Aquainnova

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RACEWAYS

A hyper-intensive fish farming concept for lasting competitiveness and superior production

The Challenge

Fish production in land-based aquaculture has increased rapidly in recent years. In many land-based fish farms, growth is currently limited by the available supply of freshwater, and the potential for adverse effects of waste water discharge. Recirculation aquaculture systems (RAS) offer a way out of these problems: in these systems, water is re-used after mechanical and biological treatment. However, initial investment costs and ongoing running costs are high, with the result that widespread production in such farms has not reached its full potential.

Project Objective

RACEWAYS provided a scientific rationale for the establishment of a cost-effective rearing system (the Shallow Raceway System) and effective husbandry strategies for several highly priced cultured fish species. As the rearing system can be combined with recirculation systems, the concept will promote aquaculture in regions otherwise impedimented from this industry. The new farming concept will significantly reduce the overall logistic needs with respect to buildings and water supply system and through its compactness and extended automation. The new concept may in fundamental ways open up for a new era in fish farming in Europe by substantially reducing start-up costs and operational costs. Due to the compactness, these farms can be building blocks in Industry Parks for Aquaculture.

Key Points

- A new and sustainable compact hyper-intensive production system for enhanced land-based aquaculture covering the whole production chain

EATiP *Thematic Area of Relevance*

TA1: Product Quality, Consumer Safety and Health
TA2: Technology and Systems
TA3: Managing the Biological Lifecycle
TA4: Sustainable Feed Production
TA5: Integration with the Environment
TA6: Knowledge Management
TA7: Aquatic Animal Health and Welfare
TA8: Socio-Economics and Management

Key Words

RAS, recirculation, tank, shallow, cleaning water reuse, land-based

Project Information

Contract number:
16869
Contract type:
FP6 SME Cooperative Research
Duration:
24 months (May 2006 – April 2008)
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Updated: September 2010

Output Highlights

- The project provided a scientific rationale for the establishment of a cost-effective rearing system (the Shallow Raceway System, SRS) and effective husbandry strategies for several highly priced cultured fish species.
- Shallow raceways in racks make it possible to rear fish in as much as ten separate levels. As an illustration, a land-based production of 10,000 tons would normally require approximately 400,000 m² of industrial buildings. This represents is a huge challenge to the industry. With SRS technology, should be possible to reduce the area needed to less than 20%, or to produce the same quantity, i.e. 10,000 tons of fish and shellfish, on less than 100,000 m².
- The hyper-intensive concept is also expected to reduce the consumption of other contributing elements like feed, water, oxygen, energy, and work-load while increasing the production volume per employee.

Next Steps – Suggested Actions/Follow On

RTD

- There is still a considerable work to be done to optimize the shallow raceways system. By linking this system with recirculation systems, the concept will promote aquaculture in regions otherwise impedimented from this industry.