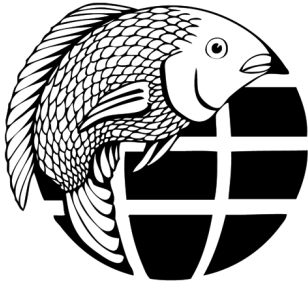


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AQUACULTURE & FISHERIES INNOVATION LAB

## RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

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**Title:** Incorporation of soybean products in summer flounder (*Paralichthys dentatus*) feeds: Effects on growth and survival to bacterial challenge

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**Abstract:** As demand for fish meal as a primary protein source in aquaculture feeds has continued to increase, aquaculturists have sought a replacement with similar nutritional profile and more consistent economic value. Two feeding trials were designed to evaluate the effect of replacing fish meal with soybean meal and soy protein concentrate in summer flounder (*Paralichthys dentatus*) diets on fish growth and survival to challenge with the pathogenic bacterium *Vibrio harveyi*. Fish fed for 12 weeks with a diet in which 60% of the fish meal was replaced with a 1:1 ratio (w/w) of soybean meal and soy protein concentrate (SBM/SPC) increased to a significantly greater mass than fish fed either a fish meal (FM) diet or a 60% replacement diet with soybean meal (SBM;  $p < 0.05$ ). Survival following bacterial challenge was significantly lower in fish fed the FM diet than fish fed the SBM or SBM/ SPC diets ( $p < 0.05$ ). In the second feeding trial, 60% of the fish meal was replaced in six diets by either soybean meal, soy protein concentrate, or varying ratios of the two. The highest body weights at the end of the trial were observed in the fish fed the FM and 60% SPC replacement diets compared to the other groups ( $p < 0.05$ ). Fish fed a 12% SBM/48% SPC replacement diet had the highest survival to bacterial challenge, significantly higher ( $p \leq 0.001$ ) than fish in other groups except the fish fed the 24% SBM/36% SPC diet. Fish fed 40% SBM/20% SPC and 60% SPC showed the lowest survival to bacterial challenge. These results show that: 1) growth of summer flounder fed a diet in which 60% of the fish meal

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was replaced with soy protein concentrate was similar to the growth seen in fish fed fishmeal diets; 2) addition of increasing amounts of soybean meal in the replacement diet led to a decrease in growth compared to diets with fish meal. However, replacement of 60% of the fish meal with a mix of soybean meal and soy protein concentrate containing 12 or 24% of soybean meal led to increased survival of fish to bacterial challenge. Further identification of the products in soybean meal leading to increased survival of summer flounder could lead to the development of replacement diets for summer flounder that provide increased survival to disease challenge without compromising growth.

This abstract was excerpted from the original paper, which was in the *Aquaculture* (2016), 452: 395-401.

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