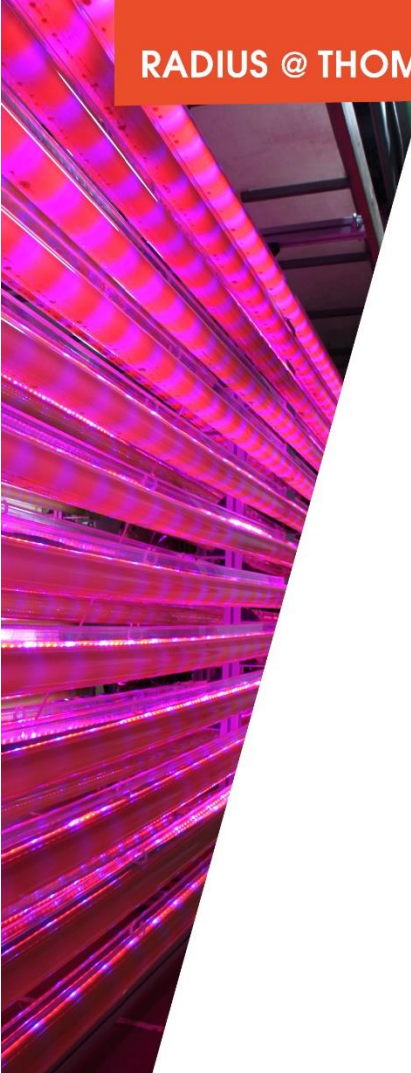




RADIUS @ THOMAS MORE

› Maestro



DEPARTEMENT
LANDBOUW
& VISSERIJ

Jasper van Houcke

Hogeschool Zeeland University
Of Applied Sciences

Elfde Vlaams Aquacultuursymposium:
Nieuwe eiwitten voor de aquacultuur

Vlaams
Aqua
cultuur
platform

THOMAS
MORE | University of
Applied
Sciences

Industriële productie van microalgen voor de aquacultuur

Jasper van Houcke

DE PERSOONLIJKE HOGESCHOOL

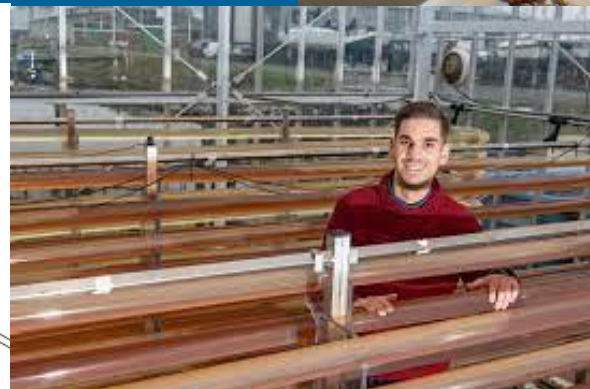
28/10/22



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Introductie

- Jasper van Houcke
- Prof. (Lector) Aquacultuur in Deltagebieden, HZ University of Applied Sciences
- Expertise: aquacultuur, seafood, schelpdieren, microalgen, sensorische en consumentenstudies



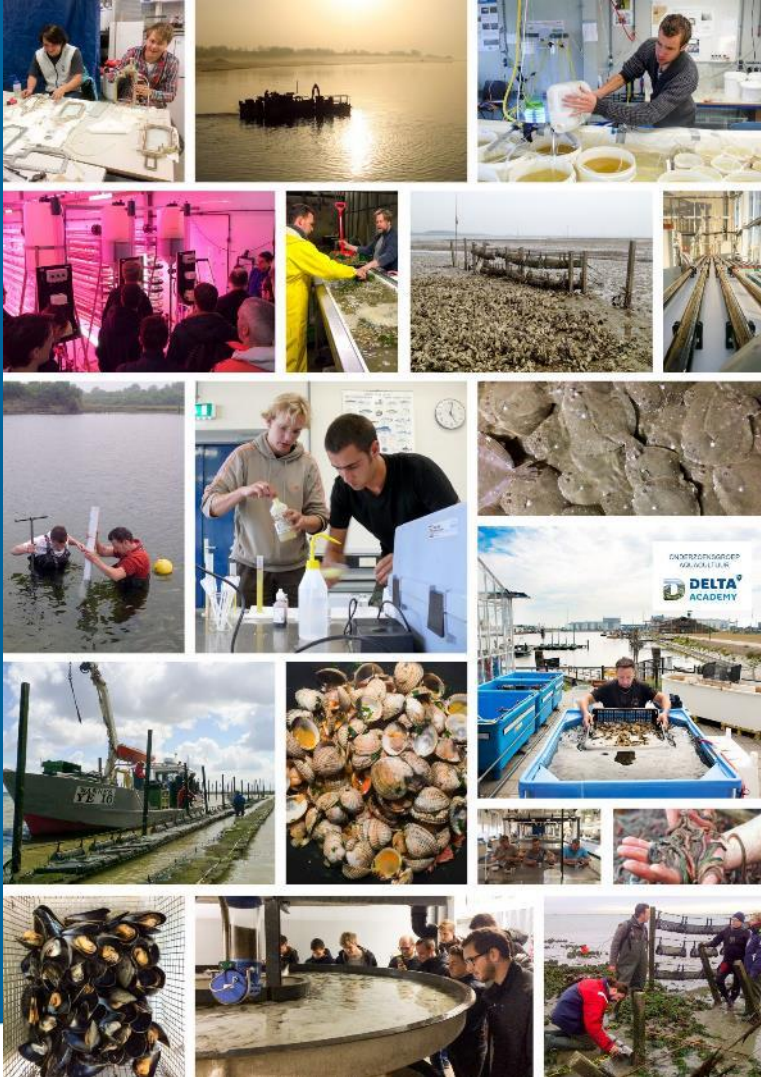
HZ University of Applied Sciences

- HZ University of Applied Sciences
- Regionale onderwijs- en onderzoeksinstituten
- Vestigingen in Vlissingen en Middelburg
- 28 BSc. en 2 MSc. programma's
- Ongeveer 5000 studenten en 500 medewerkers



Onderzoeksgroep Aquacultuur in Deltagebieden

.....



- Mariene aquacultuur
- Laag trofische aquacultuur (Micro- en macroalgen en schelpdieren)
- Praktijkgericht onderzoek met en voor MKB
- Samenwerking met (inter)nationale onderzoeksinstituten
- Training en cursussen voor professionals

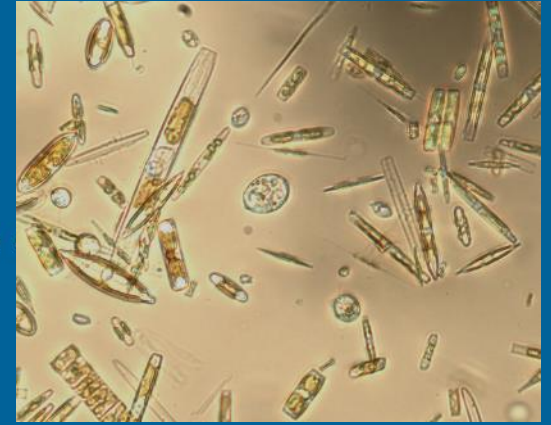


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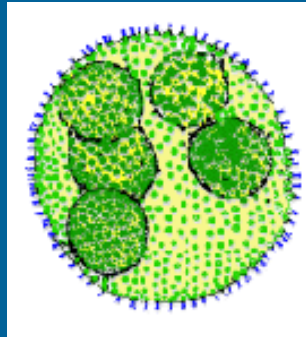
Wat zijn microalgen?



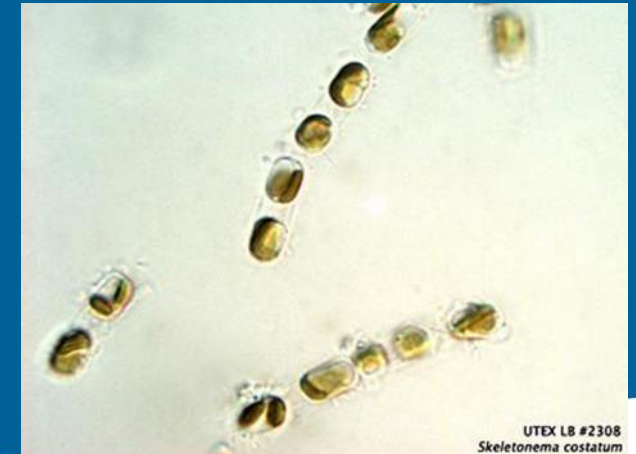
Microalgen soorten



- Meer dan 50,000 tot 1 miljoen soorten
- Eencellig
- Meercellig
- Kolonievormende cellen



- 30.000 geïsoleerde soorten
- Slechts enkele soorten in kweek op industrieel niveau



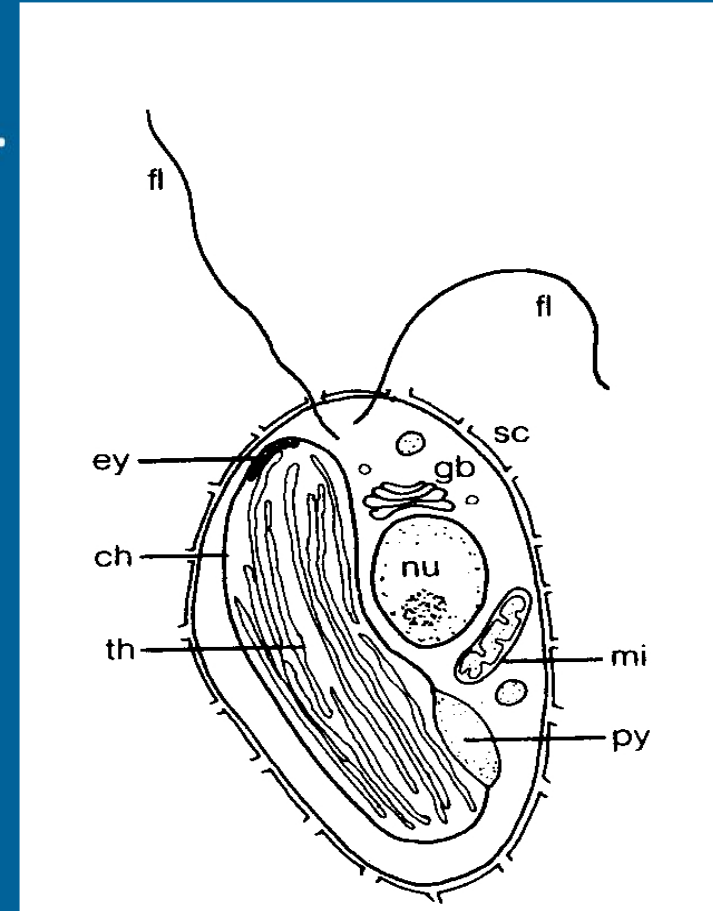
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Voorkomen in de natuur



