

Peracetic acid – a sustainable disinfectant for Atlantic salmon post-smolts

HYPOTHESIS:

Peracetic acid can be used as a disinfectant in Atlantic salmon reared in RAS with minimal effects on health, welfare and system performance.

DURATION: 2018-2021

FISH SIZE TESTED: 100 G

SALINITY TESTED: Brackish water and salt water

HIGHLIGHTS:

- The rapid decay of PAA with inert residuals in water is one of the advantages for its use in aquaculture. In addition, it has a broad spectrum of antimicrobial activity against a number of relevant pathogens in salmon farming.
- Application of PAA at concentration range 1.0-2.5 mg/L, whether a single pulse dose or a semi-continuous dose over several hours, is appropriate for fluidized sand biofilter because no significant disruption to the biofilters' nitrification processes.
- PAA application at putatively disinfection-level concentration and duration does not fully disinfect fluidized sand biofilter media and internal piping biofilms; therefore, further research is required to refine PAA disinfection method to optimize bactericidal activity.
- 1mg/L was considered the safe dose for continuous and periodic application of PAA in many farmed fish, including Atlantic salmon.
- Periodic dosing of 1mg/L PAA in brackish water RAS is a potential strategy to improve the rearing environment without significantly compromising the health and welfare of Atlantic salmon.

RECOMMENDATIONS:

- Application of PAA (1mg/L) either continuously or periodically can be used as a RAS loop water disinfection without risk of disrupting the biofilter performance nor the fish health? PAA is highly corrosive thus should be stored and used appropriately.



READ MORE:

Intermittent administration of peracetic acid is a mild environmental stressor that elicits mucosal and systemic adaptive responses from Atlantic salmon post-smolts. *BMC Zoology*. 7, 1.

Lazado, C.C., Voldvik, V., Breiland, M.W., Osório, J., Hansen, M. S., Krasnov, A. 2020. Chemical oxidative stressors alter the physiological state of the nasal olfactory mucosa of Atlantic salmon. *Antioxidants*. 9, 1144.

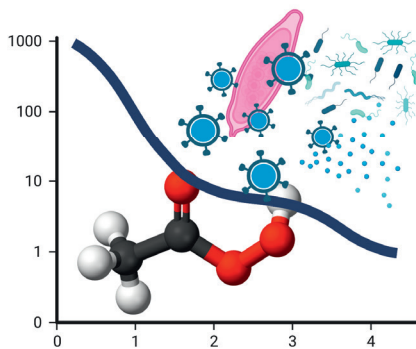
Pedersen, L.F., Lazado, C.C. 2020. Decay of peracetic acid in seawater and implications for its chemotherapeutic potential in

The factsheet is ready for implementation, but with the note that the testing has not been done for all industrial relevant conditions.

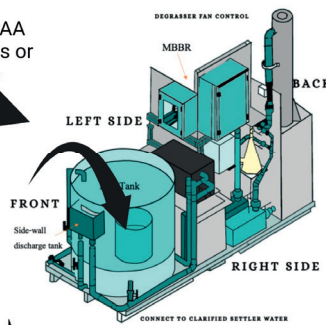
aquaculture. *Aquaculture Environment Interactions*. 12:153-165.

Lepine, C., Redman, N., Murray, M., Lazado, C., Johansen, L.-H., Espmark, Å.M., Davidson, J., Vinci, B., Good, C. (in review). Assessing peracetic acid application methodology and impacts on fluidized sand biofilter performance. *Aquaculture Research*.

Peracetic acid has a broad spectrum of antimicrobial activity and decays rapidly to inert compounds



1 mg/L PAA continuous or periodic



improved rearing environment



health and welfare not compromised



biofilter performance not affected