Reports and Comments

Welfare indicators for farmed rainbow trout: Tools for assessing fish welfare — FISHWELL handbook

This handbook — which is part of the FISHWELL project — looks to provide a fit-for-purpose tool for measuring fish welfare on the farm and reviews the welfare needs of rainbow trout at different life stages and the scientifically documented welfare indicators for them. As such, it follows the format of their handbook on salmon which was published in November 2018 (https://nofima.no/en/fishwell/) and featured in a previous report and comment (*Animal Welfare 28[2]*, 2019).

It is the product of a collaboration between fish welfare researchers and veterinarians at the food research institute Nofima, the Institute of Marine Research (IMR), the Norwegian Veterinary Institute (NVI), Nord University (all of whom are based in Norway) and the University of Stirling in the UK.

Each of the welfare indicators listed in the book — which they define as either operational (can be used on-site) or laboratory (more complex indicators that require analysis in a laboratory) — have been evaluated in terms of their relevance, usability, reliability and suitability for aquaculture.

The Report, which runs for over 300 pages, is split into three parts — the first part explains the concept of welfare as it relates to fish and their welfare needs and details the strengths and weaknesses of the different indicators of welfare in trout — whether direct animal- or indirect environment-based and when they should be used.

Part B deals with the actual practicalities and issues faced in different production systems — flow-through and seacages — and the application of the different operational welfare indicators to evaluate welfare in them. Knowledge gaps in these indicators for trout are highlighted, eg the optimal light conditions for rainbow trout (both light intensity and quality) in land-based flow-through systems is unknown.

Part C looks at the operational welfare indicators (OWIs) for different routines and operations, such as crowding, pumping, slaughter, transport, etc. Given the recent attention on them, the sections that deal with monitoring of welfare when developing and using new technology, specifically mechanical and thermal delousing, optical delousing and net cleaning, are likely to be of particular interest. The handbook identifies the need for all those developing and implementing such new technologies to ensure they are welfare-friendly and should adopt a 3Rs approach (Replace, Reduce and Refine) in their development. NB As is to be expected, many of the environmental, group and individual based OWIs are the same/repeated for each routine in this part.

Across the different systems and routines/operations the handbook suggests the use of a unified scoring system for diagnosing and classifying key external injuries. The 13 indicators cover injuries such as eye haemorrhage, opercular damage, emaciation, scale loss, fin damage etc, and pictorial examples are given indicating the level of severity (score 0–3). A scoring system covering internal changes caused by intraperitoneal vaccination — The Speilberg Scale — is also detailed.

As with the salmon handbook, this handbook should prove a very useful resource for those who farm trout or are interested in their welfare. The team involved in FISHWELL see the handbook as only the first part in a three-stage process; the second stage of which involves input from a wider range of stakeholders than scientists alone, eg NGOs, regulatory bodies, ethicists, industry and that focuses on auditing and interpreting data collected from the use of operational welfare indicators and the third achieving consensus and the development and adoption of robust assessment tools/protocols/standards across the industry.

Welfare Indicators for Farmed Rainbow Trout: Tools for Assessing Fish Welfare (May 2020). A4, 310 pages. C Noble, K Gismervik, MH Iversen, J Kolarevic, J Nilsson, LH Stien and JF Turnbull (eds). Available for download at https://nofima.no/fishwell/trout/.

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AWC Opinion on the welfare of cattle kept in different production systems

It has been over a decade since the Animal Welfare Committee (formerly Farm Animal Welfare Committee) last addressed the welfare of dairy cattle in 2009, whereas beef production was covered in a more recent (F)AWC publication from February 2019. In the latest Opinion Report from February 2021, the committee is looking at the welfare of cattle across the dairy and beef industries in the UK, including beef breeds born into dairy systems, up to the point of slaughter.

The Report is concentrated on the welfare aspects of two types of production systems: continuously housed cattle, and pasture-based systems, the latter referring to year-round grazing. However, at times, it is difficult to ascertain to what extent seasonal grazing (and by default seasonal housing) is included. Continuous housing (and therefore zero-grazing) is reported as being only a small minority (6%) of total dairy production in the UK. And, among the 94% of UK dairy producers that include grazing, only 3% give their herds access to pasture for fewer than three months.

Like a lot of animal welfare legislation following the UK's departure from the EU, the consequences of Brexit are not yet fully known. According to the Animal Welfare Act 2006 (England and Wales) and the Animal Health and Welfare Act 2006 (Scotland), causing unnecessary suffering to any domesticated animal is an offence, and anyone responsible for livestock should take all reasonable steps to ensure that the needs of the animals are met. There is also legislation in

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