

## THE CHALLENGE OF DOMESTICATION OF BLUEFIN TUNA *Thunnus thynnus* – HIGHLIGHTS OF THE SELFDOTT PROJECT FROM 2008-2009

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### 1. Overview

The 5th European Union's FP research programme, REPRODOTT, was the first ever study of the reproductive biology of the Atlantic bluefin tuna in captivity. During this project, a hormonal method for the induction of spawning was developed. The SELFDOTT project (from capture-based to self sustained aquaculture and domestication of Bluefin tuna, *Thunnus thynnus*) is implementing the knowledge on the reproduction of bluefin tuna in captivity and establishing the knowledge-base required for controlled development of eggs, larvae and suitable and environmentally-performing feeds.

### 2. Background

Tunas constitute the most valuable fishery worldwide with global catches of 4 million tonnes and a value of US\$ 6 billion. Fuelled by the increasing demand for this unique fish by the sashimi-sushi market in Japan, Europe and the United States, a "capture-based" aquaculture industry has developed in the Mediterranean Sea over the last decade, which involves the capture of migrating wild fish and their fattening in floating cages for periods ranging from 2 months to 2 years. The dramatic expansion of this industry is considered a threat to the now heavily over-fished wild stock.



In order to alleviate the pressure on the wild fishery for bluefin tuna and aid in its conservation, the domestication of this fish and the development of a sustainable aquaculture industry is necessary. This includes the propagation of this species in captive conditions, through rearing of the larvae and production of fingerlings for

further grow-out on suitable, scientifically-formulated and environmentally-performing feeds, as it is done successfully in the EU for species such as salmon, sea bass and sea bream. Therefore, there is a great interest in developing captive bluefin tuna broodstock and larval rearing methods to support the sustainable development of an aquaculture industry. Studying the reproductive biology and larval rearing of this species in captivity will also result in a better understanding of its life history, which is necessary for management of the wild stocks.

### 3. The project

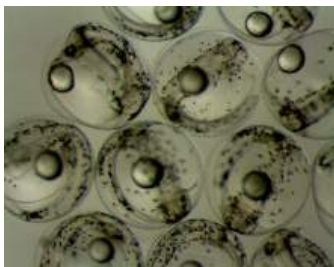
The SELFDOTT project was launched in January 2008, funded under the 7th FP Cooperation Work Programme: Food, Agriculture and Fisheries, and Biotechnology and is coordinated by the IEO, Instituto Español de Oceanografía (SPAIN). The other members of the consortium include the Hellenic Centre for Marine Research (Greece); the Institut Français d'Exploitation de la Mer (France); the Heinrich-Heine University of Düsseldorf, (Germany); the National Centre for Mariculture, (Israel); the University of Cádiz, (Spain); the University of Bari, (Italy); the Malta Centre for Fisheries Sciences, (Malta); the Centre National pour la Recherche Scientifique, (France) and the Université de Montpellier II, (France). The tuna are maintained at the facilities of Tuna Graso, S.A., (Spain) and Malta Fish Farming (Malta), who are the industrial partners of the consortium with the Skretting Aquaculture Research Centre, one of the most important fish feed manufacturing companies in the world.

### 4. Highlights



Wild juvenile and mature bluefin tuna are being reared in floating cages at El Gorguel (Spain) and Marsaxlokk Bay (Malta). A third group of broodstock is placed in Vibo Marina (Italy) and belongs to a regional research consortium (ALLOTUNA) funded by European Union Structural Funds through the region of Puglia (Italy). The two projects have some common partners and have signed a

collaboration agreement.

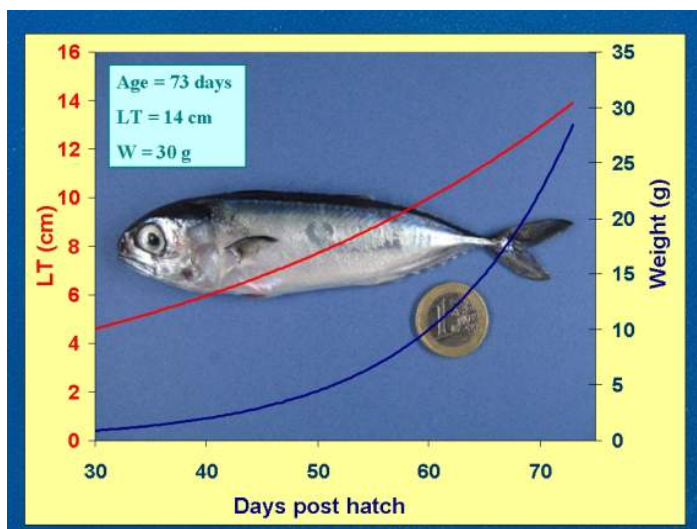


Wild juveniles were captured alive by hook-and-line and adapted to captivity in floating cages in order to establish the knowledge-base required for the development of suitable and environmentally-performing feeds, develop weaning feeds and develop formulated dry feed.

The broodstocks cages have been used to study gametogenesis, and the influence of diet on reproductive maturation and gamete quality. Mature fish have been induced to spawn using hormone implants and the eggs were collected using devices designed specifically for sea cages.

Beginning on June 29<sup>th</sup> 2009, captive-reared Atlantic bluefin tuna, maintained at El Gorguel (Spain), began spawning after being implanted with a reproductive hormone delivery-system. The fish spawned daily afterwards, producing a total of 140 million eggs, with a daily maximum of 34 million eggs. The Italian broodstock began spawning 3 days after hormone delivery system implantation (30<sup>th</sup> June), producing a total of 46 million eggs over the course of two weeks.

The eggs produced at the two sites were sent to research hatcheries in Spain, France, Italy, Malta, Greece and Israel to commence, for the first time, research on larval rearing of this magnificent and unique marine fish. The results from larval rearing have been encouraging but have also high-lighted the problems involved.



*For more information, please visit the website:*

<http://www.selfdott.org>

*Or contact the project coordinator:*

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