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Variation in the concentration of antibiotics in tissue during oral antibiotic treatments in farmed salmonids

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Abstract

Despite numerous control efforts, piscirickettsiosis remains the main cause of mortality due to infectious agents in Chilean salmonid aquaculture. In-feed treatments with antibiotics are commonly used to control this disease; however, a high proportion of these treatments are ineffective. The inconsistent treatment results have prompted a search for the cause of failure. Antimicrobial resistance has been proposed as one of the reasons for treatment failure, but recent studies place the proportion of resistant isolates well below the observed failure level. Another source of treatment failure may be the inadequate dosage of antimicrobials. We describe the tissue concentration in fish mid- and post-treatment for two commonly used antibiotics: oxytetracycline and florfenicol. We used mixed-effects linear models to assess the variation of concentration of antibiotics in the tissue of fish and evaluate the factors that may be associated with this variation. We found that most of the variation in antibiotic tissue concentration occurred between individuals in the same pen, and the second largest source of variation was between treatment events. Among the factors associated with antibiotic tissue concentrations, the weight of fish was highly significant. Other factors associated with antibiotic concentration in fish were species, water temperature, and days since the start of treatment. We discuss several

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