



ALGAE


A GLIMPSE INTO THE NEAR FUTURE

**ProAlgea 2013,
Bergen, 30th April 2013**

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Innovasjonsdirektør
ProDus Aqua as**



Who is Alltech?

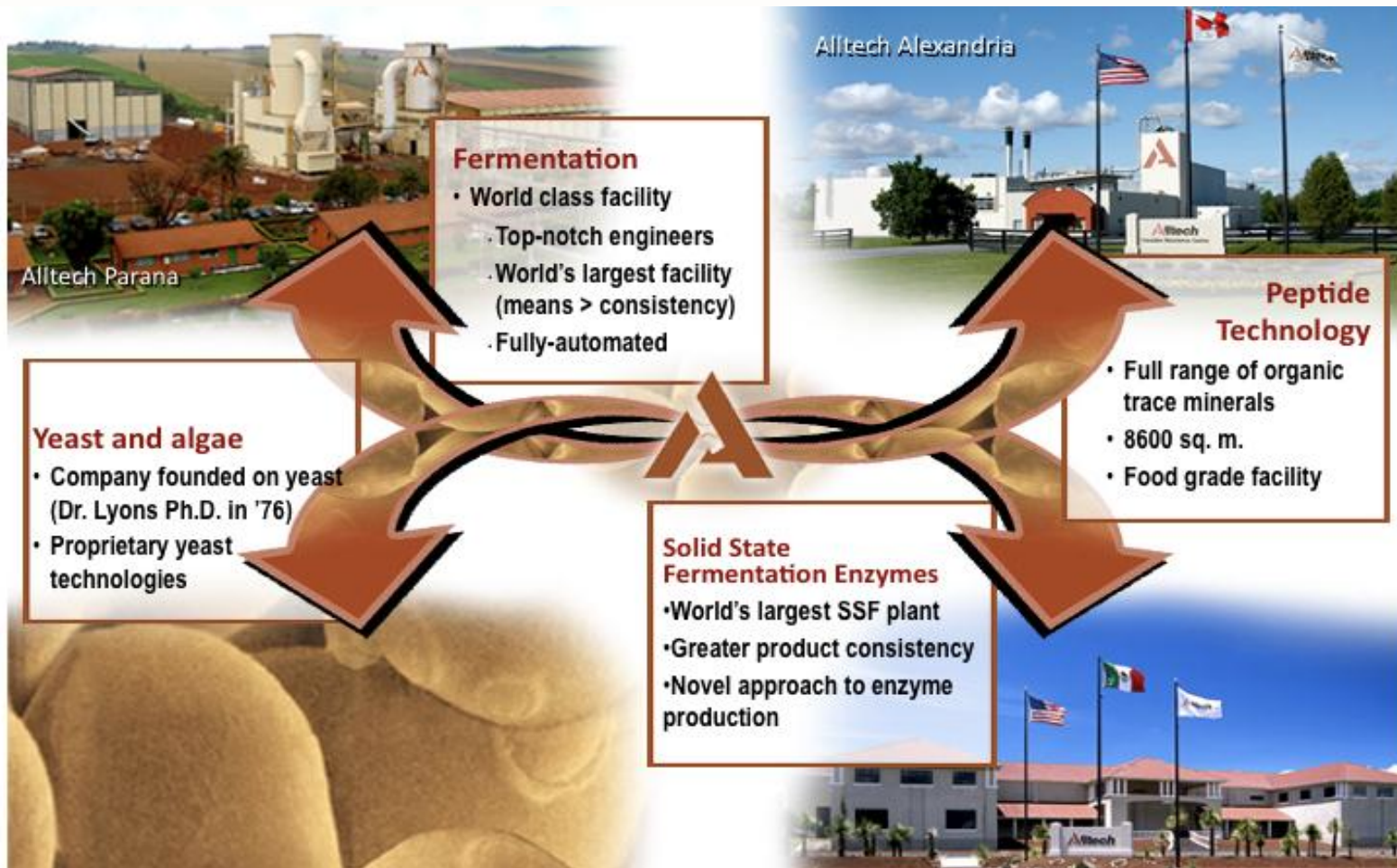
- 
- Top 10 animal health company
 - Only company that is:
 - Privately-held
 - Non-pharmaceutical
 - Growing consistently over 32 years
 - Moving towards a \$1bn company



