

TECHNOLOGY OFFER

AUTONOMOUS AQUACULTURE FISH FEEDING SYSTEM AND OPERATION METHOD THEREOF

This technology relates to an autonomous aquaculture fish feeding system and method, comprising an autonomous vessel with a plurality of temperature and salinity sensors and an electronic data processor configured for calculating a fish weight prediction model from collected temperature and salinity data.

KEYWORDS

Aquaculture

Smart Systems

Predictive Feeding

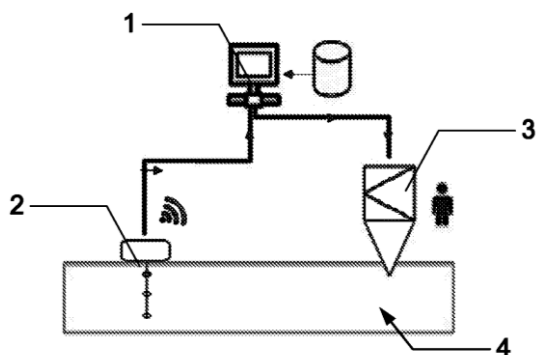
Modelling and Simulation

Autonomous Vessel

DESCRIPTION

Global population growth is causing an increased demand for animal protein, where aquaculture fish production has been playing a crucial role. However, waste production in fish feeding is responsible for most of the environmental impacts derived from this activity. Aquaculture waste is directly influenced by overfeeding and can account for up to 15-25% of feed losses, with an average nitrogen (N) discharge to coastal waters between 14,000 to 19,000 tonnes N/year.

In this context, the use of predictive models in aquaculture can be an excellent tool to combine increased production yields with reduced environmental impacts. The feeding intake of fish is highly influenced by the water parameters, such as temperature and salinity, and given that fish do not control their body temperature and most rearing facilities cannot control these parameters to a significant degree, there is a compelling reason to dynamically adjust the food offered to fish according to the environmental conditions.



This autonomous aquaculture fish feeding system comprises an autonomous vessel (2) having multiple temperature and salinity sensors; an electronic data processor (1) configured to use sensor collected information to calculate a fish weight prediction model for each prediction model segment.

The predictive model built into the device (1) receives information about the environmental temperature and salinity from the sensors disposed at pre-determined depths, fixed at the non-specific floatable vessel (2), the main device then notifies the user and/or automatic feeder (3) the feed amount prediction. The fish stock (4) is then fed with the optimal predicted amount, avoiding waste or underfed situations. This procedure is adjusted autonomously.

ADVANTAGES & INNOVATIONS

This smart autonomous predictive system was designed with a user-friendly interface for practical input of environmental and biological data and to output the feeding loads, providing fish farmers a resourceful tool to reduce operational costs, to increase production yields and reduce the feeding waste ultimately fostering the overall sustainability of aquaculture systems.

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INTELLECTUAL PROPERTY RIGHTS

Patent(s) applied for but not yet granted

International Patent Application via PCT WO2018189724, 13.04.2018:
<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2018189724>
Entry in Europe Regional phases in 13.11.2019.



DEVELOPMENT STAGE

Technology Development / Laboratory Testing (TRL 4 - 5)

TRL 4 - The technology was validated in the laboratory.
Further development for validation in large scale setups required.



COOPERATION OPPORTUNITY

Research or Technical Cooperation Agreement, License Agreement, Commercial Agreement

Collaboration for further validation in large scale setups, namely regarding the validation and optimization of the technology in large scale aquaculture setups and multi-parameter experiments. Intellectual Property Licensing agreement, product development and marketability.



RELEVANT PUBLICATIONS

Ozório, R. Souza, A. T. Pereira, L., Gonçalves, J.F., Fernandes, M. 2018. WO2018189724 - Autonomous aquaculture fish feeding system and operation method thereof. Applicants: CIIMAR - CENTRO INTERDISCIPLINAR DE INVESTIGAÇÃO MARINHA E AMBIENTAL, UNIVERSIDADE DO PORTO, FOODINTECH, LDA. <https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2018189724>

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