Evaluatie van de kwaliteit van tarbotpootvis op het herstockeringssucces in de Noordzee

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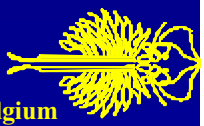
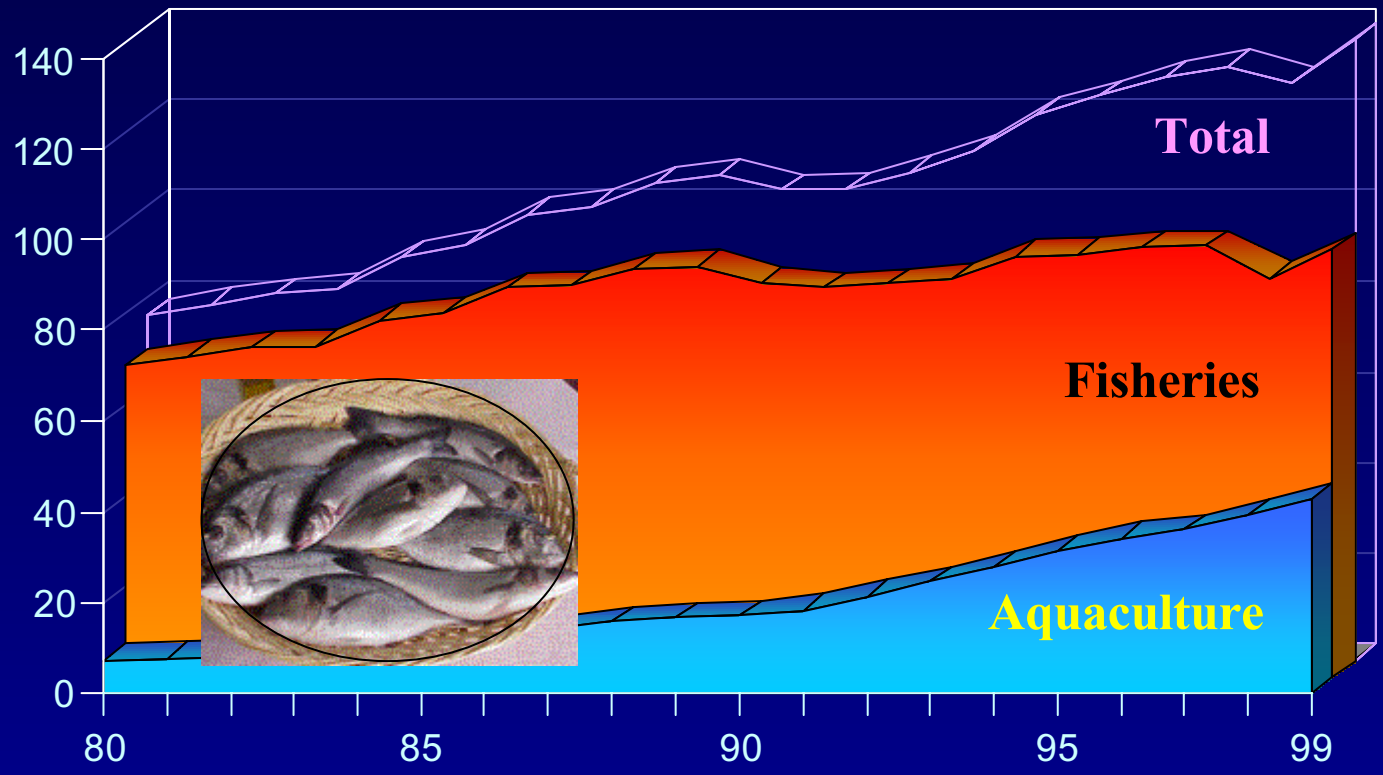


World fisheries & aquaculture production



FAO, 2001

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Production de Bars & Daurades en Europe

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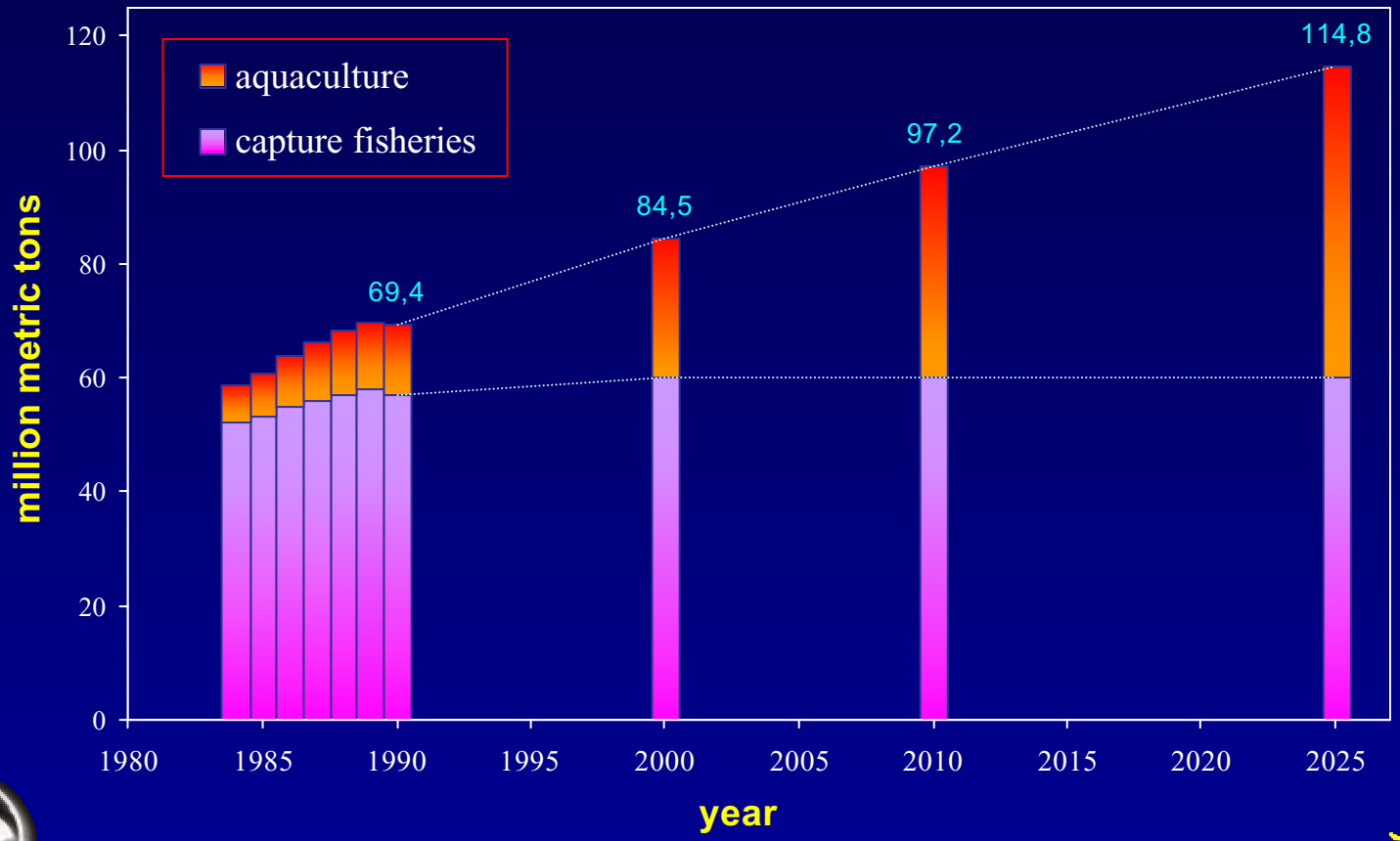
Projected requirements for food grade fisheries production based on 1989 availabillity



