Developing Yellow Tail Kingfish Farming in Land-Based Closed-Containment Systems

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Content

- Global status of Seriola farming
- Rationale for YTK in RAS
- Development of the project, Lab>Pilot>Commercial
- System lay-out
- Design parameters, water quality
- Projected cost structure; competitive power
- Marketing & Sales
- Research & Prospects

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yellowtail kingfish, *Seriola lalandi*

Global status of Seriola farming

- 9 species, 4 in aquaculture
- 130.000 tonnes production
- 80% Jap. amberjack

English name	Scientific name	Distribution
Japanese amberjack	*Seriola quinqueradiata*	Northwest Pacific
Yellowtail amberjack	*Seriola lalandi*	Circumglobal sub-tropics
Longfin yellowtail	*Seriola rivoliana*	Circumglobal Indo-West
Greater amberjack	*Seriola dumerili*	Circumglobal Indo-West
Lesser amberjack	*Seriola fasciata*	Western Atlantic
Guinean amberjack	*Seriola carpenteri*	
Samson fish	*Seriola hippos*	
Fortune jack	*Seriola peruana*	
Banded rudderfish	*Seriola zonata*	

Fish Base

- 6 sites reproduction S. lalandi

Rationale for YTK in RAS

- Demand fresh product sushi/sashimi/carpaccio
- Demand local product, certified and sustainable
- Alternative for Tuna
- Technology RAS developed
- Fingerling production developed

Development of the project

- Start: project Fork to Farm 2009: lab-scale IMARES
  - Water quality criteria
  - Performance data
- Pilot scale at farm with fish from IMARES
- Start Silt 2011

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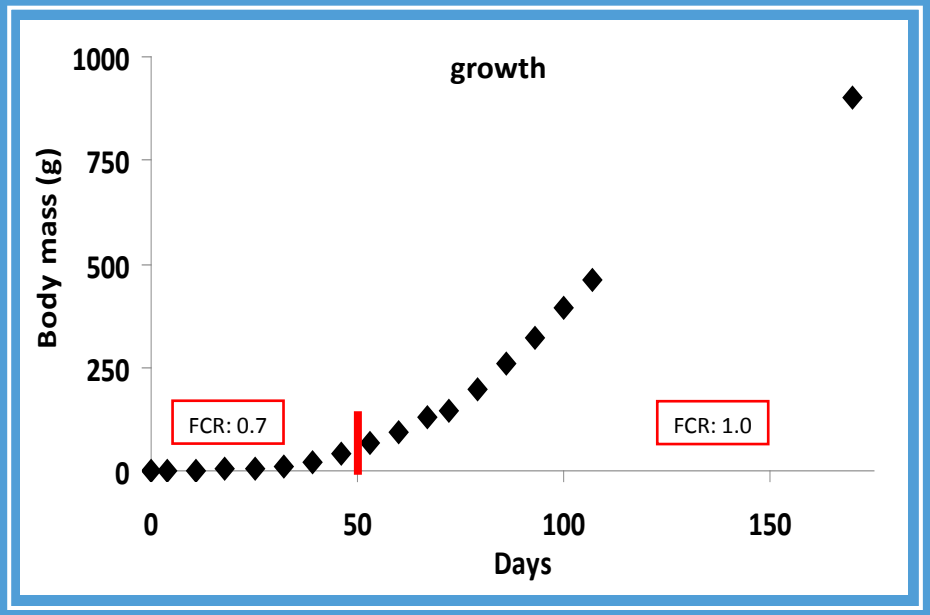
AquAVlan

