

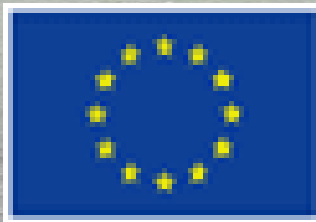
EcoFish

A transnational project 2008 -2010

Environment friendly fish farming and use of cleaner fish

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Stavanger 2009



www.afn.hibo.no



EcoFish

Aim of the project

The project will deliver methods and technology needed to produce Ballan wrasse for use by the salmon farming industry in all of the partner countries.

EcoFish will do that through:

- co-operation
- joint research
- organised exchange of information

Participating R&D institutions

- ❑ **Bodø University College, Norway**
- ❑ **Bioforsk Nord, Bodø Norway**
- ❑ **Daithi O'Muruchu Marine Research Station (DOMMRS)
Bantry, Ireland**
- ❑ **Martin Ryan Institute, National University of Ireland
(NUG), Carna, Galway, Ireland**
- ❑ **Ardtoe Marine Laboratory (VFF), Ardtoe, Acharacle,
Scotland, UK**
- ❑ **Murman Marin Biological Institute, Russia**

EcoFish - background



Infestation of an Atlantic salmon by the sea louse *Lepeophtheirus salmonis*, Costello 2006, National Research Council Canada.

- Economic losses, Norway 500 mill NOK?
- Resistance; several cases
- Good results with wild caught cleaner fish
- All partners have long experience and competence in hatchery production of fish, including ballan wrasse

Why choose Ballan wrasse

Several species have been tested

Ballan wrasse most “popular”

Effective at low temperatures

Experience using BW

Much is known on reproduction

Similarities to production of other marine species e.g cod.



BETWEEN PRODUCTIONS COMPARISONS

- **Broodstock development and management**
- **Benchmarking of results**
- **Abnormal development of ballan wrasse larve larvae**
- **Wrasse hatchery development**

Ballan wrasse broodstock

- **Broodstock established in all countries (all partners have previous experience on culture of wrasse species)**

Normal spawning (May-August)

Out of season spawning (September –December)

(Light and temperature)



Broodstock at Bodø University College Research station- Norway

- From southern part of Norway
- Transport by truck
- Atypical furunculosis – high mortality
- Vaccinate – no mortality



Atypical furunculosis

IP injection of antibiotics (improved survival)





Husbandry

Careful handling

Hiding places

- Tubes and plastic bags

Low density

Stable environment



Broodstock feeding

Feeding 3 times per week

Sausages; a mixture of;

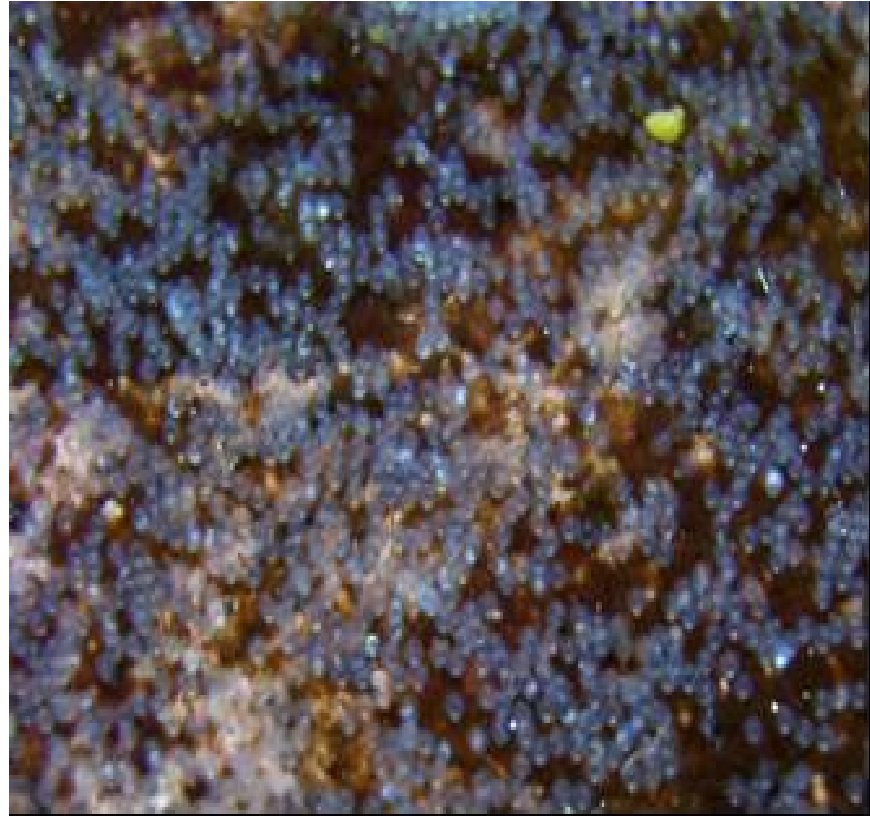
- Fish oil
- Fish meal (broodstock feed)
- Shrimps