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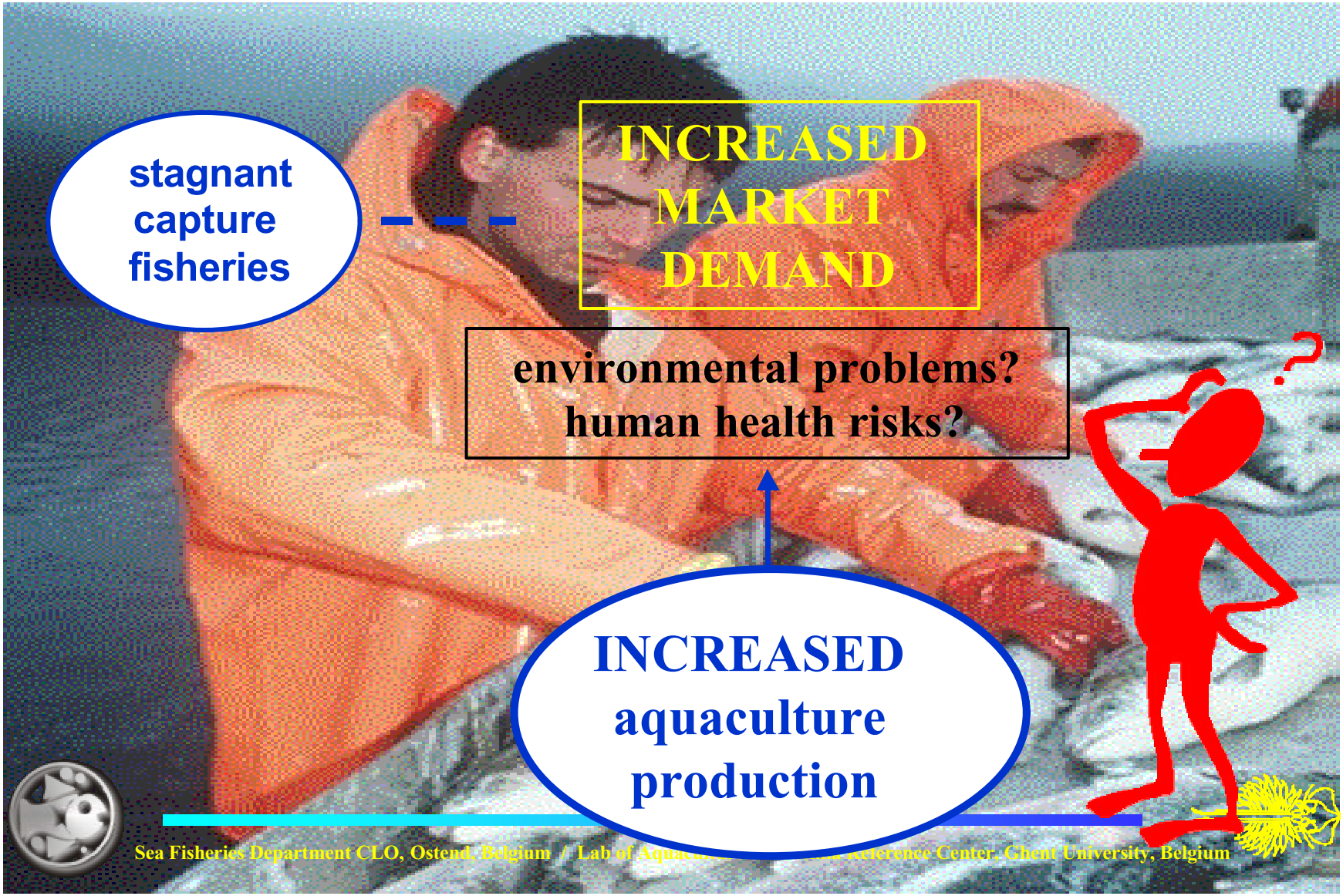
stagnant capture fisheries
INCREASED MARKET DEMAND
environmental problems?
human health risks?
INCREASED aquaculture production
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Reference Center, Ghent University, Belgium


responsible researchers
integrated R&D
21st century aquaculture
new concepts, e.g. stocking enhancement
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STOCK ENHANCEMENT
Japan, China, Russia, USA, Norway, Denmark
• juvenile fitness
• releasing strategies
• impact on wild stocks
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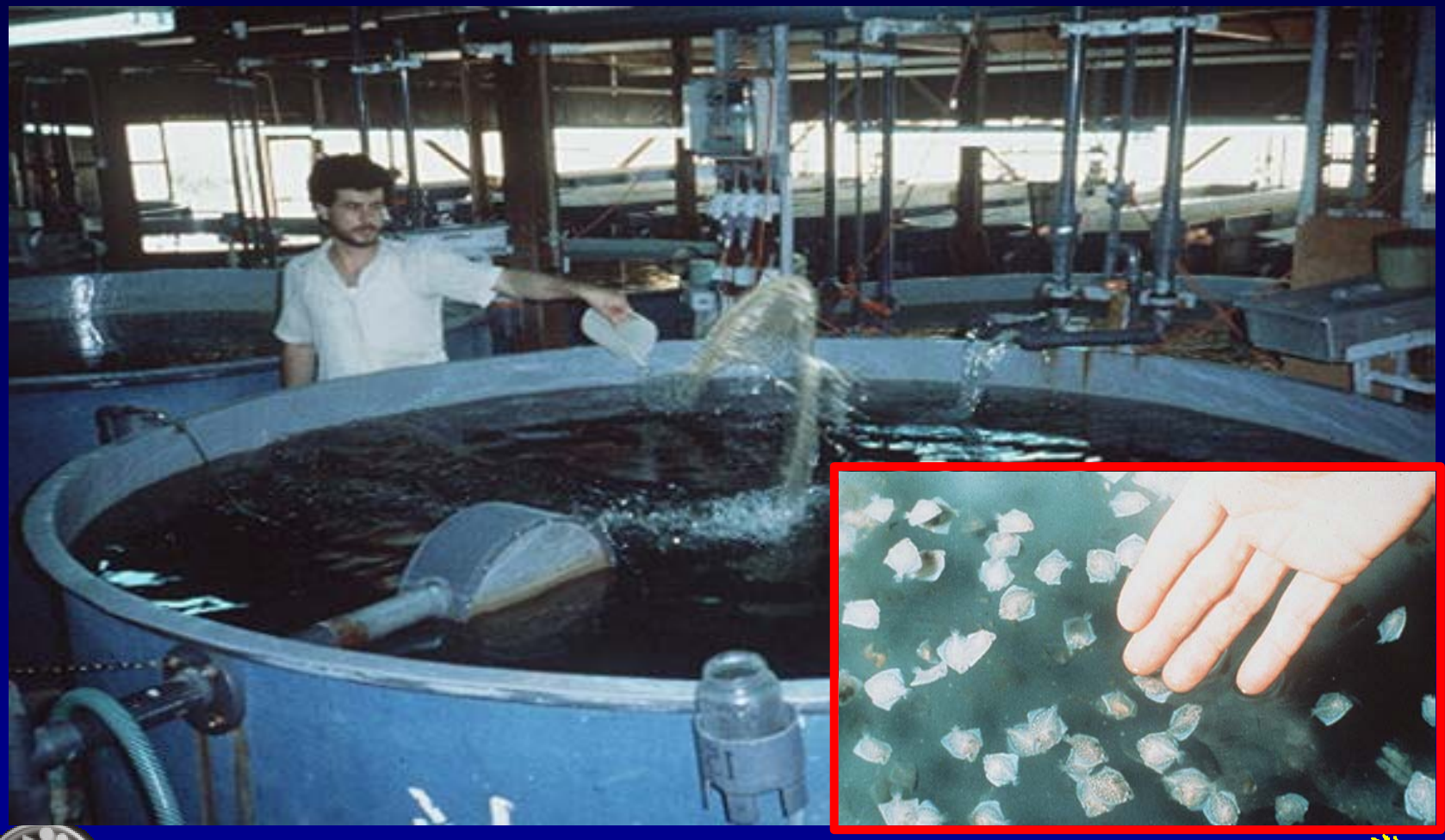
TURBOT FISHERIES / AQUACULTURE