Lab-scale trials YTK

- Replicated RAS
- Very fast growth rate



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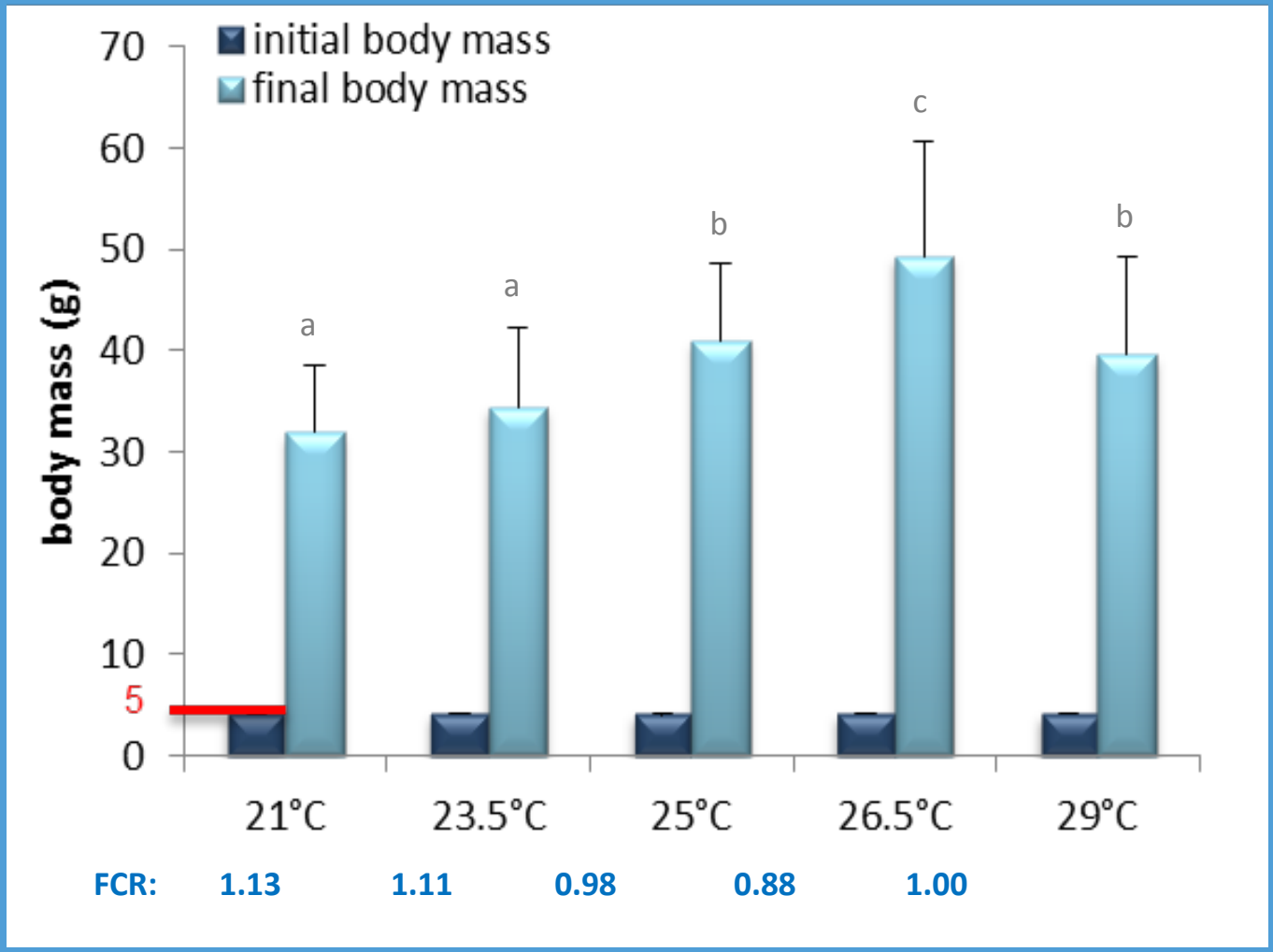
Temperature



Abbink et al.(2011). Aquaculture 330-33: p 130-135.