Spawning and eggproduction

Ballan wrasse eggs in situ on a pipe substrate

- Time May – August
- 1 male, 8-12 females per tank
- Demersal- stick to surfaces
- Removeable spawning substrates
- Disinfection of eggs important



Hatching and startfeeding

Eggincubation, startfeeding and weaning very much the same principles as with cod

Flow through systems

- Green water
- Rotifers
- Artemia/ microfeed
- Weaning feed
- Modification of feed content?

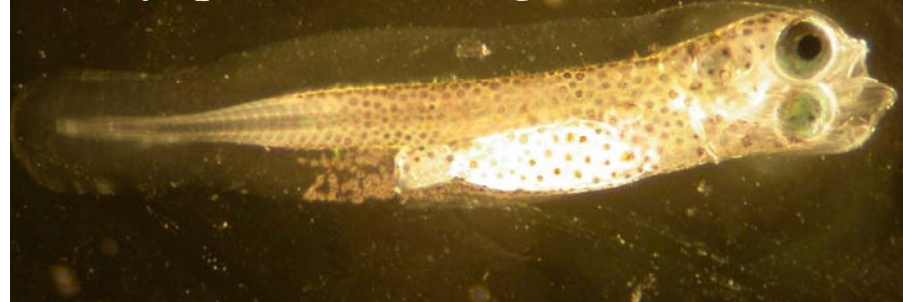
Ballan larvae

6 days post hatch. Length= 4.5 mm



Ballan larvae

17 days post hatch. Length= 5.4 mm



Ready for de-lousing

Optimal culture conditions and feeding not determined.

Probably reach 12 cm after a year.

Growth rates will improve along with more experience, better feed and methods for culture.

Manual on hatchery production of ballan wrasse

- Broodstock management
- Diets
- Egg production
- Egg collection
- Egg incubation
- Larval rearing
- Environmental conditions
- Live feed production
- First feeding
- Feeding protocols
- Weaning
- Abnormalities
- Fry transport
- Diseases
- List of protocols

All countries are involved. Ireland will have systematically investigations on use in salmon cages

Problemstillinger for videre arbeid

- **Utvikle metoder for;**
- **produksjon av kvalitetsegg med høy befruktning, normal utvikling og høy klekkeprosent**
- **produksjon av egg med steril overflate for sikring av god hygiene i påfølgende produksjonstrinn**
- **produksjon av larver og yngel med høy overlevelse og uten deformiteter**
- **bruk av immunstimulanter/probiotika for å øke overlevelsen i tidlige stadier hos berggylte**
- **sykdomsscreening og for vaksinerings mot kjente sykdommer (spesielt atypisk furunkulose) av berggylte før bruk i oppdrettsnæringen**

Bergylte i sitt naturlige miljø utenfor Vassøy

Takk for oppmerksomheten

