

The Norwegian Scientific Committee for Food and Environment
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Assignment to VKM on assessment of animal welfare in stunning and killing of farmed fish

Assignment

The Norwegian Food Safety Authority requests a knowledge summary and assessment of animal welfare regarding methods and equipment used in stunning and killing of farmed fish. The main focus should be on fish which are stunned and killed in slaughterhouses, including fish intended for destruction.

The Norwegian Food Safety Authority requests VKM to:

1. Assess what criteria should be used for documentation of methods, to ensure that fish are stunned and killed painlessly and with minimal stress.
2. Evaluate how anatomical, physiological, and behavioural differences between fish species affect animal welfare during stunning and killing, and how this might influence the criteria for documentation.
3. Summarise knowledge and risk perspectives on animal welfare concerning methods for stunning and killing which are relevant for farmed fish in Norway. The fish species included in the assignment are listed in Appendix 1.

The Norwegian Food Safety Authority will use the updated knowledge to facilitate that the industry ensure that the methods and equipment used for stunning and killing fish are suitable for the purpose of ensuring the animals' welfare. This will be done through guidance and supervision and includes mandating documentation of methods where such documentation is lacking. The knowledge obtained will also serve as a fundamental basis for any potential changes to the regulations.

Background information

The regulations state that stunning must be performed using an appropriate method which does not cause significant stress or pain to the fish. This applies to all stages of farmed fish. The Norwegian Food Safety Authority requires that stunning methods which might be painful must induce immediate loss of consciousness. The fish must remain unconscious until it is dead. This is to ensure a painless killing of the fish. The methods and equipment used for stunning and killing must be documented to meet this requirement for the particular fish (species, size, etc.) for which they are used. To ensure that experiments and testing are

adequate for documenting consequences for animal welfare, they shall be carried out in accordance with scientific principles.

History

The use of CO₂ for stunning farmed fish was banned by regulation from July 1, 2012. The Norwegian Food Safety Authority recommended such a ban, based on advice from [VKM](#) and advances in technological development.

The ban came into force despite the need for further optimisation of welfare when using alternative stunning methods and equipment. Testing and documentation were mainly carried out on salmon and to a lesser extent on other species.

After the CO₂ ban came into force, Norwegian research about stunning and killing decreased significantly. The lack of documentation on stunning and killing methods could mean there is a significant risk of poor welfare when such species are being killed.

Current situation

The Norwegian Food Safety Authority concedes there are still challenges with the documentation required to ensure ethical stunning and killing of farmed fish.

Inspection by the Norwegian Food Safety Authority have revealed irregularities related to the stunning and killing of farmed fish (this includes regular inspections and an inspection campaign at fish slaughterhouses in 2022). The irregularities include, among other things, use of methods and equipment on species and size groups without sufficient documentation. The Norwegian Food Safety Authority has followed up on the requirements for methods and equipment for stunning species other than salmon at certain slaughterhouses but has not conducted a systematic survey at all slaughterhouses and for all species. Before doing so, we seek a scientifically based assessment of what should be included in such documentation, as well as updated knowledge for the relevant species.

Situation in other countries

The requirements for the stunning and killing of farmed fish in the EU are provided in Article 3, number 1 of Regulation (EC) No 1099/2009, implemented in Regulation of January 13, 2013, No. 60 on the slaughtering of animals. This requirement states: "*Animals shall be spared any avoidable pain, distress or suffering during their killing and related operations.*" The animal welfare legislation in the EU is currently under revision, and it is expected that there will be additional regulations concerning the killing of farmed fish. The knowledge provided by this VKM report can form a basis for best practices and contribute to the processes in the EU's regulatory work.

Current legislation in Norway

The purpose of the Animal Welfare Act is "*to promote good animal welfare and respect for animals*" (§1). The law applies to farmed fish equally as it does for production of terrestrial animal (according to §2). The law states that animals have an intrinsic value which is irrespective of the utility they may have for humans, and that animals shall be treated well and be protected from danger of unnecessary stress and strains (§3).

§12 of the Animal Welfare Act states that: "*Killing of animals, and handling in connection with the killing, shall take place having regard to the animals' welfare. Anyone using equipment for stunning or killing shall ensure that it is suitable for the purpose and maintained. Animals which are owned or in any way kept by people must be stunned before being killed. The stunning method shall ensure loss of consciousness which lasts from the killing starts until death occurs. The requirement for stunning before killing does not apply if the animal is killed using a method which provides immediate unconsciousness. After the killing of the animal it shall be*

ensured that the animal is dead. Killing under emergency circumstances shall take place in compliance with the first and second article if possible."