Microalg

- Flagella
- Chloroplast
- Celkern
- Celmembraan
- Celwand
- Oog spot

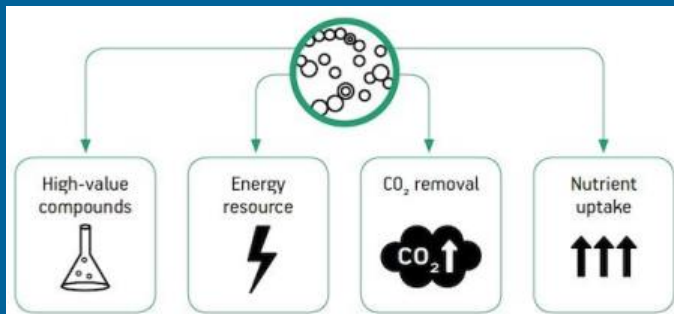
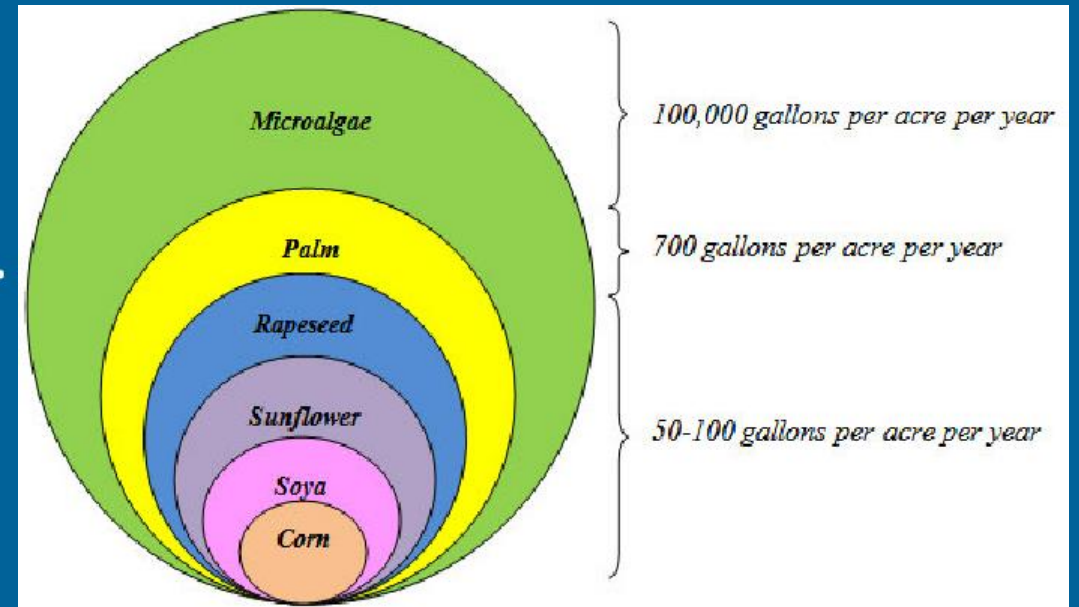


Waarom microalgen?



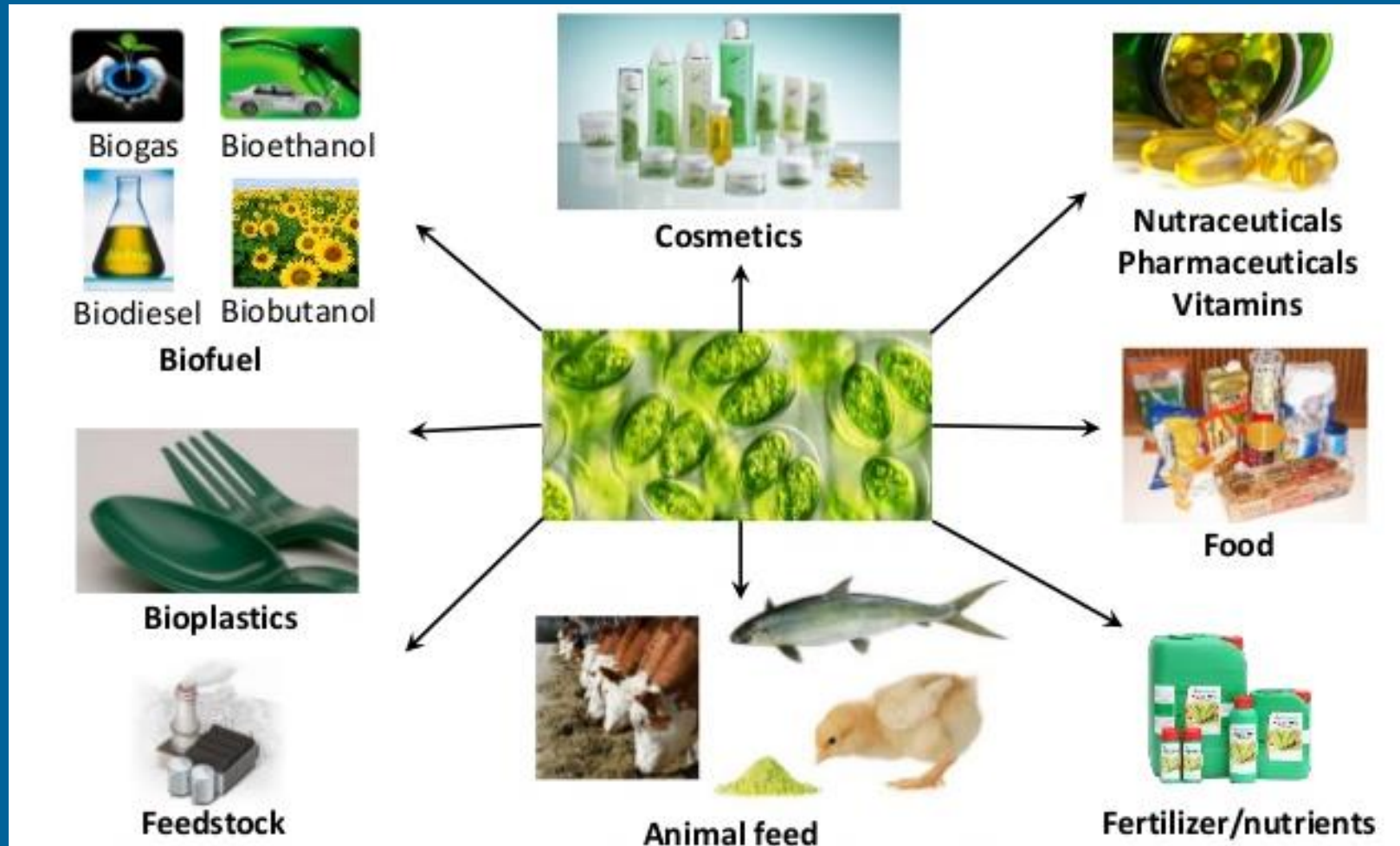
Voordelen microalgen

- Hoge productiviteit en lipiden gehalte
- Geen competitie met traditionele voedselgewassen
- Te kweken op onvruchtbaar land
- Consumeren CO₂
- Kunnen gebruik maken van nutriënten in afvalwater



Toepassingen

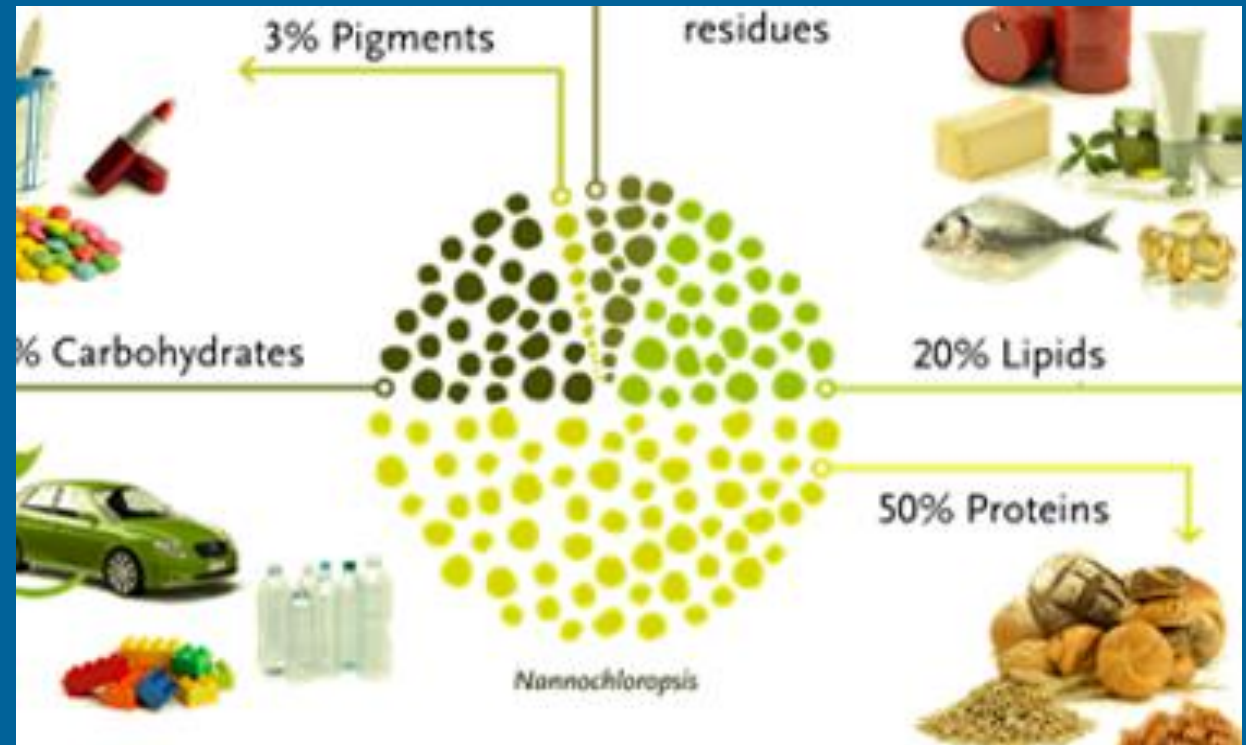
.....



Samenstelling van algen

.....

