

## Brief Editorial about Fish Health and Growth

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### Editorial

The successful production of fish depends on the availability of appropriate food, which may lead to the implementation of health and growth, especially in the larval stage. One of the many strategies to improve fish health and aquaculture performance is to produce functional feeds by adding feed additives such as iso-amino acids, antibiotics and organic acids. The use of antibiotic growth promoters in fish feed can improve their growth, feed conversion and survival rate. However, these antibiotics can develop resistance to microbes in fish that may cause human contact. Therefore, researchers focus on alternative additives such as organic acids, probiotics, herbs, enzymes and essential oils. Among them, short-chain organic acids have special significance due to their beneficial effects on feed preservation. Organic acids and their salts have been used as feed additives and as acidifiers in animal feed. These organic acids, including acetic acid, butyric acid, citric acid, formic acid, lactic acid, malic acid, propionic acid and sorbic acid, have been shown to improve the health and growth performance of livestock. The beneficial effects of acid-preserving products have aroused the attention of the scientific community, leading to research on the effects of these short-chain acids in fish feed. According to reports, the use of organic acids can improve the nutrient utilization, growth performance, digestibility, mineral absorption of aquaculture, change the reproduction of intestinal microvilli and improve disease resistance.

After a 60-day rearing period, five fish from each treatment (three from each aquarium) were quickly anesthetized with clove powder (200 mg / l), and then the body surface of the fingerlings rainbow trout was cleaned with tissue paper to avoid contamination. Blood was collected with a hypodermic syringe from the caudal blood

vessels. Blood samples were transferred to heparinized tubes for hematology and non-heparinized tubes for serum for biochemical parameters.

In animal nutrition, acidifiers influence performance through various mechanisms. Acidifiers act as preservatives, lowering the pH of the feed, thus inhibiting the growth of microorganisms and thus reducing the absorption of potentially pathogenic organisms and their toxic metabolites by farm animals. They lower the pH level in the stomach, especially in the small intestine, by supplying H<sup>+</sup> ions, on the other hand, they inhibit the growth of gram-negative bacteria through acid dissociation and the production of anions in bacterial side cells.

A positive effect of organic acids on protein hydrolysis has been demonstrated. It has been shown that supplementation of feed with organic acids leads to a decrease in duodenal pH, improvement of nitrogen retention and an increase in nutrient digestibility. Despite discrepancies between the published data, more research is needed to better understand the potential beneficial effects of these compounds and their mixtures. Therefore, in this study, an attempt was made to investigate the effect of different levels of BioAcid Ultra (a buffer mixture of formic, propionic and lactic acid) on the growth, survival, enzymatic activity, hematology and biochemical parameters of rainbow trout.

In conclusion, Observed difference in different studies indicates differences in fish species, sources and levels of organic acids in response to organic acids. In the present study, the best performance of fish in terms of growth performance in fingerlings rainbow trout, was recorded at organic acids at a 0.1% dose without any deleterious or stressor effects on fish.

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