Requirements for proper stunning and killing at slaughterhouses are provided in regulation on Slaughterhouses and Processing Plants for Aquaculture Animals ("Forskrift om slakterier og tilvirkingsanlegg for akvakulturdyr"). The regulation states that *"fish shall be protected from avoidable pain, suffering, and fear during slaughtering and related activities... No more fish per unit of time shall be slaughtered than what is justifiable based on fish welfare considerations."* (§10)

Regulation on Slaughterhouses and Processing Plants for Aquaculture Animals requires that fish must be stunned before or simultaneously with killing and remain stunned until death occurs. Stunning should be carried out using an appropriate method that does not cause significant stress or pain to the fish. (§14)

Regulation on Slaughterhouses and Processing Plants for Aquaculture Animals §15 also states that fish must be killed immediately after stunning, and it must be ensured that it is dead before further processing. The fish should die as a result of blood loss from the brain. Another method of killing may be used if it can be documented that it is justifiable.

The Animal Welfare Act §8 necessitates that methods, equipment, etc., used for fish must be tested and found to be suitable to ensure the welfare of the fish.

Regulation on Slaughterhouses and Processing Plants for Aquaculture Animals §12 necessitates that methods, equipment, etc., used for fish must be tested and found suitable to ensure the welfare of the fish.

Aquaculture Operation Regulations ("Forskrift om drift av akvakulturanlegg") has similar requirements for stunning, killing (§34), and the use of methods and equipment (§20) as regulation on Slaughterhouses and Processing Plants for Aquaculture Animals. This is to ensure that the killing of fish outside of slaughterhouses is also conducted in a manner that is appropriate for animal welfare. Aquaculture Operation Regulations §20 states, among other things, that the consequences for fish welfare must be documented. The Norwegian Food Safety Authority points out the need for documentation to verify that stunning and killing methods have been tested and found suitable, as required by §12 of regulation on Slaughterhouses and Processing Plants for Aquaculture Animals .

Submission of data, reports, regulations, etc.

[Animal Welfare Act](#)

[Forskrift om drift av akvakulturanlegg \(Aquaculture Operation Regulations\)](#)

[Forskrift om slakterier og tilvirkingsanlegg for akvakulturdyr \(Regulation on Slaughterhouses and Processing Plants for Aquaculture Animals\)](#)

[Krav til god fiskevelferd ved slakterier for akvakulturdyr \(Guidelines: Requirements for good fish welfare in slaughterhouses for aquaculture animals\)](#) (The Norwegian Food Safety Authority, 2022)

[Tilsynskampanje: Godkjenninger, fiskehelse og dyrevelferd på fiskeslakterier 2022 \(Inspection campaign at fish slaughterhouses in 2022\)](#) (The Norwegian Food Safety Authority, 2022)

[Veileder om fiskevelferd ved utvikling og bruk av metoder, utstyr, teknologi mv i akvakultur \(Guideline: Development and use of methods, equipments and technical devices\) \(The Norwegian Food Safety Authority, 2020\)](#)

[Council regulation \(EC\) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing.](#)

Conditions

Time frame

The deadline for submitting the report is May 23, 2025.

Language

We kindly request that the report be written in English with a Norwegian summary.

Contact at the Norwegian Food Safety Authority

Contact at the Norwegian Food Safety Authority, Inger Fyllingen, senioradvisor

Yours Sincerely

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Dokumentet er godkjent elektronisk / This document has been electronically approved

Appendix 1: List of relevant fish species

Fish for consume	Environment
<i>Atlantic salmon/Salmo salar</i>	Sea water
<i>Rainbow trout/Onchorhynchus mykiss</i>	Sea water
<i>Arctic char/Salvelinus alpinus</i>	Sea and fresh water
<i>Sea trout/Salmo trutta</i>	Fresh water
<i>Atlantic halibut/Hippoglossus hippoglossus</i>	Sea water
<i>European turbot/Scophthalmus maximus</i>	Sea water
<i>Atlantic cod/Gadus morhua</i>	Sea water
<i>Spotted wolffish/Anarhichas minor</i>	Sea water (landbased)
<i>Yellowtail kingfish/Seriola lalandi</i>	Tropical sea water (landbased)

Fish not for consume	Description
<i>Lumpfish/Cyclopterus lumpus</i>	Cleaner fish
<i>Ballan wrasse/Labrus bergylta</i>	Cleaner fish
<i>Goldsinny wrasse/Ctenolabrus rupestris</i>	Cleaner fish
<i>Corkwring wrasse/Symphodus melops</i>	Cleaner fish
<i>Rock cook/Centrolabrus exoletus</i>	Cleaner fish
<i>Pollock/Pollachius virens</i>	Wild fish
<i>Haddock/Melanogrammus aeglefinus</i>	Wild fish