- Vetzuren
- Eiwitten
- Pigmenten
- Andere bioactieve stoffen



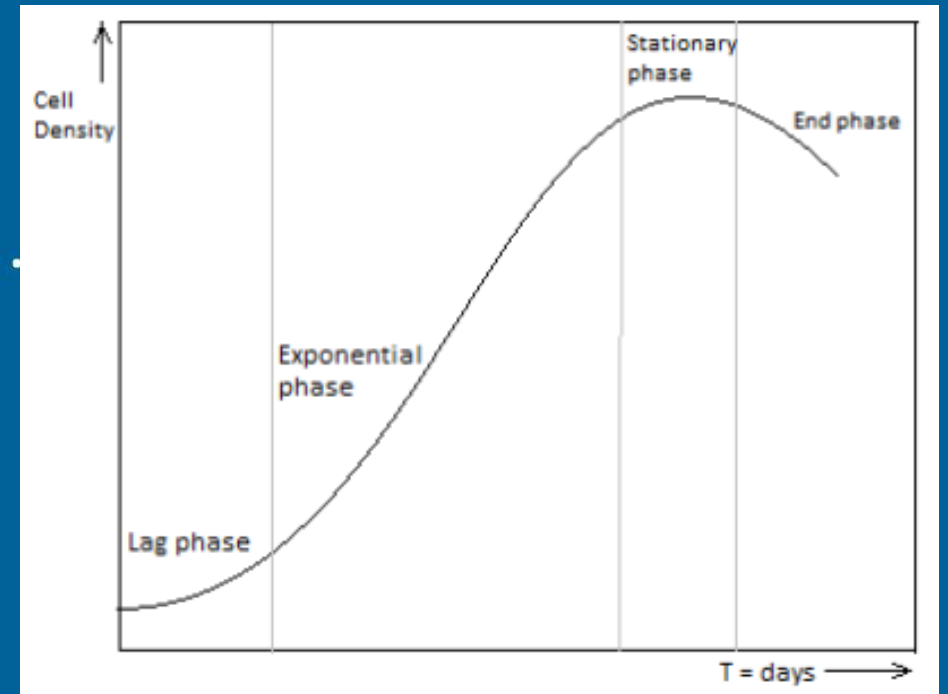
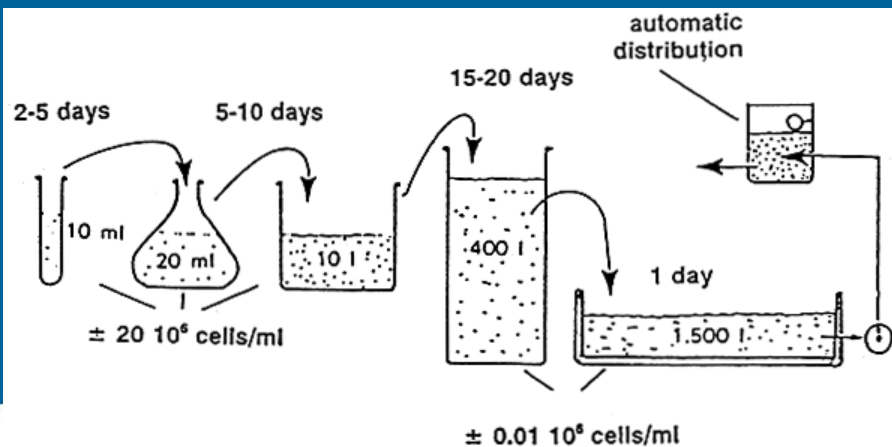
Hoe kweken we algen?



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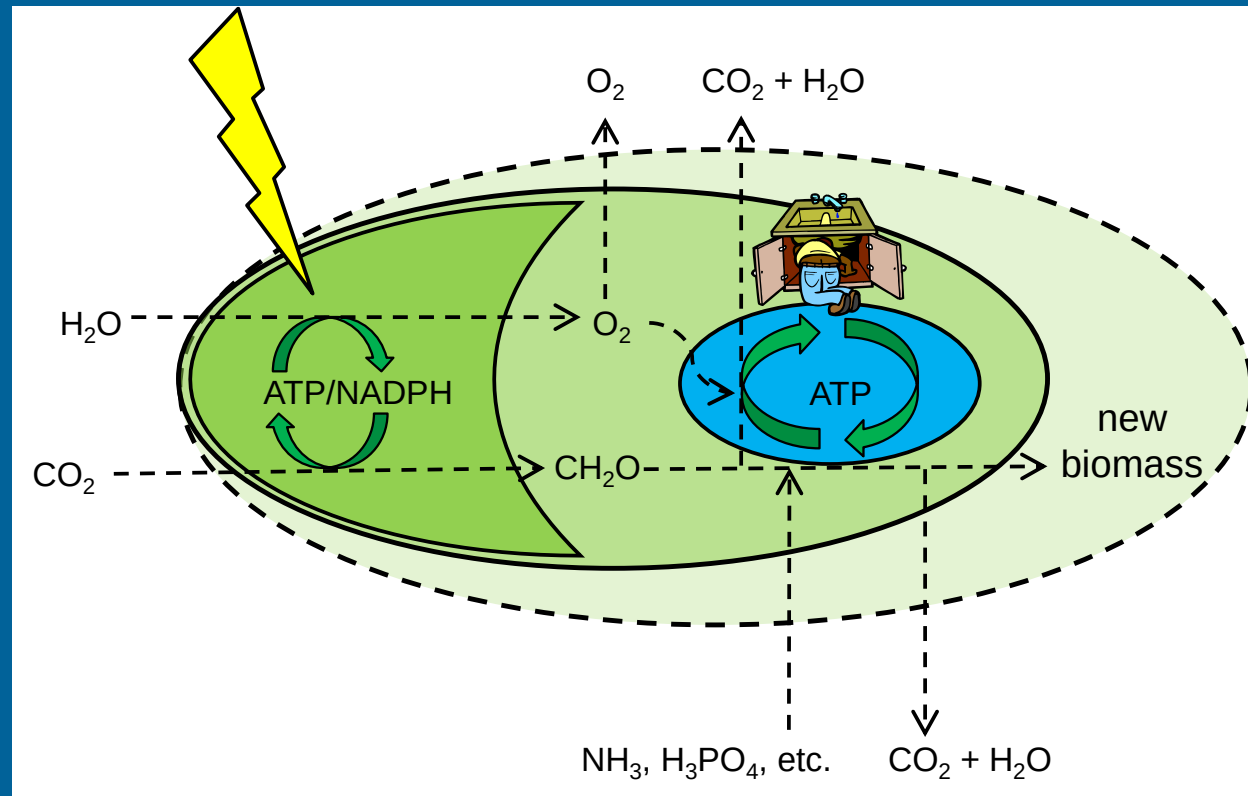
Productie

- Fotosynthese
- Nutriënten (C, N, P)
- Micronutriënten
- Vitaminen
- Silicium (diatomeeën)



Fotosynthese

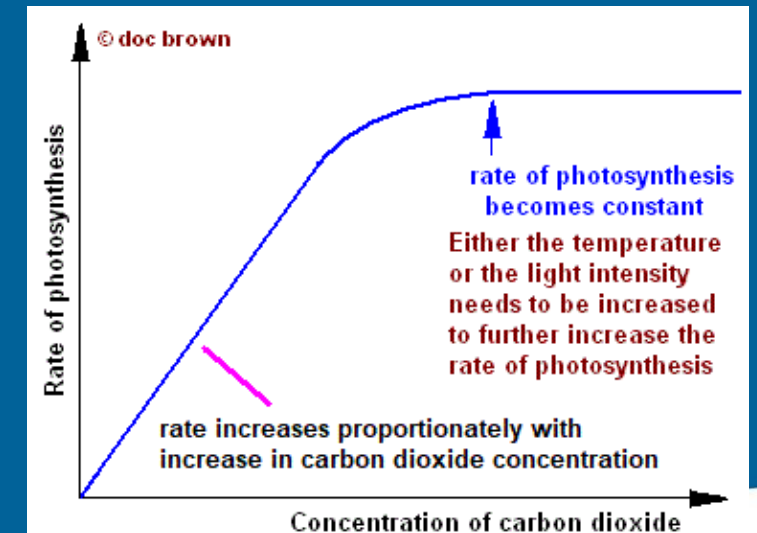
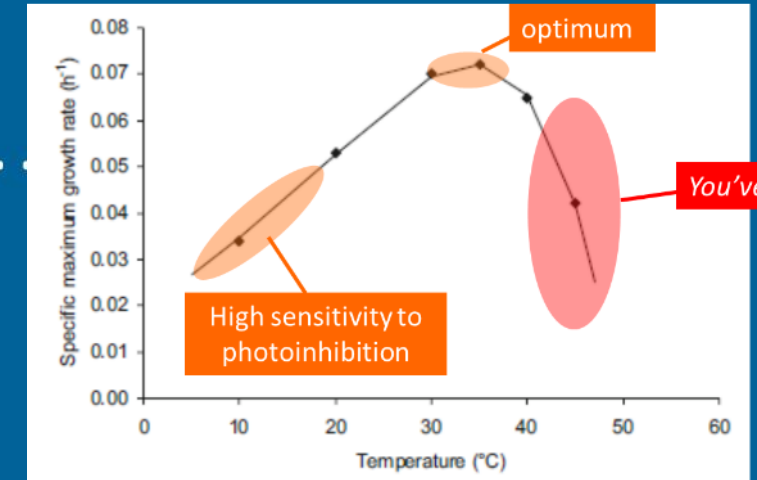
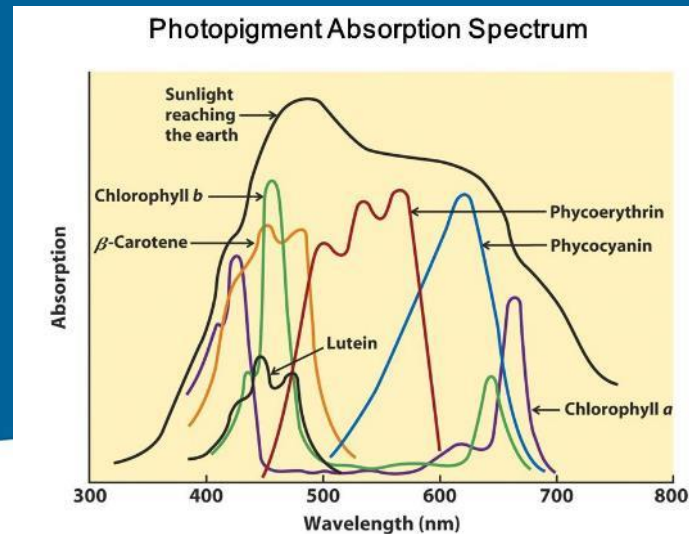
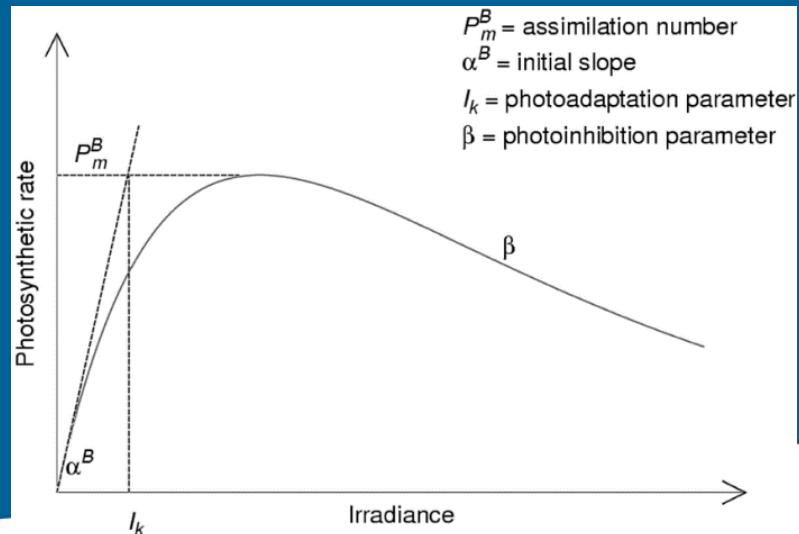
- $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$



