Managing Rainbow Trout Disease and Antibiotic Resistance by Raising Naturally Resistant Strains

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Following our research last fall discovering significant resistance to common antibiotics in Boise's waterways, we focused on Aquafarming this year, as it is a major contributor to the increased antibiotic load in bodies of water. Higher mortality rates in hatchery-bred fish when compared to the wild have resulted in the increased use of antibiotics, leading to widespread resistance to the drugs with the potential for it to spread up the food chain. By evaluating the Rainbow Trout's genetic predisposition to illness, we can identify the most hearty strains of trout to breed. Three different strains of Rainbow trout, two genetic variants (B3 and C2) and a control (C1), were collected. Their kidney and spleen samples were analyzed for the presence of Hydrofla and Sycrophyla bacteria. The bacterial level of resistance to commonly-used antibiotics in the trout samples was assessed. Analyzing the results, we found that the B3 variant, which was Hayspur mixed with Steelhead Rainbow Trout, was the most successful strain, avoiding disease and infections due to its higher natural immunity. The C1 control strain, on the other hand, with only the Hayspur trout in it was the worst, exhibiting significant infections in addition to having a documented history of disease that had to be treated with antibiotics. When fish exhibit higher immunity against infections and disease, antibiotic use can be minimized. This research could serve as a vital next step in reducing the overuse of antibiotics, while advancing best practices for marine ecosystem safety and protection.

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