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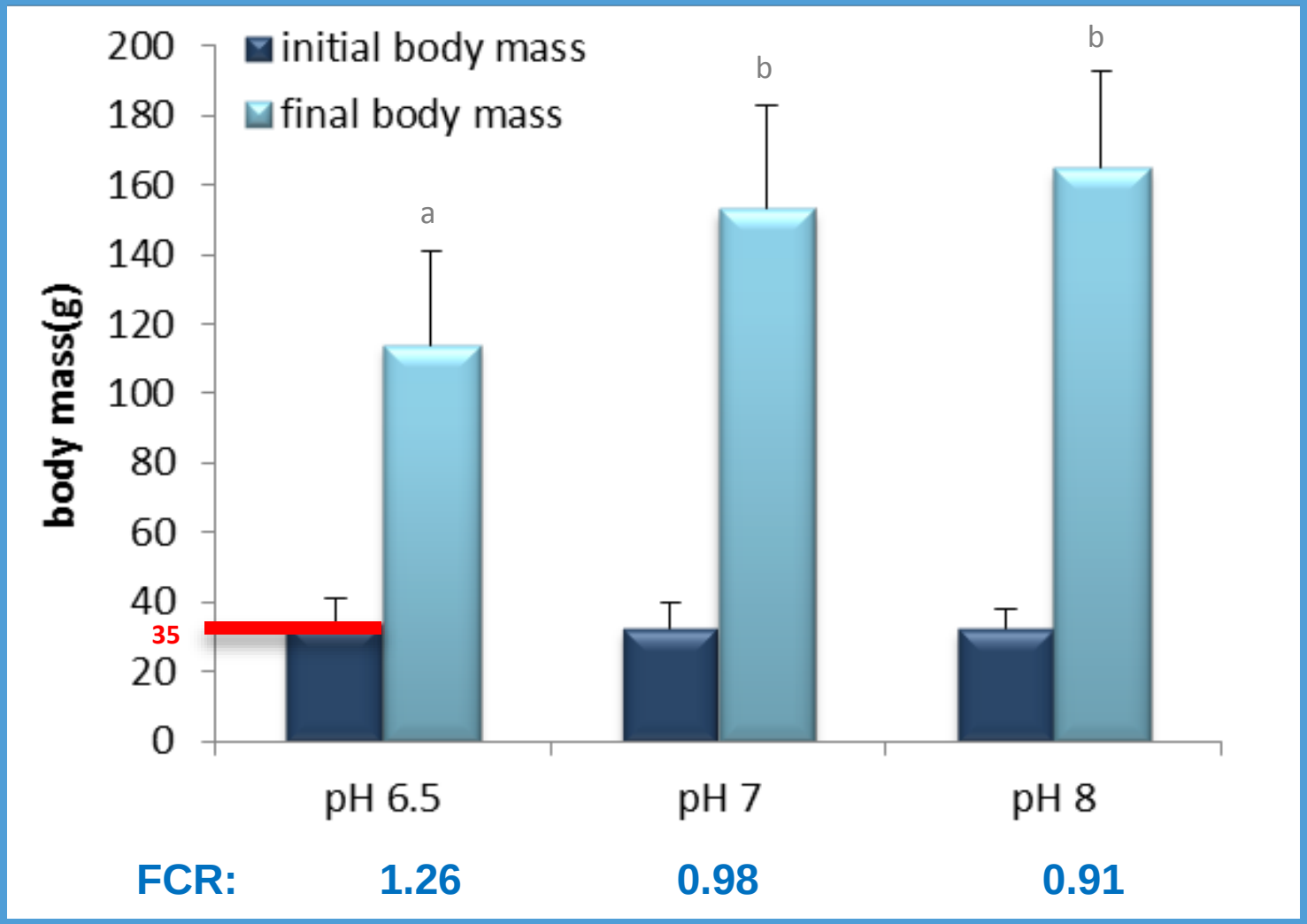
pH



FCR:	**1.26**	**0.98**	**0.91**

Abbink et al.(2011). Aquaculture 330-33: p 130-135.