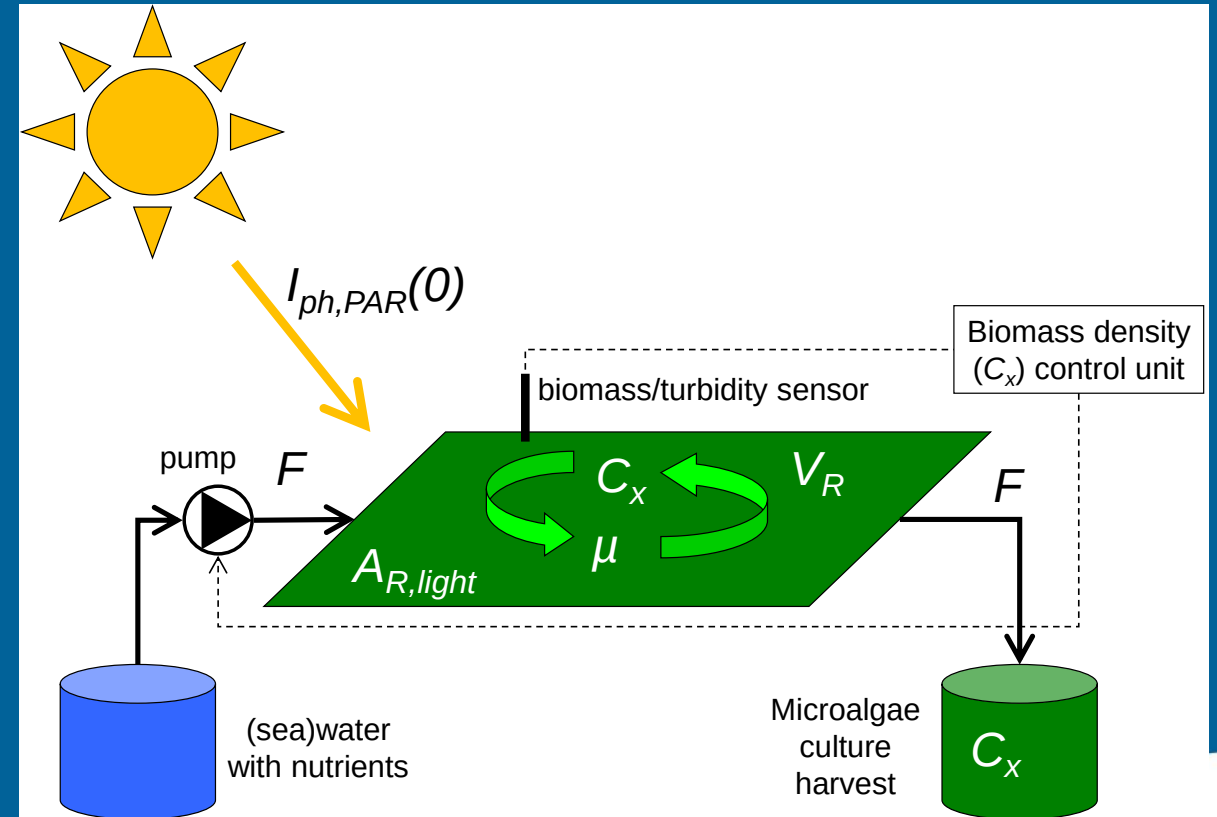
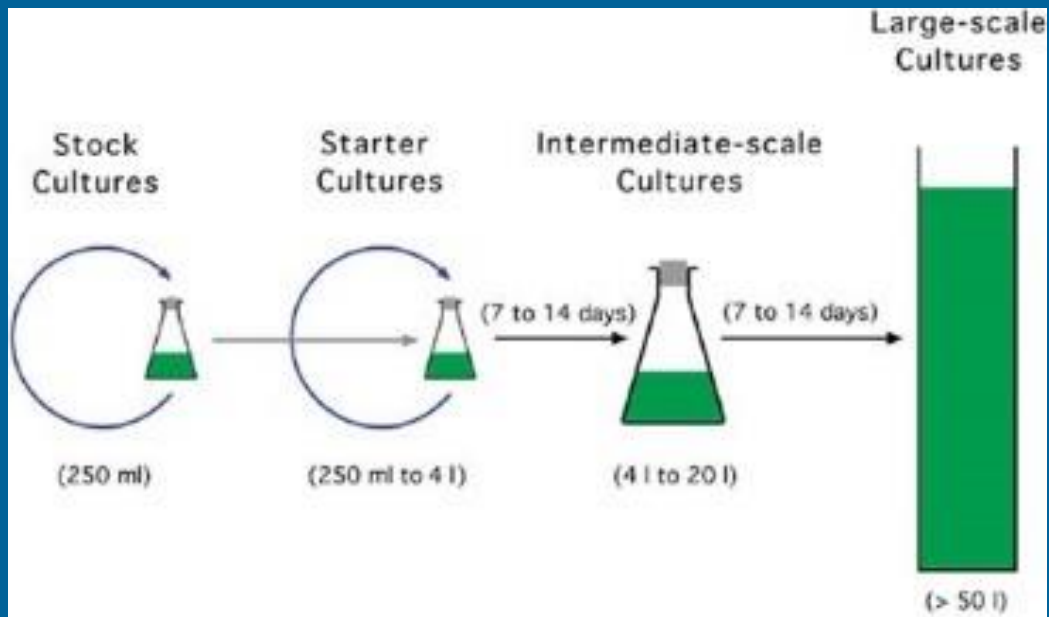
Fotosynthese

Drie belangrijke factoren

- Licht intensiteit en golflengte
- CO2 concentratie
- Temperatuur



Batch vs. continue productie



Open kweeksystemen



Gesloten kweeksystemen

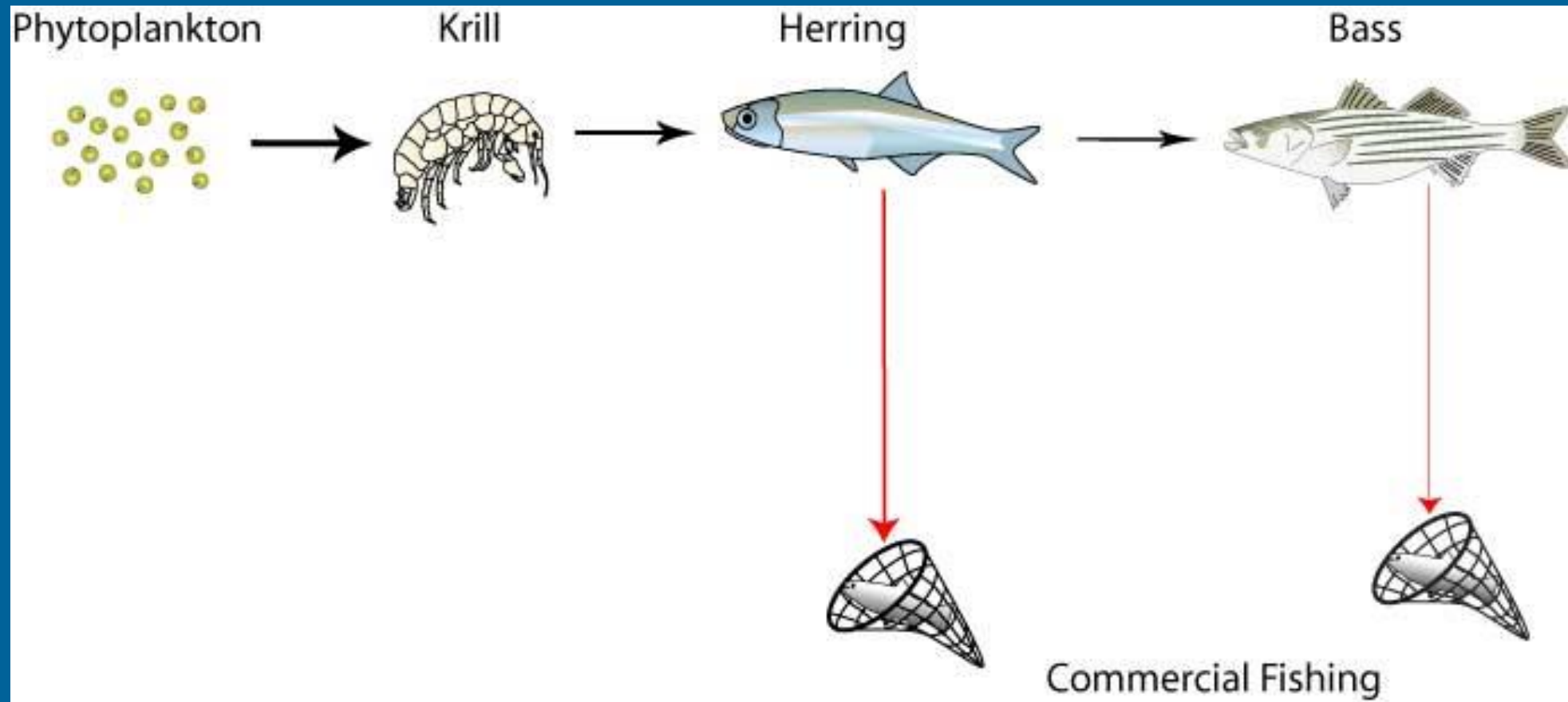
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'Fotobioreactoren'



