



**AMBERJACK RESEARCH IN MALTA  
- ADVANCES AND BOTTLENECKS -**

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**MALTA AQUACULTURE RESEARCH CENTRE**

**DIVERSIFY Annual Meeting**

**Bari, Italy 4<sup>th</sup> November, 2014**



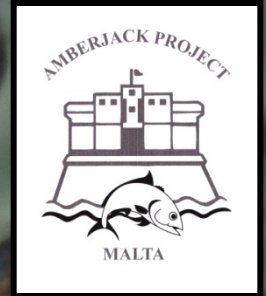
# **AQUACULTURE RESEARCH SPECIES DIVERSIFICATION**

- 1. Broodstock management**
- 2. Spawning & egg collection**
- 3. Larval rearing**
- 4. Juvenile rearing**
- 5. On-growing to market size**

**Amberjack Project  
Maltese Joint Venture Project  
MARC – MFF Ltd**



# AMBERJACK PROJECT

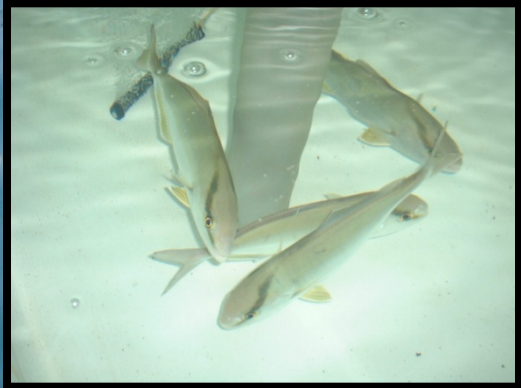


## CHRONOLOGICAL MILESTONES IN AMBERJACK DOMESTICATION IN MALTA

1. 2005 – 300ml fertilised eggs collected
2. 2006 – Amberjack Project started
3. 2007 – 10,000 juveniles produced
4. 2008 – Larval rearing trials
5. 2010 – 14,000 juveniles produced
6. 2012 – 80,000 juveniles produced - Hatchery size limitation
7. 2014 – Testing feeds in cages