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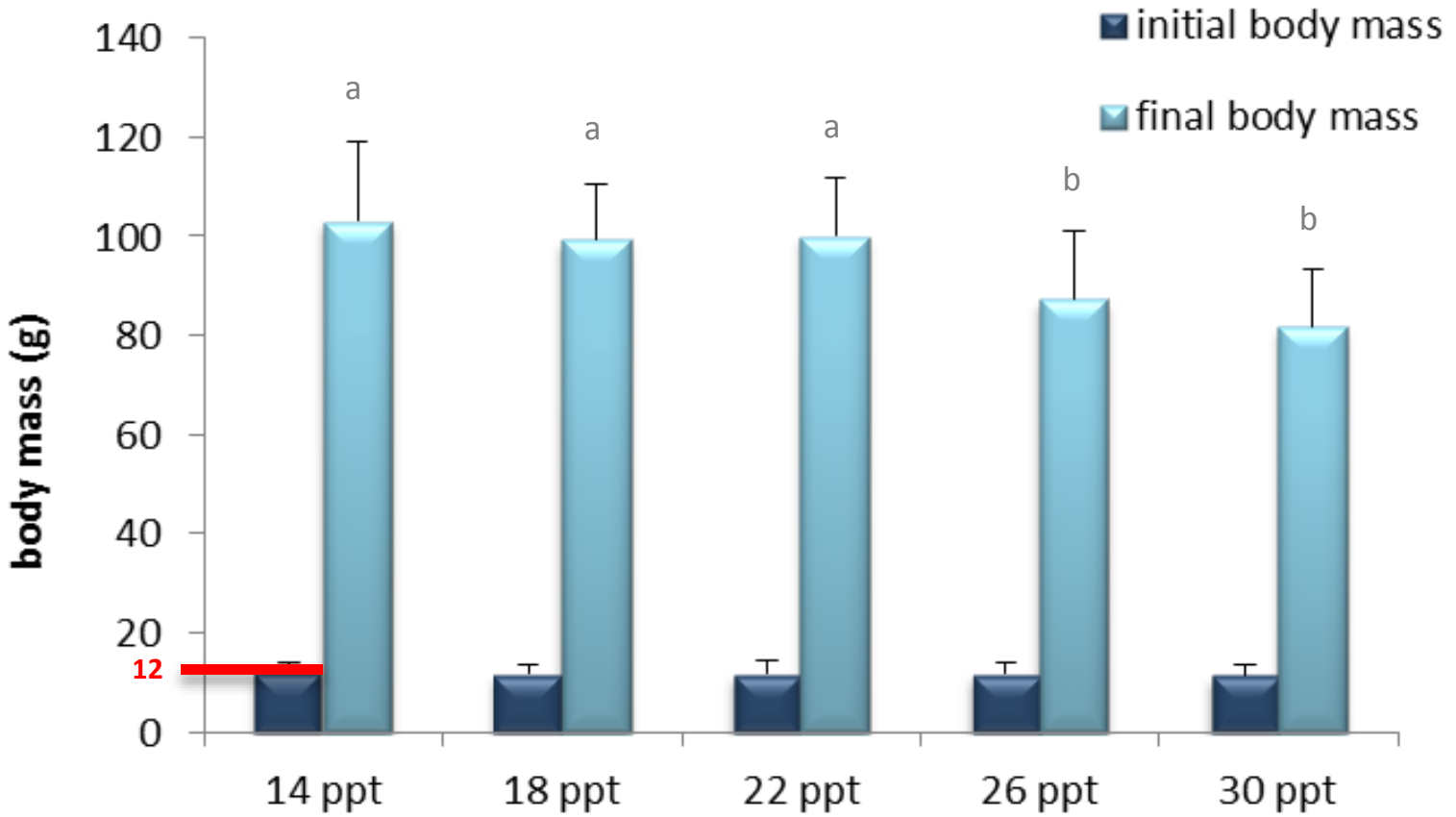
Salinity



