

Research Now

Supplementation of Availa[®]Zn to Atlantic Salmon (*Salmo salar*) Affects Growth Performance and Outcome of Sea Lice (*Caligus rogercresseyi*) Infestation

Introduction:

The objective of this study was to evaluate experimental diets with differing zinc sources on growth performance, skin strength, and effect against sea lice (*Caligus rogercresseyi*), after an infestation challenge in Atlantic salmon (*Salmo salar*).

Experimental Design:

A commercially relevant basal diet was supplemented with 1 of 3 zinc combinations to form treatments:

- 1) Sulfate: 120 ppm Zn from zinc sulfate ($ZnSO_4$)
- 2) Combination: 60 ppm Zn from $ZnSO_4$ + 60 ppm Zn from Availa[®]Zn zinc amino acid complex
- 3) Availa-Zn: 60 ppm Zn from Availa-Zn

The experimental timeline was made up of two phases:

- Days 0 to 60 were used for growth performance evaluation (Phase 1)
- Days 61 to 81 were designed for the sea lice infestation challenge (Phase 2)

Results:

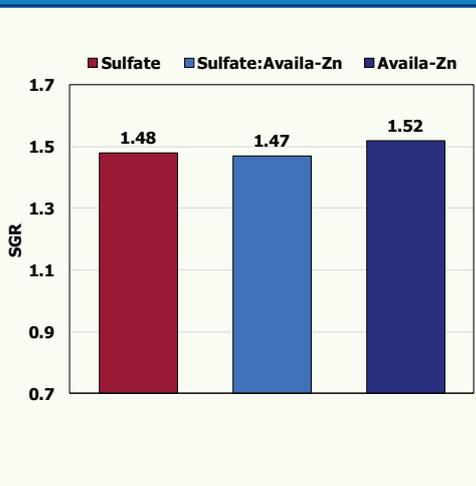
Phase 1:

- Specific growth rate was numerically greater for fish consuming solely Availa-Zn, compared to the Combination and Sulfate treatments, $P = 0.07$
- FCR was improved for both treatments incorporating Availa-Zn, compared to the Sulfate treatment, $P < 0.02$

Phase 2:

- Compared to fish consuming only $ZnSO_4$, fish consuming solely Availa-Zn had less sea lice adherence, $P = 0.04$
 - Indicating greater resistance to sea lice infestation with consumption of Availa-Zn.
- Fish fed solely Availa-Zn had a more desirable skin integrity level, than fish fed either of the other diets, though difference was not significant, $P > 0.05$

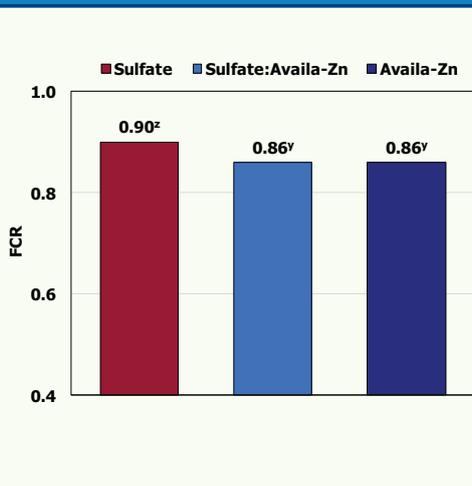
Effect of Availa[®]Zn^a on Specific Growth Rate (SGR) of Atlantic Salmon^z



^a Availa-Zn zinc amino acid complex; Treatments: Sulfate, 60 ppm Zn from $ZnSO_4$; Sulfate:Availa, 60 ppm Zn from $ZnSO_4$ + 60 ppm Zn from Availa-Zn; 60 ppm Zn from Availa-Zn

