INSTITUTE OF MARINE RESEARCH

Control of light conditions affects feeding regime and enables successful eye migration in halibut

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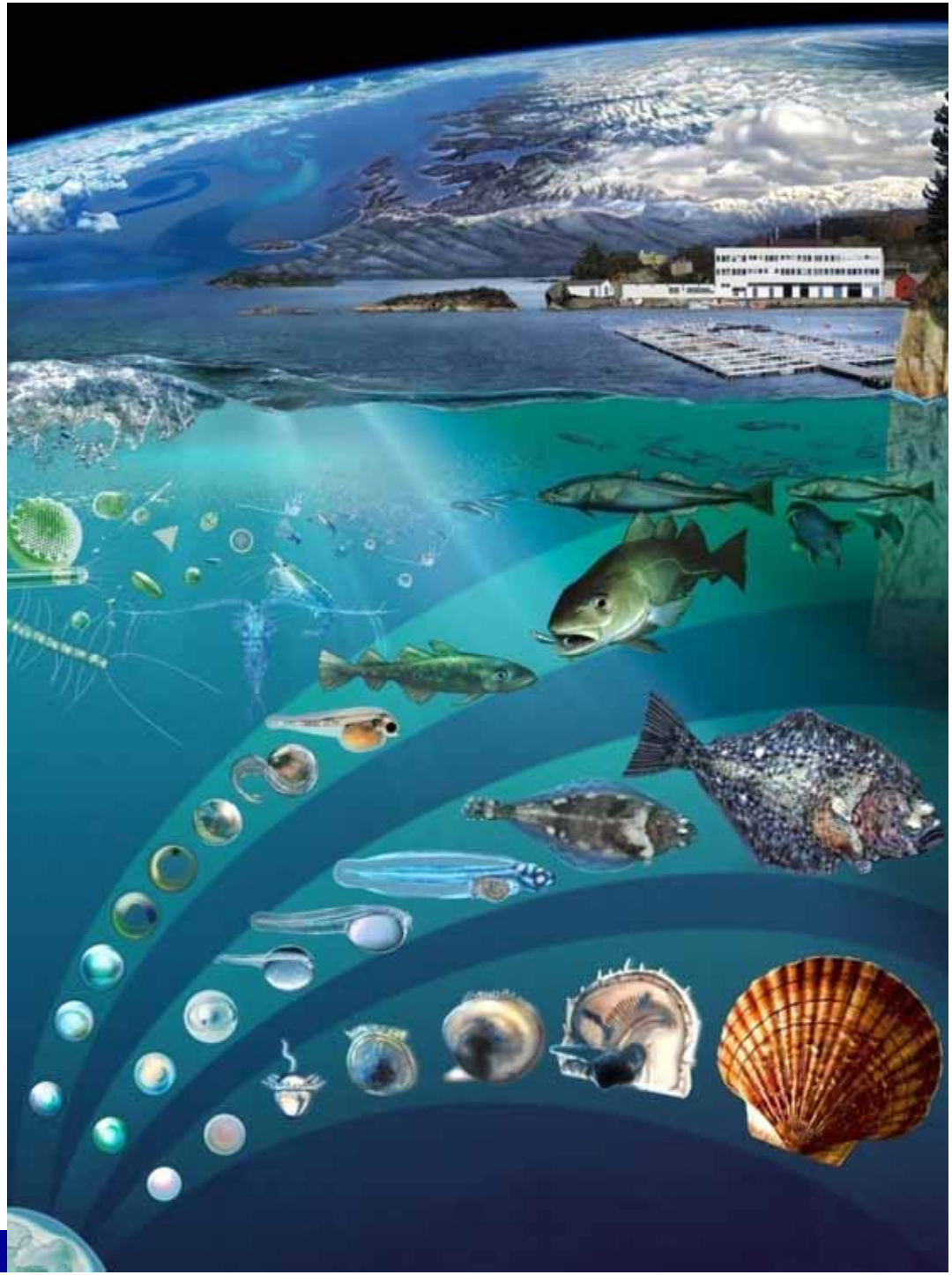
Larvi 2009

