Environmental enrichment and its potential in aquaculture

Thomas Abeel

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Environmental enrichment

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Definition

"An animal husbandry principle that seeks to enhance the quality of captive animal care by identifying and providing the environmental stimuli necessary for optimal psychological and physiological well-being." (Shepherdson, 1998)

Examples


Photo: pig-world.co.uk

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Types of enrichment

- Social contact
- Occupational enrichment (psychological challenges or exercise)
- Physical enrichment (objects, substrates, …)
- Sensory enrichment (visual, auditory, olfactory, tactile or taste stimuli)
- Nutritional enrichment

Purpose

- Improve welfare of captive animals
- Allow animals to exhibit natural behaviour
- Reduce abnormal behaviour
- Increase behavioural repertoire
- Improve the ability to cope with challenges or stress
- Enhance successful reproduction

2. Potential in aquaculture

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Räihä et al., 2019

Species:

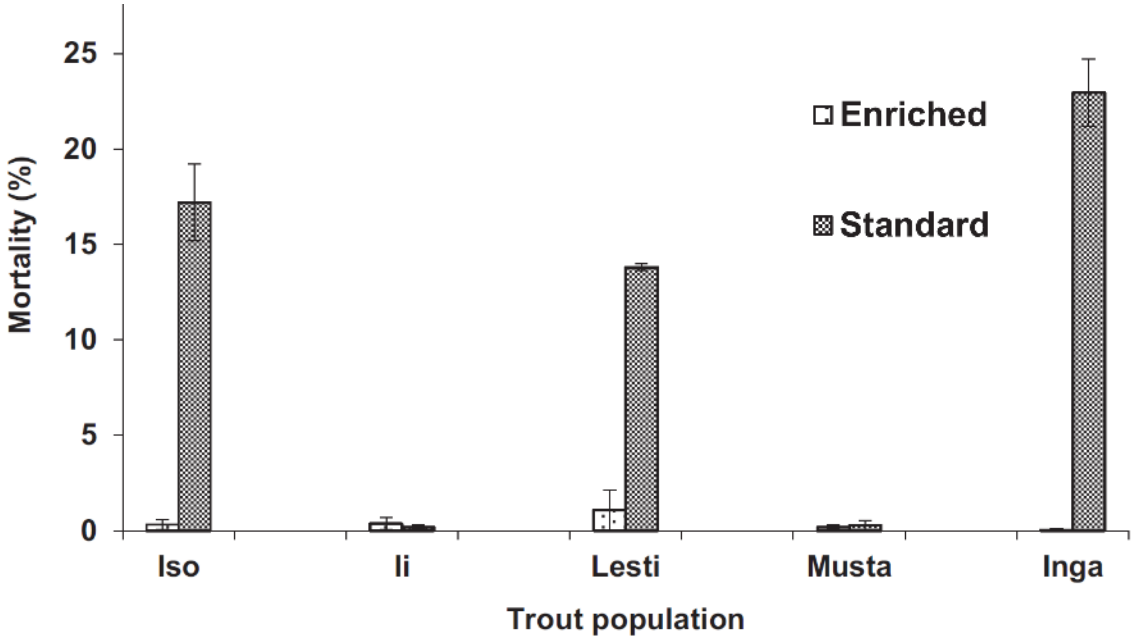
Atlantic salmon (*Salmo salar*) and brown trout (*Salmo trutta*)

Enrichment type:

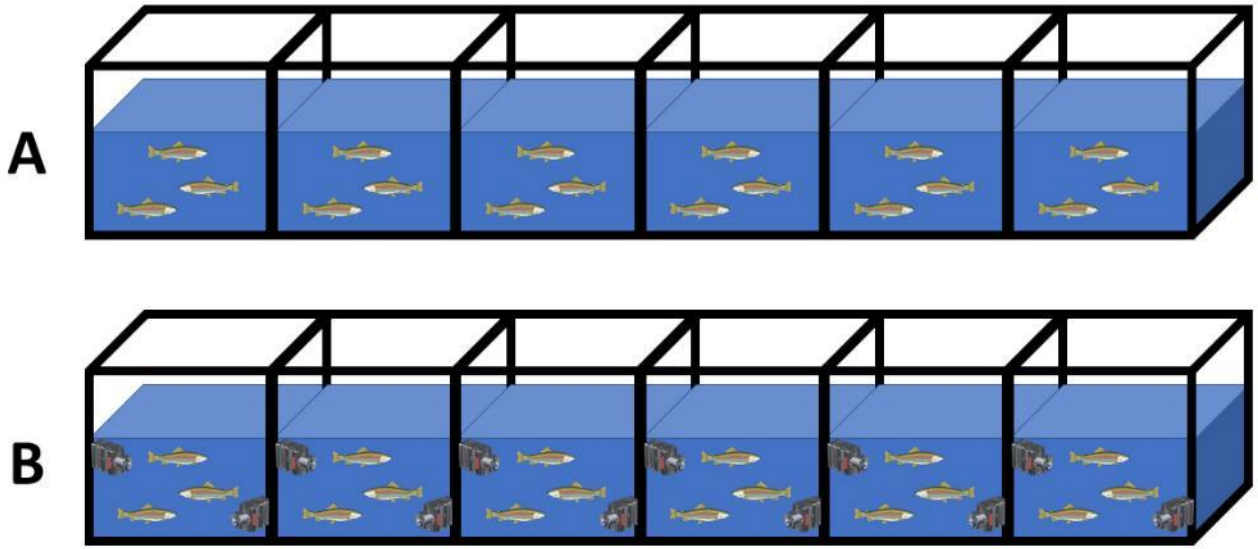
Substrate, shelters

Effect:

Enhanced survival after bacterial outbreak (*Flavobacterium columnare*)



Bermejo-Poza, 2017



Species:

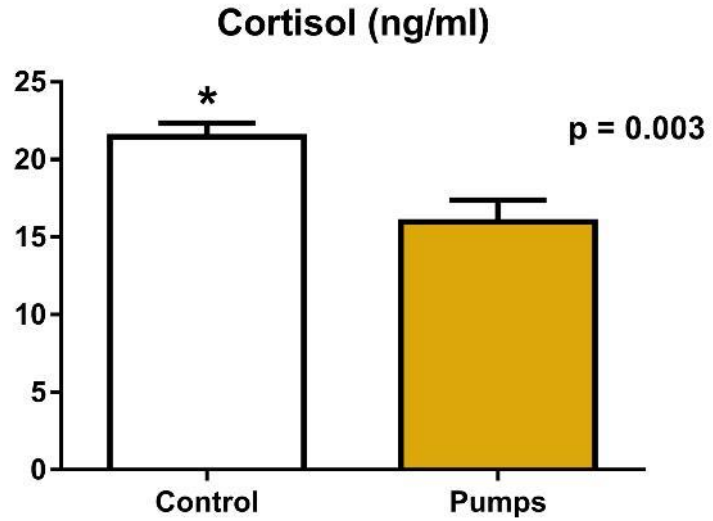
Rainbow trout (*Oncorhynchus mykiss*)

Enrichment type:

Randomly fired pumps

Effect:

Reduced stress levels (lower plasma cortisol)



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Kusku et al., 2018

Species:

