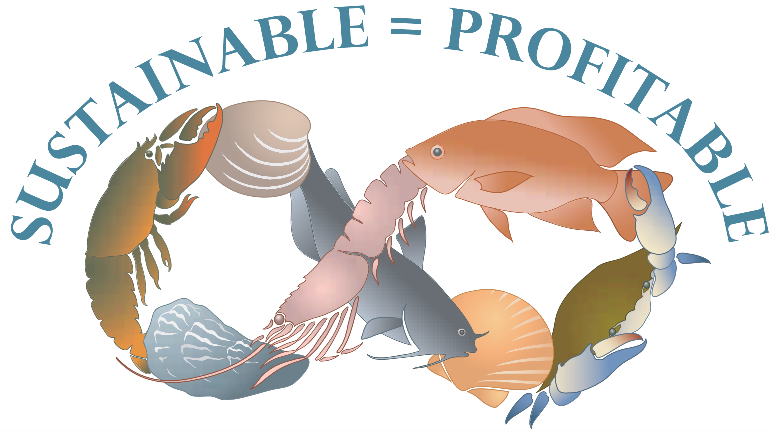

AQUACULTURE 2010

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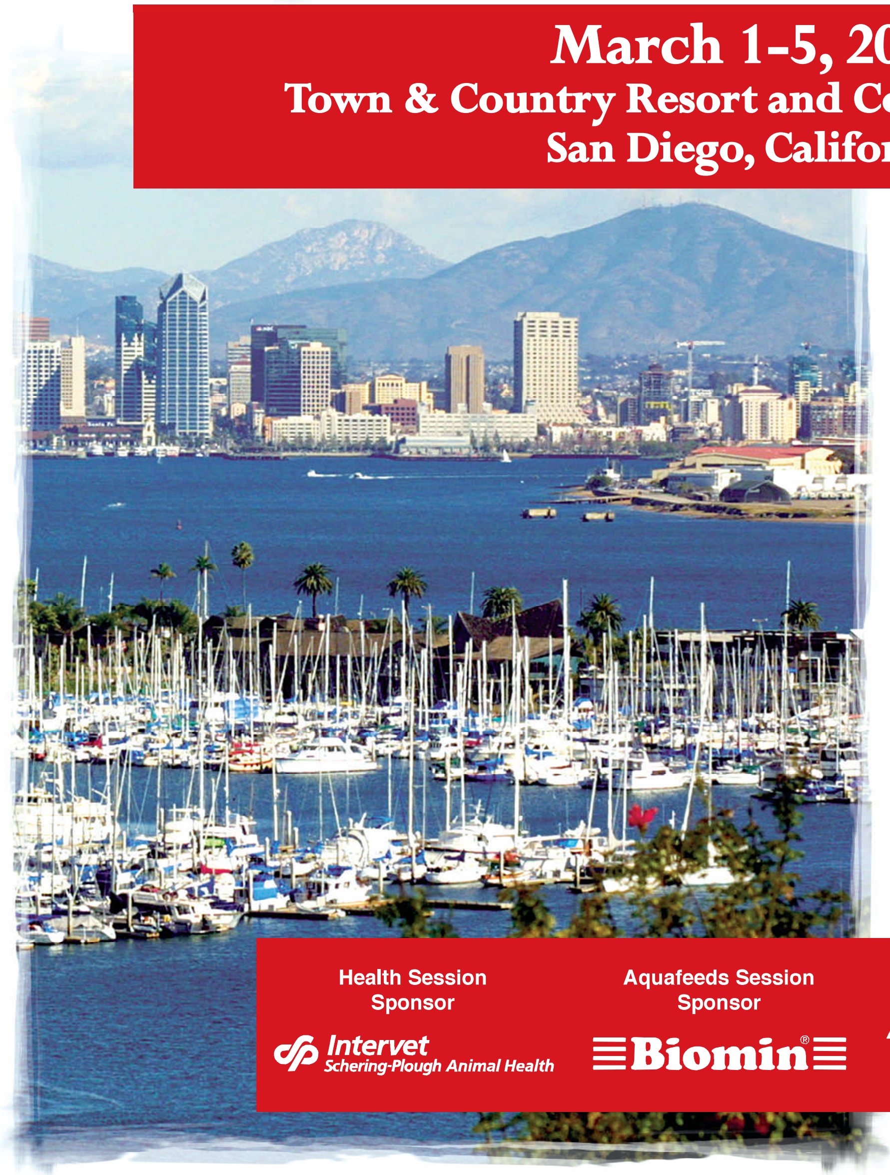

