AGRICULTURAL SIDE-STREAMS FERMENTED WITH *Ganoderma spp.* AS A NOVEL FUNCTIONAL INGREDIENT: ENHANCING FISH HEALTH AND GROWTH IN MEAGRE (*Argyrosomus regius*) AND EUROPEAN PERCH (*Perca fluviatilis*)

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WHY THIS INGREDIENT?

Aquaculture needs nutritionally robust alternatives to increasingly costly and unsustainable marine-derived feed resources.

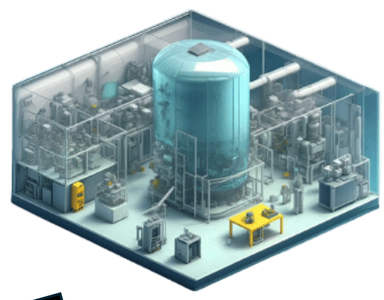
The circular strategy

- Valorization low-value agricultural side-streams
- Produce protein-rich fungal biomass
- Reduce dependence on conventional feed ingredients
- Add potential health-promoting bioactives

FROM SIDE-STREAM TO FUNCTIONAL FEED



Agri-food side-streams



Solid-state fermentation



Ganoderma spp. mycoprotein



Functional feed

MYCOPROTEIN NUTRITIONAL PROFILE

Crude protein	53.3%
Crude fat	3.9%
Crude fiber	8.5%
NDF	19.8%
ADL	10.1%

Dry matter basis.

EXPERIMENTAL DIETS

% Fishmeal substitution

CTRL | 25% | 50% | 75%

MEAGRE 20% fishmeal in control → 5.35%-15.50% mycoprotein

EUROPEAN PERCH 23% fishmeal in control → 5.75%-17.15% mycoprotein

Long-term trials in controlled recirculating aquaculture systems (RAS)

VALIDATION IN TWO SPECIES



MEAGRE (*Argyrosomus regius*)



EUROPEAN PERCH (*Perca fluviatilis*)

Growth efficiency – Feed efficiency – Product quality

Digestive system histology – Physiological health parameters

EXPECTED IMPACT

Bioactives

B-glucans – Triterpenes - Phenols

Potential support

IMMUNE CAPACITY

FISH HEALTH

GROWTH

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