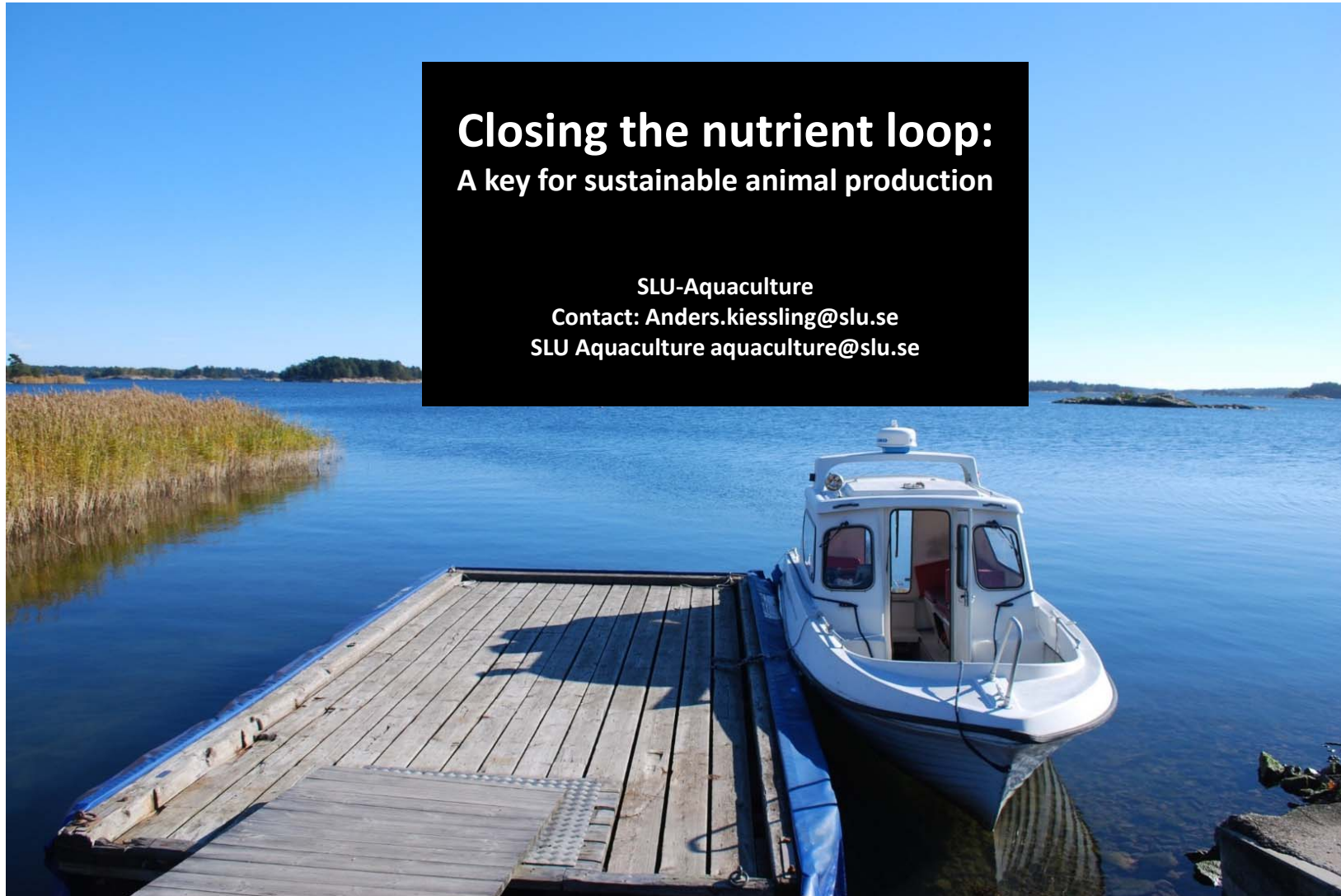




Closing the nutrient loop: A key for sustainable animal production

SLU-Aquaculture
Contact: Anders.kiessling@slu.se
SLU Aquaculture aquaculture@slu.se



Drivers for aquaculture in the Baltic region

1. Produce food from water
 1. Not using arable land
 2. Local food safety during crises
 3. Work opportunities in rural areas and for new groups
2. Reduce import of aqua food
3. Environmental service by recapturing nutrients
4. New industry, producing feed sources
5. R&D in support of regional development

