



SALMOTRIP

Feasibility study of Triploid Atlantic Salmon Production

The Challenge

The use of triploid salmon has the potential to make an important contribution towards a more sustainable salmon farming by offering a substantial step forward in the prevention of negative impacts of escapees on wild populations. Commercially viable sterile triploid fish would reduce the need for the energy intensive photoperiod control now widely used by the industry as well as reduce the welfare issues of disease and mortality still associated with maturation during the production cycle. However we can only realise these benefits if we understand and overcome some of the problems reported in earlier studies on triploid salmon. These included higher mortalities, poor growth performances, poor tolerance to sub-optimal environmental conditions and high incidence of morphological deformities. Because of these problems the industry did not see triploid salmon as a viable farming option. However, more recent results have suggested that triploid salmon have been shown to perform as well as diploid fish and even better in some cases.

To address these challenges a trans-national collaborative project supported by 5 key players of the salmon industry and 3 research centres was started in June 2008 as part of the EU 7th Framework Programme. The project focuses on 5 key areas regarding the evaluation and optimisation of triploid salmon production. Only when this knowledge will be available and consumer perception addressed can the potential for triploidy be realised as a viable farming option for the industry.

Project Objective

The overall aim of the Salmotrip project is therefore to enhance our knowledge on how triploid salmon should be reared and their potential performance. This will be achieved by testing and refining current production practices for triploid salmon as well as assessing how such a product would be perceived throughout the salmon food chain and could be marketed. The project is centred on a full scale feasibility study and market perception analysis. This will determine whether triploid salmon are suitable for farming as a means to minimize the impact of farmed fish on the environment (i.e. sterile escapees) while improving fish welfare and providing a consistent year long quality product.

Triploid induction in salmonids has been the subject of many studies and projects over the last 20 years but there are considerable gaps in our understanding of the environmental requirements, the family effects and overall welfare of these fish. To support this work the project is organised around a number of deliverables to provide protocols and additional information which will both help ensure the optimal design and analysis of the feasibility study, but will thereafter be innovative resources by themselves which will be available to the industry for future development.

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

Triploidy, triploid fish, triploid salmon culture, sterile escapees, Atlantic salmon

Project Information

Contract number:
222115

Contract type:
Research for SMEs

Research area:
SME-1 Research for SMEs (Co-operative Research Project)

Duration:
30 months (01/07/2008 – 31/12/2010)

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Key Points

The overall objective of the project is to strengthen the European research Area for Atlantic salmon culture which mainly is located in northern Europe. More specifically, the project aims to:

- Strengthen the scientific understanding of biological needs of triploid fish for successful cultivation by testing and refining current husbandry protocols
- Improve triploid fish welfare through better understanding of rearing requirements and environmental sensitivity
- Perform field validation of triploid production in commercial on-growing systems
- Assess family effect on triploid induction and contribution to performance Explore market and societal acceptance and possible added value of the production type

Key New Knowledge Expected

- Strengthened knowledge on triploid biological and culture requirements
- Development of a welfare scheme for triploid fish
- Advanced knowledge of the smolt process and monitoring
- Provision of triploid specific smoltification regimes

Potential Impacts

SALMOTRIP will generate new innovative culture options that could improve economic performance of the salmon industry in Europe while addressing environmental and farmed animal welfare concerns. The results from the project will deliver new knowledge on triploid salmon culture that would help salmon SMEs and EU legislators to make decision on their potential implementation within the salmon farming industry as a mean to minimize environmental genetic impacts of escapee fish and protect domesticated “strains” while improving fish welfare and food standards by maintaining a year round high quality product. The SALMOTRIP project identifies the following key results as areas of potential exploitation for SME:



Knowledge Transfer

- Transfer of triploid induction technology to SMEs



SME

- Minimise genetic and ecological threats to wild populations
- Improve fish welfare
- Maintain a year round high quality product acceptable to the consumer
- Increase somatic growth due to extended grow-out as diversion of energy into gonadal tissue is avoided
- Offer a means to salmon breeding companies to protect their IPR on selected strains
- Advancement of knowledge of the smolt process and monitoring
- Refined husbandry protocols for triploid S0 smolt production
- Identification of environmental and husbandry sensitivities
- Development of a deformity assessment scheme and guide of best practice for transfer to SMEs
- Identification of perceived risk-benefit of triploidy and definition of marketing strategy.

Related Publications/Projects

Sterile salmon: toward a more sustainable and eco-friendly industry. Fish Farmer, October 2008.

Migaud H. and Taylor J., 2009. Sterile salmon: toward a sustainable future? Aquaculture News, 36, September 2009.