Sea Fisheries Department CLO, Ostend, Belgium / Lab of Aquaculture & Artemia Reference Center, Ghent University, Belgium



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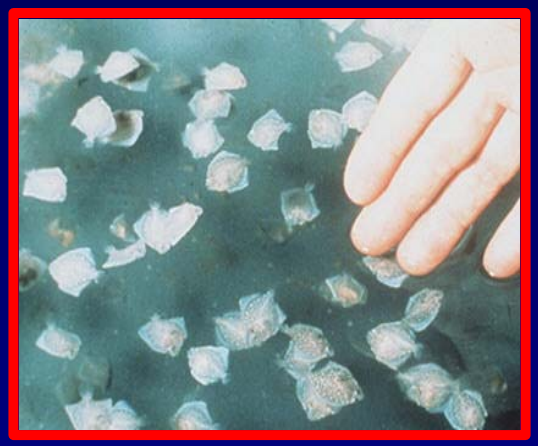
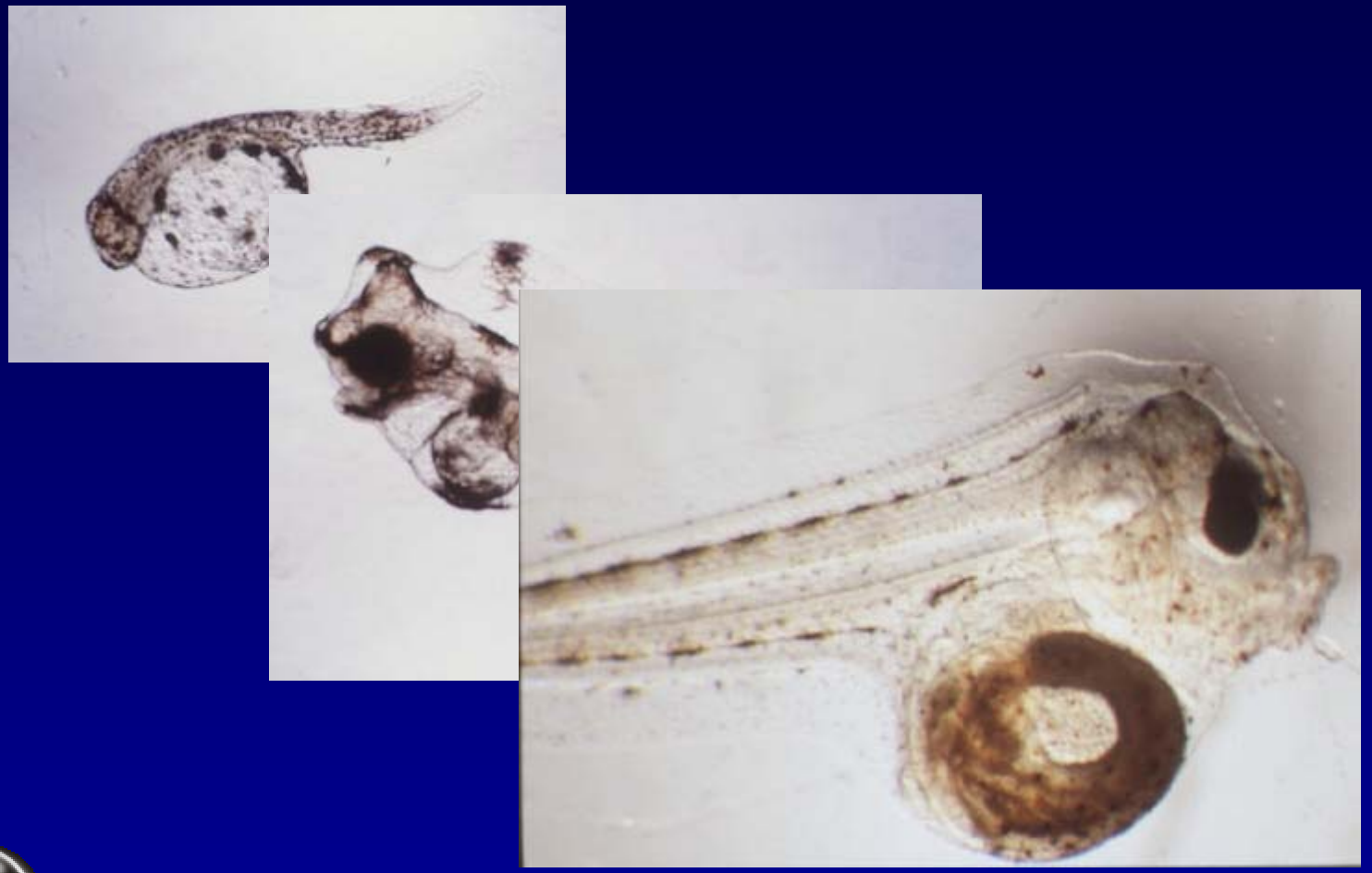
AQUACULTURE ⟷ **RESTOCKING**



