

BENEFICIARY: BORD IASCAIGH MHARA
PROJECT REFERENCE NUMBER: 19 KGS STS 007.2
NAME OF PROJECT: CLOSED CONTAINMENT
IMPLEMENTATION PERIOD: 1st JANUARY -31st DECEMBER 2019

Project Scope

The initial six months after transferring salmon smolt to sea can be very problematic with the young salmon being stressed not only by the process of smoltification but also being challenged with AGD and other environmental health issues. It is felt that if the salmon could spend the first six months in a more controlled marine environment which prevented AGD infection and other challenges, then survival and growth performance would be better.

A closed tarpaulin cage system was developed for the on-growing of salmon at sea for the first six months. The system was fitted with water filtration equipment installed to prevent contamination with AGD and other environmental challenges along with a waste removal system.

The trial took place in conjunction with the Marine Institute at their Lehenagh Pool marine site. Though there has been quite a bit of work undertaken on the concept of closed containment systems abroad there is no system currently operating commercially in similar conditions to the Irish Industry. In addition, systems designed in Norway tend to be extremely capital intensive and do not have any water quality control mechanisms when introducing the water into the closed containment system. Instead they rely on pumping water from depth. This type of system cannot work on Irish salmon sites. This prototype was designed, constructed and tested to see if the concept is technically and economically feasible.

Objectives

This project designed a flexible closed bag system that can be deployed on already existing salmon cages without significant modification. It also involved the design of a water treatment system with an emphasis on footprint and power consumption. The project sought to ascertain if;

- It is technically feasible to use mechanical and ultraviolet (UV) filtration to minimise disease, parasite and plankton risks to salmon smolts via intensive water sampling
- It is technically feasible to grow salmon smolts within the closed system without water flow through the cage walls.
- It is technically feasible to collect all waste produced by Salmon smolts being fed a full commercial diet.
- It is technically feasible to induce a hydraulic flow that will result in the system being self-cleaning.
- To establish the cost of production associated with this method of growing and determine whether this is commercially feasible.

Budget

Maximum approved expenditure on the project totaled €50,000 corresponding to the following headings:

- Rental of equipment such as drum filter and generators etc. (outsourced).
- Technical consultant and reporting (outsourced).
- Veterinary services and reporting (outsourced).
- Feed and fuel etc. for trial (outsourced).
- Miscellaneous transport etc. and any additional operatives that may be required above what is provided by the Marine Institute (outsourced).

Achievements / Spend

A flexible closed bag system has been designed and built that can be deployed from a standard salmon cage of 50 metre circumference as found on the trial site. A compact water treatment system consisting of axial flow pump, drumfilter and open channel UV have been designed and constructed. A waste collection system has also been commissioned along with a mechanism to improve the hydraulic flow within the flexible bag.

The project demonstrated the technical feasibility of all proposed elements of the study, however due to a delay in deployment it was not possible to assess the full impact of the approach on fish health and subsequent survival. This is key element to be resolved before fully demonstrating commercial feasibility.

SUMMARY OF SPEND

Total Approved	
Total Eligible Expenditure	€50,000
Total Drawdown	€ 49,102.97
EU – 50%	€ 24,551.49
Exchequer – 50%	€ 24,551.49

Report: Geoffrey Robinson

Date: May 2020