



Aquashift: Rethinking Aquafeed

Less Soy - Smart processing - More sustainable Aquafeed

Duckweed as a sustainable alternative protein source for extruded aquafeed production

Background/Problem

Aquafeed producers need sustainable alternatives to conventional protein sources, including soybean meal. Duckweed is a fast-growing aquatic plant with potential to provide a resource-efficient and environmentally sustainable protein ingredient for aquafeeds.

Practice Change

The IMPRESS project evaluated the use of *Lemna minor* and *Landoltia punctata* duckweed biomass in extruded feeds for golden grey mullet (*Liza aurata*) at inclusion levels of 10% and 20%.

Evidence

Duckweed-containing feeds maintained comparable nutritional quality to conventional feeds and were successfully produced by pilot-scale extrusion. Feeds containing *Lemnaminor* required less mechanical energy during processing, indicating improved manufacturing efficiency. The best balance was observed at 10% *Lemna minor* inclusion, where improved processing behaviour was combined with satisfactory pellet water stability.

Setting/Participants

The research was conducted at the Institute of Food Technology, University of Novi Sad, Serbia, within the IMPRESS project. Researchers and project partners involved in ingredient production, feed formulation, and aquaculture evaluated the use of *Lemna minor* and *Landoltia punctata* duckweed biomass in pilot-scale extruded feeds for golden grey mullet (*Liza aurata*).

Implementation Plan

Feed manufacturers can introduce duckweed at moderate inclusion levels to diversify protein sources. Successful implementation will require consistent biomass quality, reliable supply chains, and optimisation of formulations for higher inclusion rates.

Outcomes/Measures

- Successful pilot-scale production of duckweed-based aquafeeds.
- Comparable protein, fat, and energy content across diets.
- No negative effects on extrusion performance.
- Reduced energy demand during processing with *Lemna minor*.
- Good pellet quality at moderate inclusion levels.

Conclusion

Duckweed is a technically feasible and sustainable protein ingredient for extruded aquafeeds. At moderate inclusion levels, particularly 10% *Lemnaminor*, it can support sustainable feed production while reducing reliance on soybean-based ingredients.

20% duckweed

0% compromise on
feed quality



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Keywords

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