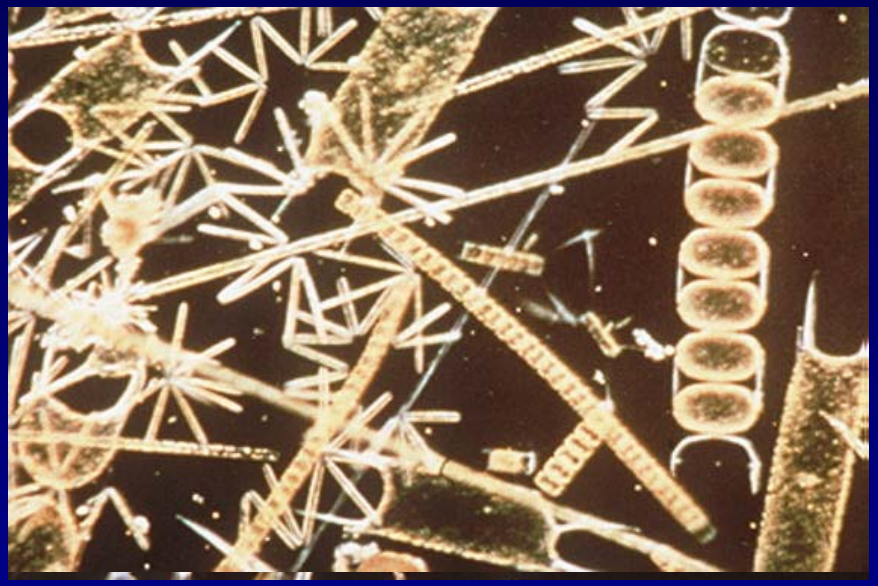
LARVAL QUALITY

FITNESS

BEHAVIOUR

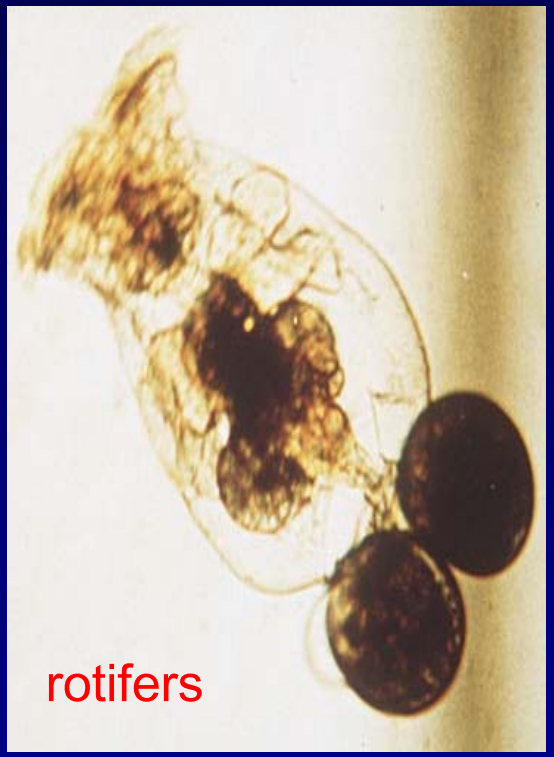


Food source in natural environment



maximum chances for meeting all nutritional requirements

LIVE FOOD USED IN FISH LARVICULTURE



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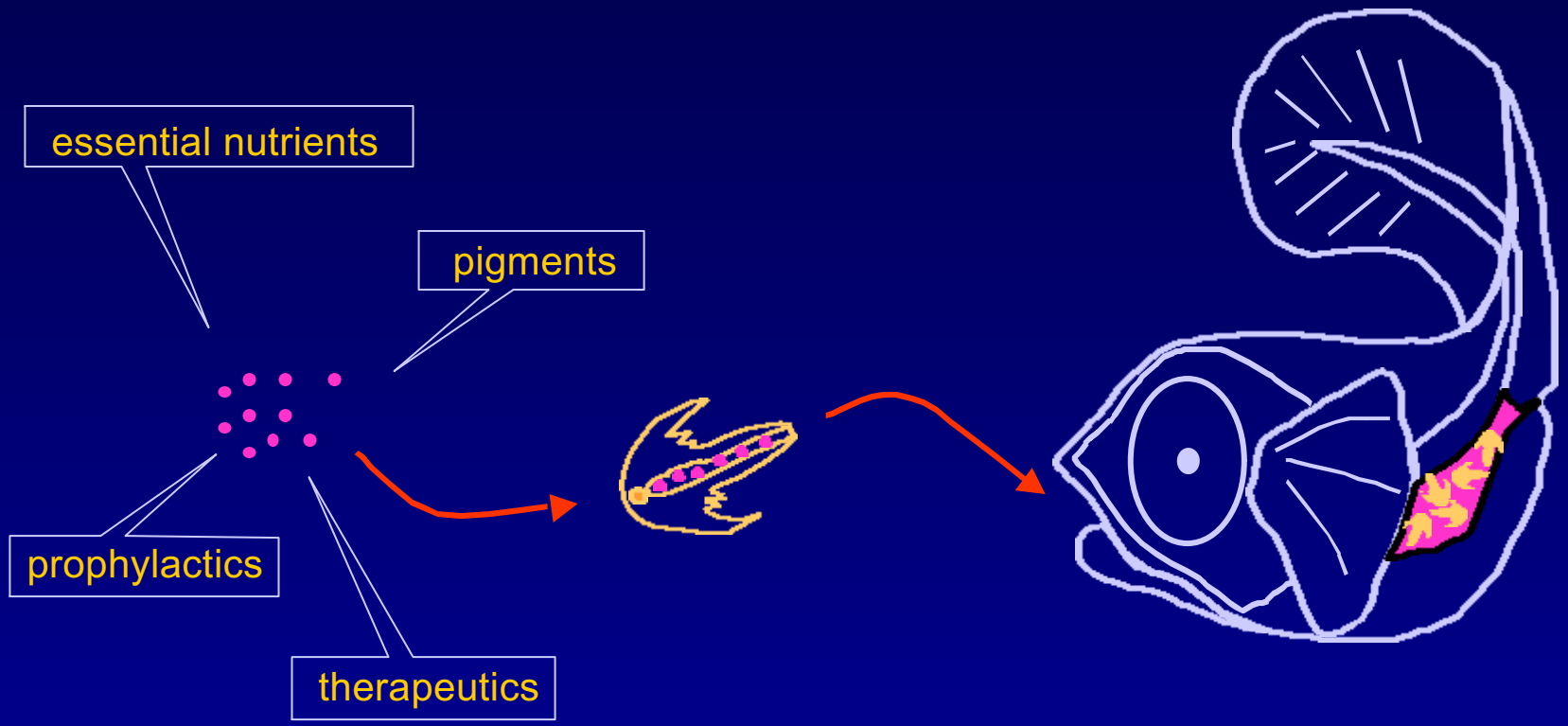
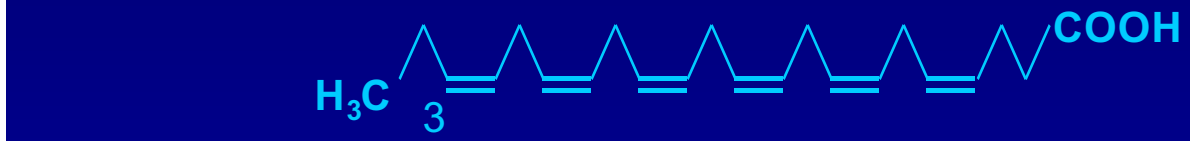
Bioencapsulation



DHA (22:6n-3)

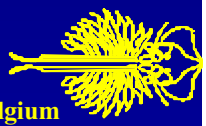
- high levels in marine fish eggs
- structural fatty acid in brain & eyes
- pigmentation of flatfish
- stress resistance
- DHA>EPA: DHA/EPA ratio !



DHA/EPA in wild copepods

Copepod species	DHA(%)	EPA(%)	DHA:EPA
Pseudocalanus acuspes	24.3	21.5	1.1
Pseudocalanus acuspes	25.8	31.6	0.8
Acartia longiremis	20.6	17.5	1.2
Calanus glacialis	24.4	20.0	1.2
Calanus finmarchicus	30.9	23.1	1.3
Pseudocalanus sp.	31.8	22.1	1.4
Temora longicornis	31.9	18.4	1.7
wild zooplankton	32.9	21.1	1.6
Centropages hamatis	37.7	17.2	2.2
tropical wild zooplankton	32.0	13.0	2.5
AVERAGE	**29**	**21**	**1.5**
MIN	**21**	**13**	**0.8**
MAX	**38**	**32**	**2.5**

data from Norbin et al. (1990), Tande & Henderson (1988), Fraser et al. (1989), Lokman (1989), Naess et al. (1995)



