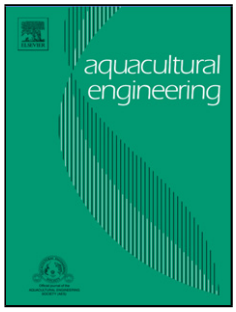

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Authors: Arve Nilsen, Kristoffer Vale Nielsen, Anders Næss, Asbjørn Bergheim

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Short communication

The impact of production intensity on water quality in oxygen enriched, floating enclosures for post-smolt salmon culture

Arve Nilsen[a*], Kristoffer Vale Nielsen[a], Anders Næss[b], Asbjørn Bergheim[c]

[a] Norwegian Veterinary Institute, P.O. Box 750 Sentrum, 0106 Oslo, Norway

[b]Akva Design AS, Havnegata 46, 8900 Brønnøysund, Norway

[c] IRIS – International Research Institute of Stavanger, P.O.Box 8046, 4068 Stavanger, Norway

*Corresponding author

E-mail address: arve.nilsen@vetinst.no

Abstract

The main aim of the study was to decide the effect of specific water consumption (L/kg/min) and feed load per water flow (g/m^3) on the water quality parameters pH, CO_2, total ammonia nitrogen (TAN) and suspended solids (SS) in two large semi-closed containment systems (S-CCS). The reported production parameters (range) in the two S-CCS were specific water consumption (q): 0.04-0.47 L/kg/min and feed load per water flow: 9.0-64 g/m^3. The study period was split in two sub-periods; January to May (4.4 -7.5 °C), and June to September (7.5-13.2 °C) before a regression model was used to determine the relationship between production intensity (q, feed load) and water quality (pH, CO_2). With the acceptable level of CO_2 defined as ≤10mg/L, the model predicted a minimum specific water consumption (L/kg/min) between 0.07 (winter) and 0.2 (summer). The predicted maximum feed load per water flow (g/m^3) was between 35 (summer) and 45 g/m^3 (winter). These calculated limits for production intensity were close to the values earlier reported for smolt or post-smolt production in large, onshore tanks.

Key words: Floating enclosures; Salmon; Oxygen injection; Water quality; Intensification; Production capacity