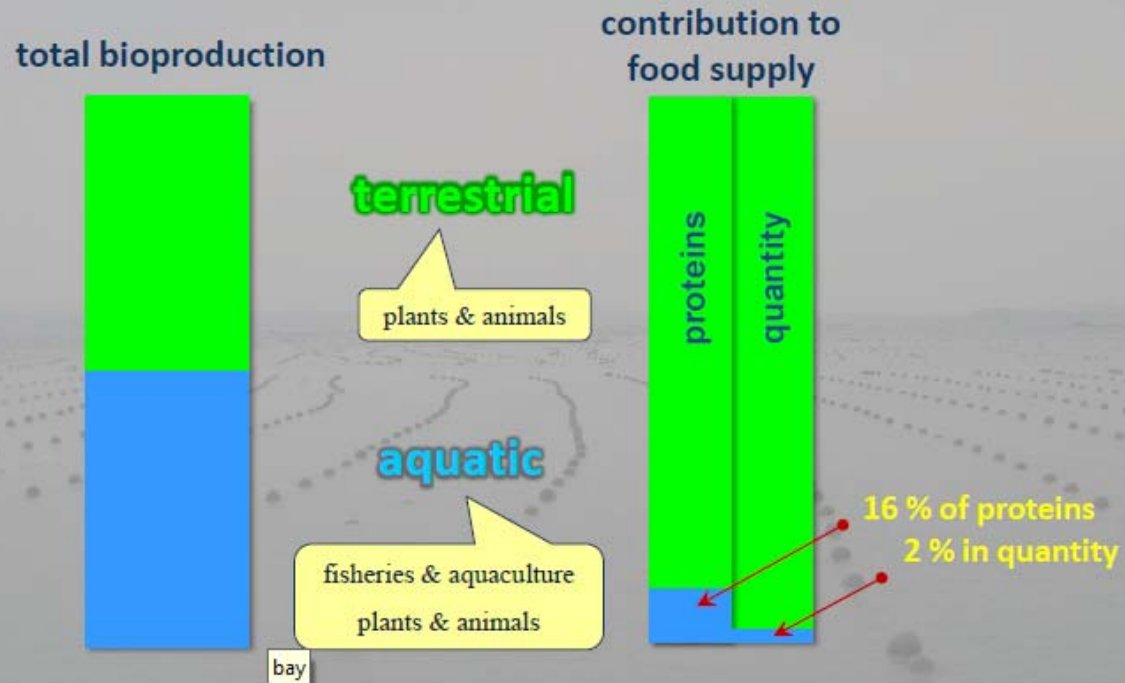
Europe imports more than 70 % of its seafood needs



What happens when these exporting countries decide to eat it them self? In fact this is already happening

Increase in price =>
Reduced intake?
Implication for health and mental development ?

GLOBAL PRIMARY PRODUCTION AND FOOD SUPPLY



from Field *et al.* (1998) and Duarte *et al.* (2009)

From Presentation by Patrick Sorgelos

Aquaculture, consist of numerous species and diversified production systems, defined by culturing in water. 597 species farmed

Photo A.Kiessling

Function well month to year
Without external input
Low investment and running cost