ICES Reference Emulsions

DHA/EPA ratios 0.6 and 4

Sum (n-3) HUFA 0, 30, 60 and 300
(in mg/g)

an initiative of the ICES Marine Fish Culture Committee

available from the Artemia Reference Center, Ghent University, Belgium

for details see website www.rug.ac.be/aquaculture

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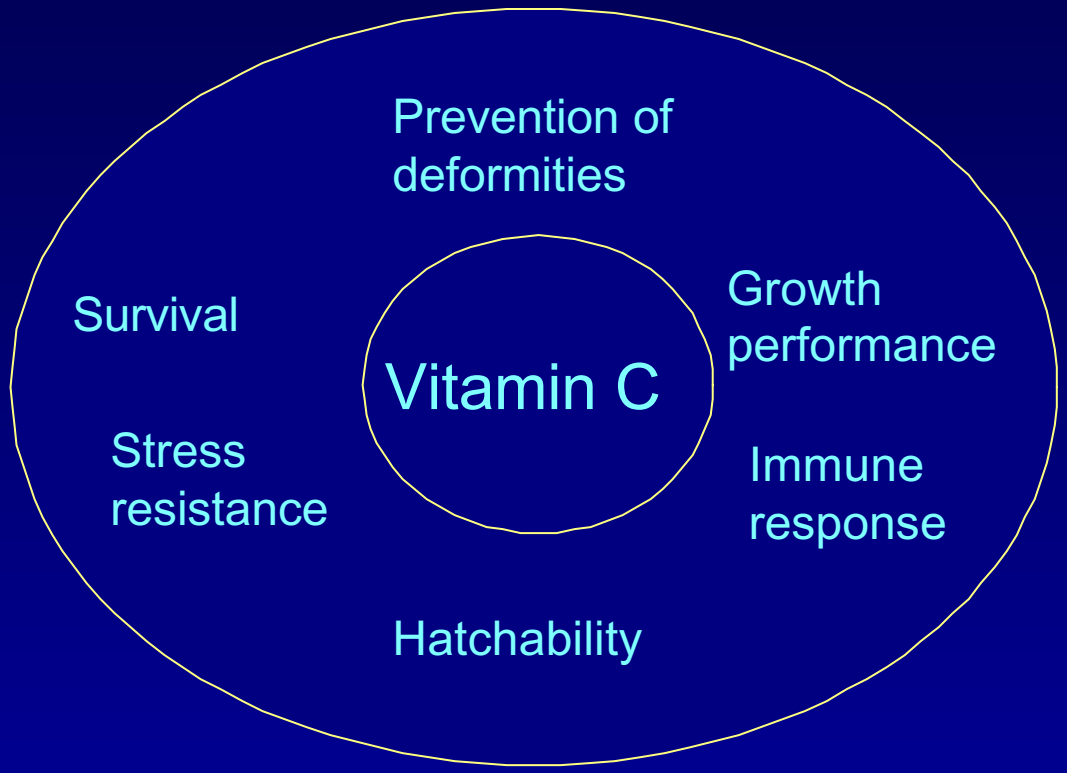
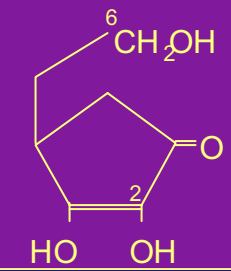
Factors affected by vitamin C status



Different forms of vitamin C

ASCORBIC ACID 6-PALMITATE (AP)

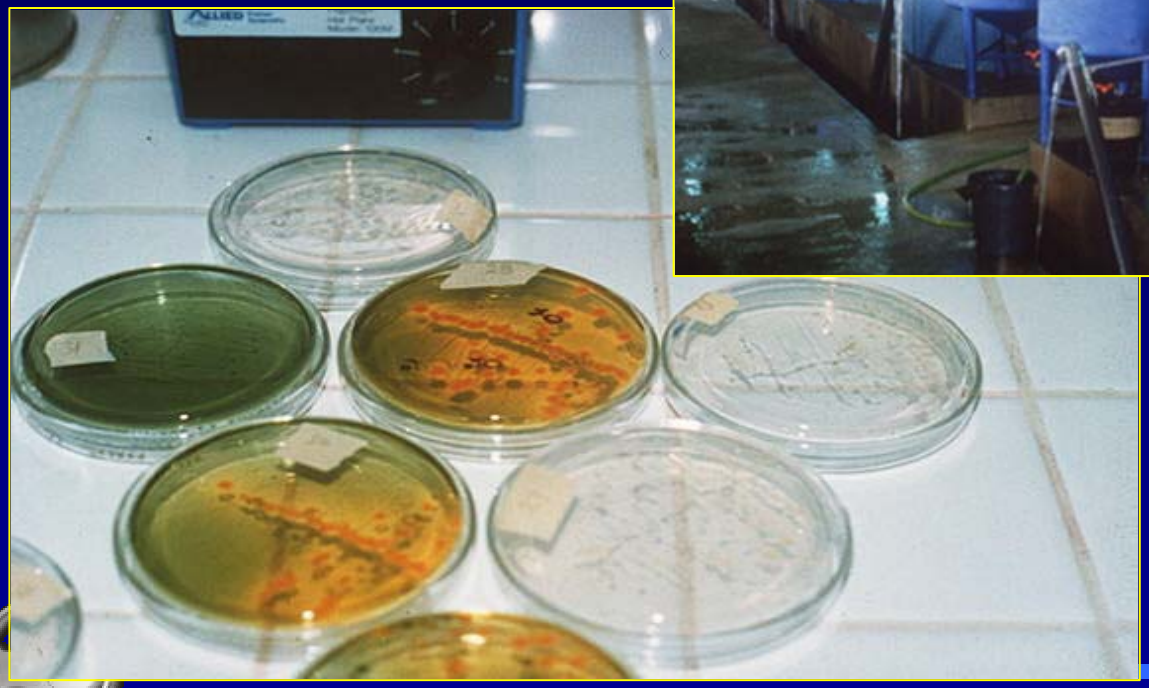
ASCORBIC ACID (AA)



ASCORBIC ACID 2-MONOPHOSPHATE (AmP)

POLYPHOSPHATE (ApP)

SULFATE (AAS)



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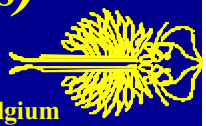
Live food = important source of bacteria

- washing does not remove all bacteria
- often source of opportunistic pathogens, especially when introduced in disinfected culture waters

➤ ***use disinfected live food***

➤ ***precolonize culture tank (f.ex. use of mature water, use of probiotic mixtures)***