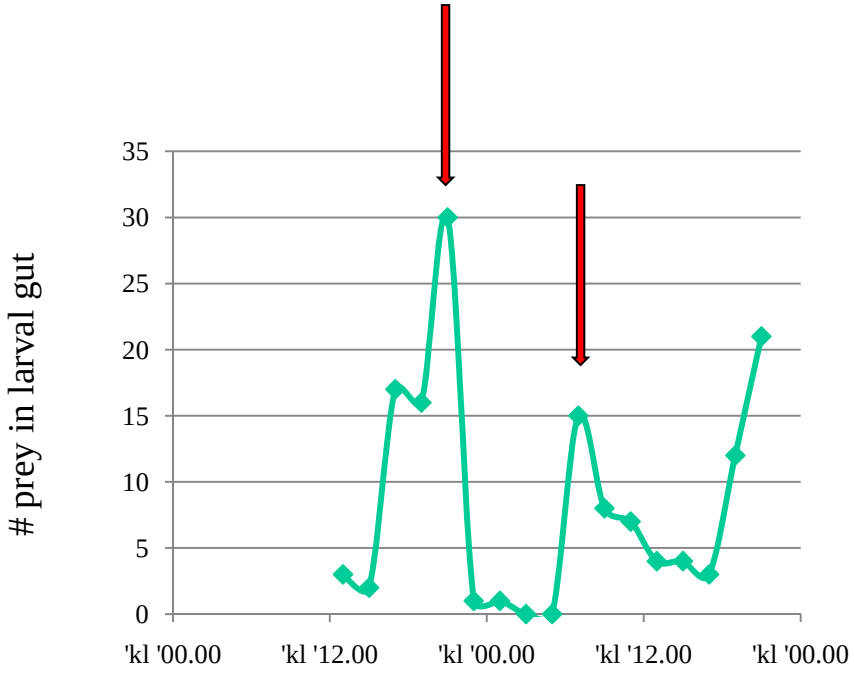
BERGEN, NORWAY

Larval feeding in nature

Larval feeding under intensive rearing conditions



Dusk and dawn feeding

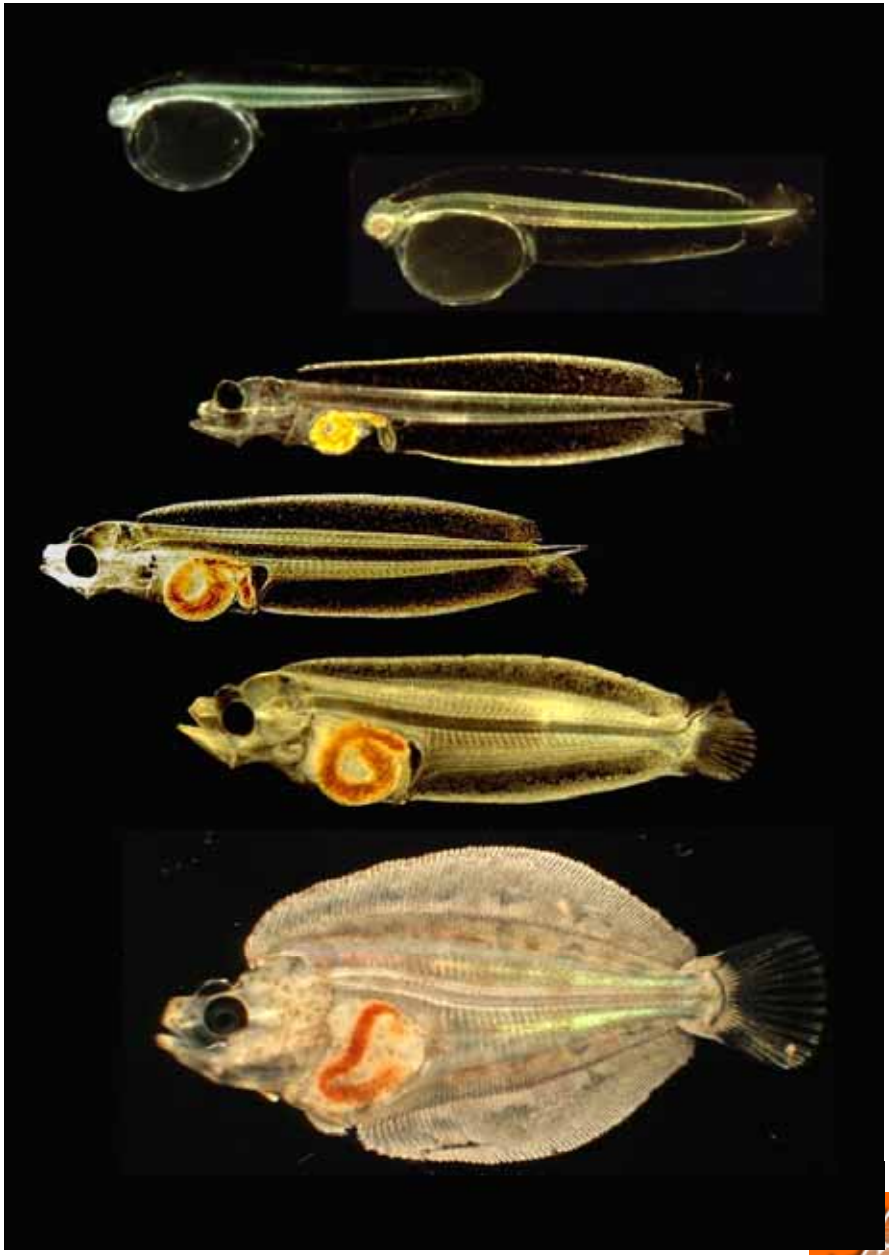