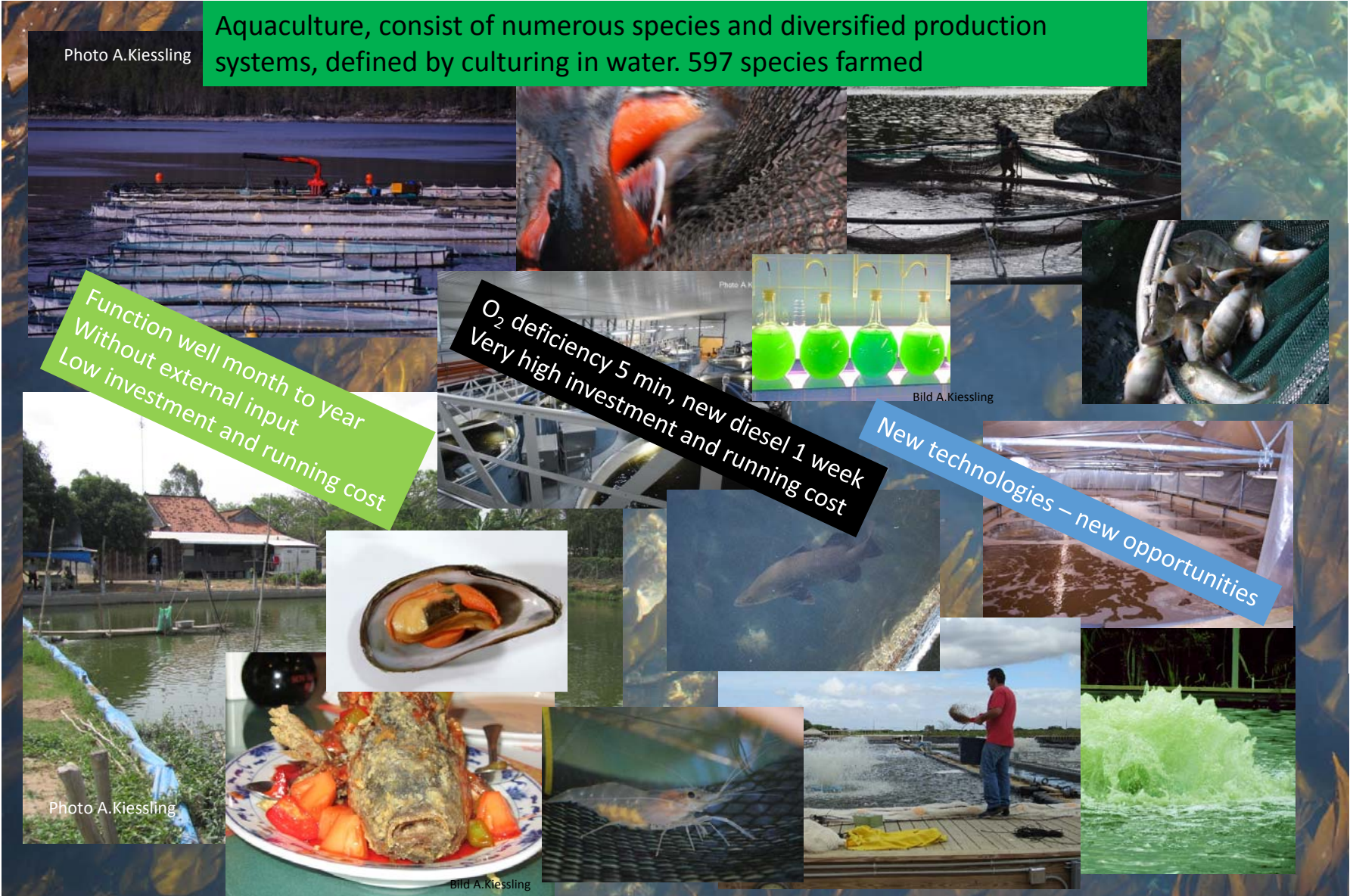
O₂ deficiency 5 min, new diesel 1 week
Very high investment and running cost