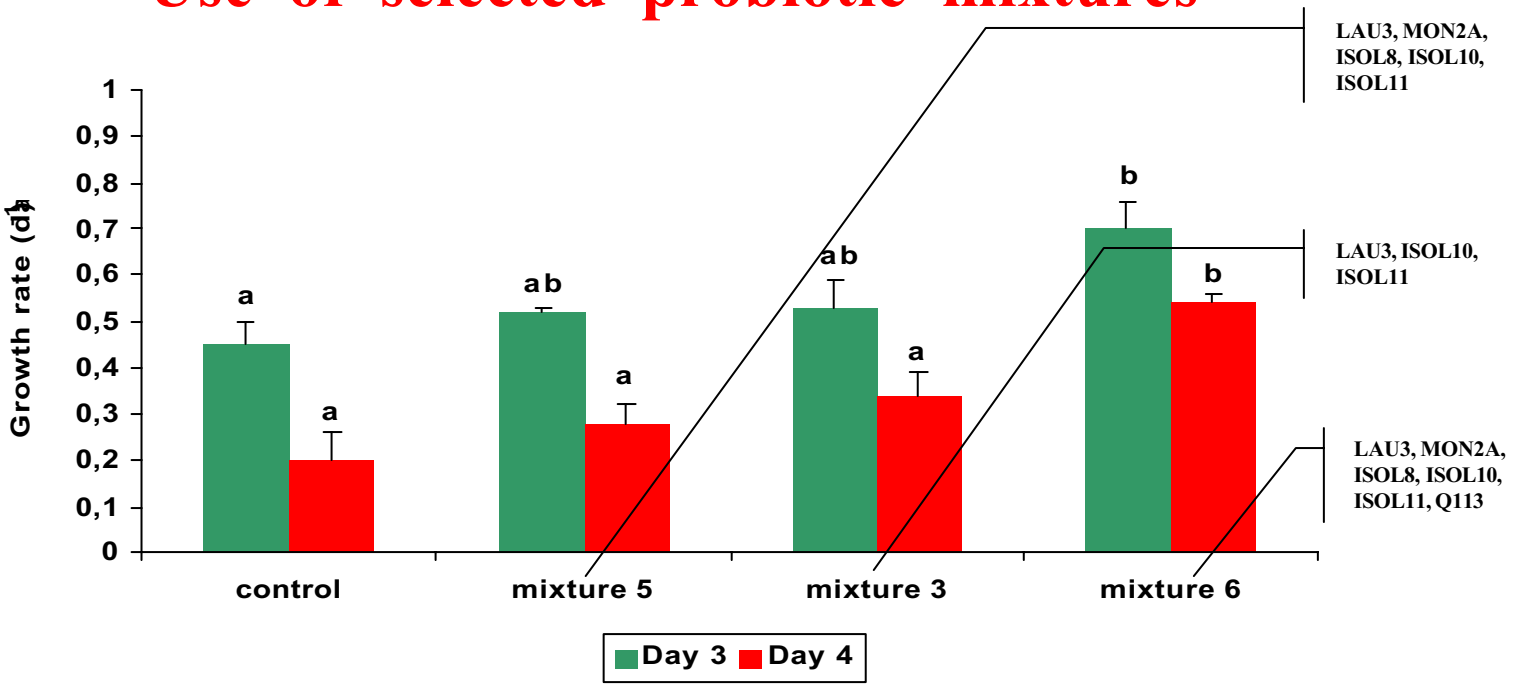


Probiotic bacteria

Establishment of a **balanced**, **protective** microbiota

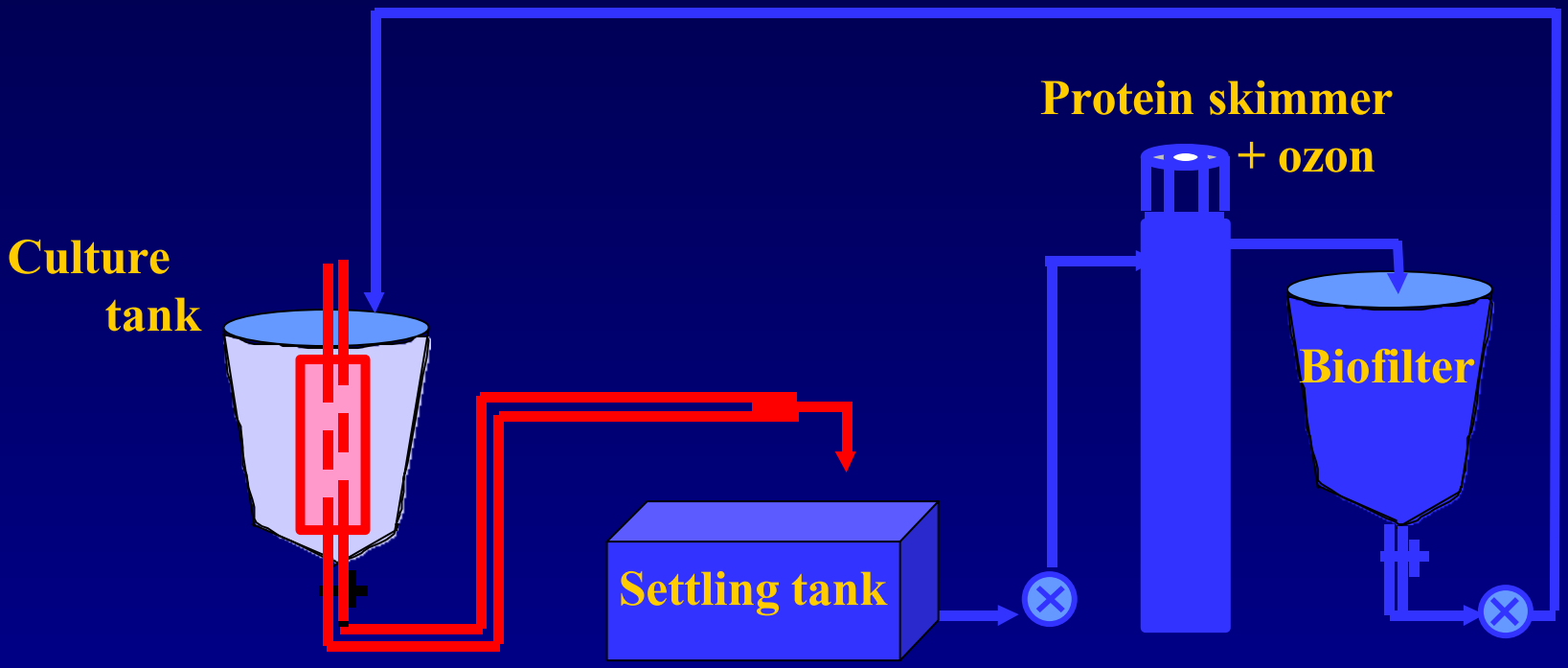
- **Predictability** and **stability** of the culture

Use of selected probiotic mixtures



- Growth rates on day 3 and day 4 in the presence of mixture 6 were significantly higher than those in the control and treatments with other mixtures