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ABSTRACTS

USE OF ORGANIC ACIDS AND THEIR SALTS IN FISH DIETS: A REVIEW

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In intensive aquaculture production systems, bacterial diseases have been identified as a major industry problem. Loss of over 30 percent of aquaculture populations from stocking to harvest is common, and represents a major economic loss to producers. Feeding antibiotic-medicated feeds is the common practice to treat bacterial infections. The prophylactic use of antibiotics as growth promoters in aquaculture production has also occurred, although not as extensive as in swine and poultry production. This can lead to the emergence of antibiotic-resistance bacteria, and contamination in food product and the environment. The use of antibiotics in animal production has been banned in EU countries and is increasingly under public scrutiny and criticism in most other countries. As a result, research is continuously being conducted to look for alternatives to antibiotics to enhance growth and disease resistance in fish. Organic acids (such as acetic acid, formic acid, fumaric acid, lactic acid, propionic acid and citric acid) and their salts or their mixture have received considerable attention in recent years.

A number of investigations have been conducted to evaluate the use of organic acid and their salts to enhance growth and feed efficiency (FE) and health status of various fish species, but results obtained are inconsistent. Studies in Arctic char (*Salvelinus alpinus*) showed that fish fed diets supplemented with 1-1.5% Na-lactate or 1% Na-acetate had significantly better growth than those fed the control diets or diets supplemented with 1% Na-formate. Addition of 1% Na-propionate depressed weight gain. In Atlantic salmon (*Salmo salar*), supplementation of 1.5% Na-lactate had no effect on their growth performance. Later studies indicated that Atlantic salmon fed diets in which fish meal was treated with 0.8 or 1.4% K-diformate had significantly improved FE and the growth rate of fish fed 1.4% K-diformate treated fish meal was better than the control. In rainbow trout (*Oncorhynchus mykiss*), the growth improved with increasing levels of organic acid blend (forming acid, its salt and sorbic acid) and the value became significantly better than the control at 1-1.5% inclusion level. The growth of fish fed the 1.5% acid supplemented diets was similar to that fed the diet with 40 mg/kg of flavomycin. A study in hybrid tilapia indicated that dietary inclusion of 0.2% K-diformate significantly increased growth and FE. Survival following experimental challenge with *Vibrio anguillarum* (10 days after feeding K-diformate diets) was significantly higher in fish fed diets containing K-diformate. In contrast, a more recent study with red hybrid tilapia showed that supplementation of 0.1, 0.2, 0.3% of organic acid blend or 0.2% K-diformate had no significant effect on growth and feed utilization efficiency. However, cumulative mortality 16 days post challenge with *Streptococcus agalactiae* was lower in fish fed organic acid diets. A study with Nile tilapia (*Oreochromis niloticus*) also showed no differences in growth and FE in fish fed diets supplemented with 0.5, 1.0 or1.5% organic acid blend, relative to the control diet or the diet with 0.5% oxytetracycline. In catfish (*Clarias gariepinus*), supplementation of 0.2% Na-butyrate to fishmeal or soybean meal-based diet did not improve growth or feed efficiency. Based on this information, the efficacy of organic acids or their salts on fish performance appears to vary depending on fish species and the type and concentration of organic acids or their salts.