

Project *brief*

Thünen Institute of Fisheries Ecology

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Development of Sustainable Feeds for Rainbow Trout Based on Locally Available Feed Resources in the Islamic Republic of Iran

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- Iran is the world largest producer of rainbow trout, but recent development goals were missed
- Locally available by-products can be used as ingredients for aquaculture feeds
- Processing of by-products can increase their suitability as feed ingredients and reduce environmental impact of aquaculture

Background Information on Aquaculture in Iran

The Islamic Republic of Iran is the largest producer of rainbow trout worldwide. According to FAO data, in 2020 about 200 000 mt of rainbow trout were produced in this country, corresponding to 20.5% of the world production. Significant further increase of the production had been foreseen in the development plan, but the goals could not be fully reached. The development of the aquaculture sector is hampered among others by the availability of high-quality feeds. Poor water quality in some rivers in Iran is attributed to the usage of aquaculture feeds with low digestibility.

Key Questions

Which by-products from agro-industry are potentially available as ingredients for aquaculture feeds?

How can they be characterized by their chemical composition and physiological effects?

Can they be combined to form a highly digestible feed resulting in good growth performance of the fish?

Methods

- Evaluation of statistical data and expert interviews in Iran to identify potential ingredients for aquaculture feeds
- Analysis of proximate composition and amino acid profile of candidate ingredients
- Determination of *in-vivo*-digestibility of selected ingredients and their respective nutrient retention coefficients
- Test of a diet composed of these ingredients against a laboratory standard diet in fish of marketable size

Results

Canola meal and various by-products from poultry industry such as feather meal, blood meal and poultry by-product meal were identified as available resources for aquaculture feeds. All of these ingredients have high digestibility. However, it was noted in the feeding trials that the nutrient retention of ingredients originating from Iran was substantially lower than that of the corresponding ingredients of German origin, which stresses the importance of processing. Using a fish meal free diet based exclusively on locally available ingredients from Iran we could achieve the same growth rates and feed conversion coefficients as with commercial feeds from Germany, which reduces the environmental impact per unit of production compared to currently used feeds in Iran.

Conclusion

Locally available ingredients from Iran can be used to produce high quality aquaculture feeds, provided these by-products are properly processed.

Fig. 1: Experimental Feeds in Comparison to Commercial Feed (lower right)



Further Information

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