

Dietary phytase supplementation and the utilisation of phosphorus by Atlantic salmon (*Salmo salar* L.) fed a canola meal-based diet

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Background - Plant proteins offer a promising source of protein for fish meal replacement in aquafeeds, but there are some limitations to their use. Phytate is an antinutritional factor that found in many plant meal. Phytate phosphorus is lost via fish faeces, contributing to pollution and eutrophication of the aquatic environment. Phytase hydrolyses phytate to release phosphorus and it has been used successfully to increase phosphorus digestibility for several monogastric animals. Its potential with Atlantic salmon has yet to be tested thoroughly.

Objective - To determine the effect of dietary phytase on phosphorus digestibility in Atlantic salmon fed a plant meal-based diet.

Design - Four diets were made with canola meal as main protein source. The control diet contained 35% canola meal and three experimental diets were formulated to contain phytase; inorganic phosphorus (diabasic sodium phosphate); phytase and inorganic phosphorus.

Outcomes – Phosphorus digestibility was significantly ($P < 0.05$) higher in fish fed phytase supplemented diets in comparison with the control diet. The control fish had significantly lower bone ash ($46.53 \pm 0.75\%$) and bone phosphorus ($9.78 \pm 0.23\%$) content. Phosphorus load was the lowest in fish fed phytase supplemented diet (3.9 g kg^{-1}) and the highest value was observed in fish fed diet supplemented with inorganic phosphorus (8.1 g kg^{-1}).

Conclusions - Inclusion of phytase in an Atlantic salmon diet increased phytate phosphorus utilisation. The use of supplementary phytase was shown to be effective in Atlantic salmon feeds and to have the potential to limit pollution when plant proteins are used.