FCR: **0.77** **0.76** **0.77** **0.81** **0.82**

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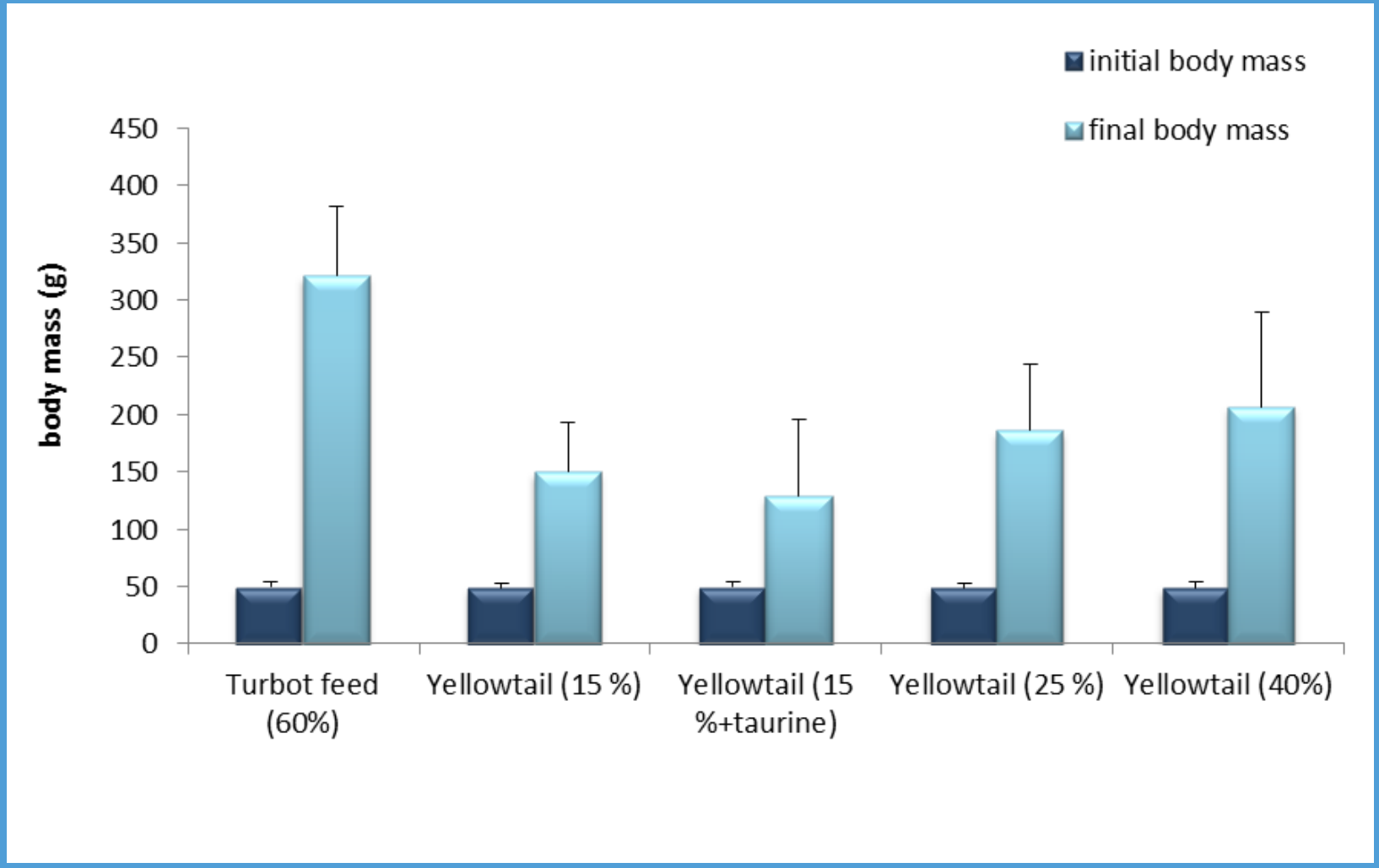
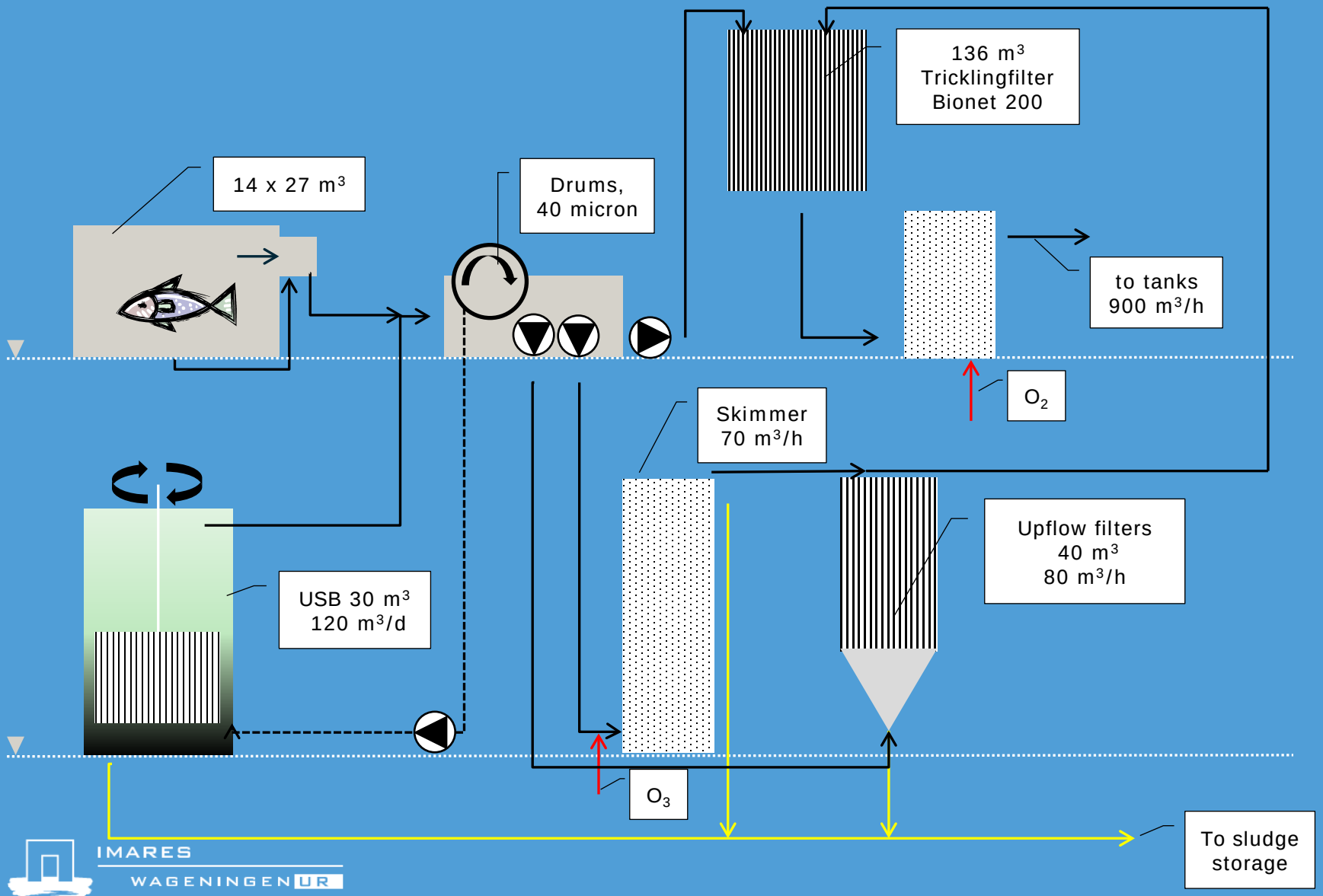
Feed