Recirculation systems
for rotifer and tarbot culture



Larval Release

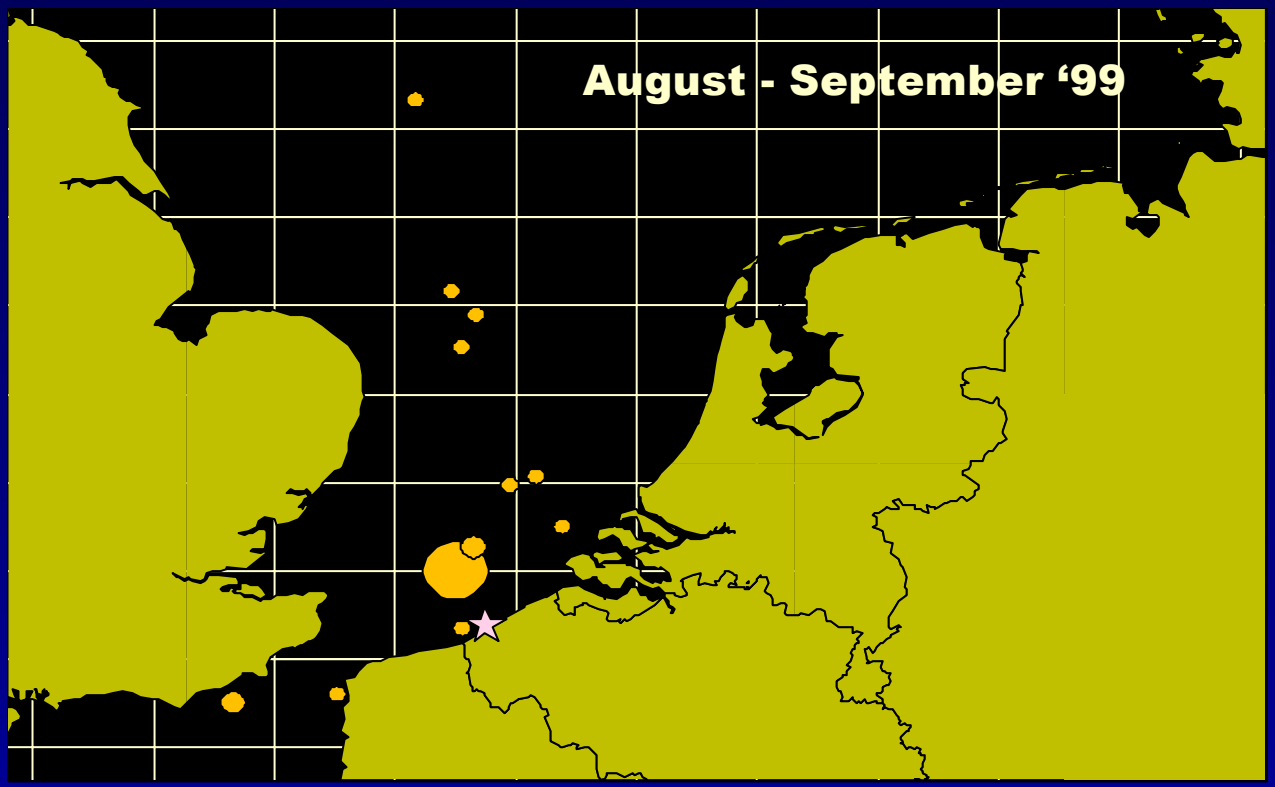
- Tagging with Petersen disc
- Release in closed area

