are triploids. These techniques can be used to achieve better productivity but their effect in fish welfare is unknown.

In some cases, it exist the risk of also affecting wild populations health if they escape the cages where they are reared

Genetics
Use of genetic engineered salmon
Use of cloned salmon
Use of triploid salmon

Health Planning and Treatments

Health Planning and Treatments	
Designated fish health/welfare responsible	
Health and Welfare Plan	Presence and design
	Revision
	Treatments outlined
Non-antibiotic treatments	Approval
	Registration
Growth promoters	
Vaccination	Salmon
	Cleaner fish
Antibiotic treatments	Prophylactic use
	Permitted use
	Use of critical antibiotics
	Reduction plan
	Target
	Measuring unit
	Public reporting

The health and welfare of salmon is paramount and should be included in a plan designed and review by a professional of health or welfare.

It should be clear when salmon are treated and who is approving any type of treatment and keep a record of the reasons and quantities used. Especially relevant is the use of antibiotics due to the worldwide increase of antibiotic resistance. One of the recommended practices is vaccinating fish that are under rearing conditions.

Humane Slaughter

All animals killed for food should be slaughtered humanely. This means that they must be effectively stunned, rendered instantaneously insensible, and remain unconsciousness until death supervenes.

There are technical solutions commercially available, and therefore they are expected to be used. This parameter will reflect what stunning and slaughter methods are communicated to be in use, and the degree of implementation.

Similarly, as a humane end to their lives is expected, a back-up system is expected.

Humane Slaughter	
Statement on humane slaughter	
Implementation	Percentage of implementation
	Target to implement
Stunning and slaughter	Use of a stun-kill method
	Stunning method
	Slaughter method
Back-up system	

Key Welfare Indicators (KWI)

Key Welfare Indicators (KWI)	
General statement on monitoring welfare	
Physical indicators	Monitoring frequency
	Registration
	Types
Behavioural indicators	Are they used?
	Monitoring frequency
	Registration
	Type (Not Scored)

Health and welfare status of fish must be assessed and monitored during the rearing period as frequently as possible.

There are different types of indicators that can be used. Exist different type of classification of indicator, for this Scorecard it was decided to differentiate them between physical and behavioural indicators to promote the use of the later.

Physical indicators are well established, and their use is expected while behavioural indicators are not used as frequently, and generally they are disclosed very vaguely.

Mortality

While mortality could have been included as a welfare indicator, we decided that it deserved a parameter by itself due to its social relevancy for society, data availability and how it is reported.

It is widely collected data (often required daily or with high frequency). It is a crude indicator of on-farm welfare issues as it is retrospective. However, increases in mortality rate can indicate welfare issues that have been overlooked.

Mortality and its cause should be reported, and how it is calculated and what is included in the mortality calculation should be clearly disclosed.

Also, we are suggesting that acute mortality events can be another measurement to understand welfare practices in a farm.

Mortality	
Recording frequency	
Mortality reduction plan	
Mortality reporting	Publicly reported
	Losses included
	Causes reported
	How it is calculation?
	% of cumulative mortality (Not Scored)
Acute mortality events	Number of acute mortality events (Not Scored)
	Publicly reported
	Causes reported
	Intervention

Predator Management

Predator Management
Predator control plan in place
Use of lethal methods
Non-lethal methods
Protected predators specifically mentioned

Salmon farms share the space with local fauna, among them predators that feel attracted by the concentration of fish and the use of fish feeds.

Presence of predators can create stress for the fish but also injure them when trying to catch them. They also can injure themselves in this process.

The interaction between the farms and predators should be collected in a control plan that establish actions and methods that are non-lethal, bans the use of lethal methods and specifically mentions the protection of protected predators.

Sea Lice

Nowadays, sea lice are one of the biggest welfare issues for salmon. They are crustacean parasites that attach to the skin and soft tissue of salmon and find farming conditions perfect for spreading and increase their numbers, affecting salmon welfare and ultimately causing death.

In this parameter we are looking in how sea lice is counted and reported. Ideally, producers should have a crew exclusively dedicated to this purpose, so they do not have a time constrain.

Ideally, producers should prevent a sea lice infestation rather treating the affected pens. Current treatments for sea lice are known to be harmful to the salmon, and we suggest that they should be phased out and substituted by more efficient and welfare friendly treatments.

Cleaner fish are used to prevent or to treat salmon, depending on the practice of each producer. We suggest that using cleaner fish should be phased out, its use represent extending the welfare impact to more species, and it is not clear that welfare of these species can be maintained.

Sea Lice	
Reporting	Public reporting
	Reporting level
Who counts the sea lice	
Prevention methods	
Treatments	Hydrogen peroxide
	Medicinal (chemical) treatment
	Thermal treatment
	Mechanical treatment
	Cleaner fish
	Other treatments

Stocking Density

Stocking Density	
Maximum stocking density set	
What volume of water is used to calculate stocking density	
Stocking density reported	Average stocking density
	Separate freshwater and seawater stages
	How it is calculated

Stocking density is an important management tool for optimising farmed fish welfare that is strongly influenced by both environmental factors and fish behaviour. Additionally, is not a uniform at any point in time.

