The Nutrition group at Ås has worked with different aspects of lipid nutrition in fish for more than 25 years. We are working within topics such as alternative feed ingredients, omega-3 requirement, lipid metabolism, fat deposition, pigmentation and muscle quality.

A main focus of our research is related to the influence of dietary lipids, including new feed ingredients, on fish health and interactions between nutrition, metabolic consequences and genetics.

The lipid research group consists for the moment of four scientists, one PhD student and one engineer securing a good teaching environment for the master candidates.

Lipids are important components of cells and organs of the salmon body. Changes in fatty acid composition of salmon diets and interaction with other nutrients may impact the health and robustness of salmon. The master student will in collaboration with our research team improve the biological understanding of responses to dietary lipids and interactions with other nutrients, and study regulation of fat metabolism in salmon.

Contacts: Bente Ruyter main supervisor BioVit				
Prof. Bente Ruyter	**Dr. Tone-Kari Østbye**	**Dr. Marta Bou Mira**	**Dr. Esmail Lutfi**	**Dr. Trine Ytrestøyl**
Mobile: 93097531	Mobile: 98010035	Mobile: 45861831	Mobile: 92206747	Mobile
bente.ruyter@nofima.no	tone-kari.ostbye@nofima.no	marta.bou@nofima.no	esmail.lutfi.royo@nofima.no	Trine.ytrestoyl@nofima.no

Suggested master thesis subjects:

1. Improve knowledge on how important nutrients in feed, such as lipids and minerals, influence salmon health and performance. Using either *in vitro* or *in vivo* studies.

2. Regulation of fat deposition in salmon – exploring the function of central genes by gene editing (CRISPR/cas9)

3. Regulation of genes involved in fat metabolism in salmon by miRNAs

4. Identify and characterize genes involved in resistance of salmon to furunculosis (Collaboration with Department of Breeding and Genetics (Dr. Nick Robinson) and Department of Fish health (Dr. Elisabeth Ytteborg).

5. Effect on dietary factors on pigmentation in salmon
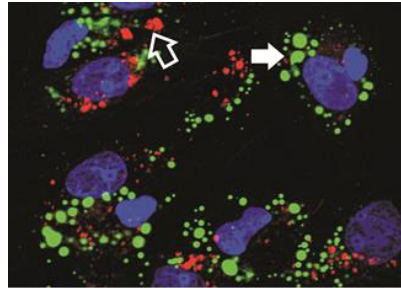
Relevant methods:

- *In vitro* cell culture (adipocytes, muscle cells, immune cells, bone cells heart cells, stem cells, liver cells)
- Gene and miRNA expression (qPCR, microarray)
- Lipid and fatty acid analysis
- Gene editing
- Microscopy