Algen voor aquacultuur

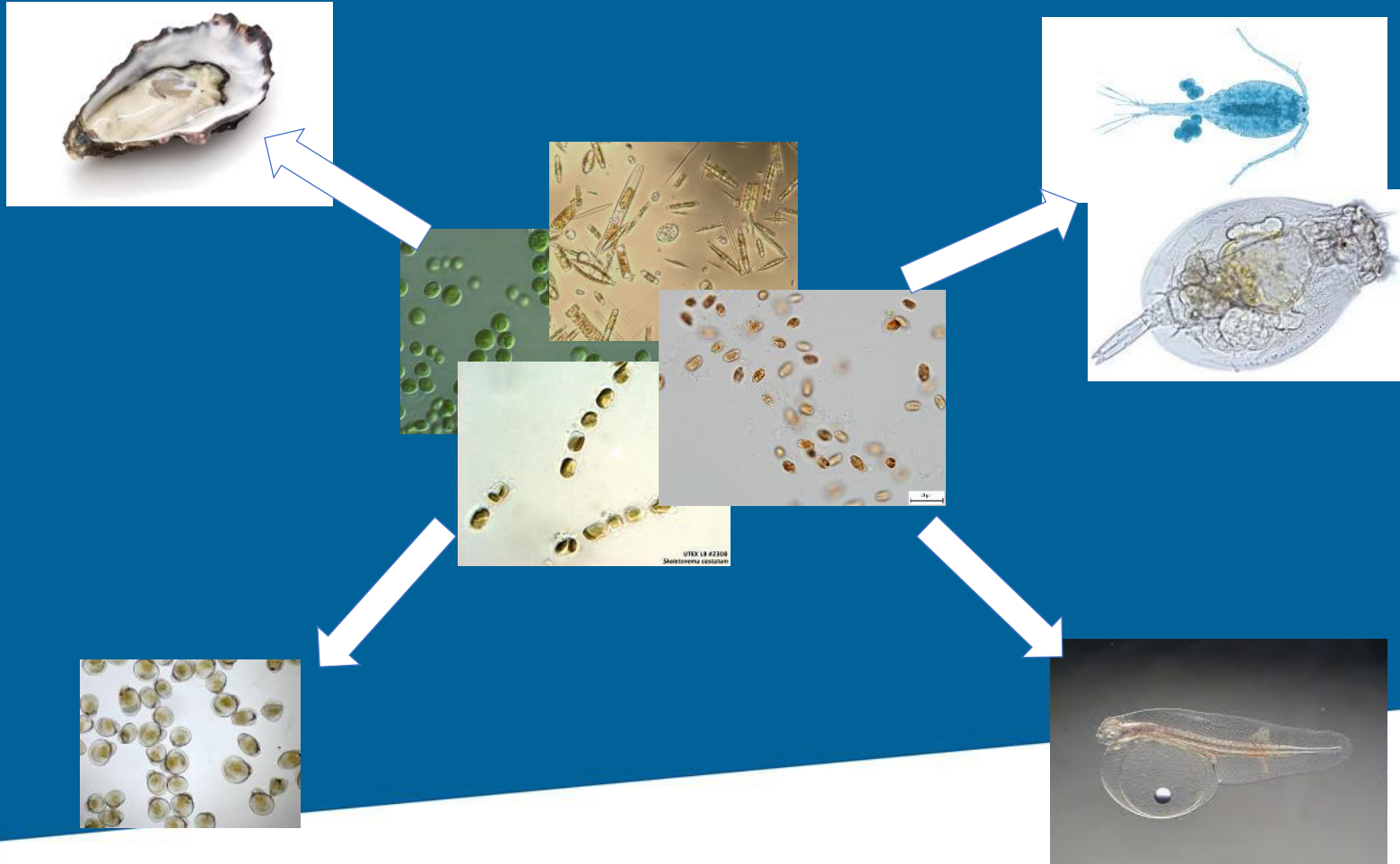


Basis van de voedselketen

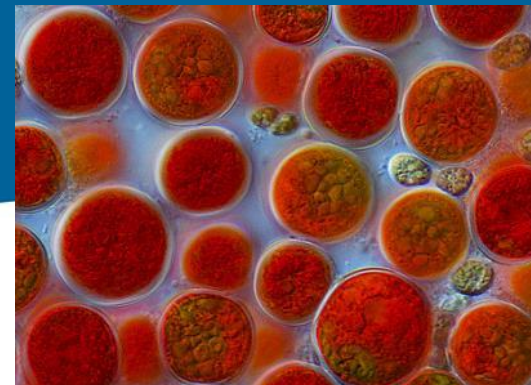
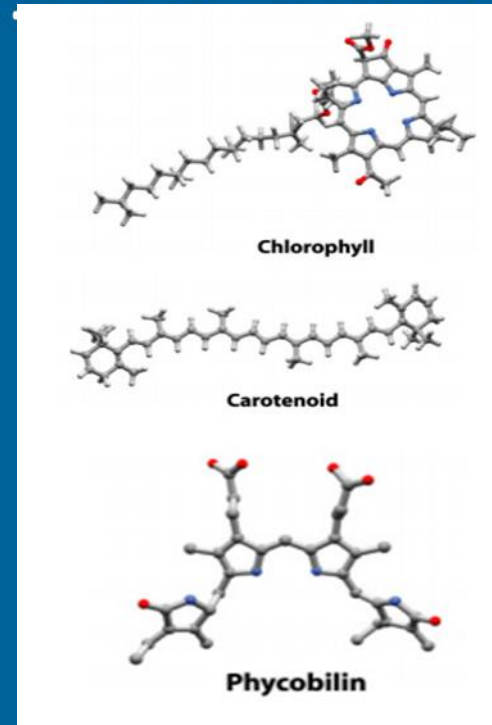


Centrale rol in de aquacultuur

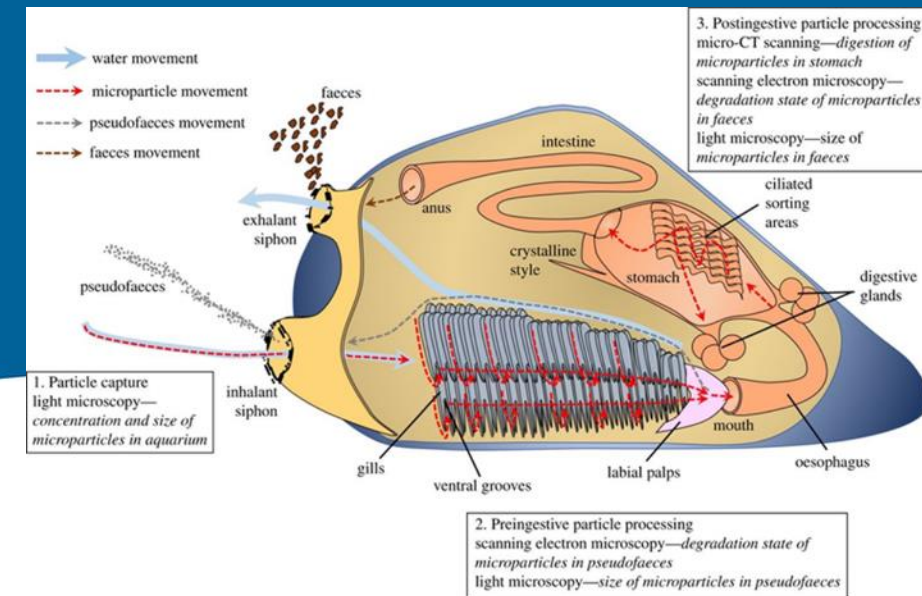
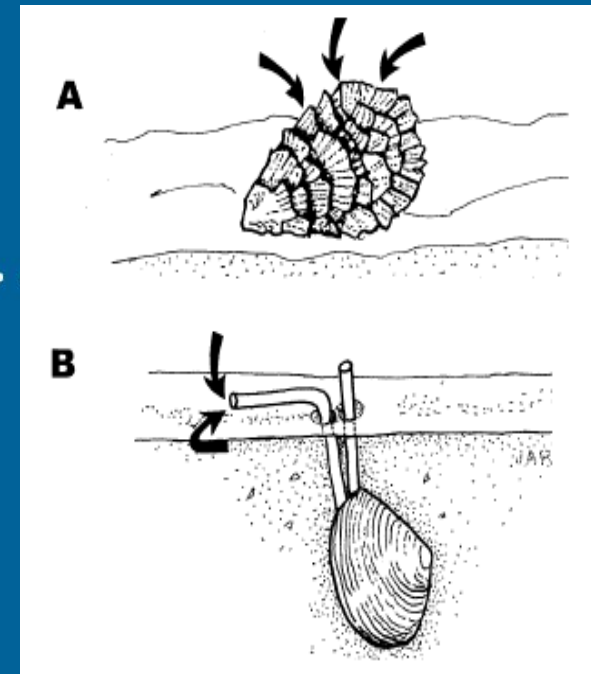
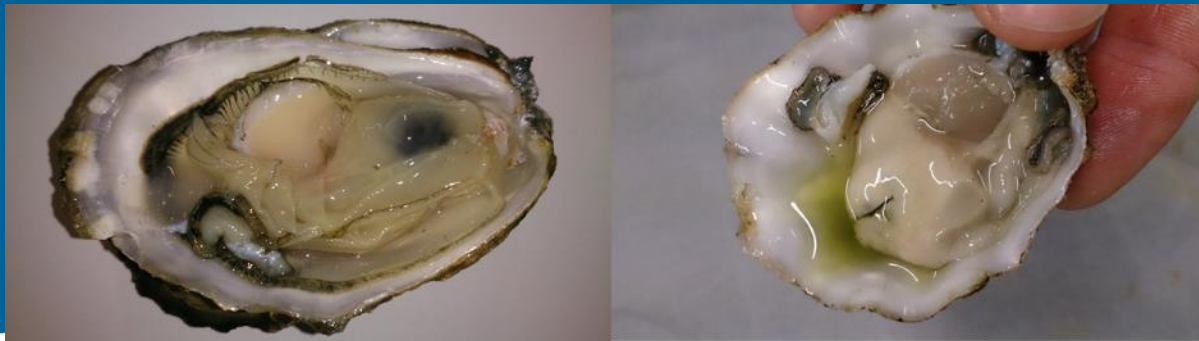
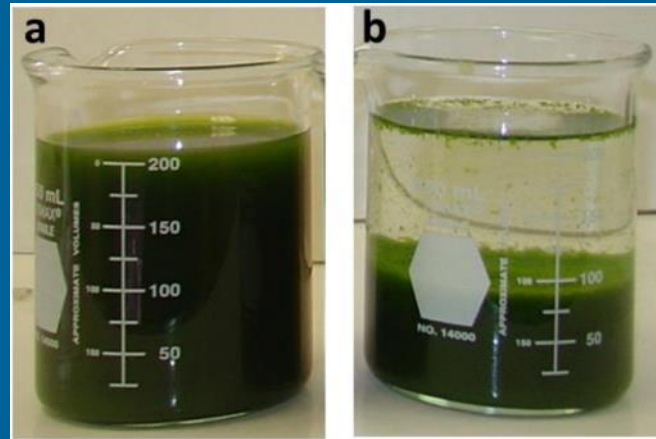
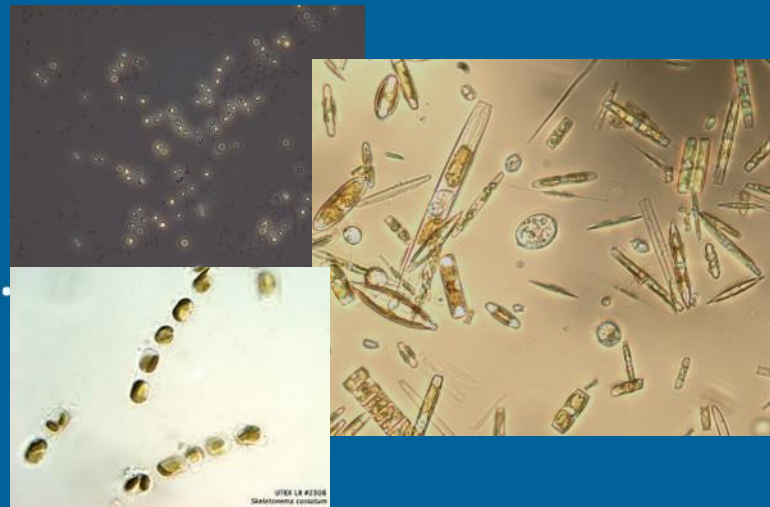
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Algen voor de aquacultuur