New technologies – new opportunities

Photo A.Kiessling

Bild A.Kiessling

Bild A.Kiessling

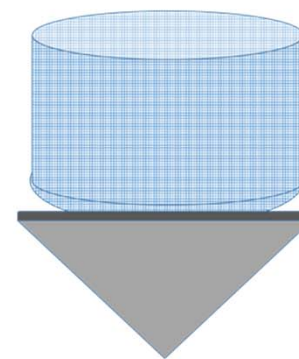




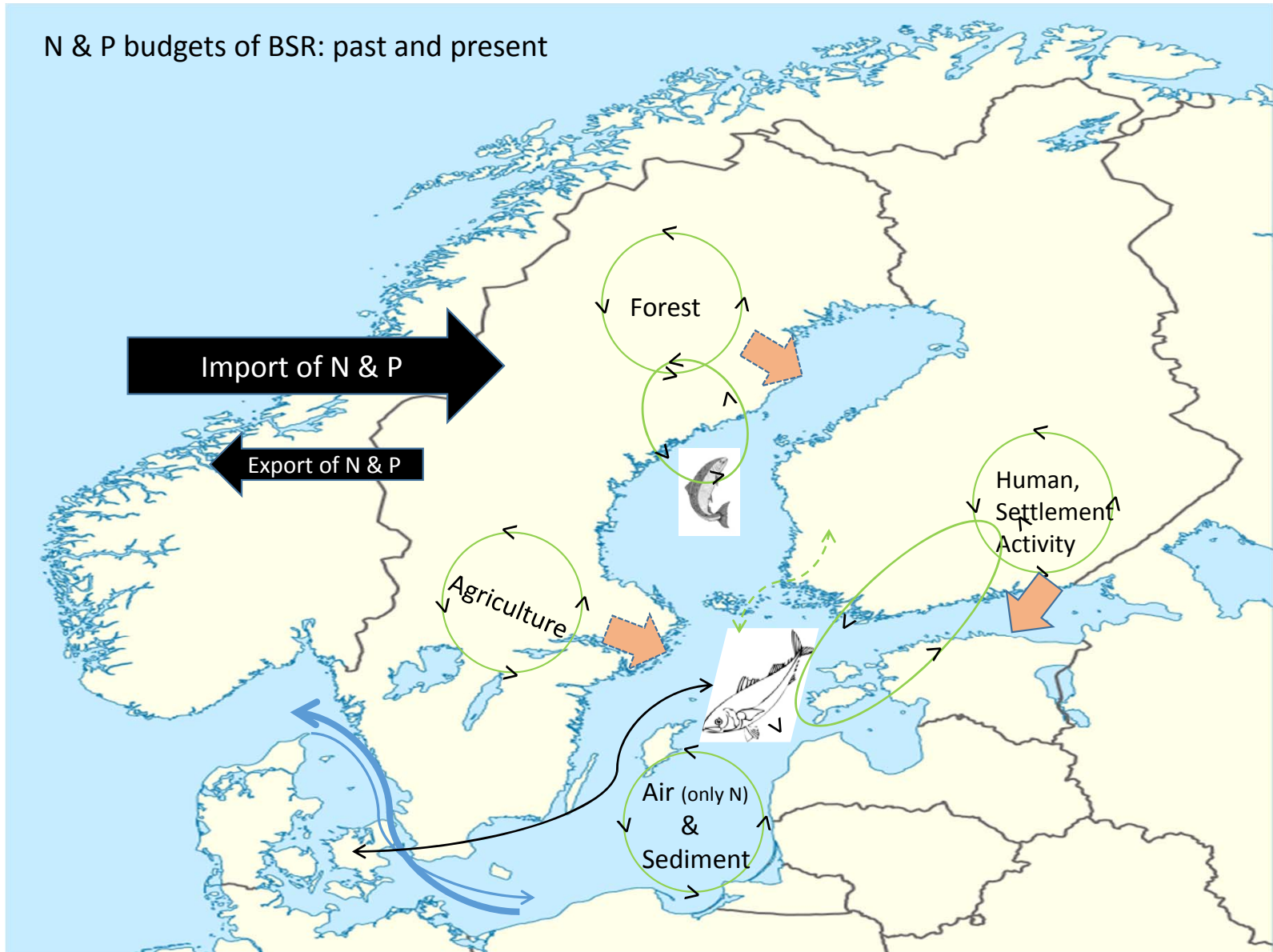
EU, presently focus open Atlantic and Mediterranean cage farming.

We must move towards a more diverse and location based approach.