initial body mass
final body mass
body mass (g)
450
400
350
300
250
200
150
100
50
0
Turbot feed (60%)
Yellowtail (15 %)
Yellowtail (15 %+taurine)
Yellowtail (25 %)
Yellowtail (40%)

Flow scheme Silt bv



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System performance

- Design capacity 100 T/y
- Max feed load realised: 450 kg/d = OK

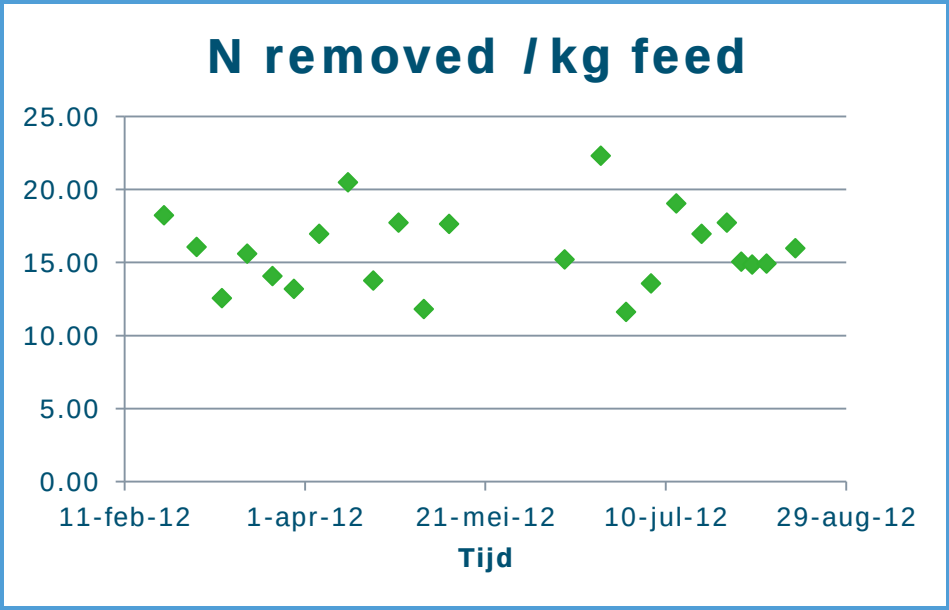
- Water use: 1000 l/kg feed (borehole 25 ppt)
- Temperature: 21-24
- TAN: 1.3 ± 0.8
- NO_2-N: 0.4 ± 0.2
- NO_3-N: 55.3 ± 11.1
- pH>7.2
- CO_2 < 10 mg/l

Denitrification: Upflow Sludge Blanket (USB)