Turbot restocking

Introduction | Materials and methods | Results and discussion

Distribution

Migration



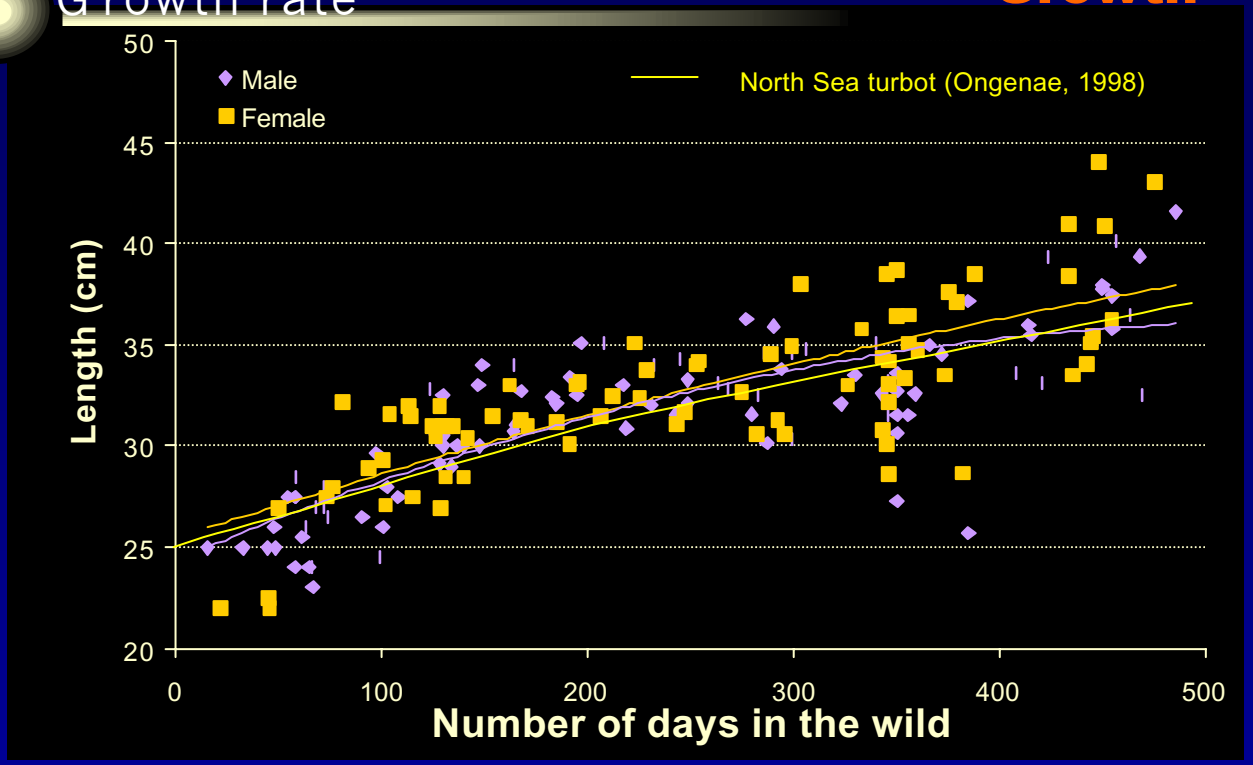
Turbot restocking

Introduction | Materials and methods | Results and discussion

Migration

Growth

Growth rate

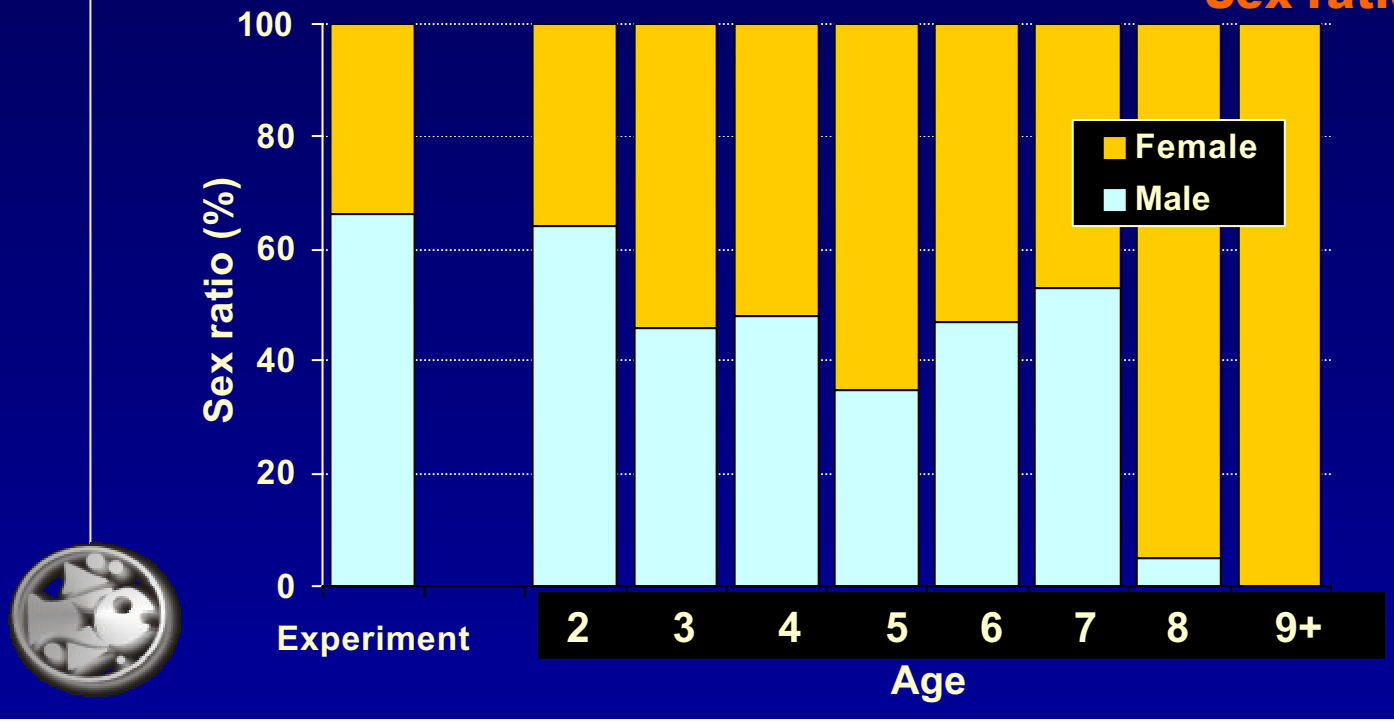


Turbot restocking

Introduction | Materials and methods | Results and discussion

- Migration
- Growth
- CF
- **Sex ratio**

Sex ratio



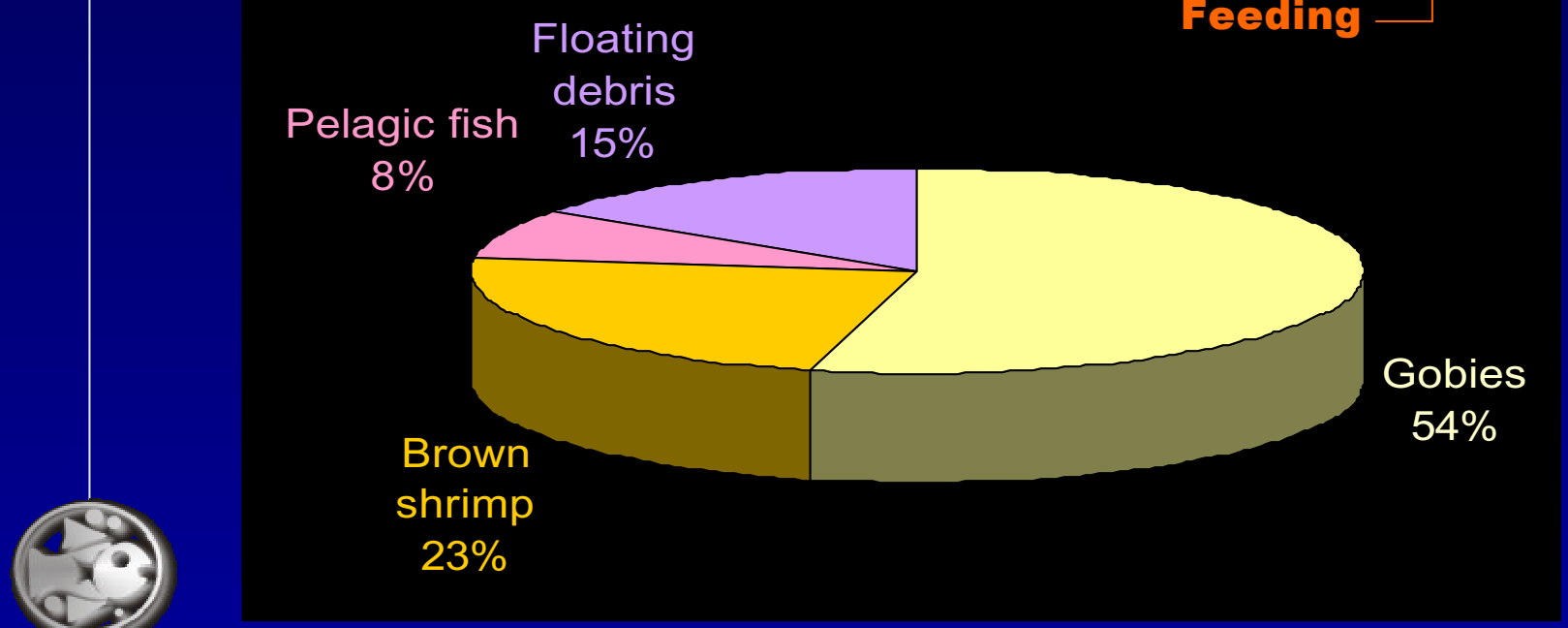
Turbot restocking

Introduction | Materials and methods | Results and discussion

- Migration
- Growth
- CF
- Sex ratio
- **Feeding**

Prey spectrum

30 - 32.9 cm



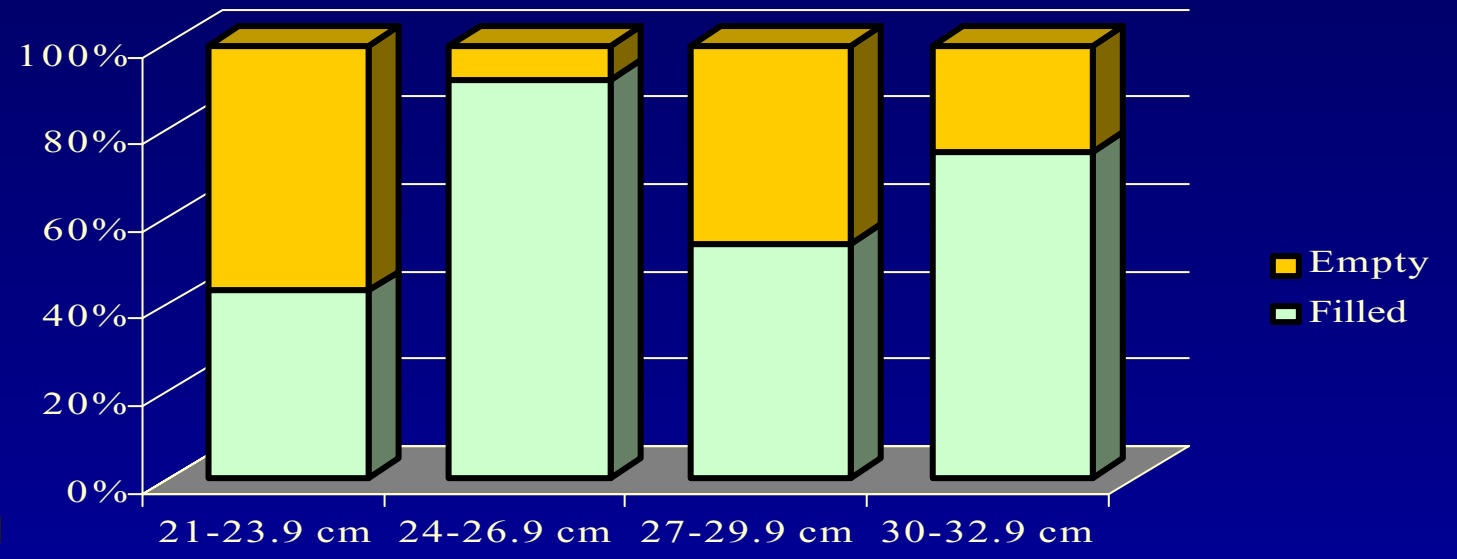
Turbot restocking

Introduction | Materials and methods | Results and discussion

- Migration
- Growth
- CF
- Sex ratio
- **Feeding**

Prey spectrum

Stomach filling



Turbot restocking

Introduction | Materials and methods | Results and discussion

- General conclusion
  - Adaptation
  - No national restocking programme
  - Ecological problems ?
  - Economical analysis ?