Our Global Presence

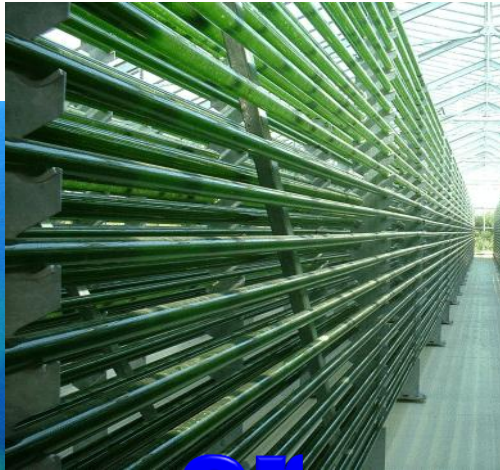
- Trading in 128 countries
- 32 core manufacturing facilities
- 3,112 employees
- 3 Bioscience Center's

Core Competencies





Science



or



Industry?

Seafood benefits to man are they at risk ?



- ✓ Cut the risk of Diabetes
- ✓ Important for brain development
- ✓ Decrease risk of asthma
- ✓ Decreased risk of developing Alzheimer's
- ✓ Cut the risk of heart diseases
- ✓ Improve intelligence
- ✓ Stress, depression, Schizophrenia
- ✓ Prevention of Obesity
- ✓ Decrease risk of cancer
- ✓ Improve skin conditions
- ✓ Positive influence on dyslexic and hyperactive children
- ✓ Improvement of migraine

Source: Aquamax project, 2007

How will you supply the needed nutrients?

Diet and Fillet Composition

Supermarket standard	2005	2008
Minimum marine product (Fishmeal + fish oil)	50%	20%
Fishmeal (min.)	30%	-
Fish oil substitution	40%	75%
EPA + DHA (%fat)	>15%	>6%
Omega 3 (%fat)	>18%	>10%
ω -3 / ω -6 ratio	>2	>0.7

Heterotrophic algae production

- Closed, controlled system
- Traceable
- Pure
- Higher level of consistency
- Protected by AQS



Meeting & Exceeding
Globally Accepted Standards



Produs Aqua AS

Pilot Plant and labs

- The pilot plant is an exact replication of the entire process
- Research
 - new strains
 - optimize growth
 - optimize desired components
 - reduce costs



Our facility...



Industrial production

-micro alga



- Capacity
- Automation
- Quality
- From 1.5ml to 260 000l product in 9 days!!

Water Removal



Altech[®]