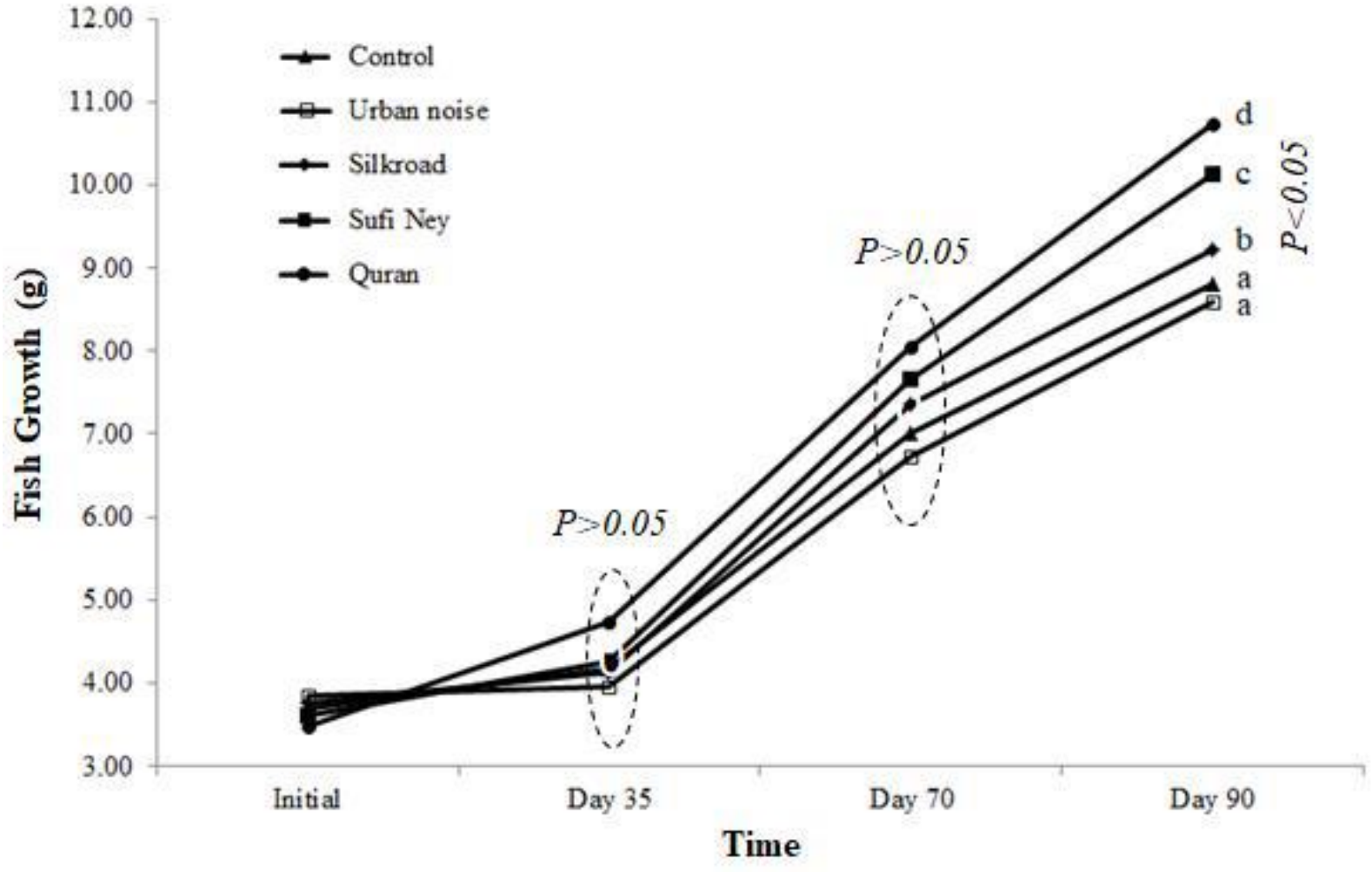
Koi carp (*Cyprinus carpio*)

Enrichment type:

Exposure to urban noise and music

Effect:

Higher growth rates when exposed to music



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Potential benefits for aquaculturists

- Better fish health and welfare
- Better product quality
- Improved growth and feed conversion
- Higher resistence to stress and disease
- Positive sector image

