

## Reports and Comments

### The welfare of farmed fish at the time of killing

In June 2014 the Farm Animal Welfare Committee (FAWC), an expert committee of Defra in England and the devolved administrations in Scotland and Wales, published its Opinion on the Welfare of Farmed Fish at the Time of Killing. The Opinion covers the welfare of various species of fish, of which 100 million individuals are estimated to be growing on UK farms at any given time, for human consumption. The Opinion focuses on Atlantic salmon and rainbow trout, whose industries are becoming more centralised, with fewer companies increasing production, according to FAWC. Indeed, FAWC points out that Defra, the Scottish and Welsh Governments have all pledged to support their aquaculture industries in sustainable increases in production. In terms of tonnage, salmon and trout production by far exceeds that of other UK aquaculture finfish species, which are typically farmed through small-scale agricultural diversification. Some of those other species (halibut and tilapia) are specifically referred to in the FAWC Opinion, including in the tables of parameters for stunning. FAWC also make reference to 'cleaner-fish' (eg species of wrasse) which may be kept in marine pens, alongside the farmed fish species that are intended for human consumption, to reduce the populations of parasitic sea lice. It is predicted that, by 2017, more than 2 million cleaner-fish might be used per year. The Opinion considers the welfare of fish that are routinely slaughtered for human consumption, killed in emergencies following detection of an untreatable or notifiable disease or the irreparable failure of life-supporting equipment, and those individuals that are culled for invasive health sampling or because they are deemed unlikely to thrive (whether slow-growing or moribund) or surplus to production requirements.

FAWC state that if slaughter or killing of farmed fish is to be humane, with minimal pain, distress and suffering, then certain principles should be observed, including that: personnel involved with killing must have a duty of care, be trained and be competent; only fit and healthy fish should undergo the complete routine harvesting/slaughter procedure; handling must be performed with consideration for fish welfare and only equipment that is fit-for-purpose should be used; fish must be rendered unconscious instantaneously or unconsciousness must be induced without pain or distress; and fish must not recover consciousness before death ensues. Even if it is not possible or practicable to handle certain fish individually, FAWC states that those persons involved in harvesting/killing farmed fish should regard fish as individuals and take responsibility for ending each fish's life. FAWC commend those operations that already use high standards of killing technology and practices for farmed fish.

Feed withdrawal, crowding, handling, manipulation and transport are discussed with respect to pre-slaughter management processes. FAWC recommend that research should aim to determine humane feed withdrawal limits.

FAWC also recommend that cleaner-fish should be separated from the farmed species, when any food withdrawal period commences, to prevent the cleaner-fish from being predated by the farmed species. FAWC point out that crowding and removal from water are two management operations that are often performed and invoke the maximal stress response in fish; "...some degree of stress is unavoidable although it should be minimised through husbandry practice and operating system design... it should be questioned in designing systems and practices whether removal of fish from water is necessary at all".

FAWC believe that all farmed fish should be stunned before killing. However, the Committee notes that there is anecdotal evidence that farmed fish in the EU and beyond are killed without prior stunning, using asphyxiation in air or ice, rapid chilling, water saturated with carbon dioxide, or by cutting their blood vessels. These methods, however, are considered to cause unacceptable levels of pain and suffering and FAWC argues that such methods should not be used under any circumstances because European Council Regulation 1099/2009 on the Protection of Animals at the Time of Killing requires that "[fish] shall be spared any avoidable pain, distress or suffering during their killing...". FAWC also state that "emergency killing, including where automated stunning or other methods fail, should not be by methods considered inhumane at other times... and that automated killing facilities must have available in the killing area, a method of manual percussion...". Another recommendation is that research should be carried out into the detection, retrieval from stocked pens and killing of sick and moribund fish.

The Opinion provides tables of stunning methods and parameters (in the format of Annex I of EC Regulation 1099/2009) and advises that the EU Commission should consider inclusion in EU law, of such requirements for the welfare of farmed fish at the time of killing. The tables list the method (percussive stunning, electrical stunning) and its characteristics, conditions for use, key parameters and specific requirements. FAWC states that the parameters should be considered as a guide rather than minimum values for stunning and recommends that "operators... should... demonstrate that the key parameters in the [FAWC] Opinion... are properly taken into account". In some cases it may be possible to re-use healthy cleaner-fish in the same geographical area (rather than killing them after only one use), but when the time does come to kill the cleaner-fish, FAWC believes they can be killed by anaesthetic or percussive equipment.

FAWC advise that there may be requirements, under EC Regulation 1099/2009, that are suitable for adoption by fish killing establishments, eg Standard Operating Procedures, training and Certificates of Competence to kill animals, maintenance of equipment related to handling and slaughter, monitoring and recording of electrical stunning equipment, animal welfare monitoring processes and Animal Welfare Officers.

