

New tools to improve fish health and environment in organic aquaculture.

Background

Organic rainbow trout production is challenged by

➡ High mortality in fry caused by skin/gill parasites

➡ “Red Mark Syndrome (RMS)” causing discard when the fish are placed on the market.

Objectives

Integrating *Fish-pathogens-farming system-environment-water quality* by

- 1) Environmental enrichment (hide/shade);
- 2) Anti-parasitic/immune stimulatory effects of surfactant/herb extracts to reduce skin/gill infections;
- 3) Inducing RMS immunity in portion-sized fish by exposure of fingerlings to RMS;
- 4) Reduce organic matter load and hence prevalence of harmful bacteria.

Methodology

1) Test of shelters and impact on fish welfare (performance, stress coping ability etc.).

2) Establish *in vitro* cultures of *Costia (Ichthyobodo)* and selected amoebae, - test effect of surfactants and herb extracts on parasite viability. Establish infections *in vivo* by the gill pathogens on rainbow trout, - perform dose-response studies to evaluate the anti-parasitic effects of herbal extracts and the novel *Pseudomonas*-surfactant.

3) Test development of long-term natural immunity to RMS following early exposure to the non-lethal disease RMS. Disease free fingerlings will be exposed to the disease by co-habitation with RMS carriers. After 6-12 months the same fish will be re-exposed to RMS-donors in parallel with naïve sibling controls to evaluate natural immunization to RMS.

4) Test and implement assays and procedures to ensure optimal water quality in organic trout farms, i.e. reduced organic matter load and bacterial activity; including treatment units and management practices.

Expected impact: Robust farming systems; i.e. improved fish health and welfare, improved water quality, improved production efficiency and competitiveness.



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