



**ParaFishControl**

# Health management strategies for cleanerfish

**ParaFishControl Workshop “North European Fish Parasite Management Strategies in Aquaculture Farms”**

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# Challenge and Impact

## ➤ Challenge

### ➤ Sea lice



## ➤ Impact

- Estimated to be a problem of 6Billions nok/ year in Norway
- Treatment for sea lice the first cause of mortality in A.salmon

- Treatment ?
- Vaccine?
- Laser?
- Phisical/mechanical control (heat, FW)
- BIOLOGICAL CONTROL

## STATE OF ART

- Resistance ☹️
- Not available ☹️
- Prototype released ?
- High mortality ☹️
- CLEANERFISH 😊

# Our approach and our team

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- **Brief description of the proposed solution**
  - By establishing proper surveillance scheme, diagnostic methods and risk assessment it is possible to control viral diseases in cleanerfish, minimize risk for co-habiting salmon stocks and enhance proper “cleaning” performances
  
- **Team involved in the development**
  - DTU-AQUA (Niccoló Vendramin and Niels Lorenzen) and University of Stirling (James Bron)



# A few number on Cleanerfish

- Cleanerfish production and use has significantly increased in recent years (around 30 millions in 2017 in Norway and 46 tonns produced in Scotland in 2017)
- New pathogens emerged -> risk for the salmon production and reduced performance of the cleanerfish in their feeding activity (less lice removed).

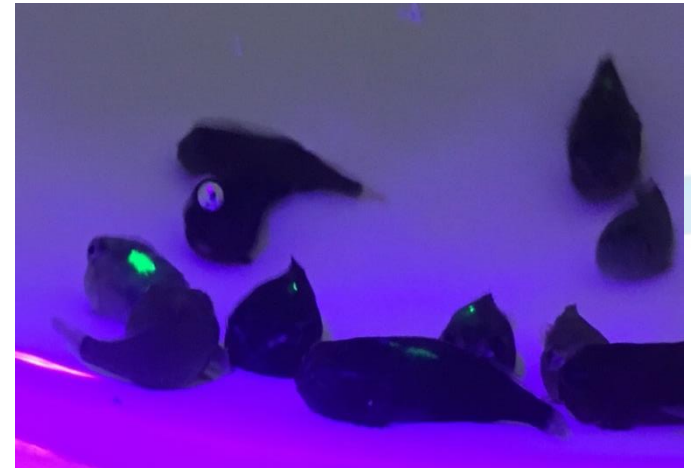
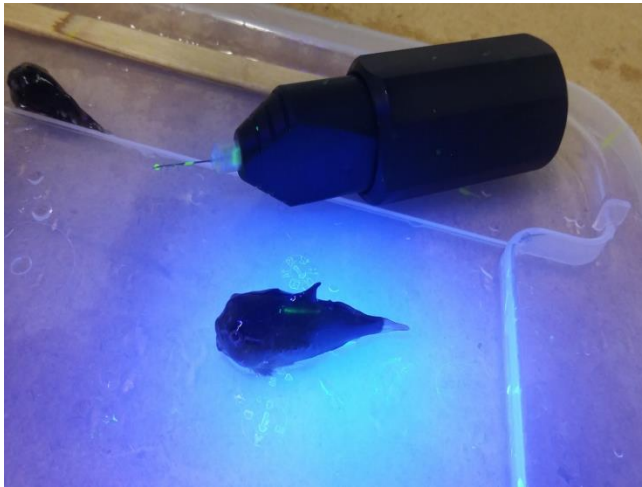
Among others...

- VHS outbreak (Scotland genotype III, Iceland genotype IV)
- Ranavirus detection (Iceland, Scotland, Ireland, Faroese Island)
- Nodavirus detection (Norway-Sweden)
- new flavivirus (Norway)
- New totivirus-like (Norway)
- Etc.



# Cohabitation challenge models for viral pathogen in Cleanerfish

- Define surveillance systems for relevant viral pathogens in Cleanerfish
- Develop diagnostic procedures
- Establish challenge model
- Test model for VHSV (Genotype IV) and Ranavirus
- Provide know-how and Technologies for future preventive measures (e.g. Vaccines)



