Poster topic 02 Poster 7

Factors associated with changing efficacy of emamectin benzoate against sea lice (*Lepeophtheirus salmonis*) on farmed Atlantic salmon (*Salmo salar*) in the Bay of Fundy, Canada, 2004-2008

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Emamectin benzoate (EMB) (an avermectin product administered to fish as an in-feed treatment) has been used to treat sea lice infestations on farmed Atlantic salmon in the Bay of Fundy, Canada since 1999. This retrospective study examined the efficacy of 114 EMB treatment episodes from 2004 to 2008 across 54 farms. Study objectives were to investigate changes in the effectiveness of EMB over this period, to examine factors associated with treatment outcome, and to determine variables which influence differences in post-treatment lice abundance. The analysis was carried out in two parts: first, treatment efficacy and trends in sea lice abundance were explored, and second, linear and logistic regression models examined the effects of multiple variables on post-treatment sea lice abundance and treatment outcome. To account for the hierarchical data structure with repeated measures, a linear mixed model was used with treatment episodes as random effects and follow-up weeks were nested within treatment episodes. Post-treatment lice abundance was found to increase in the later years examined. Mean abundance was found to differ between locations, with higher lice numbers on farms closer to the mainland and lower levels around Grand Manan Island. Significant variables associated with higher post-treatment lice quantities were location, year, pre-treatment abundance, and an interaction between age of fish and season of transfer. Not all treatments were observed to be effective with an increased risk for unsuccessful treatments being identified for 2008. Treatments applied during autumn were more likely to be ineffective than those applied during summer.