

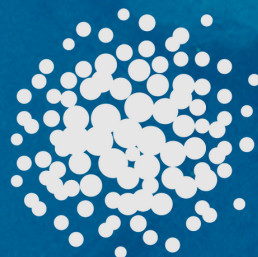
Exploring the latest developments in fish nutrition



Marine ingredients, such as fishmeal and fish oil, have a vital contribution to the growth and health of farmed fish, providing essential nutrients, minerals and vitamins, which are then passed onto humans.



As a finite resource, we need to fully understand the properties of marine ingredients and their role in fish health. This means looking beyond the well-known nutrients to help ensure their optimal strategic use.



FISH GROWTH AND HEALTH

MARINE OSMOLYTES

- Marine osmolytes are essential for fish to stay hydrated
- Hydration balance helps fish better resist skin wounds and reduces mortality at sea
- Marine-derived osmolytes (eg. TMAO*), found in fishmeal, are vital in fish feed



*Dr Antony J Prabhu Philip
Nofima*



Watch the video featuring Antony
<https://www.iffo.com/videos>

*TMAO: trimethylamine oxide

FISH GROWTH AND HEALTH

CETOLEIC ACID



- Marine-derived cetoleic acid is a type of fatty acid found in herring and capelin oils
- It helps with improved retention of EPA and DHA in body tissues



Tone-Kari Østbye
Nofima



Read article:

doi:10.1017/S0007114519001478

FISH GROWTH AND HEALTH

FISH PROTEIN HYDROLYSATES



- Hydrolysis is a process of breaking down proteins into smaller molecules called peptides
- Hydrolysates help stimulate feed intake when used appropriately
- Studies have shown that hydrolysates help improve the resilience of fish to disease



*Professor Luisa Valente
University of Porto*



Watch Luisa's interview
<https://www.iffocom/video>

FISH GROWTH AND HEALTH

PHOSPHOLIPIDS

- Fishmeal is a rich source of lipids, a more easily digested and absorbed form of lipids compared to fish oils
- Phospholipids are crucial in larval and juvenile fish diets, improving survival, growth, and development
- They also play a role in the formation of micelles, molecules which assist the uptake of lipids into the cells



*Nini H. Sissener,
Senior Scientist,
Nofima*



Read article: **Are we what we eat? Changes to the feed fatty acid composition of farmed salmon and its effects through the food chain**

<https://doi.org/10.1242/jeb.161521>

FISH GROWTH AND HEALTH

NUCLEOTIDES

CONDITIONALLY ESSENTIAL NUTRIENTS

- Nucleotides are the building blocks of nucleic acids like DNA and RNA
- Fishmeal is among one of the richest natural sources of nucleotides
- Nucleotides have been shown to stimulate both growth and the immune system in fish and crustaceans



*Professor Delbert Gatlin
Texas A&M University*



Read article:
<https://doi.org/10.1111/anu.13157>