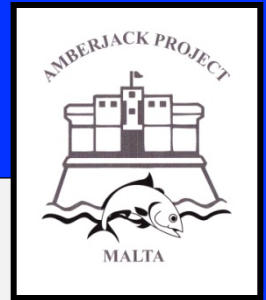
# 1. BROODSTOCK MANAGEMENT



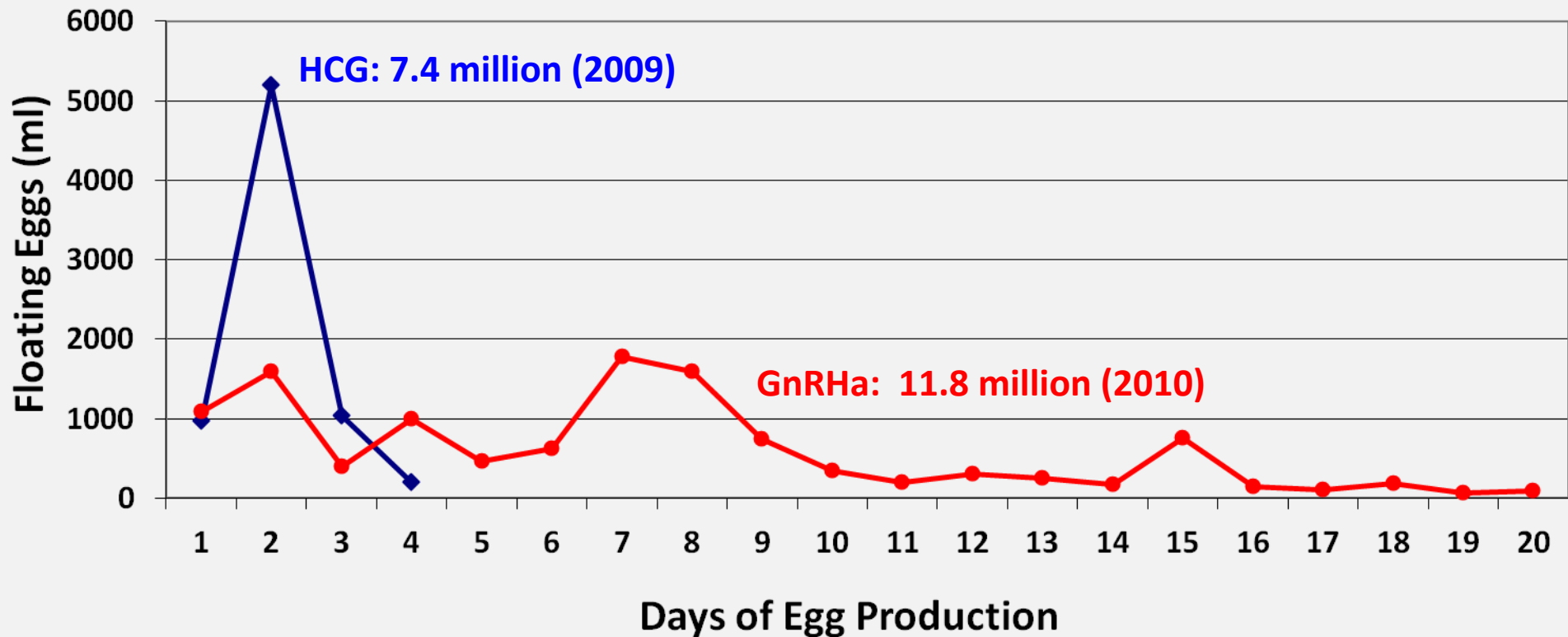
**FEEDING ALL YEAR ROUND**



# 1. BROODSTOCK MANAGEMENT



HCG vs GnRH $\alpha$  Induction Methods



**6M : 6F SELECTED FOR SPAWNING**  
**Av BW 16 – 24kg**

## 2. EGG COLLECTION 2005 / 2006





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Hand net

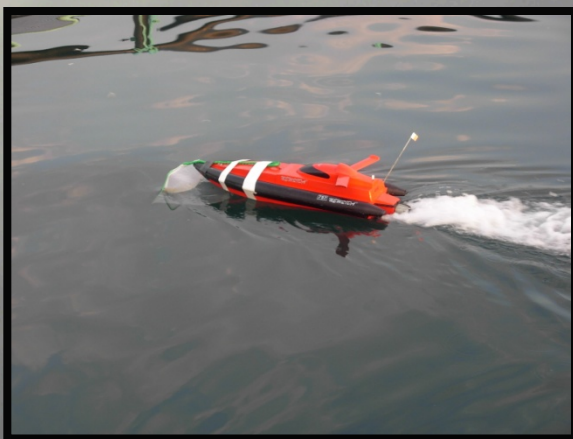
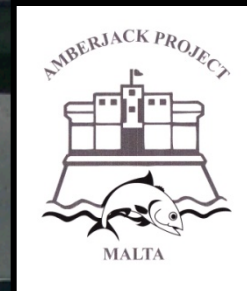