The density used in a salmon farm should allow salmon to express their natural behaviour and disperse to more favourable areas when water conditions are sub-optimal, to gain access to feed or find their preferred water condition. Our

recommendation is that salmon farms should set up a maximum density of 10 kg/m³ and report their stocking density as accurately as possible.

Training and Husbandry

Awareness of fish welfare is very important to achieve good practices across the company. Understanding what is behind the reasoning of those practices and create empathy for the animals under the care of the staff is rooted in creating adequate training that covers every topic and that should be constantly refreshed to incorporate new concepts and developments.

In this parameter we included a set of three husbandry procedures that are key points where the salmon welfare can be affected: crowding, grading, and handling. These procedures in general should be avoided or reduced only to when necessary, and always setting up limits and procedures to assess welfare during their practice.

Training and Husbandry	
Fish welfare training	Training topics
	Repetition
Husbandry procedures	Crowding
	Grading
	Handling

Transport and Transfer

Transport and Transfer	
Fish are transported for slaughter?	
Materials and methods for transfer of fish	Equipment
	Use of pumps
Transport of fish for slaughter or other reasons	Method
	Stocking density
	Water quality
	Fish welfare

During the rearing of salmon, they can be transported to or from the salmon, generally at the end of their lives to be slaughtered at a land site. They can also be transferred for treatments or changing cages. These events are stressful, and the welfare of salmon can be compromised.

In this parameter we want to see reporting if they are transported, how they are transferred and if welfare of fish is ensured.

Water Quality

Water quality is essential for the rearing of salmon and any other fish. Deterioration of water quality is related with welfare issues and there should be a reaction plan to ensure that this does not happen to the salmon under the producer care.

We recommend that water parameters needs to be frequently measured, ideally daily depending on the parameter, but also at different depths of the facility to ensure knowledge of which volume of water is available for the salmon.

Water Quality	
Reaction plan to rapid changes and suboptimal conditions	
Measurements at different depths	
Parameters measured and frequency	Oxygen
	Salinity
	Temperature
	Turbidity
	Other parameters

Calculation of scores

Basis of the scoring

The scores are based on CIWF corporate asks and recommendations for Atlantic salmon (*Salmon salar*) which are based on the knowledge reviewed and summarised in our technical resources for Atlantic salmon ^(1,2,3,4,5).

Through the process of stakeholder feedback, we received feedback and information that has been incorporated in the questions and answers of the scorecard. While not all was incorporated, we believe that the feedback had an important influence over the design and score distribution of the Salmon Welfare Scorecard.

Scores

The calculation of each score was done using formulas embedded into the assessment form. Each subdivision used a formula to calculate the score based on the answers chosen.

Individual scoring

Each of the thirteen parameters are scored individually. The final score for each parameter it is not modified by the answers given in other parameters.

The only exception for the individual scoring rule is related to the use of cleaner fish. This is not used to score but to assign the right score distribution. i.e.: If cleaner fish are disclosed as used in the *Sea Lice* parameter, in the *Enclosure* parameter the environmental enrichment score will be distributed between cleaner fish and salmon.

The Scorecard does not calculate or contain an overall score for each producer that encompasses the score of all parameters.

Weights or proportions

Calculation of the scores was based in distributing the score for each parameter across each subdivision. This was done by assigning a proportion for each subdivision relative to the importance for salmon welfare from the point of view of CIWF, promote better practices and reporting and reward good welfare practices.

Similarly, each answer had a proportion assigned, with a higher proportion for better practices. This was done to create differentiation based on good welfare practices.

Calculation rules

Several rules were introduced in the calculation of the scores when the answer of a subdivision depended on other within the parameter or when only one answer was not enough to describe the topic. The following rules are used across the parameters by themselves or in combination:

- **Addition:** Used in multiple choice answers. The score of each answer will be added to create the score for that subdivision.
- **Condition:** Used when the answer of a subdivision can define the answer to other subdivision. Depending on the answers different answer options are considered.
- **Prioritization:** Used when a multiple-choice answer could not be answered with *Addition* and the answers described different practices that could be practiced. It was used to set the score of the subdivision with the score corresponding the practice considered the worst for salmon welfare, or for reporting, but still register all the practices reflected in the documents.

CIWF salmon technical resources

1. Improving the welfare of farmed Atlantic salmon
(https://www.compassioninfoodbusiness.com/media/7436972/126859_ciwf_salmon_insert-4_welfare2.pdf)
2. Improving the welfare of farmed Atlantic salmon at rearing
(<https://www.compassioninfoodbusiness.com/media/7436971/improving-welfare-at-rearing-atlantic-salmon.pdf>)
3. Improving the welfare of farmed Atlantic salmon at slaughter
(https://www.compassioninfoodbusiness.com/media/7436973/126860_ciwf_salmon_insert-56_slaughter.pdf)
4. Welfare issues in Atlantic salmon
(https://www.compassioninfoodbusiness.com/media/7436970/126857_ciwf_salmon_insert-2_welfare-issues.pdf)
5. Best Practice Guidance Document: Pinniped Predator Control
(<https://www.compassioninfoodbusiness.com/media/7443858/best-practise-guidance-predator-control.pdf>)



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