

# Facilitating the circularity of aquaculture feed

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Connecting the dots for a circular blue bioeconomy-  
*From science to policy and regulatory solutions*  
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# What is fish sludge?

- Faeces from the fish
- Undigested excess feed
- Collected from closed on-land aquaculture systems

Salmon and rainbow trout production in Norway	Biomass (tons)	Sludge (10% DM, tons)	Sludge (90% DM, tons)
Production in 2017	1 300 000	2 145 000	238 333
Doble of 2017 production	2 600 000	4 290 000	476 667

# Fish sludge as fertilisers - regulations

## Alternative 1.

The product is an EU-fertilizer product

Regulation (EU) No. 2019/1009

## Alternative 2.

The product follow the national regulation

## Alternative 3.

The product is put on the marked within the principle of mutual recognition

Regulation (EU) No. 2019/515

- In Norway the national regulation on fertilising products allow the use of fish sludge in the production of fertilising products.
- Fish sludge is not in the list of component materials and therefore not allowed
- Fish sludge is not covered by the animal by-product regulations, since excrements and/or urine of farmed fish is not included in the definition of manure

# Fish sludge as fertilisers- possible challenges with the use and need for knowledge



**Organic pollutants**



**Hygiene**



**Heavy metals**



**Efficient use of resources and high-quality fertilisers**

# Production of farmed insects for feed and food

- Farmed insects fall within the category farmed animals.
- All requirements for feed apply.
- It is not allowed to use faeces, urine and content from the digestive tract, irrespective of any form of treatment or mixture.
- It is only allowed to use animal material of category 3 as feed for farmed animals.

**So, fish sludge can not be used as feed for farmed insects**

# Requirements for feed

Feed may only be placed on the market and used if:

- It is safe; no adverse effects on human or animal health or make the food derived from food-producing animals unsafe for human consumption
- It does not have a direct adverse effect on the environment or animal welfare (ex. covers the nutritional requirements)

**So, for the use of sludge as substrate for insects, knowledge of feed safety and effects especially on animal health and welfare is required.**

# How to change regulations-

the regulations are established based on the «precautionary principle»,  
i.e. if there is a lack of knowledge or scientific uncertainty

There is new scientific knowledge  
available

The new data is risk assessed by  
EFSA

There is a political will to change  
the regulation