Temperature control





## 2. EGG COLLECTION 2007 / 2008



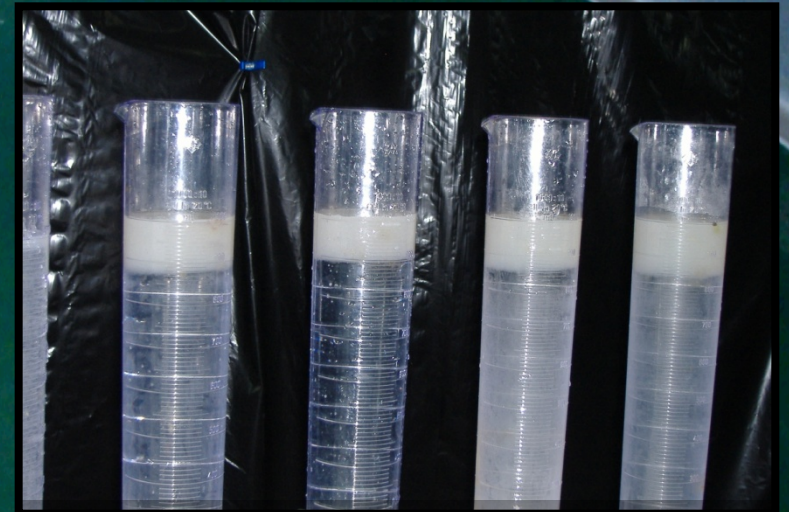
Remote Control Boat  
Egg Collector



## 2. EGG COLLECTION 2008 - 2014



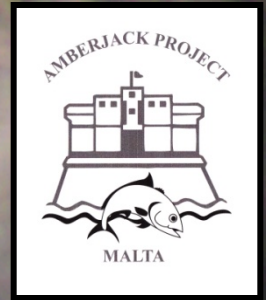
Egg Collection



Egg Volume Measurement



## 2. EGG COLLECTION 2008 - 2014



2006 – 2014

HCG

GnRHa

**Buoyancy Rate:**

85.6%

82.4%

**Fertilization Rate:**

77.5%

96.7%

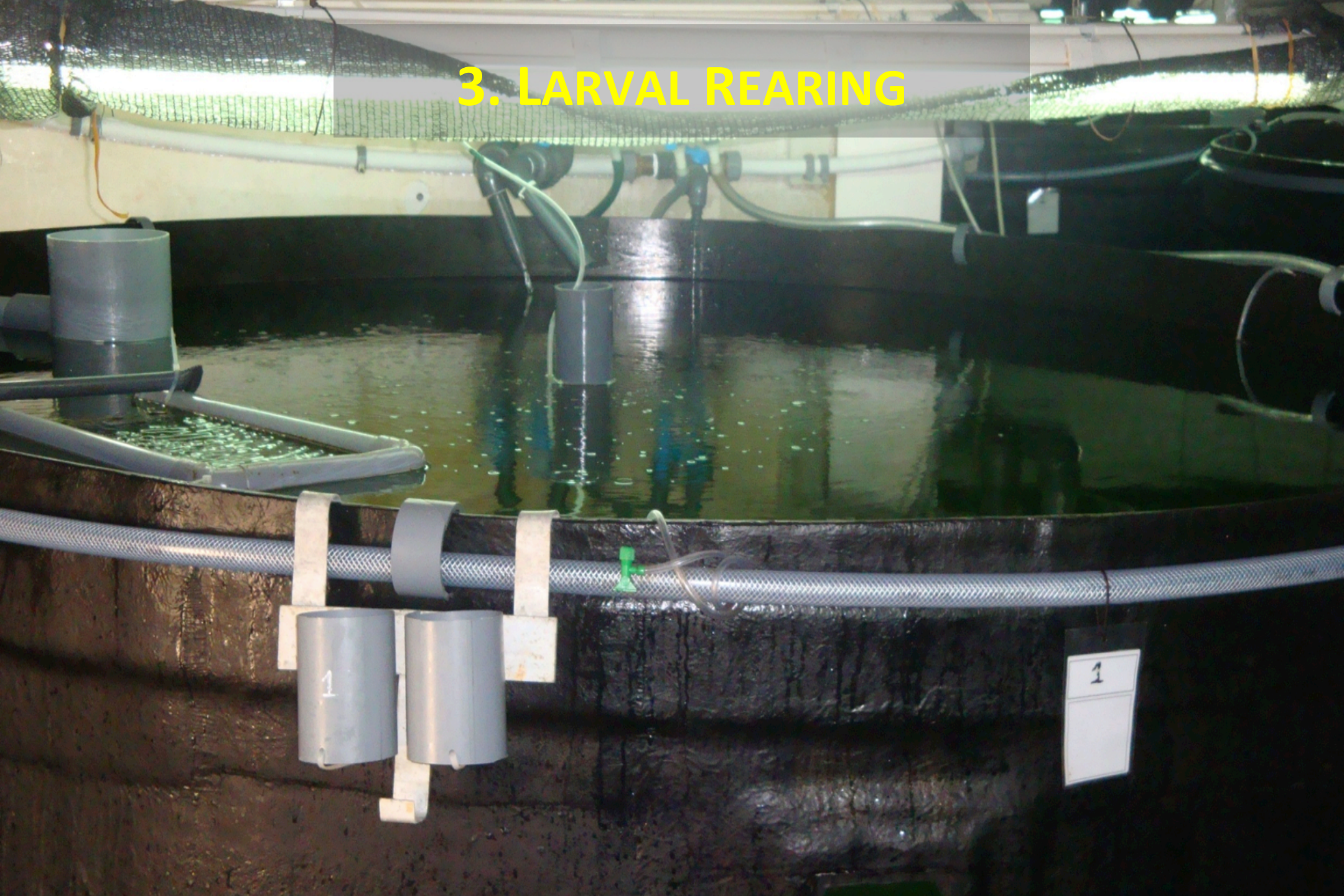
**Hatching Rate:**

>90%

>90%

