

Salmon are less aggressive in tanks with darker backgrounds

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Coho salmon may be four times less aggressive in tanks with darker backgrounds than in tanks with light backgrounds, according to a study published March 30, 2016 in the open-access journal *PLOS ONE* by Leigh Gaffney from the University of British Columbia, Canada, and colleagues.

Fish are known to be sensitive to light, and the colors of fish environments can affect their growth, survival, aggression, and reproduction. However, the effect of background darkness had not previously been determined. The authors of the present study assigned one hundred Coho [salmon](#) to ten [tanks](#), each tank split into two areas whose sides and base were lined with different backgrounds, for example, light grey versus black. Tank backgrounds ranged from very dark (black) to very light (white), and the authors also included a light blue background and a light grey dappled background, making up eight background color variants overall. The salmon indicated their preference of light level by moving to one of the two different areas of their tank. The authors not only assessed the fish' choice of background, but also monitored instances of aggressive acts, such as chasing or attempting to bite another fish, to assess aggression levels in the salmon for each tank background.

The researchers found that the fish preferred darker backgrounds such as dark grey and black over lighter backgrounds such as white and light blue. The darker the background, the stronger their preference, with black backgrounds being the most strongly preferred. Dark backgrounds

were also associated with a reduction in instances of aggression per fish - aggression levels were four times reduced in tanks with black backgrounds compared to those with light blue backgrounds. Interestingly, tanks with a dark 'refuge' on one side seemed to show decreased aggression levels throughout the tank, including on the lighter side.

This study only assessed salmon behavior within set environmental conditions, and further research might examine the effect of variables such as temperature, fish age, and time of year. However, the authors note their results provide the first evidence that darker tank backgrounds are preferred by salmon and decrease aggression levels. As farmed salmon are usually raised in tanks with a light blue background, the results suggest that switching to tanks with a black background could be an easy way to improve their welfare.

Co-author Marina von Keyserlingk states: "Compared to the industry standard (light blue) backgrounds, [fish](#) both preferred and were dramatically less aggressive in darker backgrounds. Thus, we found a relatively simple environmental modification that has the potential to improve animal welfare."

More information: Gaffney LP, Franks B, Weary DM, von Keyserlingk MAG (2016) Coho Salmon (*Oncorhynchus kisutch*) Prefer and Are Less Aggressive in Darker Environments. *PLoS ONE* 11(3): e0151325. [DOI: 10.1371/journal.pone.0151325](https://doi.org/10.1371/journal.pone.0151325)

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