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On-farm evaluation of the Salmon Welfare Index Model (SWIM 1.0): theoretical and practical considerations

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Abstract

*The present study investigated the operational feasibility of the recently developed Salmon Welfare Index Model (SWIM 1.0) designed for Atlantic salmon (*Salmo salar *L) in production cages. Ten salmon farms containing spring smolts were visited twice, first between May and June the first year in sea cages, and secondly 2–3 months later. On each farm the SWIM 1.0 assessments were carried out for the two cages assumed by the farmer to represent the best and worst welfare status. The applied welfare indicators (WIs) were water temperature, salinity, stocking density, lighting, disturbance, daily mortality rate, appetite, sea lice infestation ratio, condition factor, emaciation state, vertebral deformation, maturation stage, smoltification state, fin condition and skin condition. The effective time to carry out the welfare evaluation was about 1.5 h per farm. The results showed some marked differences between visits; relatively larger proportions of emaciated fish were sampled during the first compared to the second visit, and more homogeneous scores of skin and fin damage were found on the second visit. The overall welfare index scores were generally in accordance with the farmers' ranking of the 'best' and the 'worst' sea cage during the first visit. Together, the findings of this study suggest that the SWIM model may be employed for documentation of animal welfare over the salmon marine production cycle. The results call attention towards re-assessment of some of the welfare indicators, improved sampling methods, and a more user-friendly interface. All-in-all, the current SWIM model is regarded as a promising candidate tool towards welfare assessment of farmed salmon.*

Keywords: *animal welfare, aquaculture, Atlantic salmon, diagnostic, sea cage, semantic modelling*