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*Thermal delousing in anaesthetised small Atlantic salmon (*Salmo salar*) post-smolts: A case study showing the viability of anaesthesia prior to delousing for improved welfare during treatment for salmon lice*

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Abstract

*Delousing treatment for salmon sea lice (*Lepeophtheirus salmonis*) is considered a significant welfare concern in farming of Atlantic salmon (*Salmo salar*), where both industry and legislative bodies prompt for better methods. Currently, the most common method is thermal delousing, where fish are crowded, pumped into a vessel and exposed to ~28–34°C for ~30 s. Physical collisions occurring as a result of a loss of behavioural control lead to acute stress. Crowding triggers vigorous escape behaviour as salmon respond not only to treatment but also to being channeled to and from the treatment zone. A sequence of events considered to cause mortality and poor welfare. The present case study was motivated by an urgent need for delousing in groups of small salmon post-smolts in experimental research. For this purpose, a simple, small-scale system for thermal delousing was constructed, including anaesthesia to alleviate behavioural responses. The anaesthetised fish showed little behavioural response to thermal treatment, strong appetite within hours, and negligible mortality. The described method is regarded as a welfare-friendly alternative to industrial delousing in smaller fish groups, for example, in experimental research. We would encourage detailed research aimed towards gaining a deeper understanding of the welfare effects of anaesthesia prior to treatment for delousing.*

Keywords: *anaesthesia, animal welfare, Atlantic salmon, behaviour, handling, thermal delousing*