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Reducing sea lice re-infestation risk from harvest water at a salmon farm site in Ireland using a bespoke sieving and filtration system.

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Abstract

Water samples from the harvest water outflow of a salmon farm harvest line were sampled at different stages for the presence of sea lice before and after filtration to establish the quantity of sea lice that escaped back into the water column. During the processing of fish through the harvest line the mechanical abrasion experienced by the fish cause sea lice to be knocked off into the harvest outflow water, these lice have the potential to re-infest remaining stock on site. The use of two types of filtration systems at a harvesting site where in-situ culling is on-going reduces the risk of re-infestation. In this site the sieve system was particularly effective. The reduction in sea lice numbers achieved by filtering discharge water using sieves was 89.5% using 1mm screens and was over 99% using 80µm filters.

Keywords: sea lice, *Lepeophtheirus salmonis*, *Caligus elongatus*, salmon farm harvest, salmon farming, salmon louse, *Salmo salar*.

Introduction

In some regions during the sea water production cycle, farmed Atlantic Salmon (*Salmo salar*) are prone to infestation with sea lice. The two species of sea lice of greatest concern are *Lepeophtheirus salmonis*, the salmon louse, which can occur on all salmonid species, and *Caligus elongatus*, which can affect over 80 species of marine fish. Sea lice are endemic ectoparasites which cause direct physical damage to fish and incur expensive treatment costs for the aquaculture industry. A combination of animal medicines and animal husbandry practices have traditionally been used to keep these parasites under control.

Jackson *et. al* (1997) noted a steep rise in the levels of sea lice during periods of harvesting, they found an increase in ovigerous and adult sea lice in routine sampling but not a build up of juveniles, this was presumed to be as a results of lateral transfer. On some salmon farm sites along the west coast of Ireland, small scale onsite harvests are carried out on a weekly basis to meet market demands for organic salmon. A typical harvest for this site would be up to 30 tonnes per day , one day per week with approximately 8000 fish being processed per harvest. During the harvest process sea lice are knocked off their hosts by physical abrasion and become suspended in the harvest water. In order to reduce the risk of transfer of these sea lice between salmon being harvested and the remaining in-situ stock, the use of sieves and filtration to remove sea lice from the harvest water has been employed.

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