

Trout welfare and environmental enrichment

Experiments in mammals have shown that environmental enrichment can help to decrease fear and aggression while decreasing stress levels. Less is known about the effect of environmental enrichment in fish. In most land-based aquaculture, fish are reared in raceways or tanks that are rather barren and some efforts have been made to enrich the culture environment. However, adding objects into the tanks may cause problems due to abrasions or the possible accumulation of waste or bacteria which are hard to clean regularly. For that reason, water inlets or pumps seem to be a good alternative since they are easy to install and turn on and off automatically.

A few weeks ago, our group presented a [Poster](#) at the European Aquaculture Conference (Dubrovnik, October 17-20, 2017) about environmental enrichment in trout (part of results from the WIN-FISH Project*). We used 240 rainbow trout (live weight 374 ± 3.62 g), placing them in 12 cages (n=20 fish/cage), six of which had water pumps (simple pumps that injected a flow of water inside the tanks) and the others had none. In addition, the six water pumps or inlets were fired randomly, creating an enrichment of the environment, as often performed in zoos where the location of food is changed every day in order to keep the animals active.

The trial was run for one month, after which the trout were weighed and blood sampled to measure stress levels. The weight gain was similar among groups but the fish from the enriched cages had lower stress levels (lower cortisol in plasma). So, randomly fired pumps can help reduce stress, probably by increasing environmental variability and unpredictability. Uncertainty provides a beneficial psychological challenge and the rainbow trout seemed to have reacted to that stimulus in a positive way.

If you are interested in fish welfare, please more of our publications:

[López-Luna, J.](#), Vásquez, L., Torrent, F. and Villarroel, M., 2013. Short-term fasting and welfare prior to slaughter in rainbow trout, *Oncorhynchus mykiss*. *Aquaculture*, 400, pp.142-147.

[López-Luna, J.](#), Torrent, F. and Villarroel, M., 2014. Fasting up to 34° C days in rainbow trout, *Oncorhynchus mykiss*, has little effect on flesh quality. *Aquaculture*, 420, pp.63-70.

[Bermejo-Poza, R.](#), De la Fuente, J., Pérez, C., Lauzurica, S., González, E., Diaz, M.T. and Villarroel, M., 2015. The effect of intermittent feeding on the pre-slaughter fasting response in rainbow trout. *Aquaculture*, 443, pp.24-30.

[Bermejo-Poza, R.](#), De la Fuente, J., Pérez, C., Lauzurica, S., González de Chávarri, E., Diaz, M.T. and Villarroel, M., 2016. Reducing the effect of pre-slaughter fasting on the stress response of rainbow trout (*Oncorhynchus mykiss*). *Animal Welfare*, 25(3), pp.339-346.

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