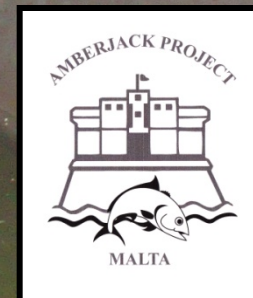


### 3. LARVAL REARING





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Grading by beaker

Dry Feed

*Artemia*

Rotifers

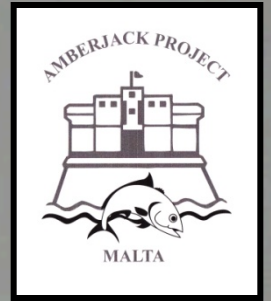
Algae

0 3 11 15 25 40 45

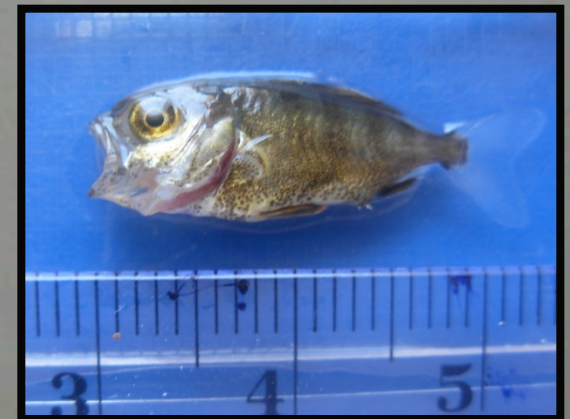
Age of Larvae (DPH)



# 3. LARVAL REARING



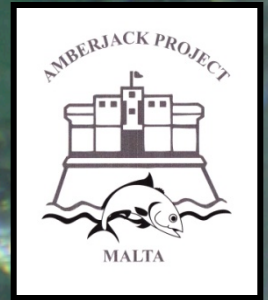
13 DPH



33 DPH



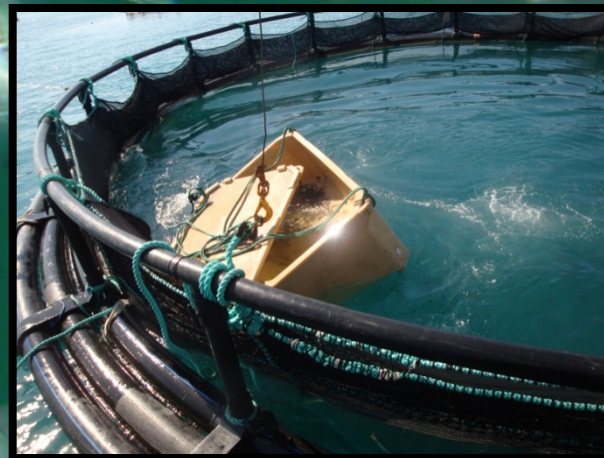
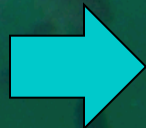
# AMBERJACK TRANSPORTATION



