EFFECTS OF PHYSICAL OR SENSORY ENRICHMENTS ON RAINBOW TROUT (*ONCORHYNCHUS MYKISS*) WELFARE

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Introduction:

Today, fish consumption in the human diet has increased and is becoming an important part of protein intake. Given the increase of aquaculture production, it is important to consider the rearing conditions of fish and especially their welfare. In this study, we investigated the influence of enrichment of the rearing environment on the welfare of rainbow trout, and in particular on stress levels reduced or not in the presence of structural and sensory enrichment.

Methodology:

Female triploid rainbow trout (*O. mykiss*) were acclimatized in 24 fiberglass tanks (200 L) with 30 fish per tank. The experimental conditions were as follows: (1) neutral condition with PVC pipe, (2) positive stress condition without enrichment and with a stress protocol conducted weekly with water reduction and dip-net fishing, (3) structural enrichment with rubber tubbing, (4) structural enrichment with a rubber wall in the tank, (5) structural enrichment with a floating grass carpet, (6) structural enrichment with various thin pipes imitating luminaria seaweed, (7) sensorial enrichment with gas bubbles and (8) sensory enrichment with a blue filter on the tank. Each condition was run in triplicate with 30 fish per tank, i.e. 90 fish per condition at the beginning. Each week, all conditions were observed and scored using various behavioural indicators. Blood, scales, fin and brain were collected at different time to assess some stress indicators (cortisol, glucose and lactate).

At the end, robustness of the fish was evaluated by a bacteria challenge (*Aeromonas salmonicida salmonicida*) conducted by immersion.

Results:

Statistical analysis showed significant differences between enrichment conditions for growth performance and behavioural indicators such as swimming, space occupation and aggressive behaviour. Response to the infectious challenge showed different trends depending on the enrichment tested.

Conclusions:

Some enrichments seem be more efficient on welfare indicators and fish robustness to pathogens: rubber tubbing, blue filter, and “luminaria seaweed”. The duration of enrichment exposure could be extended to determine more benefits, but this seems to be a good way of improving fish welfare.