- Beschikbaarheid
- Dimensies
- Drijvend vermogen
- Opname
- Verteerbaarheid



Uitdagingen

- Van lab naar commerciële schaal
- Kostprijs
- Trade-off kwantiteit (productie) en kwaliteit (specifieke eigenschappen)



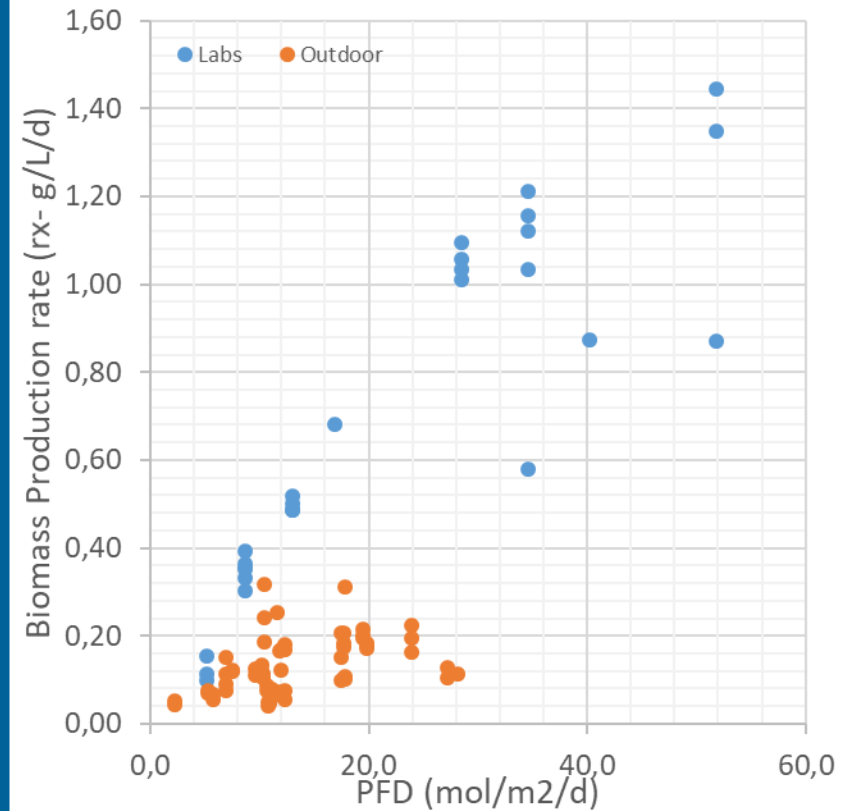
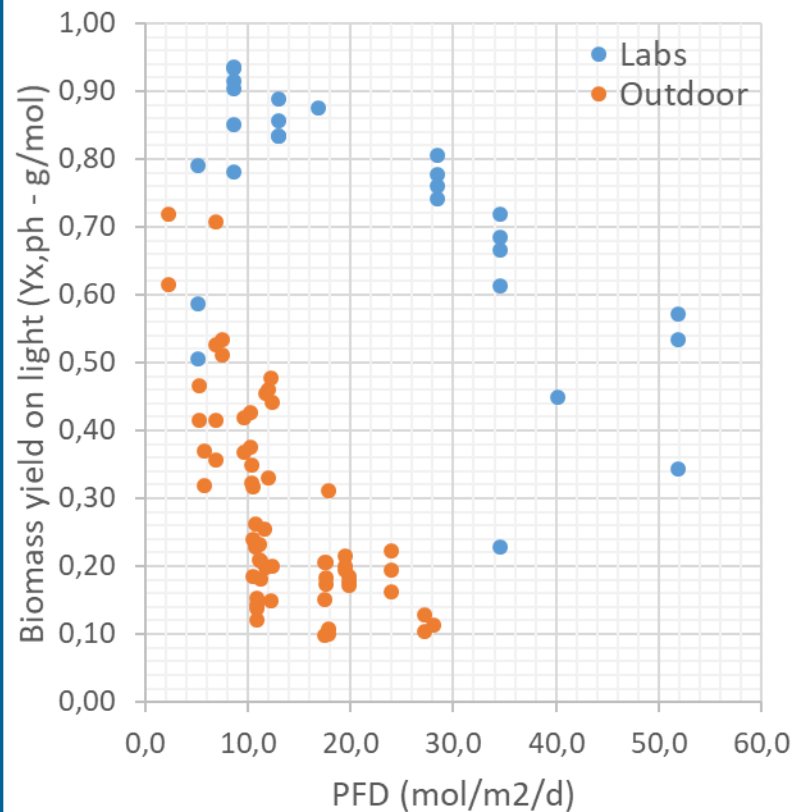
Opschaling: van lab naar commerciële schaal

.....



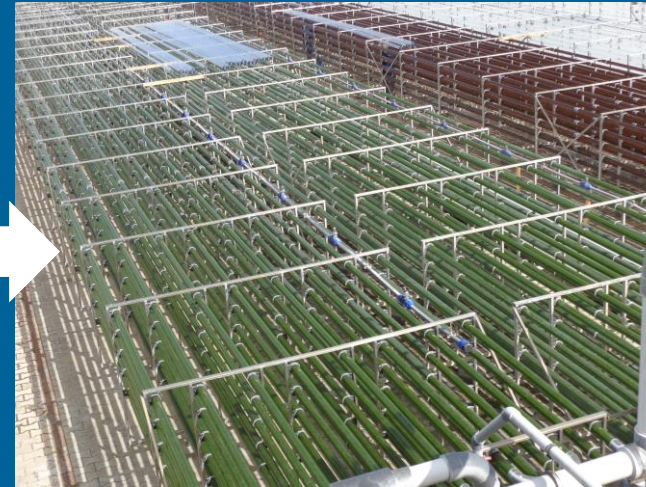
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Lab vs (outdoor) commerciële schaal

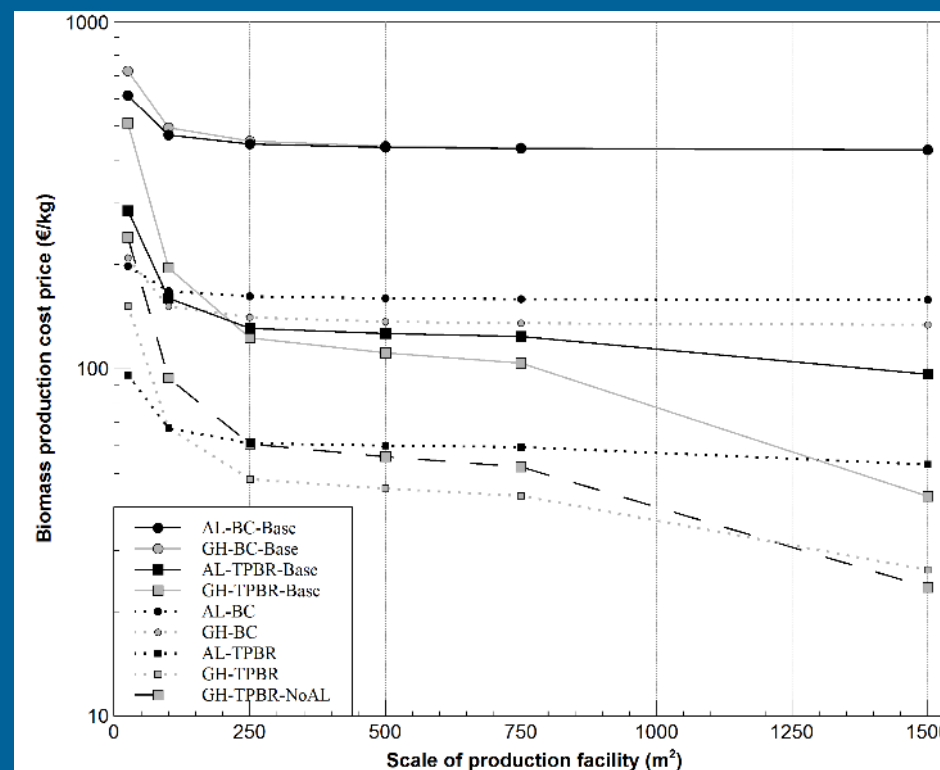
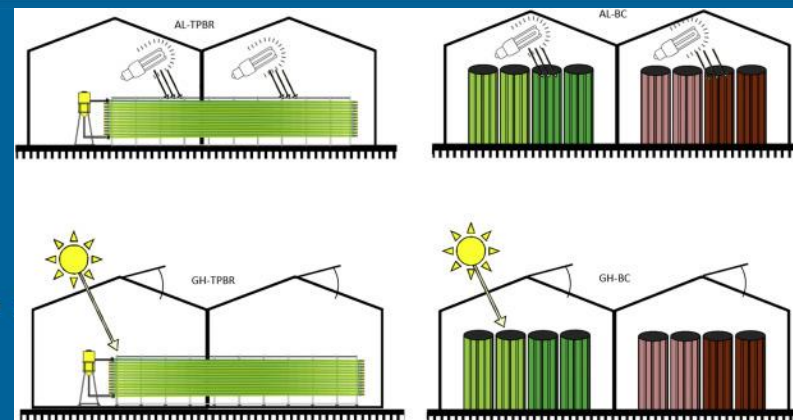
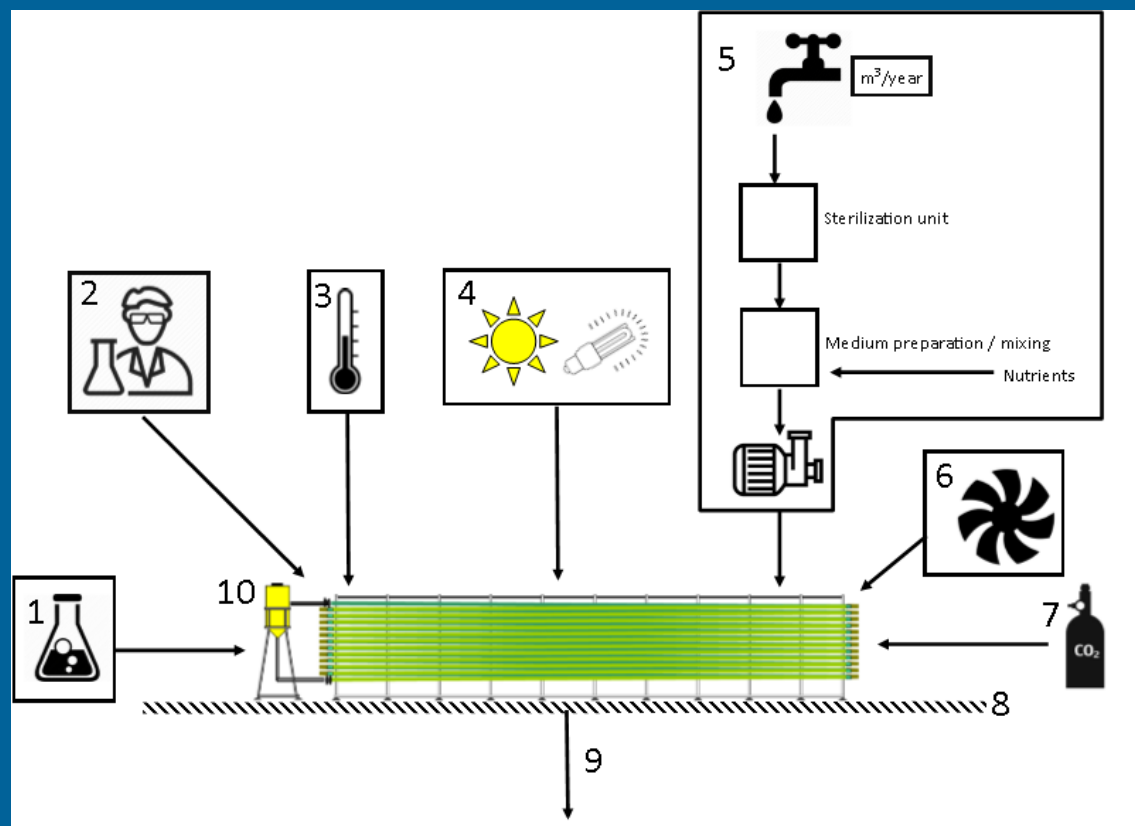