Harboe & Huse 1992

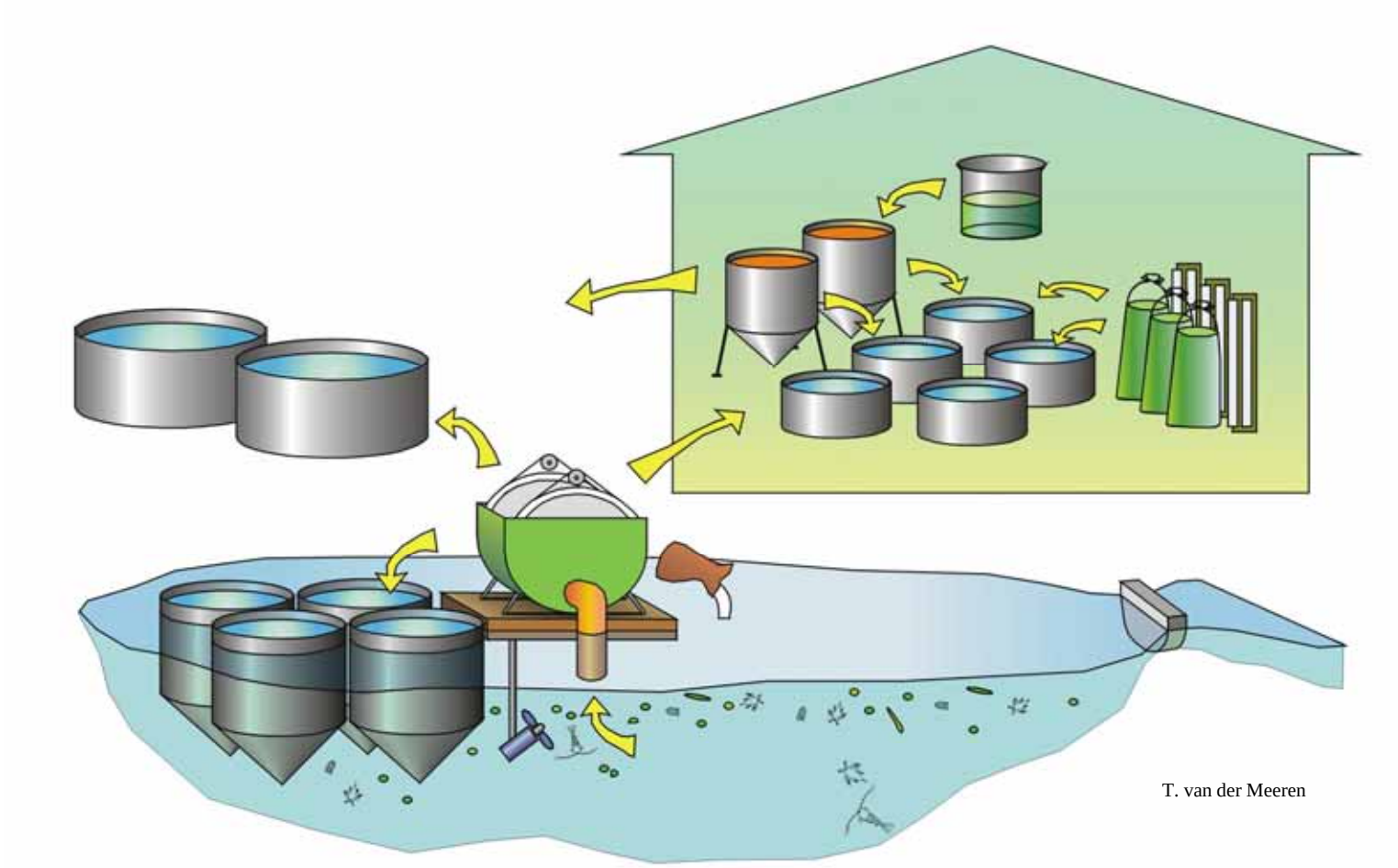
Improved rearing conditions

Improved prey capturing

Changes in gut transit time
(retention time of food particles)