USB

- Low C/N ratio
  - 70 g COD/kg feed
  - 66 g N/kg feed

C/N ratio 1.1



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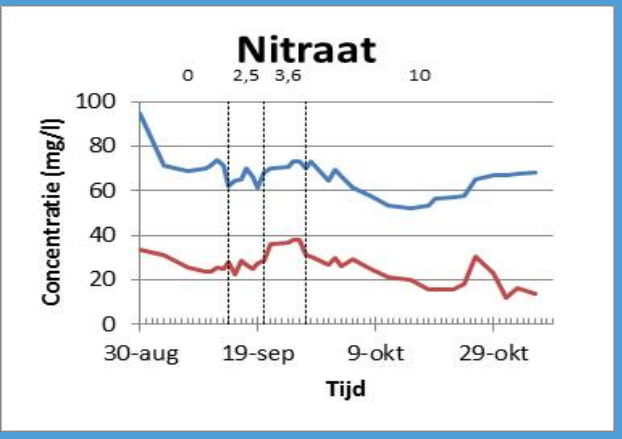
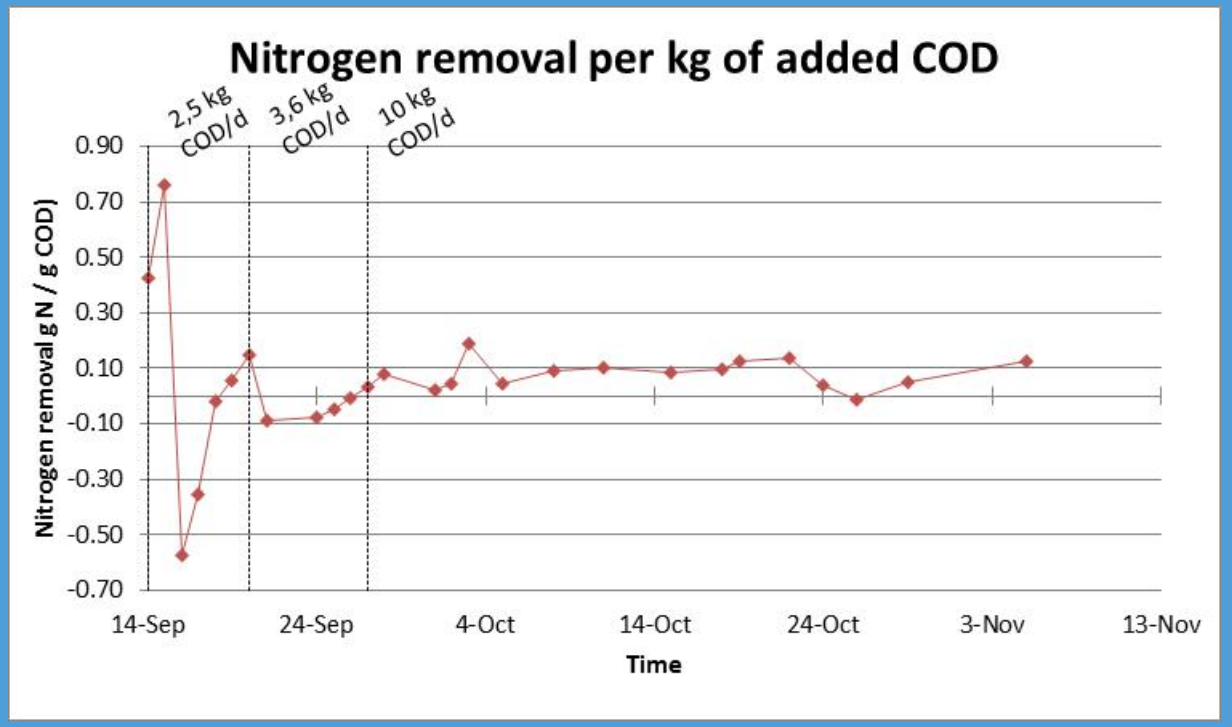
Sludge+external COD





- COD addition not effective
- Separate reactor for external COD

Denitrification in USB:

- Low volumetric capacity; 166 g N/m3
- Sludge removal?