Opschaling: van lab naar commerciële schaal

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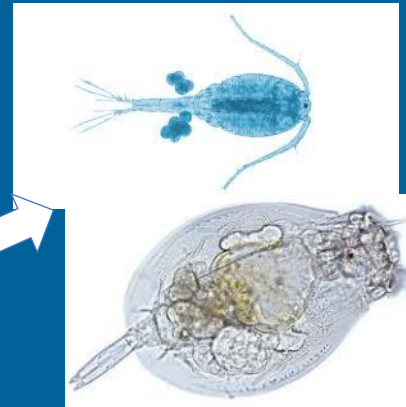
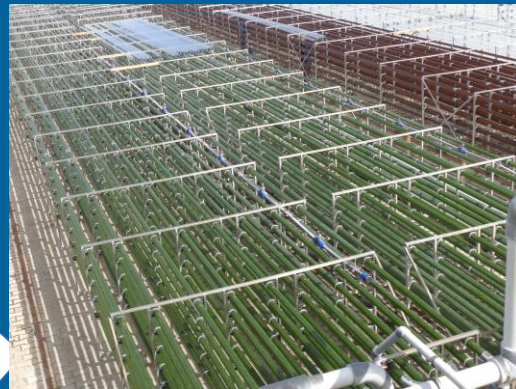


Kostprijs



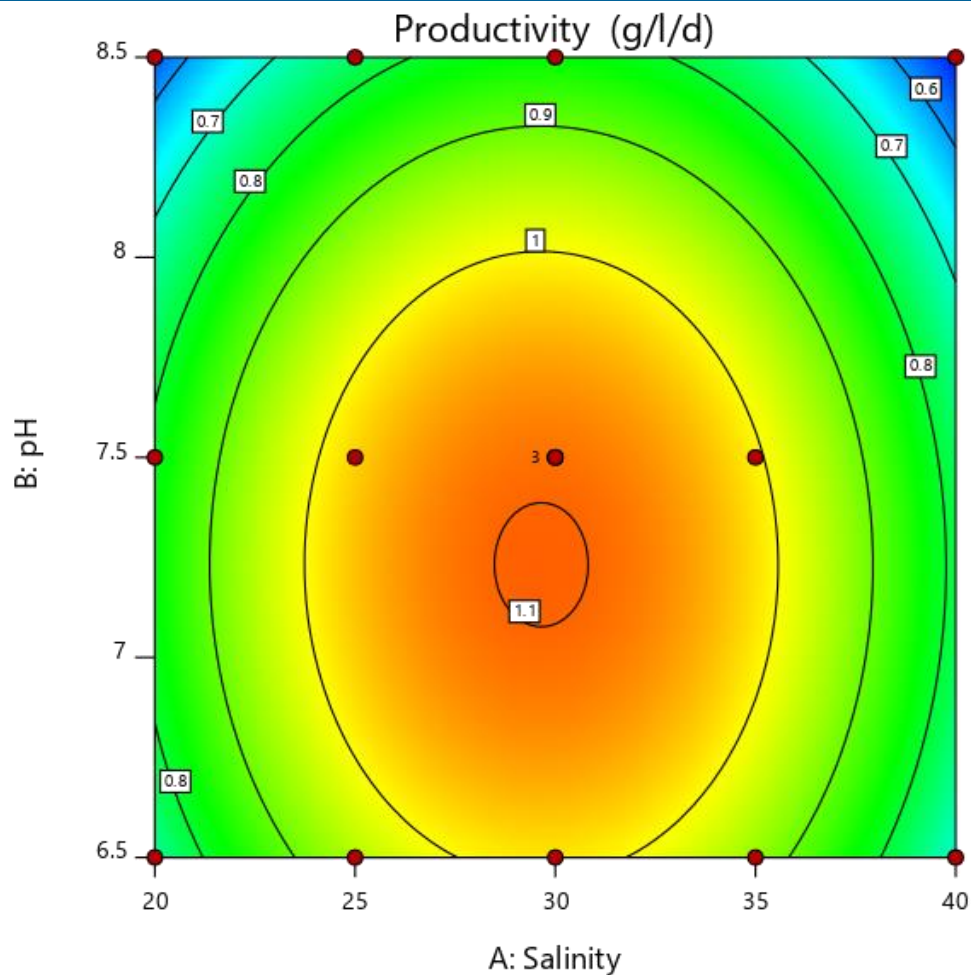
Centrale algenkweekfaciliteiten?

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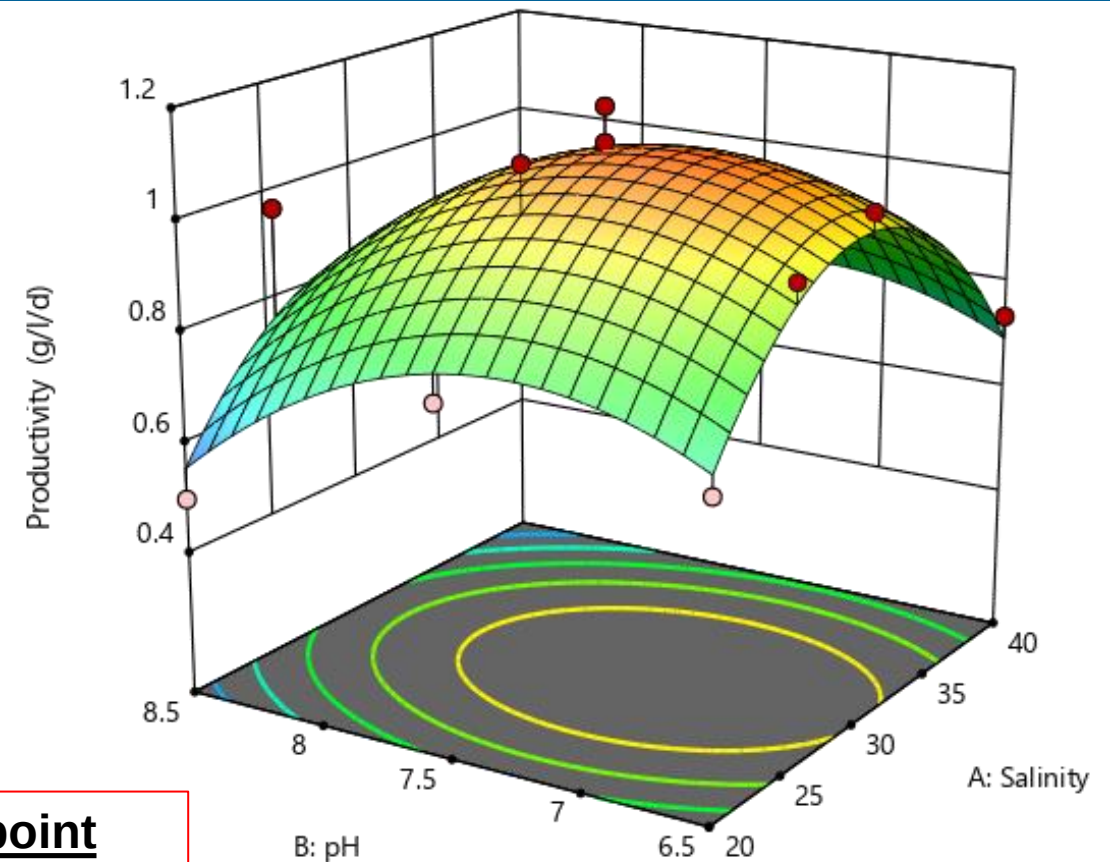
Trade off: kwantiteit - kwaliteit