Numbers estimated



Transport truck

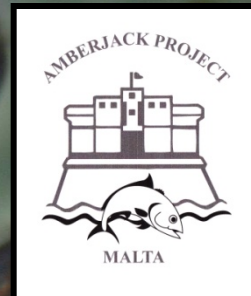


Released into cages





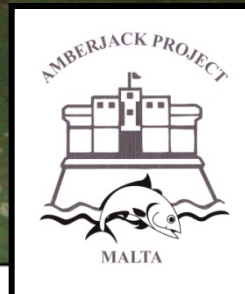
## 4. JUVENILE PRODUCTION



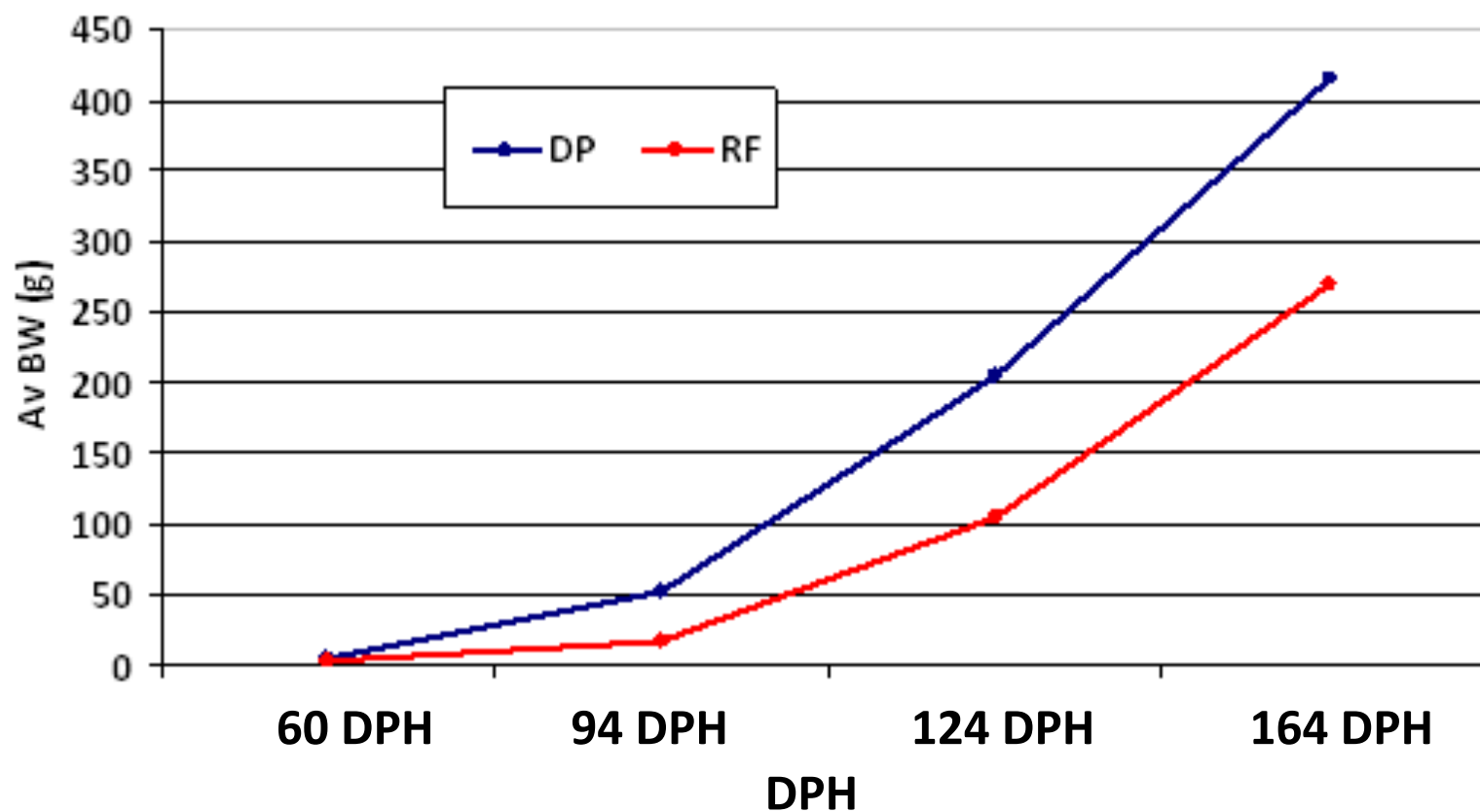
10,000 Juveniles produced in 2007  
14,000 Juveniles produced in 2010  
80,000 juveniles produced in 2012



# 4. JUVENILE PRODUCTION



### Amberjack Feed Trial in Cages 2008





# 5. ONGROWING TO MARKET SIZE



Japanese Restaurants



Whole Fish



Processing / Steaks



## 6. BOTTLENECKS



**Cannibalism**



**Gill fluke**  
*(Zeuxapta seriolae)*



# AMBERJACK PROJECT 2014 and beyond...



## 1. FUTURE PROSPECTS

- Close the cycle
- Improve buoyancy rate of eggs
- Confirmation of larval rearing protocol
- Genetic selection

## 2. BOTTLENECKS

- On-growing in cages
- Gill fluke (*Zeuxapta seriolae*)
- Larger marine hatchery in Malta
- Lack of controlled scientific trials



**THANK YOU  
FOR YOUR ATTENTION**