^z Numerical trend for mean differences, $P = 0.07$

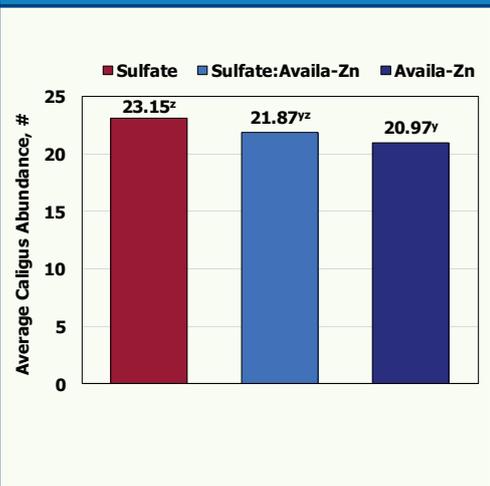
Effect of Availa[®]Zn^a on FCR of Atlantic Salmon



^a Availa-Zn zinc amino acid complex; Treatments: Sulfate, 60 ppm Zn from $ZnSO_4$; Sulfate:Availa, 60 ppm Zn from $ZnSO_4$ + 60 ppm Zn from Availa-Zn; 60 ppm Zn from Availa-Zn

^{yz} Means lacking a common superscript letter differ, $P < 0.02$

Effect of Availa[®]Zn^a on Adult *Caligus* Abundance of Atlantic Salmon



^a Availa-Zn zinc amino acid complex; Treatments: Sulfate, 60 ppm Zn from $ZnSO_4$; Sulfate:Availa, 60 ppm Zn from $ZnSO_4$ + 60 ppm Zn from Availa-Zn; 60 ppm Zn from Availa-Zn

^{yz} Means lacking a common superscript letter differ, $P = 0.04$

Abstract

Growth performance, skin strength and consequent infestation of sea lice *Caligus rogercresseyi* on Atlantic salmon *salmo salar* fed with Availa®Zn Mihai Sun^{*1}, Alba K. Fireman¹, Terry L. Ward¹, Claudia V. Pavez², and Javier Alcaíno², ¹Zinpro Corporation, Eden Prairie, MN, ²Quillaipe Research Station - Fundación Chile, Quillaipe Puerto, Montt Chile.

The objective of this study was to evaluate the growth performance, skin strength and determine the effect against sea lice (*Caligus rogercresseyi*) after a challenge infestation on Atlantic salmon (*Salmo salar*) fed with experimental diets added different sources of zinc.

Two sources of Zinc were used in this experiment, one is inorganic form Zinc Sulfate, the other Availa®Zn which is a chelated form of zinc complex. A commercial relevant basal diet was used for all the 3 dietary treatments, the zinc supplemented treatments are described as follow: Diet 1 (120 mg kg⁻¹ of zinc sulfate), Diet 2 (60 mg kg⁻¹ of zinc sulfate + 60 mg kg⁻¹ of Availa®Zn) and Diet 3 (60 mg kg⁻¹ of Availa®Zn). The experiment was designed with two phases, the first phase day 0-60 is primarily evaluating growth performance, the second phase day 60-81 is used for sea lice challenge test. In phase 1, growth performance was good for all the dietary treatments, final weigh of fish fed diet 3 was significantly higher than fish fed with diet 2 ($P < 0.05$), however, there was no significant difference between diet 3 and 1. In phase 2 sea lice challenge evaluation, fish fed with diet 3 had significant less sea lice attached to fish compared with fish fed with diet 1 ($P < 0.05$), which indicated that fish fed with Availa®Zn 60 ppm had a significant higher resistance to sea lice infection than the fish fed with inorganic form. The skin damage score was used to evaluate the skin integrity after sea lice infection, it indicated that fish fed with diet 3 had better skin score than the fish fed with diet 1 and 2 even though the difference is not significantly.

Current experiment results indicate 60 ppm Availa®Zn is recommended for Atlantic salmon in order to increase growth performance and lessen sea lice impact.

2017 World Aquaculture Society Latin American & Caribbean Chapter, November 7-10, 2017, Mazatlán, Mexico