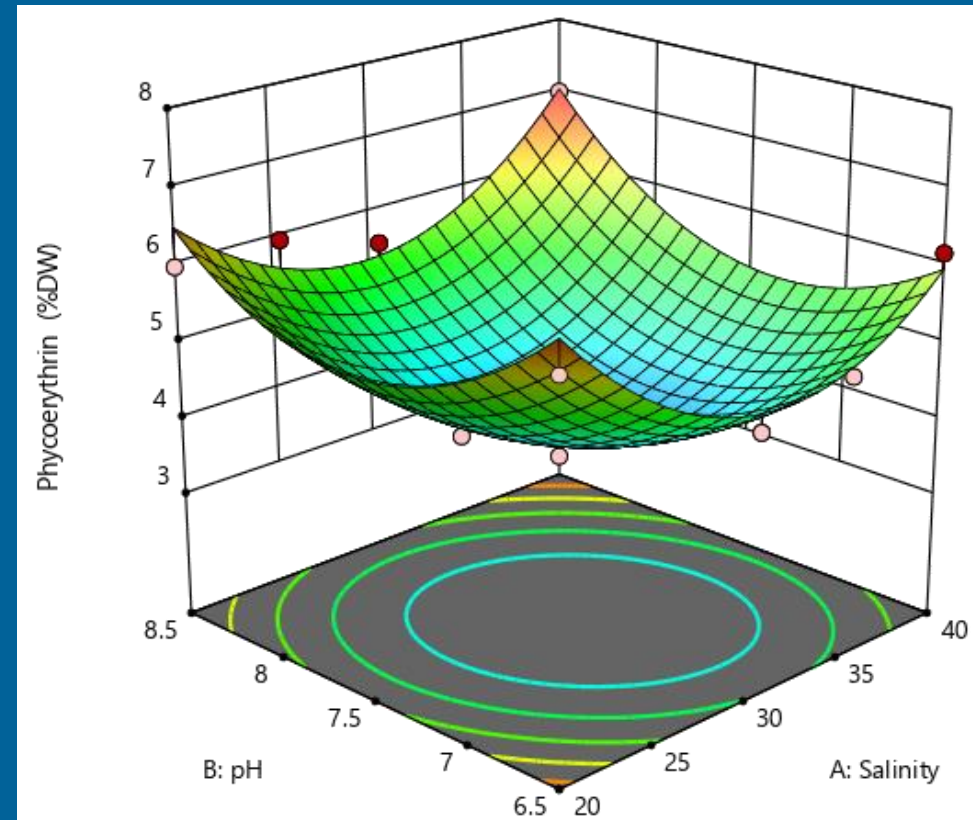
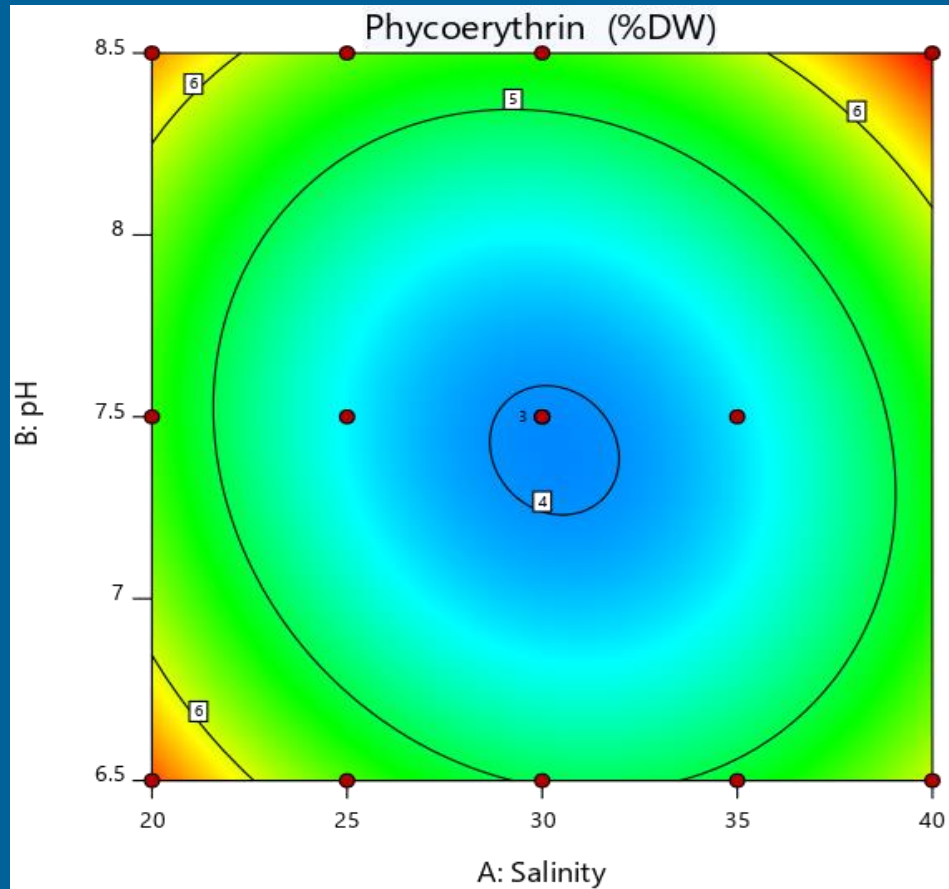
Optimal point

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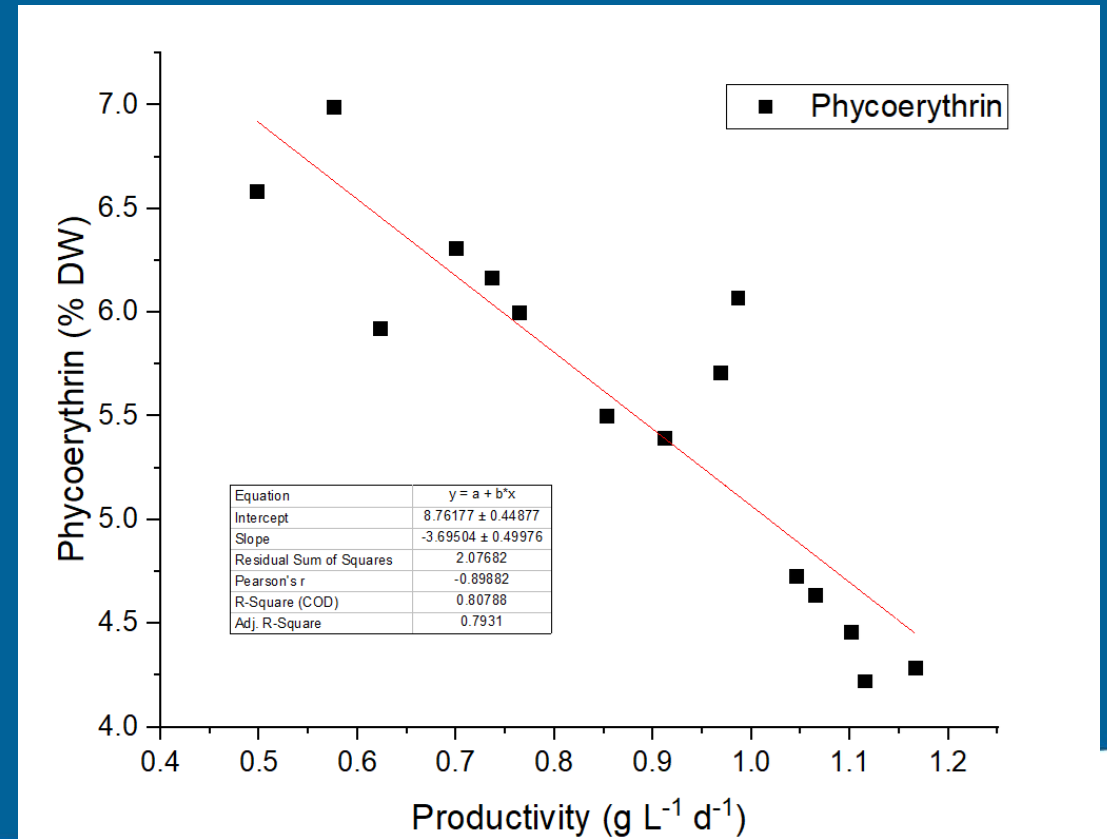
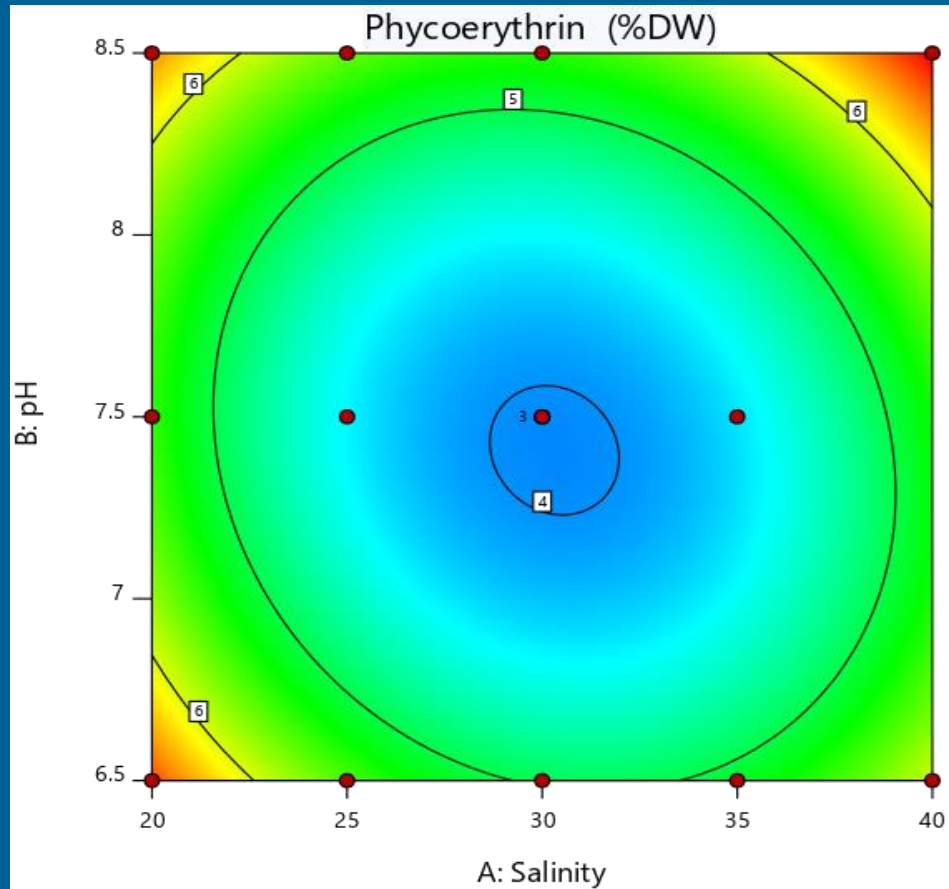
salinity=30 ppt



Trade off: kwantiteit - kwaliteit



Trade off: kwantiteit - kwaliteit





**Bedankt voor
uw aandacht**

j.van.houcke@hz.nl