Award Details

Discovering mechanisms of fatty acid nutrition in fish for aquaculture sustainability

Research Details

Competition Year:	2018	**Fiscal Year:**	2018-2019
Project Lead Name:	Colombo, Stefanie	**Institution:**	Dalhousie University
Department:	Plant and Animal Sciences (Faculty of Agriculture)	**Province:**	Nova Scotia
Award Amount:	24,000	**Installment:**	1 - 5
Program:	Discovery Grants Program - Individual	**Selection Committee:**	Biological Systems and Functions
Research Subject:	Animal nutrition and husbandry	**Area of Application:**	Aquaculture
Co-Researchers:	No Co-Researcher	**Partners:**	No Partners

Award Summary

With the global population expected to surpass nine billion by 2050, pressure on our ocean resources as a source of food will challenge both our environment and our health. Our oceans uniquely supply the omega-3 (n-3) long chain- polyunsaturated fatty acids (LC-PUFA) that have critical roles in the physiological functioning of vertebrates. Fish are typically our main dietary source of n-3 LC-PUFA, and the majority of our seafood is now produced through aquaculture. However, challenges concerning environmental sustainability, use of marine resources, and climate change threaten the production of n-3 LC-PUFA in aquaculture. Farmed fish were traditionally fed diets composed of fish meal and oil, harvested from marine fisheries. This supplied the fish with a source of n-3 LC-PUFA; however, reliance on the limited supply of wild fish is unsustainable. Further, n-3 LC-PUFA are threatened by climate change because they are optimally produced in colder waters. External pressures on aquaculture due to climate change have potential to further impact nutritional quality of feeds, especially n-3 LC-PUFA, as well as fish metabolism. Understanding how fish can change and adapt biochemically and metabolically to fundamental shifts in their diet is important from physiological, ecological, and aquaculture perspectives.***The long-term goal of my program is to understand and discover novel processes in fatty acid nutrition and metabolism in fish, in the context of aquaculture. This work is critical toward producing a sustainable supply of n-3 LC-PUFA from farmed fish, while using our ocean resources effectively. ***The overall objective is to understand the impacts of external factors, such as limited essential nutrients and climate change, on the growth and metabolism of farmed fish. This Discovery grant has three objectives that focus on the n-3 LC-PUFA in fish.***Objective 1) Discover novel sources of n-3 LC-PUFA to replace fish oil, and to understand the impact on growth, metabolism, and n-3 LC-PUFA storage in fish. ***Objective 2) Understand and improve n-3 LC-PUFA synthesis in fish. ***Objective 3) Understand how climate change may impact nutritional resources, and nutrient metabolism in fish.