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www.ufaw.org.uk

Animal Welfare 2021, 30: 19-24
ISSN 0962-7286
doi: 10.7120/09627286.30.1.019

*Rubber net mesh reduces scale loss during routine handling of farmed Atlantic salmon (*Salmo salar*)*

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Abstract

*Atlantic salmon (*Salmo salar*) are an economically and ecologically important fish species that interact with humans during farming, fishing and research operations. Routine handling in nets exposes fish to mesh and causes scale loss. To promote welfare and experimental refinement, a study was performed in a controlled environment to investigate the effect of net mesh type (rubber-coated or standard knotless, both bag volumes* circa *7 l; mesh size: 6 mm) and the number of fish per net (capture density) on scale loss. Up to three large adult salmon (mean weight: 900 g) or 15 small smolts (mean weight: 145 g) were briefly captured in hand-nets during routine immersed-stock movement between tanks. Scales were recovered and counted from transportation containers, to establish a simple and rapid methodology. For both size grades, scale loss was generally proportional to capture density. For large adult salmon, scale loss significantly increased with capture density when knotless mesh was used, however the increase was less marked and not statistically significant for adults handled in rubber mesh. Small smolts also demonstrated significantly reduced scale loss when handled with rubber mesh, which increased gradually with capture density. In contrast, small smolts handled in knotless mesh showed greater scale loss as capture density increased. An overall reduction in scale loss with increased capture density was not shown, although the biomass loading per net used in this study were intentionally low (< 3.5 kg). This method suggests a low-tech and rapid approach to quantitatively compare net types and husbandry techniques and suggests a fundamental but simple improvement to salmonid handling in recreational and commercial operations. However, any correlation to conventional stress assays or behavioural observations remains to be established.*

Keywords: *animal welfare, aquaculture, fish health, mesh, salmonid, skin damage*