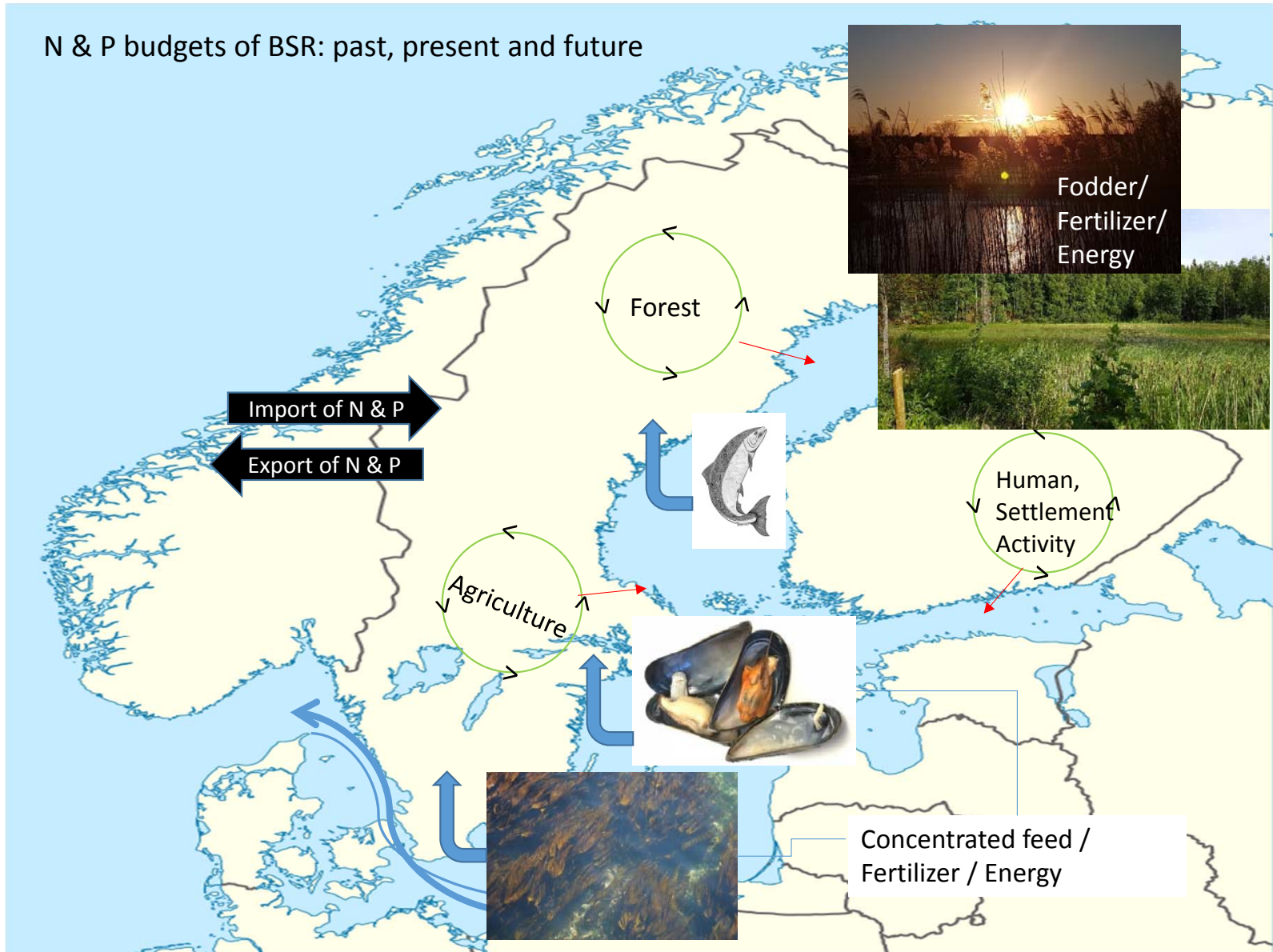
Aqua – Agro circular production systems

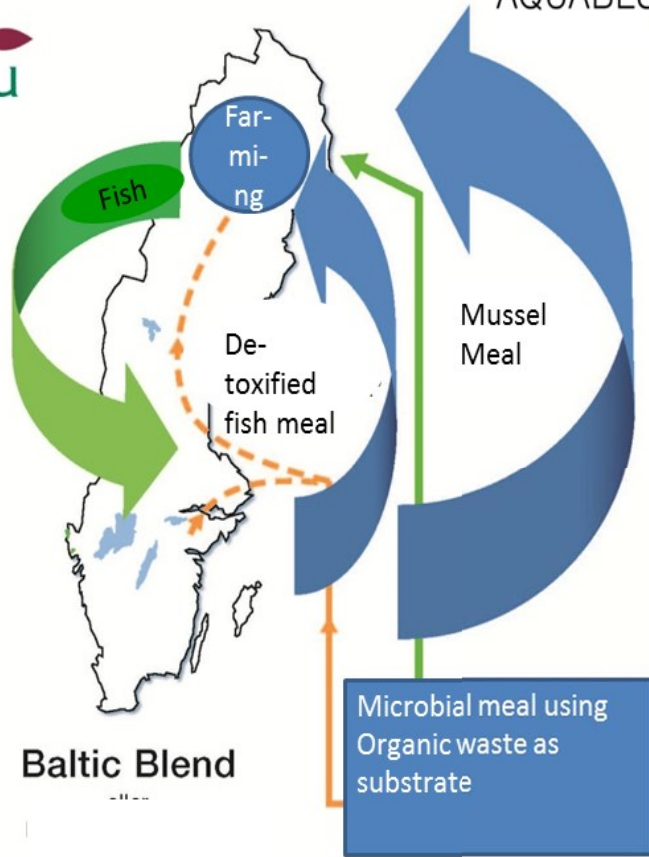


N & P budgets of BSR: past and present



N & P budgets of BSR: past, present and future





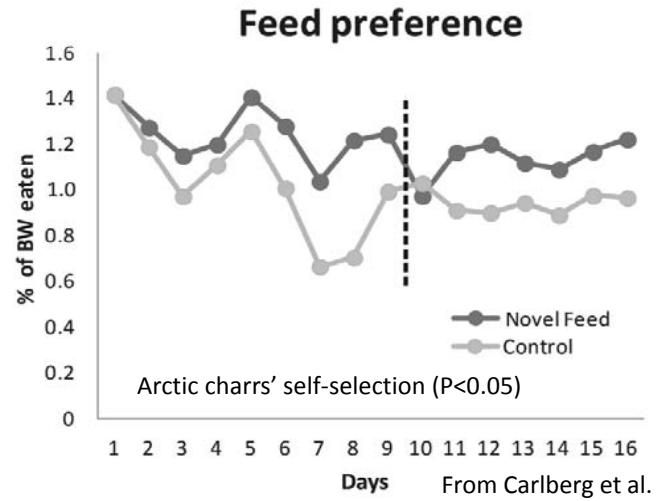
A.Kiessling

Preference test:

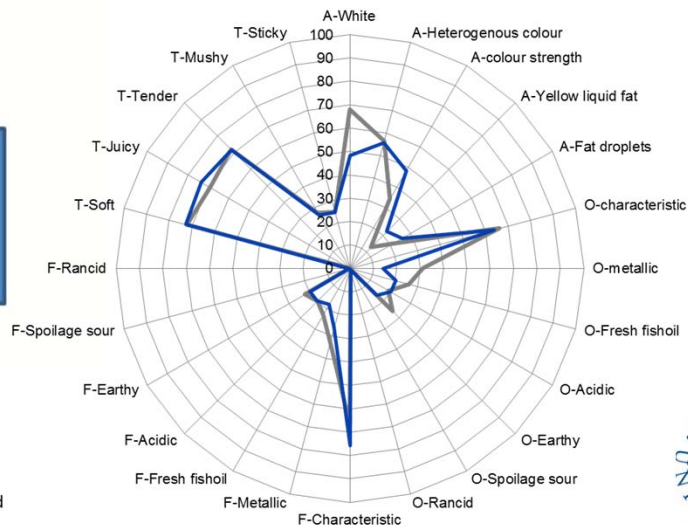
C: 6.19 out of 9

BB: 6.35 out of 9

— Baltic Blend
— Commercial type



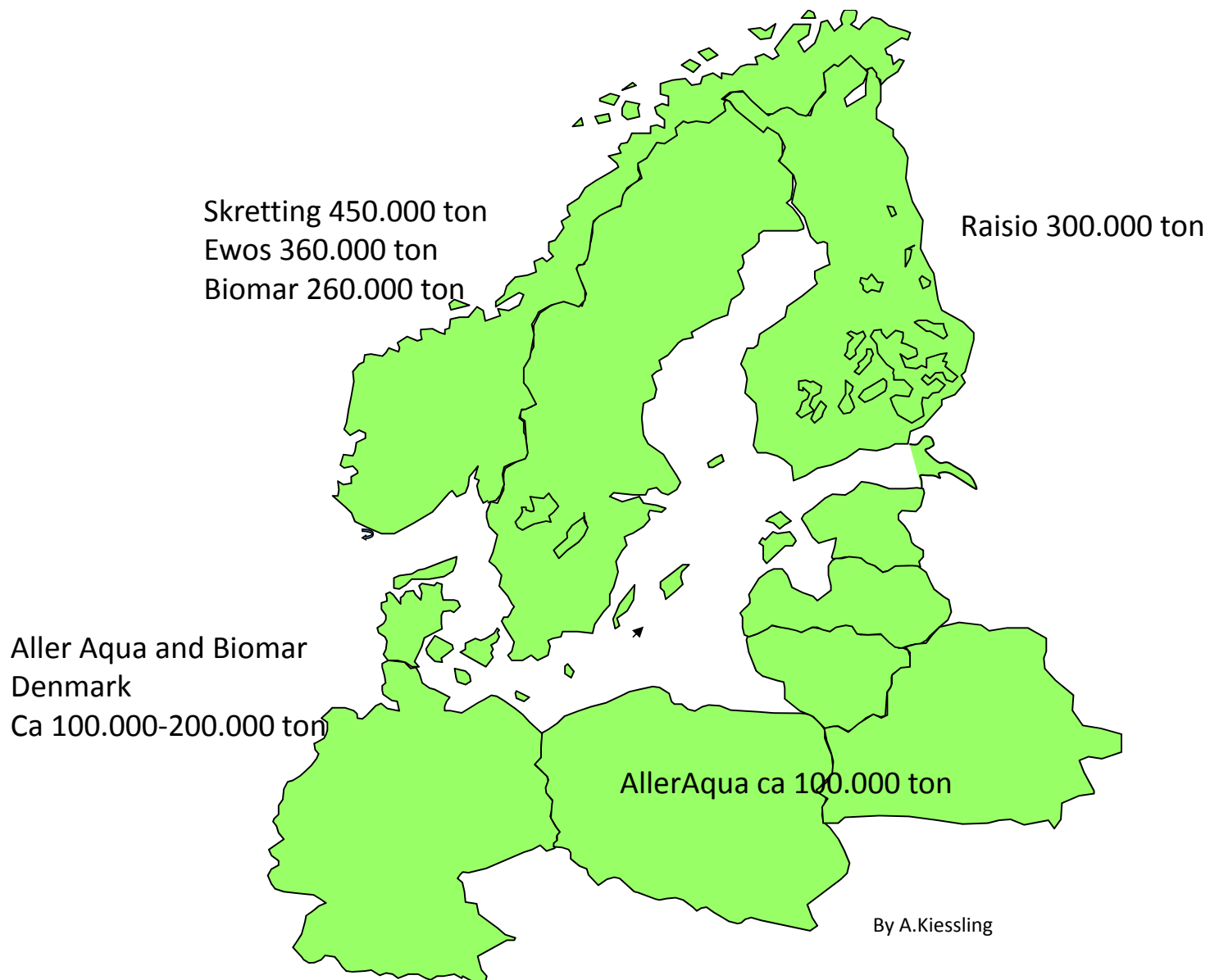
Sensory evaluation



From Carlberg et al.