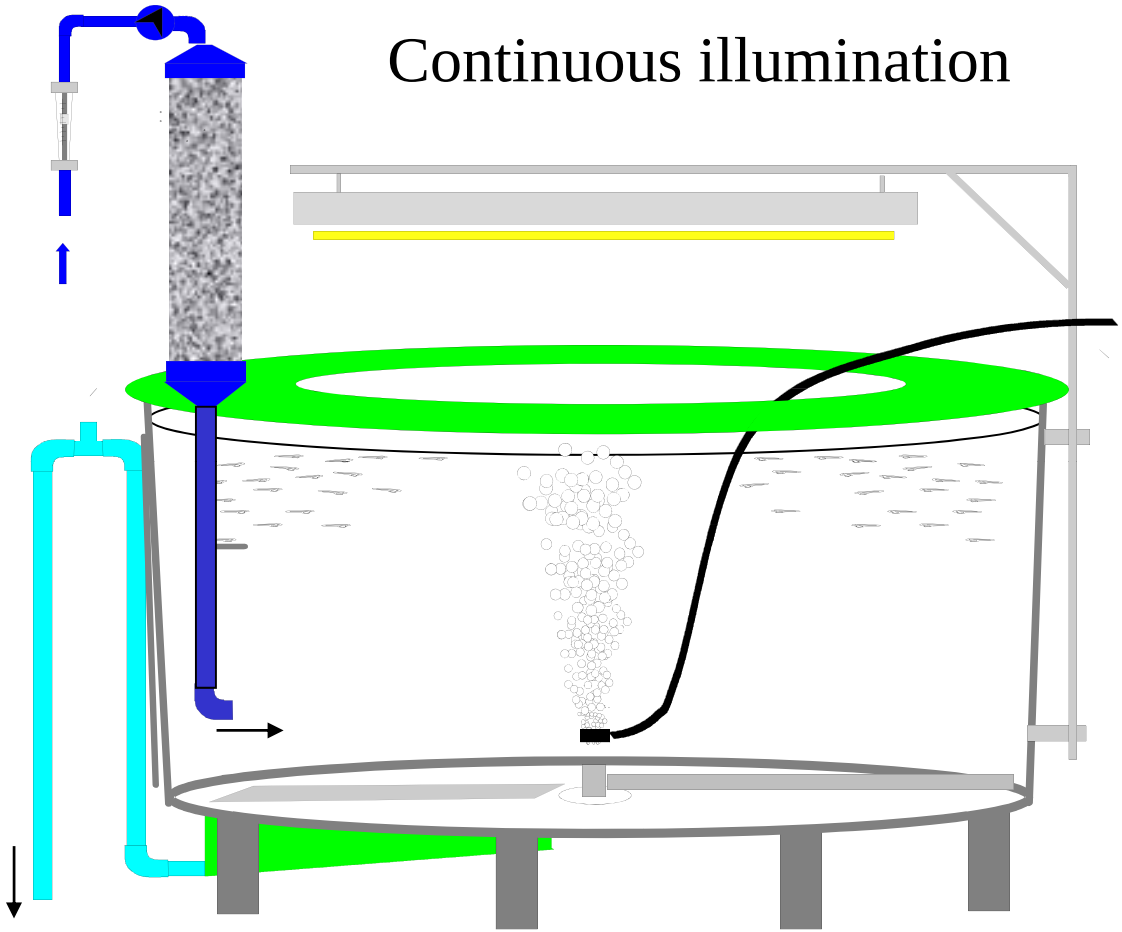


Method development



T. van der Meeren

Rearing conditions



Turbidity

Photo: IMR

