

## FIRST PRO-EEL EEL LARVAE SUCCESSFULLY PRODUCED IN FULL SCALE EXPERIMENTS

The PRO-EEL project aiming at breeding European eel (*Anguilla anguilla*) in captivity experienced a productive and fruitful first year out of a four year period. The Consortium successfully integrated into a focused research group and the first series of joined experiments resulted in good batches of larvae living up to 18 days post hatch.

Full scale experiments to reproduce eels and obtain viable offspring form the backbone of the PRO-EEL project, supplemented by small scale trials and laboratory analysis by partners studying various biological mechanisms. The scheduled first experimental series included experiments with broodstock eels originating from commercial eel farming. The second series used wild silver eels as female broodstock to benchmark the quality of the farmed broodstock. The aim is to use farmed broodstocks in the production of larvae for a self-sustained aquaculture of European eel.

**Farmed broodstock eels:** Researchers with different expertise provided methods for application in the first experimental series. This series started in June 2010 by hormonal treatment of female and male eels. In autumn 2010, we successfully harvested eggs and sperm, made fertilisations in vitro and cultured eggs and larvae, with the longest living larvae reaching an age of 13 days post hatch.

The project approach where a number of subject-specific research protocols are integrated into one single full scale experiment was an exciting and challenging experience. The experiments were successful and achieved good results as well as integrated project participants in a joint effort.

A vast number of samples for specific analysis were obtained from these experiments comprising 120 farmed female eels reared on three different broodstock diets in order to enhance female nutritional status and thereby egg quality.



MSc student Martin Davidsen NTNU performing experiments on the effect of temperature on embryo and larval development. Photo Sune Riis Sørensen, DTU

Sampling included filets and liver for nutritional and contamination studies; pituitaries and blood plasma for hormone profile and gene expression; liver and ovaries for analysis of development in relation to treatments, etc.

In particular, the processes leading to ovulation and the fertilisation success are object for dedicated studies to improve the quality of stripped eggs.

Farmed male eels similarly receive hormonal treatment and they are timed to develop and produce sperm during the period where females are ripe. Also the stripped eggs, embryos and larvae produced are sampled to study development. Eggs and larvae are used in rearing experiments to improve culture conditions and to test potential larval diets. Eggs from a single batch were furthermore transferred to a partner in Norway and successfully hatched in rearing experiments.

**Wild caught broodstock :** The second full scale experimental series focused on nature's own broodstock. In autumn 2010, silver eels from a lake in Thy National Park in Jutland were caught in a traditional type of trap called an "Ålekiste" during the time of natural migration.



The approximately 200 year old wooden trap called an "Ålekiste", which captured the eels used as broodstock in the second series of experiments. Photo Sune Riis Sørensen, DTU

The aim of using the wild broodstock is to study the condition of the female silver eel and gain knowledge about the quality and composition of the eggs they produce. These features are applied in a comparative analysis to enhance the performance of domesticated European eel.

In total, 40 beautiful wild female eels were applied in the experiments and the egg production peaked in April and May 2011. These experiments produced many large egg batches, high fertilisation rates and good quality eggs and larvae. The longest living larvae reached an age of 18 days. These experiments enabled researchers possessing specific expertise within aquaculture research e.g. fish final egg maturation, fertilization procedures, egg quality criteria and culture conditions, to join the full scale experiments at the research facility in Denmark.



Work station in use at Lyksvad Research Station. Here by Helge Tveiten, NOFIMA. Photo Sune Riis Sørensen, DTU

The project partners participating in the joint experiment and other participants who conducted small scale experiments are now engaged in the analysis of samples and data. Further small scale and full scale experiments will be conducted in the coming years. The first PRO-EEL results are expected in autumn 2011 and will be presented at the Aquaculture Europe 2011 in Rhodes, Greece in October (EA2011).

For the second series of experiments a new broodstock container was provided for culture of wild broodstock eels. The purpose is to keep wild and farmed eels at the same location, but separated thereby minimising the risk of transfer of diseases and parasites between wild and farmed broodstocks.

### Further information:

For further information, visit our homepage [www.pro-eel.eu](http://www.pro-eel.eu)

News and events of the project will be regularly updated to inform about progress of the project and you can join the PRO-EEL networks via the project homepage to obtain our regular Newsletters and further relevant information. Next news letter will become available in September 2012.

Project coordinator:  
Jonna Tomkiewicz, DTU,  
[jt@aqu.dtu.dk](mailto:jt@aqu.dtu.dk)

Project manager: Hans van de Vis,  
DLO, [Hans.vandervis@wur.nl](mailto:Hans.vandervis@wur.nl)



Laboratory containers at Lyksvad Research Station. Photo Sune Riis Sørensen, DTU

The joint experiments represent new and promising steps in the direction of establishing suitable rearing conditions and identify feed that is needed to increase survival and allow on-growing of the larvae produced.

The Lyksvad research facility used for the joint experiments was upgraded in autumn 2011 with two laboratory containers. The Containers were provided by DTU Aqua for use in the project in order to improve the opportunities of researchers to visit and work at the facility. The containers were equipped and used during the Danish Galathea III Research Expedition (2006-2007). They feature basic laboratory facilities and offer calm quiet space for experiments and were ready for use in the first experimental period.

*This collaborative research project falls under the European Community's Seventh Framework Programme under the Food, Agriculture and Fisheries, and Biotechnology (Grant Agreement No. 245257).*

