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Effects of physical or sensory enrichments on rainbow trout (*Oncorhynchus mykiss*) welfare

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► **To cite this version:**

Baptiste Véchart, Céline David, Guillaume Morgant, Violaine Colson, Lionel Pineau, et al.. Effects of physical or sensory enrichments on rainbow trout (*Oncorhynchus mykiss*) welfare. 21. International Conference on Diseases of Fish and Shellfish, Sep 2023, Aberdeen - Scotland, United Kingdom. , 21, pp.132-133, 2023. hal-04221012

HAL Id: hal-04221012

<https://hal.inrae.fr/hal-04221012>

Submitted on 28 Sep 2023

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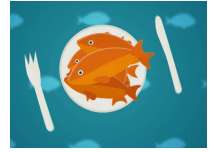
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CONTEXT

- Fish consumption increased and is becoming an important part of the protein intake with a global fish consumption expected to reach 21.5 kg per person per year in 2030, compared to 13.4 kg in the period 1986-1995 (FAO 2020)
- World aquaculture production increases reaching 90 millions tons today (FAO 2020)
- Intensive production and altered environmental conditions could be responsible of stress and pathologies
- Animal welfare is an important societal consideration

OBJECTIVES OF THIS STUDY

- ✓ Influence of rearing environmental enrichment :
 - on the welfare of rainbow trout (stress and behavioural indicators)
 - on the pathogens resistance of rainbow trout (response to a bacterial challenge)
- > **How can enrichment improve the welfare of fish (rainbow trout)? What indicators should be assessed?**
- Which enrichments should be studied?**



<https://vimeo.com/346815935/22785b0ebf>

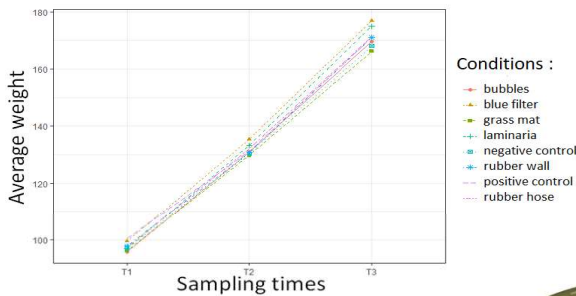
METHODOLOGY

APAFIS #40967-2023021514284658 v4 - Oniris experimental facilities (D 44 272)

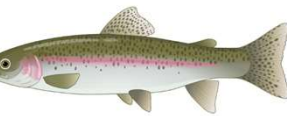
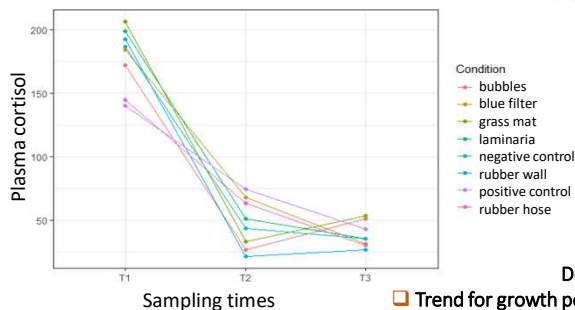


RESULTS

Growth performance



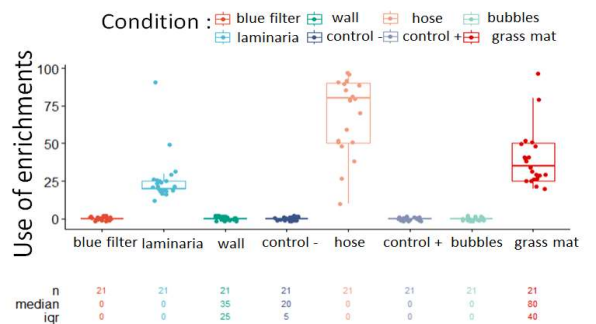
Stress indicator



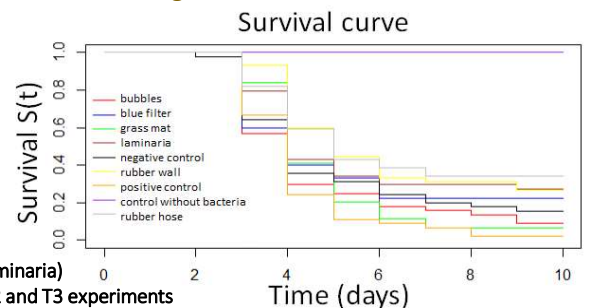
Depending on conditions :

- Trend for growth performance (better: blue filter and laminaria)
- No significant difference in blood cortisol levels, but lower levels in T2 and T3 experiments
- Significantly different use of enrichment (better: rubber hose, grass mat and laminaria)
- Significant differences in percentage mortality and disease onset kinetics (best: rubber hose)

Behaviour



Pathogens resistance



FIRST CONCLUSIONS

- Rubber hose, blue filter and "laminaria seaweed" appear to be relevant enrichment strategies
- Behavioural indicators and infectious challenge appear to be relevant
- Conventional stress indicators (cortisol, glucose, lactate) do not appear to be relevant

Pos. Control < Neg Control < Bubbles = Rubber wall < Grass mat < Laminaria = Blue filter = Rubber hose

IN PROGRESS - FUTURE

- Cortisol in scales
- Genes expression in brain and blood

FUNDINGS

French funding account CASDAR (Compte d'Affectation Speciale Développement Agricole et Rural) under grant agreement n° 19AIP5919.

REFERENCES

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Further discussion? Partnership?
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