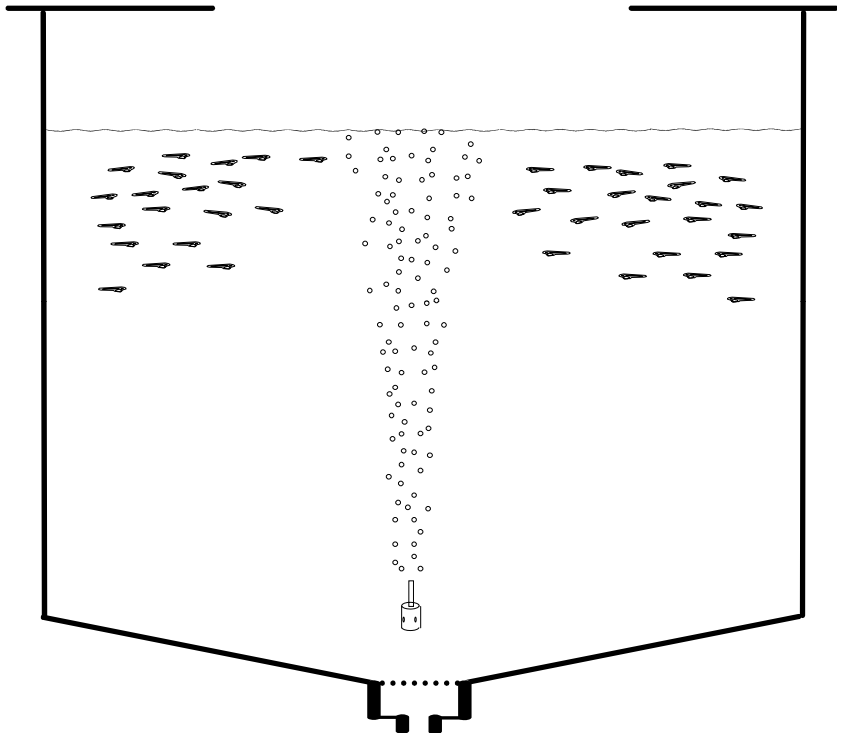
Algae paste

Photo: IMR

Clay

Photo: IMR

Turbulence

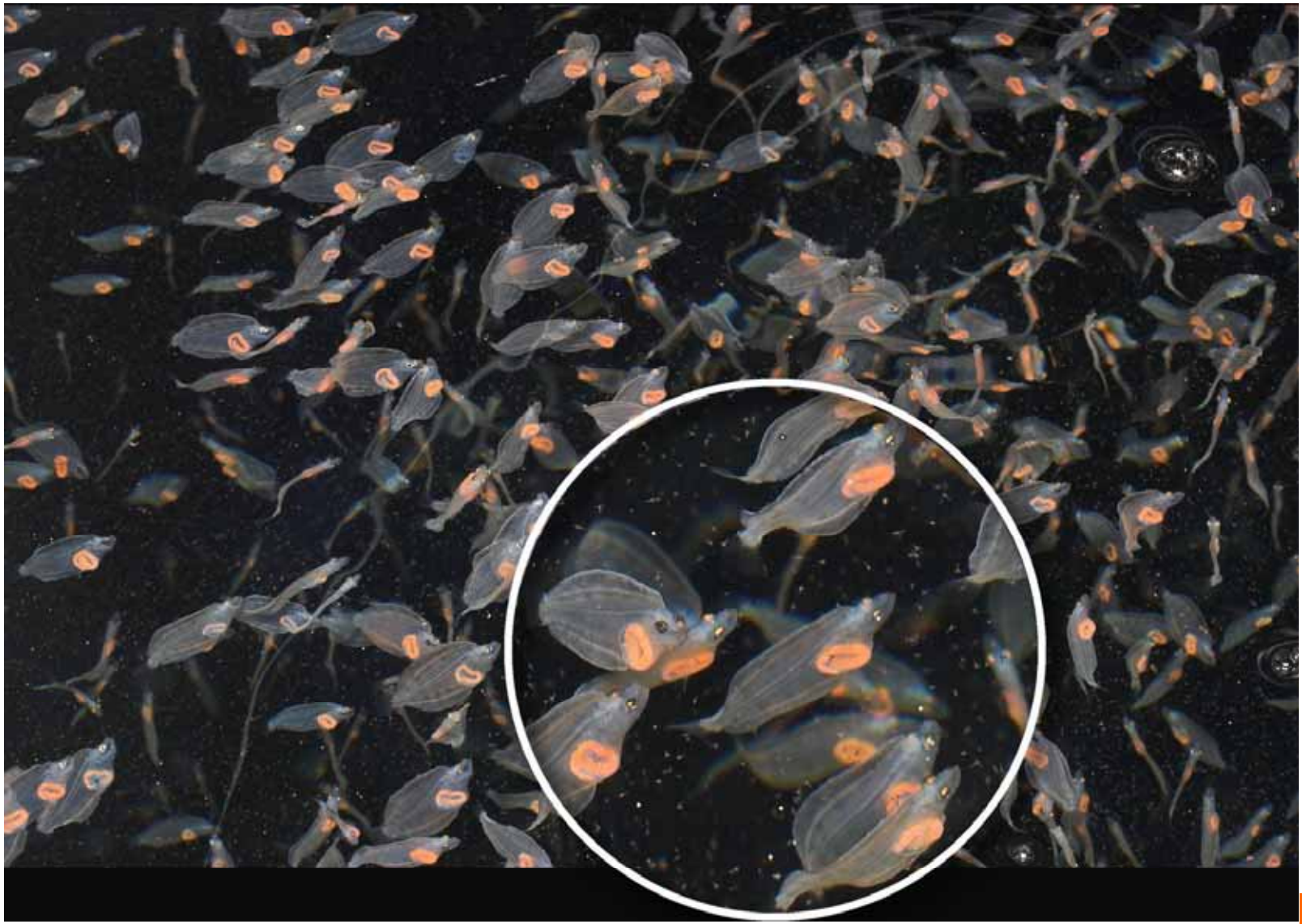


Harboe *et al*., 1998.