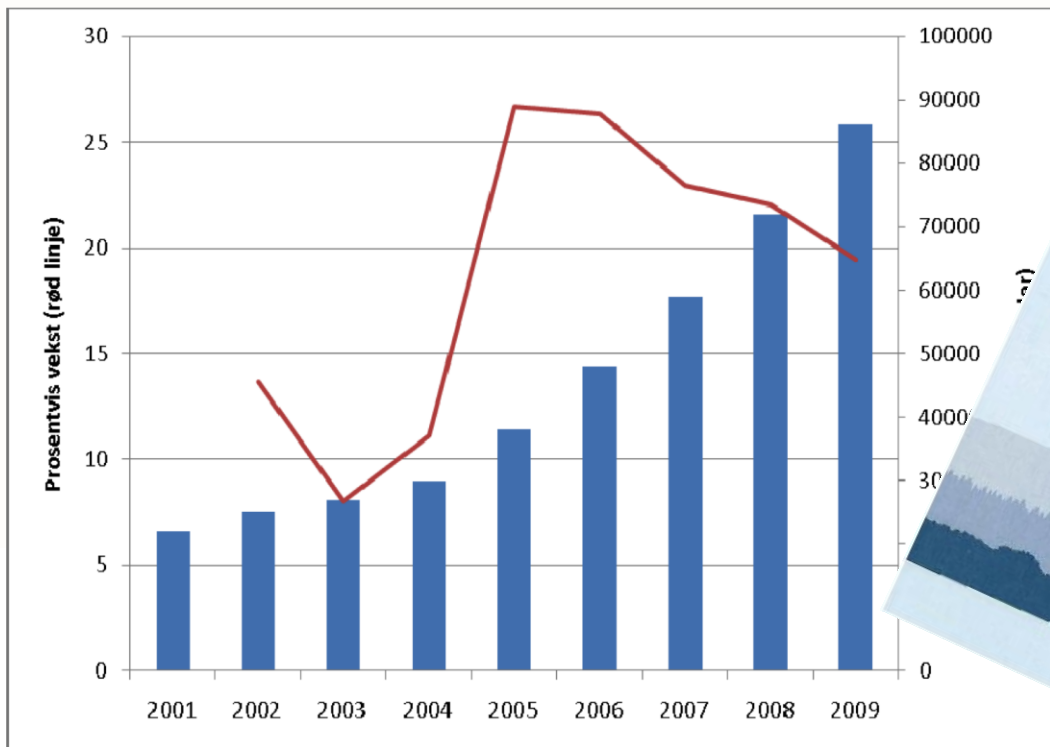
Probus Aqua AS

But what are you REALLY getting...

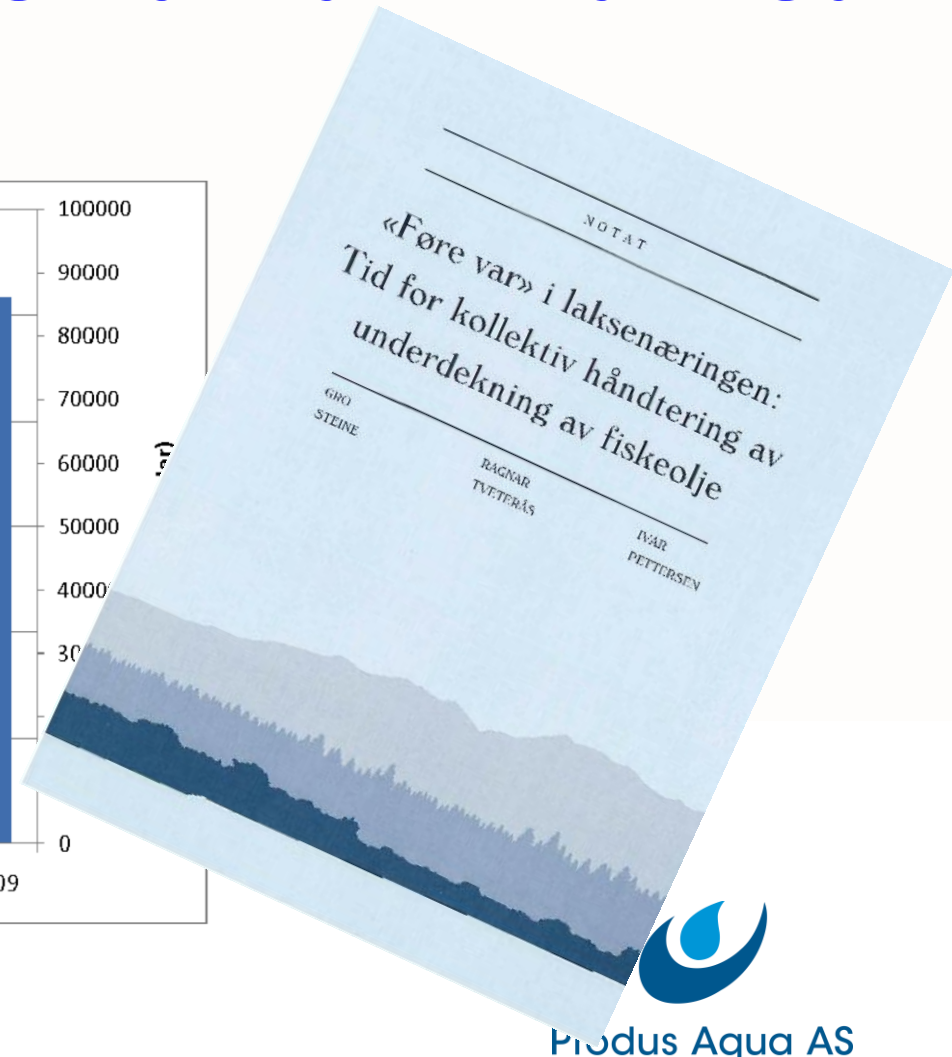
		HUFA	EPA	DHA	Difference
Fish Oils	AVG Atlantic Oil	36	15	10	11
	Menhaden Oil	32	13	6	13
	Salmon Oil	31	9.5	9	12.5
Vegetable Oils	Palm Oil	0	0	0	0
	Rapeseed Oil	0	0	0	0
	Soybean Oil	0	0	0	0
Algae	Alltech SP1	32	0.5	28.5	3

