

MSc Defence

Feed additives in aquaculture: astaxanthin, selenium, and yeast as growth, health, and microbiome modulators in rainbow trout (*Oncorhynchus mykiss*)

Samantha Bezner

Date: Friday April 17, 2026 at 10:00 am

The MSc Defence for Samantha Bezner has been scheduled for Friday April 17, 2026 at 10:00 am. The defence will be held online via Teams and in room 141: <https://teams.microsoft.com/meet/2208904442876?p=cxyVCx617TajKJ2CO9>

Examining Chair: Dr. Lee-Anne Huber

Advisor: Dr. David Huyben

Advisory Committee Member: Dr. Neil Rooney

Additional Member: Dr. Elijah Kiarie

Abstract:

Feed additives provide large effects despite low dietary inclusion levels: inorganic and organic forms that influence bioavailability and also cause complex interactions which influence the overall performance of fish. First, an 84-day feeding trial aimed to prove that microalgal astaxanthin was equally effective at colouring rainbow trout fillet. While fillet colouration was comparable, growth, plasma biochemistry, antioxidant capacity, and nutrient retention were also unaffected. Only gut microbiome was influenced by the microalgal astaxanthin to increase probiotic *Enterococcus saccharolyticus* abundance, indicating improved gut health. The second study was a 112-day feeding trial comparing sodium selenite and selenoyeast across autolyzed yeast inclusion levels of: 0, 0.1, 0.2, and 0.3%. Organic selenium compensated for decreased growth performance at the 0.3% dosage, altered serum biochemistry content showing enhanced liver function, and decreased the amount of bacteria associated with dysbiosis. Increasing yeast trended to improved gut mucosa function, which aligned with the increase of *Peptoniphilus* and *Vagococcus*. Across these two studies, the efficacy of organic feed additives were proven and the synergistic effects between nutrients was illustrated, providing the aquaculture industry with renewed incentive to utilize feed additives for rainbow trout.