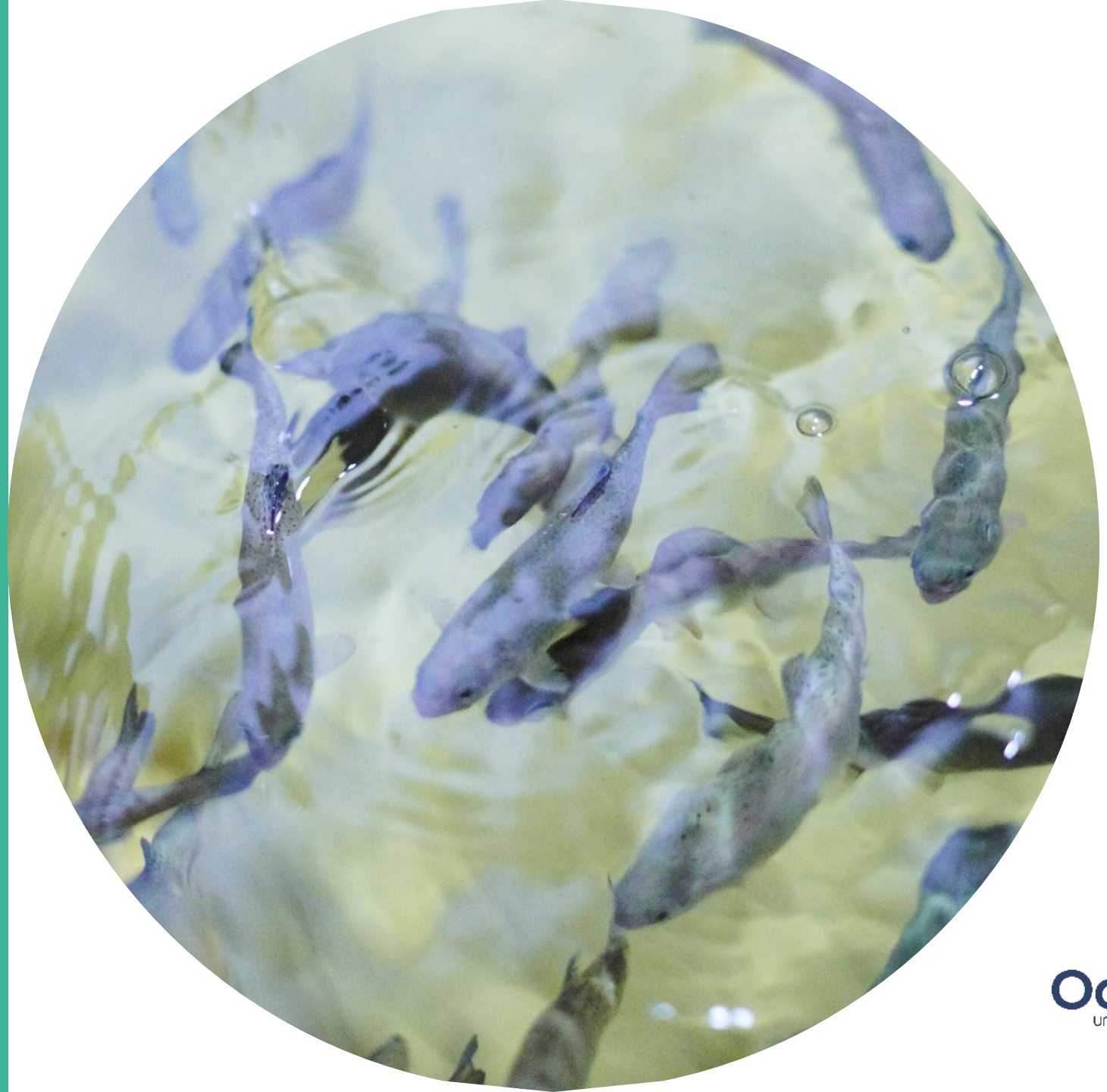
Challenges

- Identification of suitable enrichment types for aquaculture
  - Evaluation of welfare effects
    - Physiological stress indicators
    - Behavioural parameters
    - Physical/operational welfare indicators
  - Species specific response (unfavourable effects!)

Challenges

- Practical implementation in farms
  - Low-cost, low-maintenance and easy to use
  - Education/sensitization of farmers

Thanks for your attention!



Contact: thomas.abeel@odisee.be

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