Fatty acid profile of major oils in aquafeeds (as % of total FA)

Pressure from the human marked



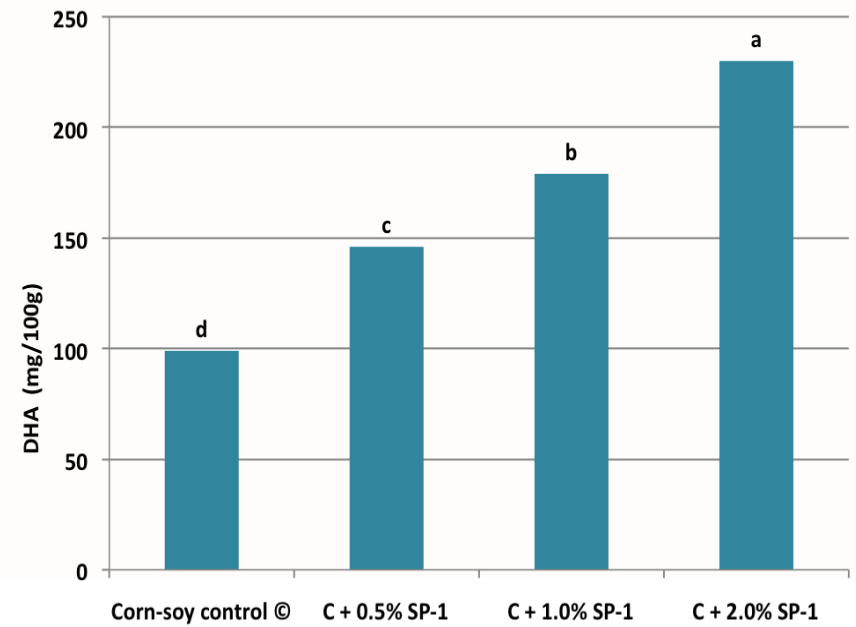
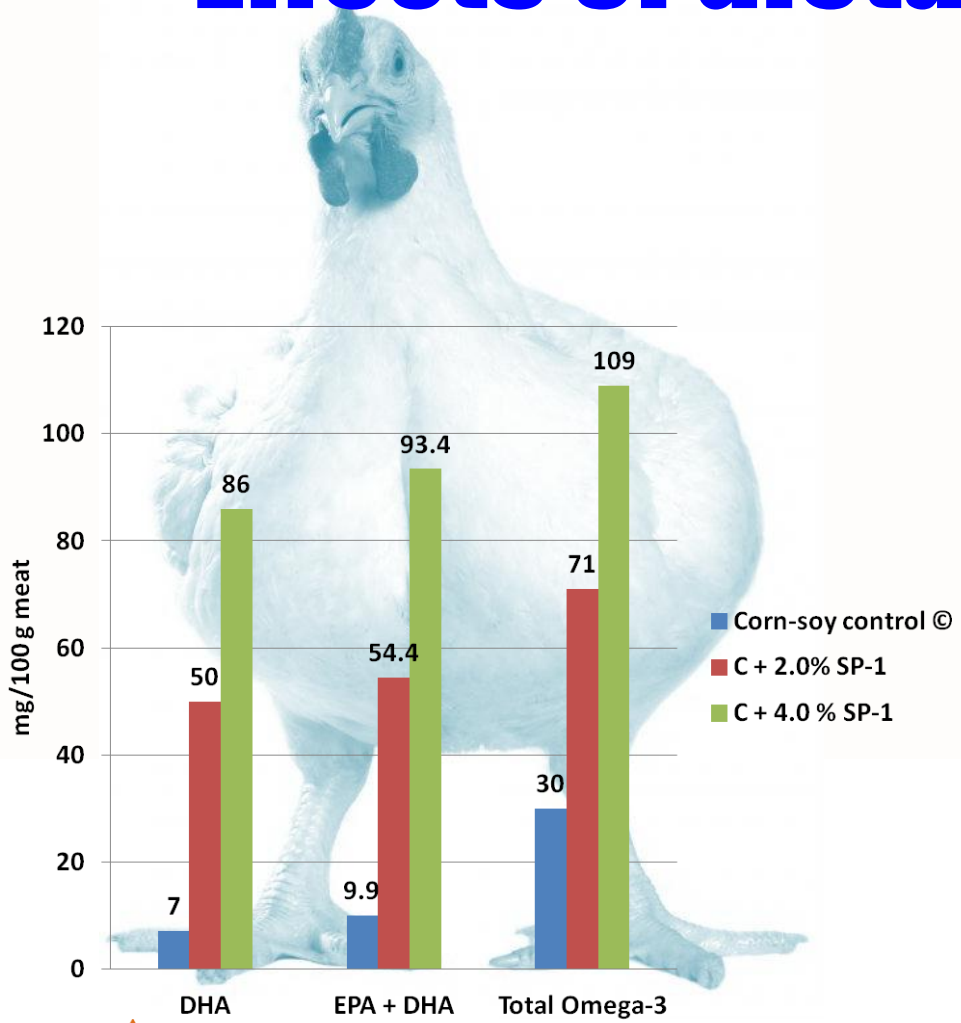
Source: "Føre var rapporten", 2011