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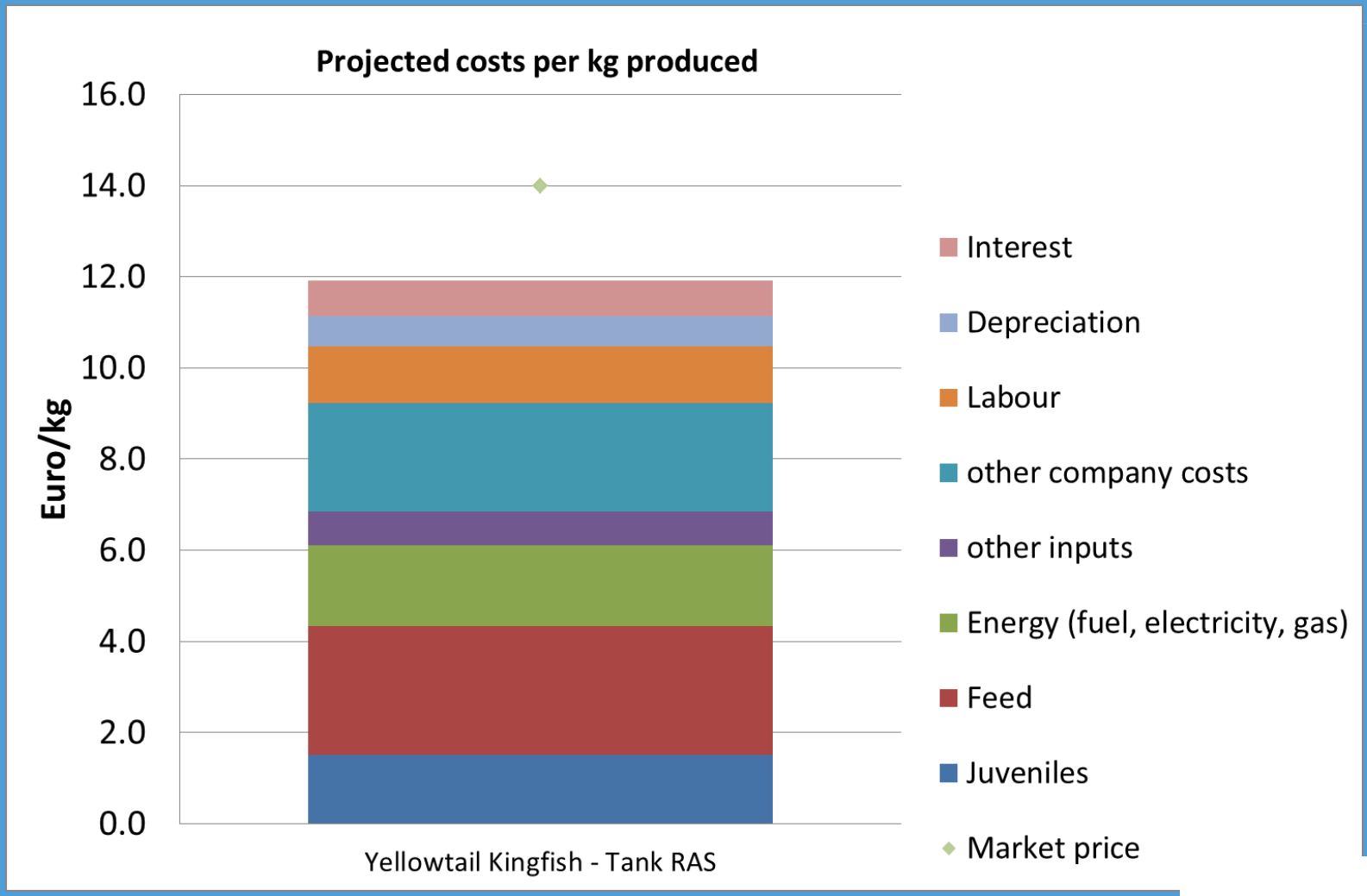
Economy: key numbers

- 100 T/Y, not reached
- Desk study Aquavlan

- 1-2500 grams in 1 year
- 250 kg/m^3/y
- FCR 1.6

- Investment 6,70 €/kg production
- IRR 22%

Projected cost structure



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AquAVlan

Competitive power RAS vs Cages

- RAS more expensive
- RAS better certifiable
- RAS for ‘local’ production
- ¥ vs €/$

Marketing & Sales

Food4You festival

Marketing & Sales

- Well received product
- Applications: sushi/sashimi
- Western-Europe, fresh round

Depuration!

- Marine RAS have off-flavour
  - Turbot
  - Kingfish
- For YTK 2 days in make-up water
- Awareness with all producers!

Research & Prospects

- Reproduction/breeding
- On-growing diets
  - Quality
  - Reduction fish meal
- Welfare,
  - slaughter methods,
  - water quality

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Thank you for your attention.

Questions?

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