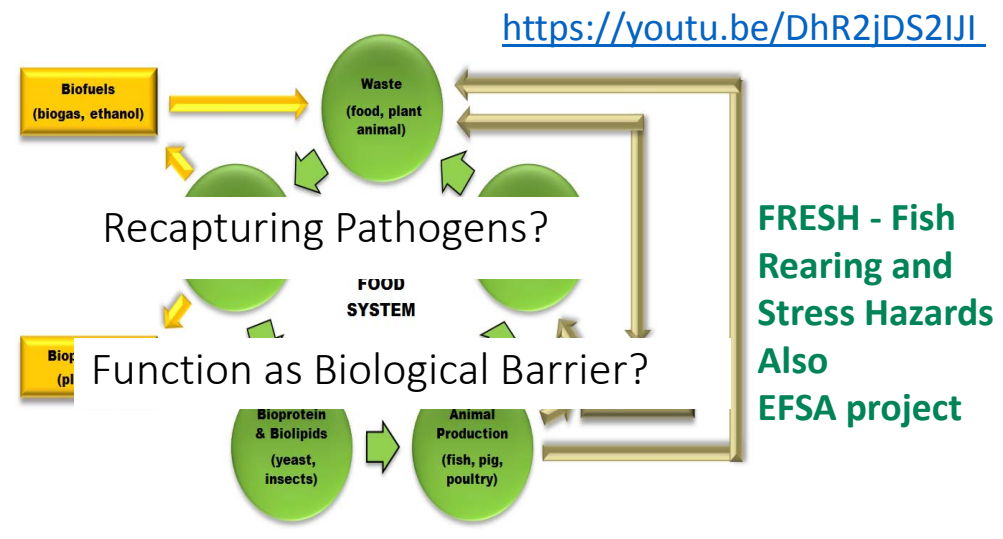
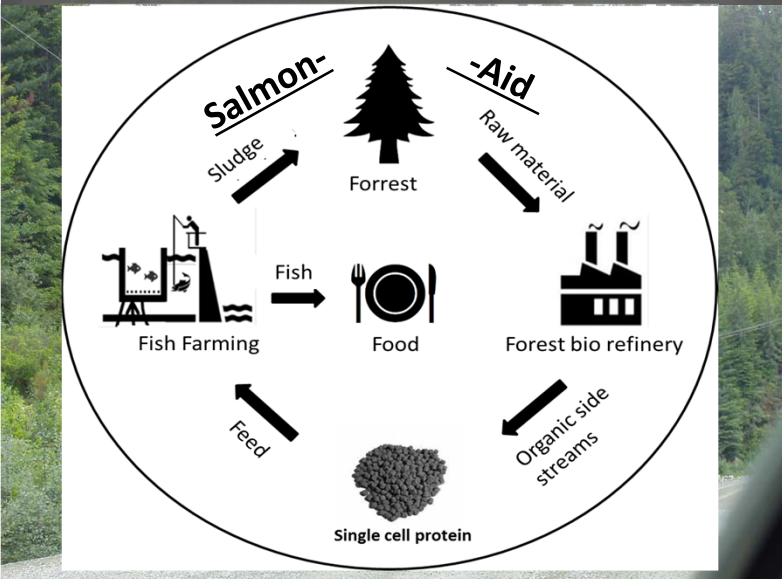
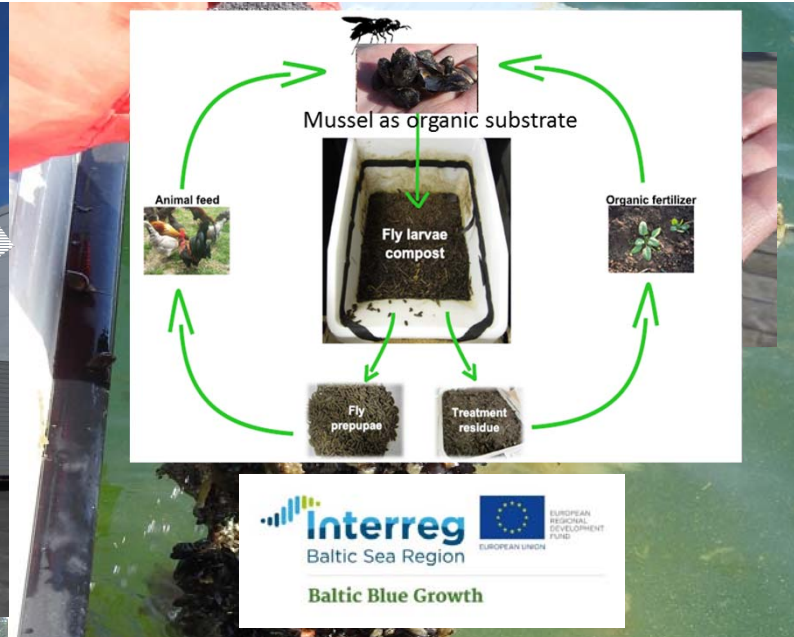
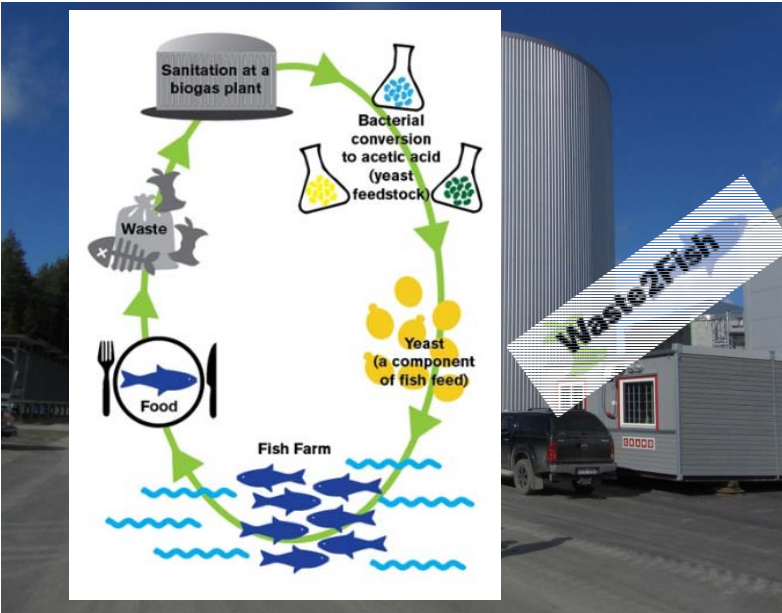


Aqua Feed A Baltic Possibility





CARBON TO FOOD





Jästbolaget, Rotebro, Sweden.
Produce 20.000 ton yeast/year
optimized for producing CO₂

Good condition 10 mg of yeast => 150 ton in a week.

Growth rate / day:
Bacteria every 20 min => 2⁷²
Yeast every 2 h => 2¹²
Micro algae once a day => 2¹

<https://youtu.be/DhR2jDS2UJI>

Yeast picture courtesy of Matilda Olstorpe

Single
chemicals and
carbon chain



Sanitized
Protein, lipids
and vitamins

Protein of low
value



Sanitized
protein of
high value

Concept for transfer of knowledge in order to support regional development