Effects of dietary supplementing

SP-1 on the FA profile of chicken breast and Eggs



What is the status for application in -Salmon feed?

Statement;

- The industry is not very well prepared

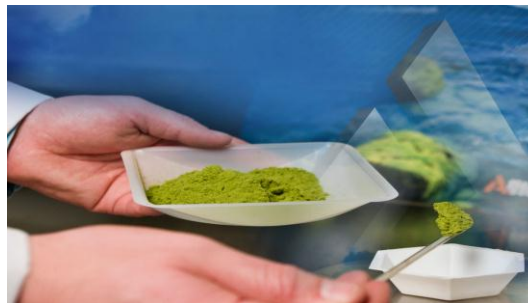
Different scenarios;

- With 10% EPA/DHA
 - the industry has 2 to 3 years to find new solutions
- If reduced to 7,5%
 - this will give additional 2 years
- If reduced from 10% to 5%
 - the immediate shortfall will be prolonged to 2016

Alltech;

- The worlds biggest producer of omega-3 from alga
- Initiated a feeding trial with salmon at Nofima with commercial produced micro alga
- The result will be published in internationally recognised publications
- 100% financed by Alltech

Source. "Føre var rapporten, 2011

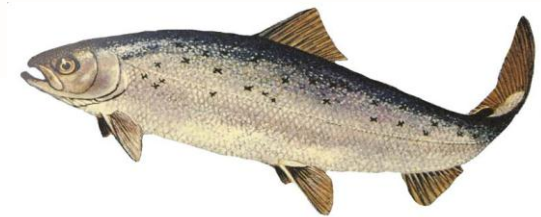




Algae in formulated feeds

Some considerations

- ✓ Availability, quality & price
- ✓ Interaction with fish physiology
- ✓ Level of incorporation to achieve nutrient goal
- ✓ Effect on pellet quality
- ✓ Fish Appetite
- ✓ Growth & FCR at different stages
- ✓ Digestibility
- ✓ Impact on health, flesh quality
- ✓ Product acceptability – consumer & industry



Peace of Mind – The Alltech Quality System

- Global Quality System
- From Farm to Fork
- Positive Release Program

Globally

ISO **HACCP**
CERTIFIED

Regionally



Locally



Meeting & Exceeding
Globally Accepted Standards

- ✓ Quality
- ✓ Safety
- ✓ Traceability
- ✓ Consistency



Thank you

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We will feed the
world but not
in the way we
do today.

We will do it
better!



Altech[®] SP1