Rheotactic behaviour

Transit time

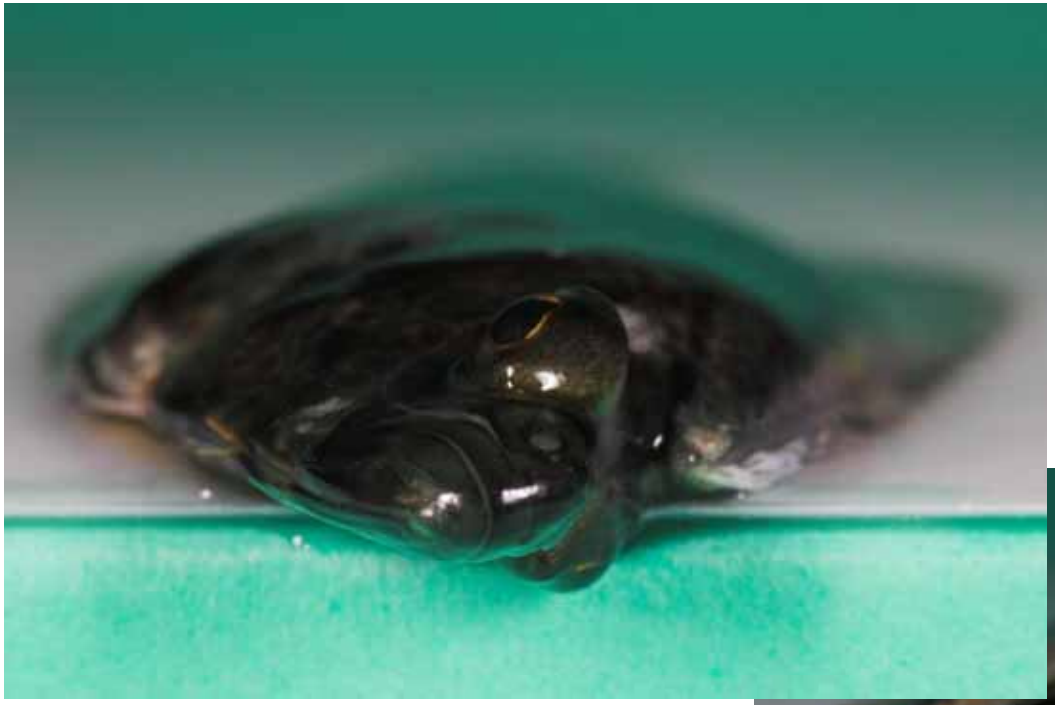
Transit time



Atlantic halibut, success factors

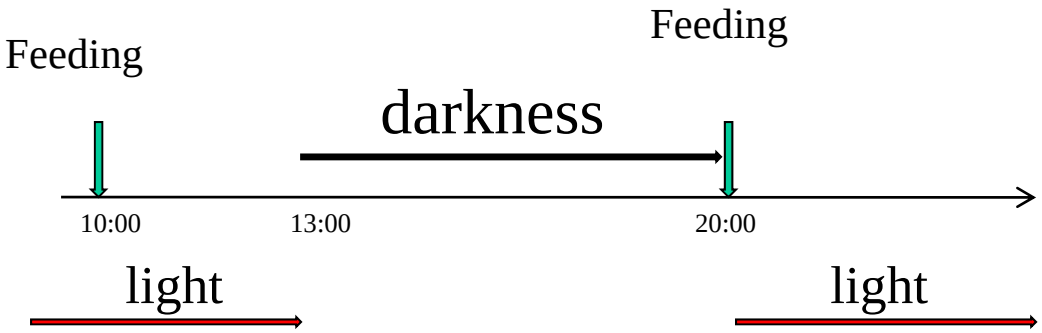
Survival, pigmentation and eye migration

Eye migration



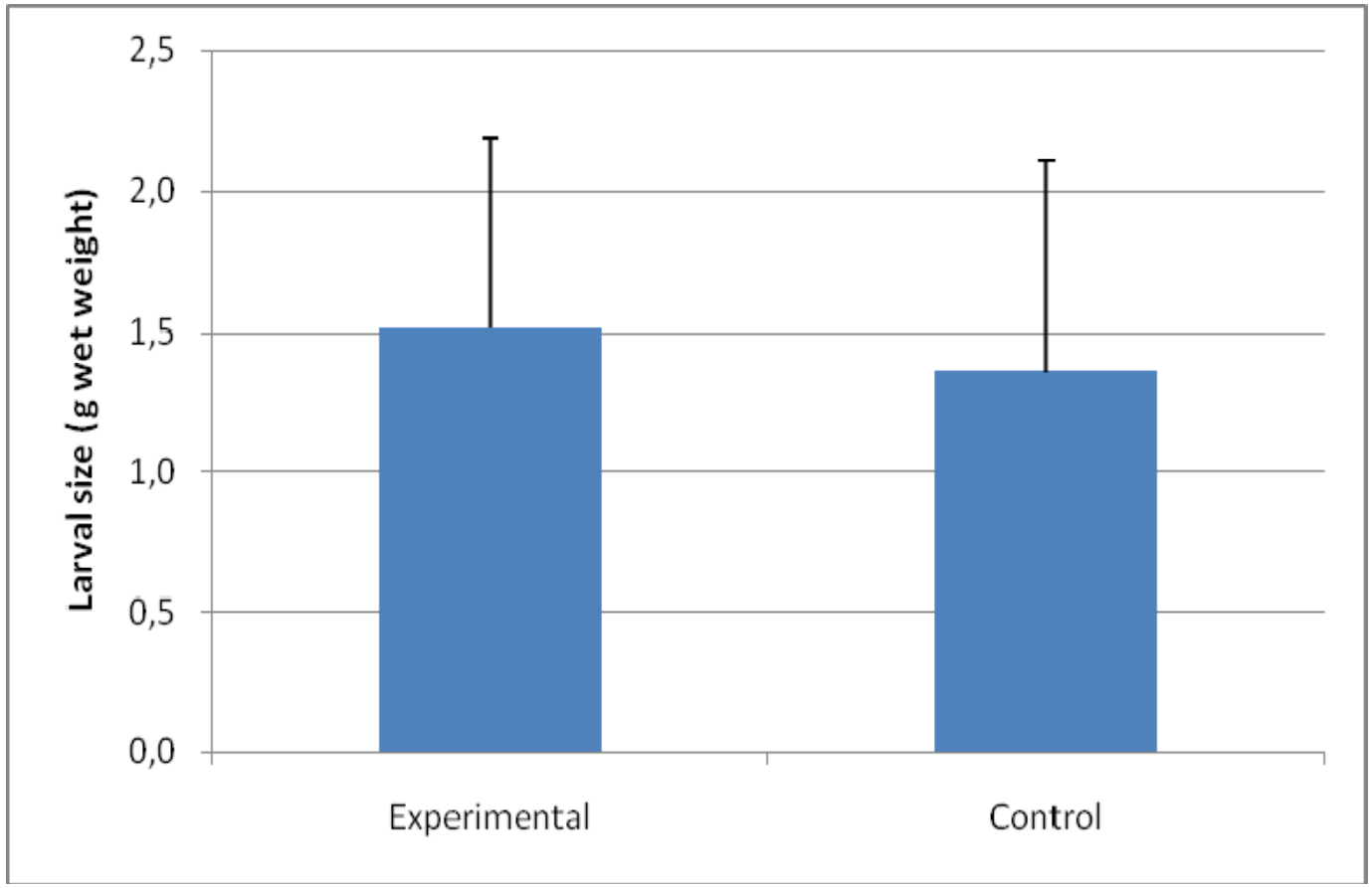
How to control feeding in larval tanks fed live prey

- Tank dynamics – larval density and flowrate.
- Removal of prey by filtration.
- Use of light and darkness.

