

Assessing Factors to Evaluate Welfare in Atlantic Salmon (*Salmo salar*) Infested With Sea Lice (*Lepeophtheirus salmonis*)

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Abstract

Fish welfare is an important factor to consider in aquaculture. The issue is to define parameters that could be used in a production setting to assess whether fish are exhibiting undue stress. The purpose of this study was to assess a number of different physiological and behavioural traits to assess which may be most effective in determining the welfare state of individuals or populations of Atlantic salmon. In this study, we exposed salmon to sea lice copepods and assessed the behaviour of salmon over the course of early infestation from chalimus to pre-adult stages using underwater cameras. The exposed group had a variable feed response that was lower than the control. There were no significant differences between the feeding and post-feeding respiratory rates in exposed group vs. control group. However, there was more variability in feeding and post feeding respiratory rates amongst individuals in the exposed group. The control had mean respiratory rates of 84 beats/min (SD=4.6) during feeding and 78 beats/min (SD=3.8) post-feeding. The exposed group had mean rates of 80 beats/min (SD=8.3) during feeding and 79 beats/min (SD=8.3) post-feeding. Additionally, the exposed group showed increased post-feeding activity 14 days post-infection and decreased activity was observed on day 0, 7, 19 and 21 post-infection. Flashing was observed in the exposed group but not the control group. Reduced feed consumption and abnormal erratic activity (i.e. outside the expected feeding frenzy) and large respiration variability within a population appeared to be the best indicators to assess welfare in this study.



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