Whether the European Parliament and Council will provide legislative proposals for more specific requirements for fish at the time of killing should become evident after December 2014. However, FAWC also mention that “greater public understanding of [fish] welfare issues... informed by scientific evidence... is needed... to motivate ethical consumer choice”.

**Opinion on the Welfare of Farmed Fish at the Time of Killing** (2014). A4, 36 pages. Farm Animal Welfare Committee (FAWC). Available at: <http://www.defra.gov.uk/fawc/>.

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### **Animal welfare monitoring procedures at slaughterhouses**

According to European Council Regulation 1099/2009 on the Protection of Animals at the Time of Killing, which has applied across Europe since 1 January 2013, “[animal welfare] monitoring through indicators... should be carried out to evaluate the efficiency of the [slaughter] procedure under practical conditions” and reliable results on the status of animal welfare at the time of killing can only be obtained if business operators develop monitoring tools to evaluate the effects of the management of daily procedures. Article 5 states: “...checks shall be carried out on a sufficiently representative sample of animals and their frequency shall be established taking into account the outcome of previous checks and any factors which may affect the efficiency of the stunning process”. A range of requirements are listed under Article 16, including that the indicators of consciousness, unconsciousness and death must have criteria for determining whether the results shown by the indicators are satisfactory and if the results are not satisfactory, then the cause must be identified and the necessary changes made to the operation procedure.

To assist with these aims, in December 2013 the European Food Safety Authority (EFSA) published a series of scientific Opinions on slaughterhouse monitoring procedures for bovines — slaughter with prior stunning (penetrative captive-bolt) and slaughter without stunning; pigs — slaughter with prior stunning (head-only electrical or gas); poultry (chickens and turkeys only) — slaughter with prior stunning (electrical water-bath or gas) and slaughter without stunning; and sheep and goats — slaughter with prior stunning (head-only electrical) and slaughter without stunning.

The EFSA’s aim is to suggest procedures that Food Business Operators (FBOs) can use to help prevent negative welfare outcomes for animals at slaughter. The procedures use ‘toolboxes’ of animal-based welfare indicators, selected by EFSA on the basis of their sensitivity, specificity and feasibility, to assess signs of consciousness in animals stunned during slaughter, and signs of unconsciousness and death in animals slaughtered without stunning. EFSA has also identified common risk factors for the slaughter scenarios and types of stunners and their welfare consequences and provided examples of sampling protocols based on those risks.

When animals are stunned during the slaughter process, EFSA recommend that the risk of poor welfare can be better detected if animal welfare monitoring is focused on detecting indicators of ineffective stunning, ie, failure to lose consciousness or recovery of consciousness after stunning. An indicator is considered to be 100% sensitive if it detects all conscious animals as conscious and 100% specific if it detects all unconscious animals as unconscious. It must also be feasible, which depends on the slaughterhouse layout.

EFSA recommend that operators choose at least two ‘recommended’ indicators and thereafter may choose ‘additional’ indicators according to the individual’s expertise and the infrastructure of the slaughterhouse. The ‘additional’ indicators are relatively low in sensitivity or feasibility and are insufficient for use on their own, without ‘recommended’ indicators. The indicators are phrased neutrally (eg ‘breathing’) in the toolboxes but depending on whether the indicator is present or absent, the outcome may be a conscious or unconscious, or live or dead, animal. Each animal must be repeatedly assessed for consciousness, or life, during a number of key stages of monitoring, which vary depending on the slaughter scenario and the stunning equipment used. For example, for poultry stunned using an electrical water-bath, the two key stages are: (i) between the exit from the water-bath stunner and neck cutting; and (ii) during bleeding. Flow charts of the toolboxes at all key stages, the outcomes for consciousness, unconsciousness and death and any necessary interventions (eg back-up stunning) are displayed in the scientific Opinions for all species and slaughter and stunning scenarios.

In the case of animals slaughtered without stunning, every animal must be monitored (EC Regulation 1099/2009). Where animals are stunned, EFSA recommend that slaughterhouse personnel should check all animals immediately after stunning, during neck cutting or sticking and during bleeding and that operators should confirm each animal is not conscious, and/or not alive, before further processing takes place. In addition, the Animal Welfare Officer (AWO) should periodically assess a sample of the slaughter population using the EFSA sample size calculation tool (EFSA Stun Model software) to estimate: i) sample size needed to achieve the desired accuracy at a specific failure rate threshold; and ii) expected failure rate (ie a tolerance level for the highest, acceptable proportion of potential failed/ineffective stuns), given the sample size. Based on EFSA’s definition of a slaughter population, slaughterhouses killing multiple species of mammals or multiple species of poultry may need a separate protocol for each mammal, or bird, type. The tool is intended to act as a ‘standard’ sampling protocol but EFSA states that it was established for information and consultation purposes only and... it has not been adopted or in any way approved by the European Commission”.

In the scientific Opinions, EFSA suggest different risk factors and scenarios which can define the level of the monitoring protocol required by each slaughterhouse when stunning, eg whether it should be a ‘normal’/standard