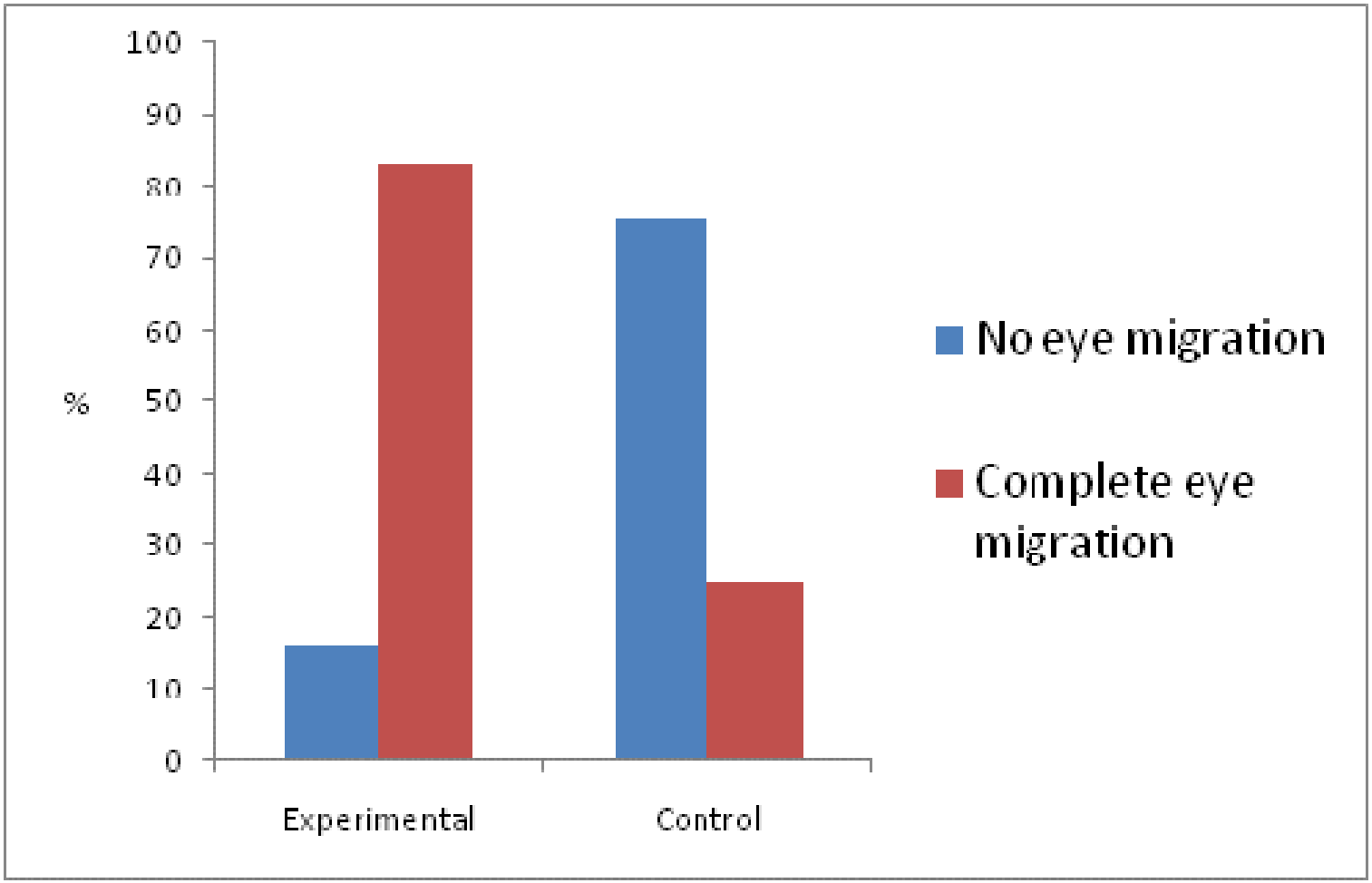

Feeding
Feeding
darkness
10:00
13:00
20:00
light
light


3

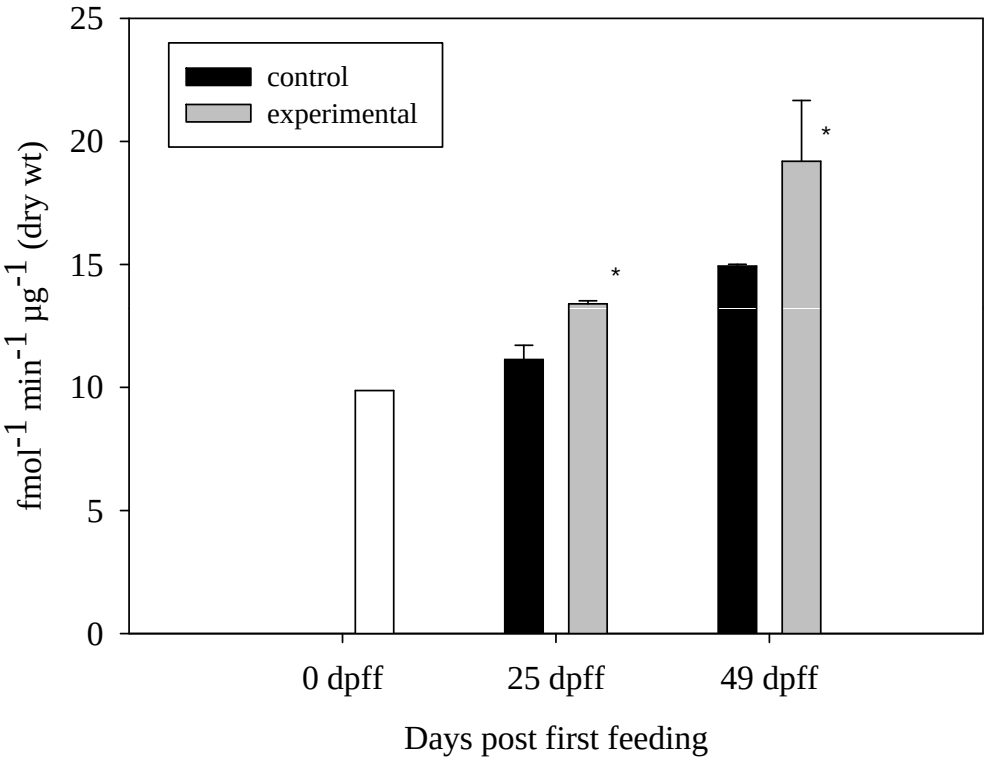
Growth


Larval size (g wet weight)
2,5
2,0
1,5
1,0
0,5
0,0
Experimental
Control

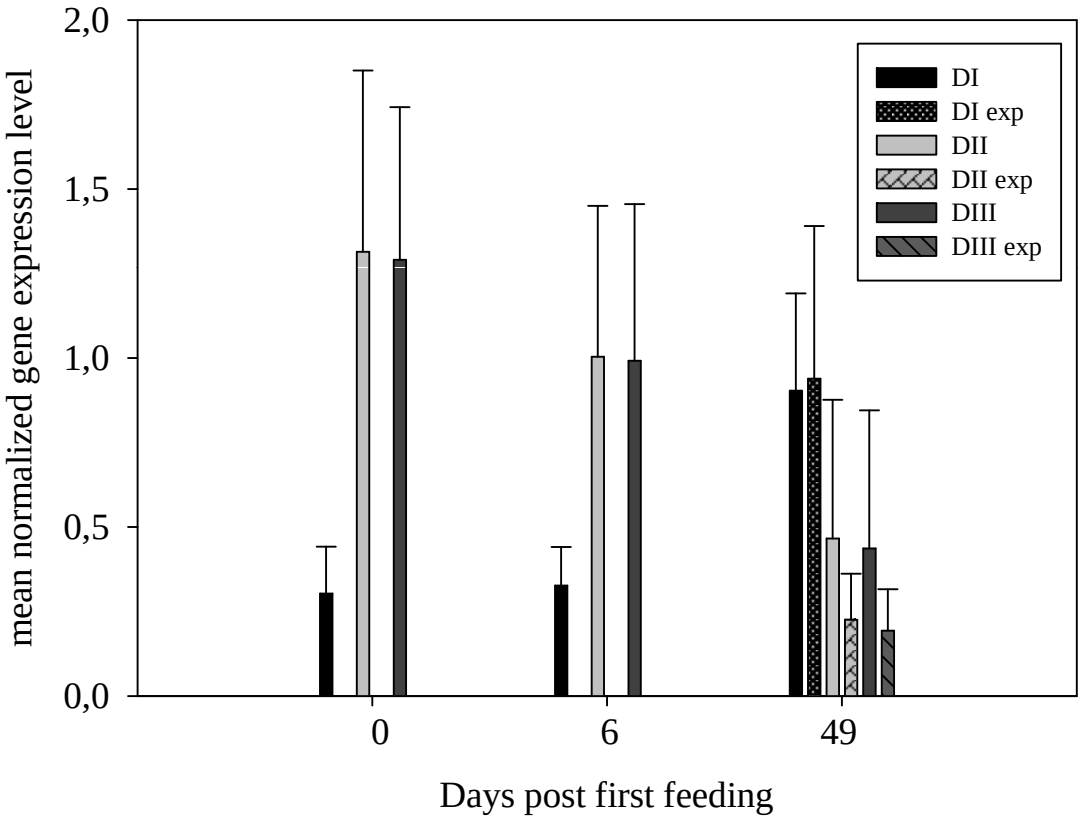
Eye migration



ORD activity



Deiodinase expression



Future work:

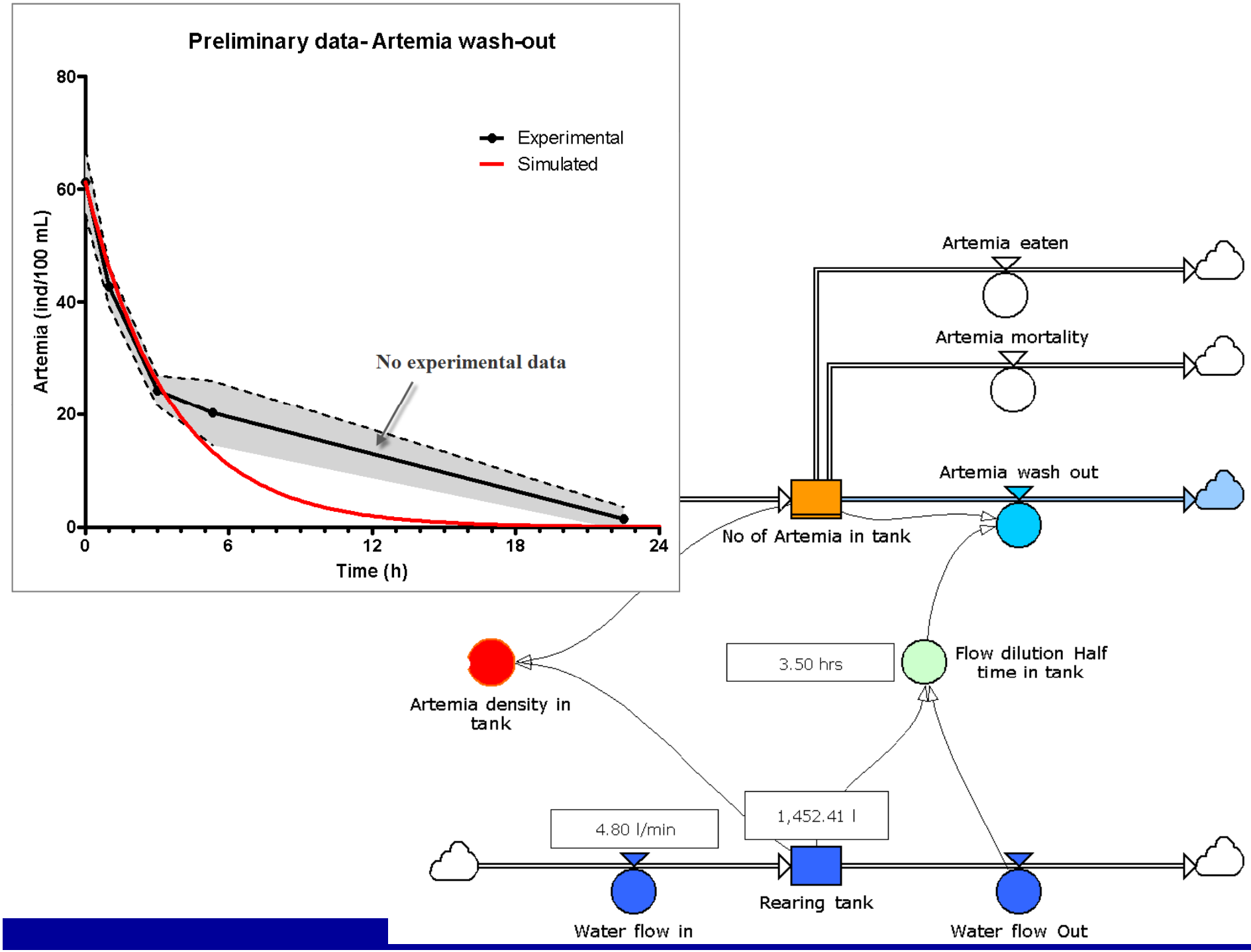
Tank dynamics

Model based on retention time of the prey in the tank

- Retention time:
  - 1 Water flow
  - 2 Feeding intake of the larvae and
  - 3 ”Natural” death rate of the prey

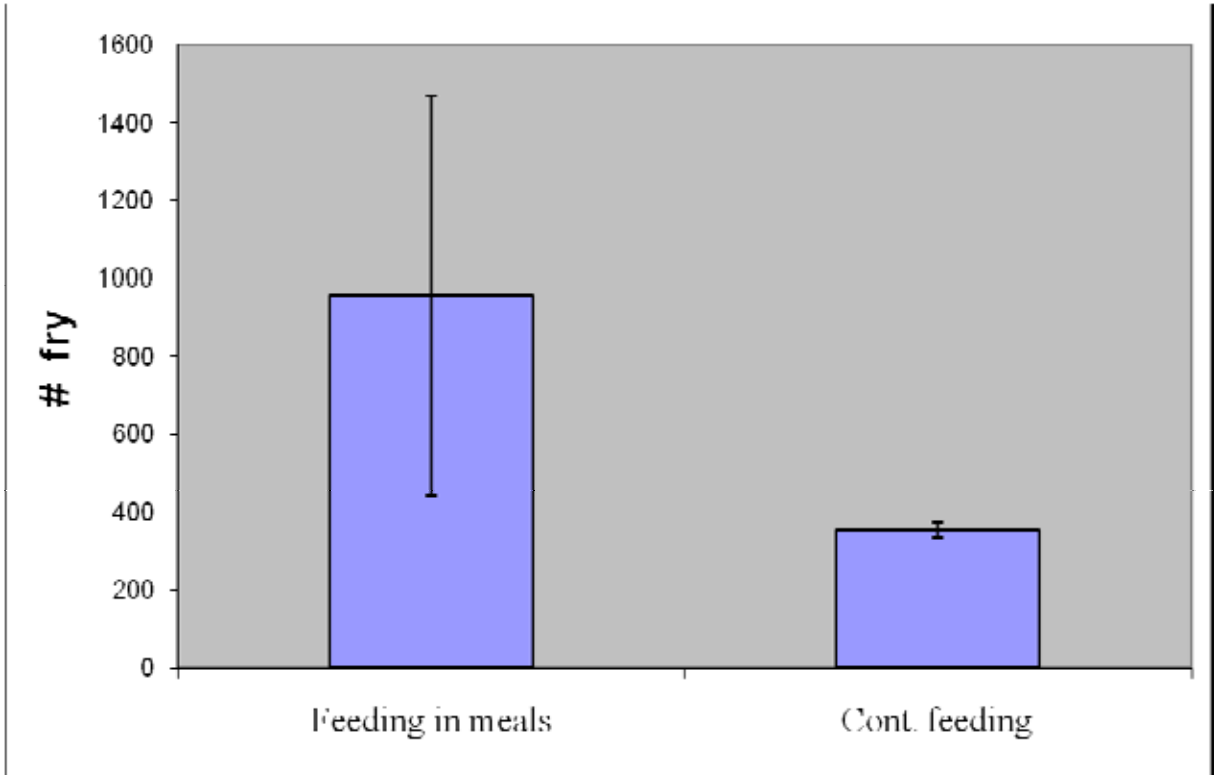
- Gut filling and evacuation time

- Effect of light / darkness


Preliminary data- Artemia wash-out
Artemia (ind/100 mL)
80
60
40
20
0
0
6
12
18
24
Time (h)
Experimental
Simulated
No experimental data
Artemia eaten
Artemia mortality
Artemia wash out
No of Artemia in tank
Artemia density in tank
3.50 hrs
Flow dilution Half time in tank
4.80 l/min
1,452.41 l
Rearing tank
Water flow in
Water flow Out

Survival:

Feeding regimes



Harboe *et al.*, in prep.