

9. Given the number of fish harvested in UK aquaculture each year⁶, the UK Governments should introduce specific legislative protections for the welfare of farmed fin fish at the time of killing to reinforce existing good practice by the aquaculture industry.

The welfare of farmed fish during harvesting operations

7. There are several key stages during the pre-slaughter harvesting process that can impact on fish welfare⁷, these are:

- feed withdrawal
- crowding
- handling and removal from water;
- transportation from pen to harvesting station

8. We strongly recommend that all those involved in the harvesting of fish familiarise themselves with, and adhere to, best practice to promote positive fish welfare during harvesting, as set out in the following documents:

[Humane Slaughter Association guidance on the Humane Harvesting of Fish](#)

[RSPCA Assured standards](#) for salmon and trout

[The Code of Good Practice from Scottish Finfish Aquaculture](#)

Feed withdrawal

9. Withdrawing feed from fish before handling and slaughter reduces faecal contamination, reduces metabolic activity and can reduce distress and oxygen demand during handling operations. There is currently nothing set in legislation to specify maximum withdrawal food periods.
10. We support RSPCA Assured standards and Humane Slaughter Association guidance that stipulates a maximum of 72 hours withholding of food to completely empty the gut, while minimising any negative welfare implications. There may be circumstances where a longer withdrawal period is appropriate, however withdrawal periods should only be extended under the guidance of a veterinary surgeon.
11. However, we note that there is a discrepancy in how feed withdrawal is measured in the RSPCA Assured standards for salmon and trout. In the salmon standards feed can be withheld for a maximum of 72 hours, whereas in the trout standards feed can be withheld for a maximum of 54 degree days.
12. See [Noble, C. et al. \(2018\). Welfare Indicators for farmed Atlantic salmon: tools for assessing fish welfare](#), for more information on the welfare implications of fasting in fish across different time periods.
13. Before feed withdrawal takes place, it is also important that the welfare of cleaner fish is taken into account eg the risk of predation. Protective measures, such as the potential removal of cleaner fish from pens at this stage, should be specifically add health plan.
14. In addition, further consideration should be given to the welfare implications of intermittent feeding pre-slaughter and the potential need to restrict this. With this in mind, it would be useful

⁶ Scottish Government, 2019. [Scottish fish farm production survey 2018](#).

⁷ FAWC, 2014. O Tm7(t)-1e1g0 G[()] TJETQq0.000008869 0 595.2 841.8 reW* hBT/F3 9 TfETQ2008869q0.000008869 0 595.1.8 reW*

for AWC to consider recommending potential maximum number of fasting periods pre harvest. See Bermejo-Poza et al. (2015) The effect of intermittent feeding on the pre-slaughter fasting response in rainbow trout.

Crowding

15. Crowding is the process in which the area available to fish is reduced to capture and remove them from the water before slaughter. As recognised in the previous FAWC opinion, if poorly managed, the process of crowding can invoke a high distress response in fish by decreasing oxygen levels, and also lead to physical damage through abrasion on nets or other fish if there is overcrowding.⁸

16.

the anaesthetic solution delivered into the water before removal for slaughter. As the fish are sedated, they do not experience the welfare risks or stressors associated with handling or removal from water. Anaesthetic concentration, exposure time, water temperature, and fish size and weight are factors that need to be carefully considered when using this method. However,

33. However, it is important to note that research by Readman et al (2013)¹³ concluded that tricaine (MS222) and benzocaine were aversive to adult zebrafish, and that for ethical best practice, compounds that are aversive, even at low concentration, should no longer be used routinely for anaesthesia or indeed the first step of humane euthanasia of adult zebrafish. With this evidence in mind, it would be useful to review the impact of these anaesthetics on salmon, trout and cleaner fish, to assess how they are tolerated to inform anaesthetic protocols and euthanasia best practice going forward. As part of this, it will be important to recognise that current Cascade rules do not permit the use of anything other than tricaine and benzocaine in fish. Also see Schroeder P, Lloyd R, McKimm R, et al. (2021) [Anaesthesia of laboratory, aquaculture and ornamental fish: Proceedings of the first LASA-FVS Symposium](#).

Routine or production culling

34. With regard to culling, the 2014 FAWC Opinion states that:

This typically occurs in the juvenile stages, and generally involves the removal of fish deemed unlikely to thrive through to harvest.

Culling can also be necessary for some commercial companies where overproduction means some stock is unsold (this is especially relevant to salmon, where the window of sale for smolts (seawater adapted juveniles) is quite restrictive). In both cases, fish are usually killed with an overdose of

45.