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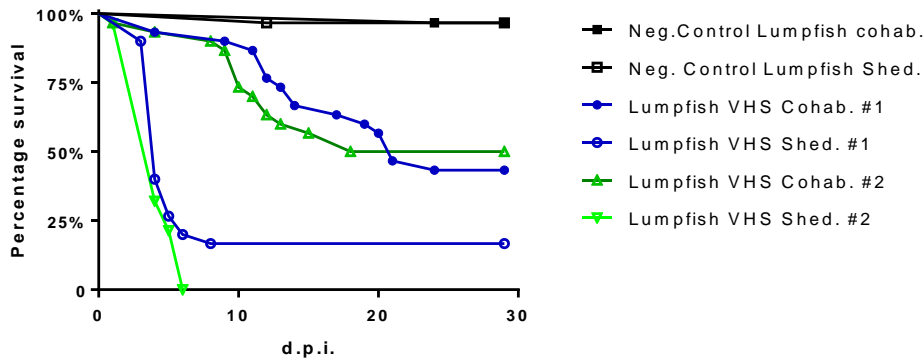
ORIGINAL ARTICLE

WILEY *Journal of Fish Diseases* 

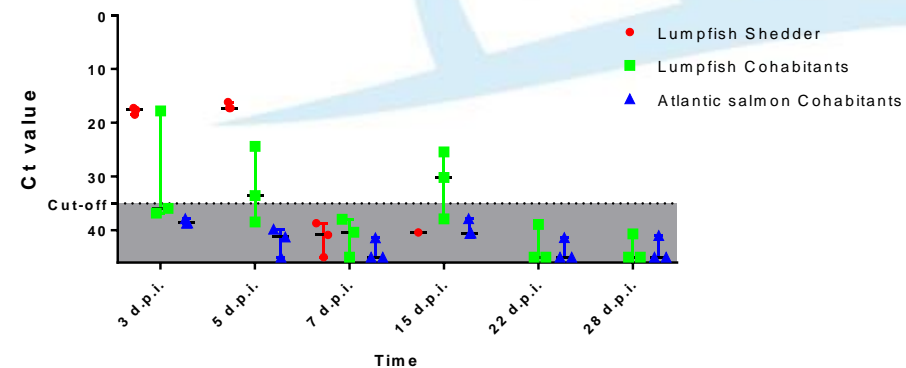
## Outbreak of viral haemorrhagic septicaemia (VHS) in lumpfish (*Cyclopterus lumpus*) in Iceland caused by VHS virus genotype IV

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Survival rate of VHSV cohabitation challenge



VHSV kinetics in cohabitation trial



# IMPACT

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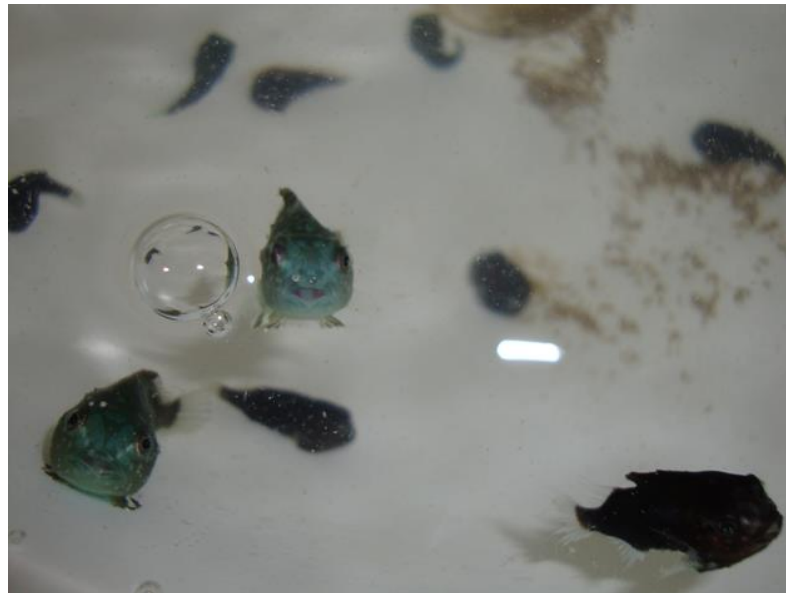
Cleanerfish now listed as susceptible species in legislative framework for control of diseases in aquatic animals



# Expected benefits for the industry

Following guidelines provided by the project:

- Minimize risk for Atlantic salmon stocks
- Minimize risk of spreading pathogens
- Healthier and more efficient cleanerfish



# Current status and next steps

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- Increased number of new pathogens detected in connection to disease outbreak in Lumpfish
- Need of standardized diagnostic methods
- Development of vaccines



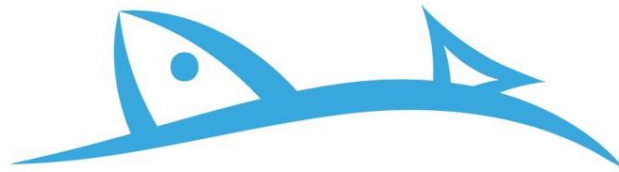
# Conclusions

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Health surveillance and disease control are pivotal for development of sustainable cleanerfish production



# Thank You



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