



# Marine Ingredients

MareLIFE 15. juni, Bergen



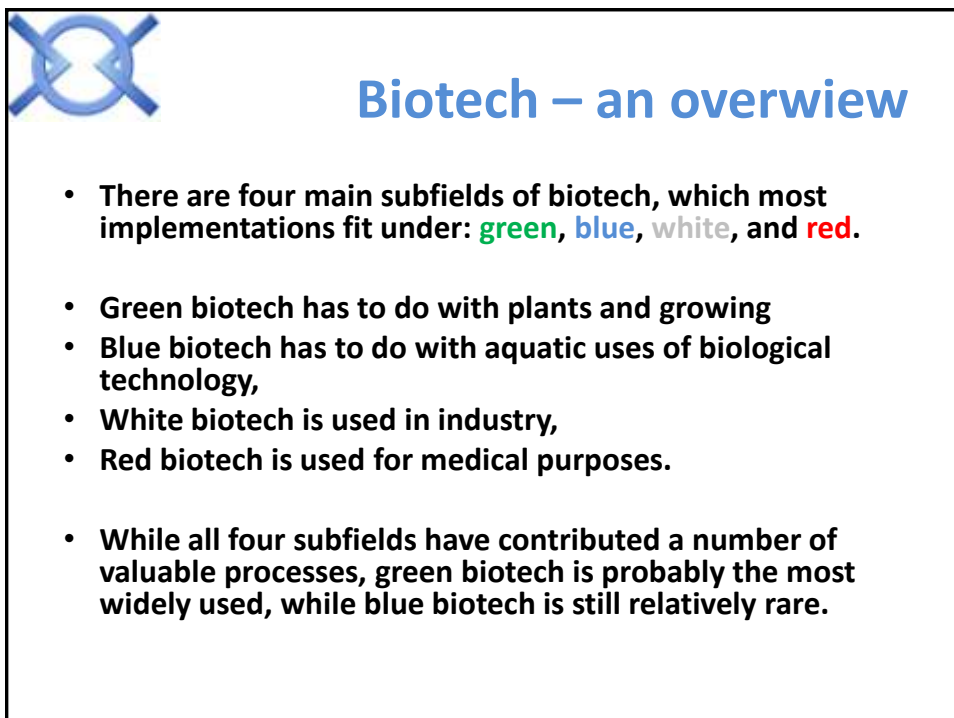
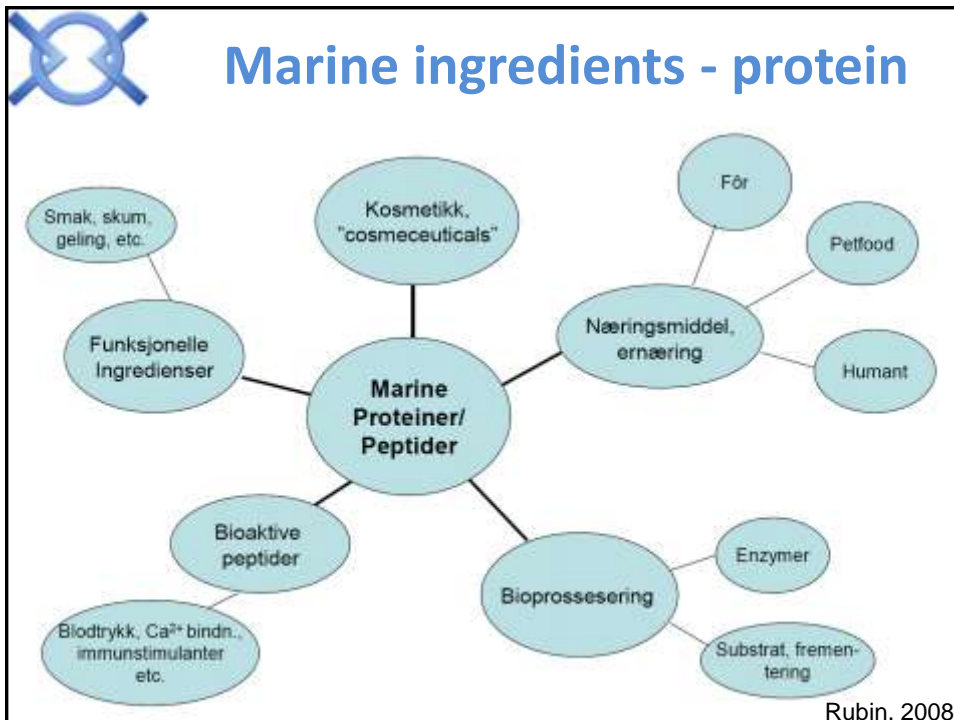
**Kjartan Sandnes, Dr. philos.**  
**Marine Bioproducts AS**  
R&D manager




# Contents

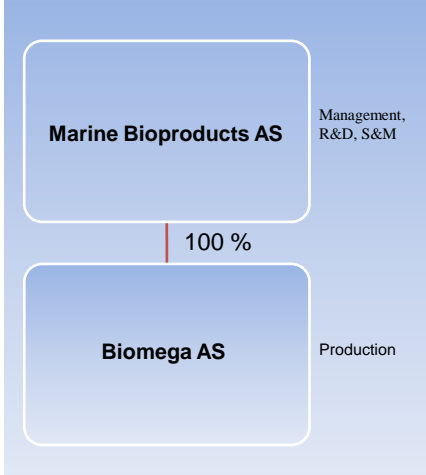
- Products
- Potentials
- Industrial biotechnology







## Main activities




Marine Bioproducts AS  
Management, R&D, S&M

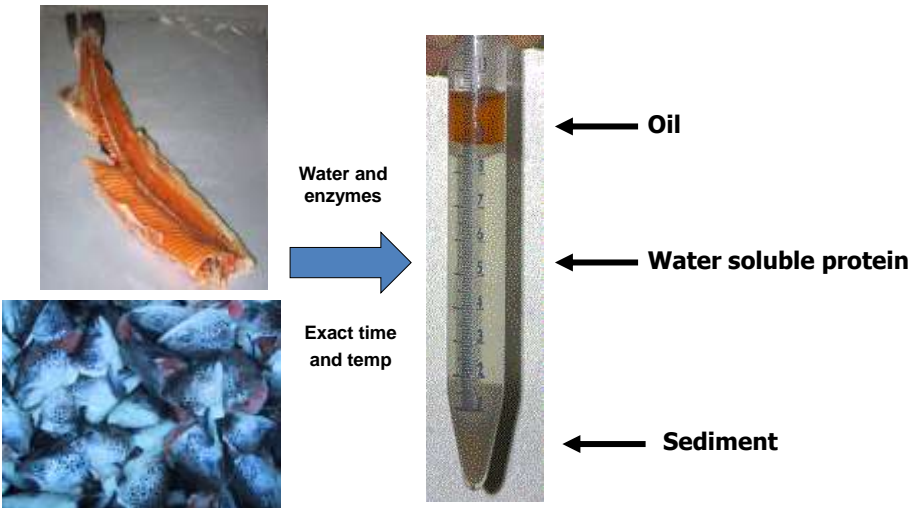
100 %

Biomega AS  
Production

- Marine Bioproducts AS established 2000
- Production established 2002 at Biomega AS, Sotra
- Continuous enzymatic hydrolysis
- Fresh raw material
- 25.000 tons annually
- No chemical processing aids
- New oil extraction plant opened in Florø June 2009



## Enzymatic hydrolysis



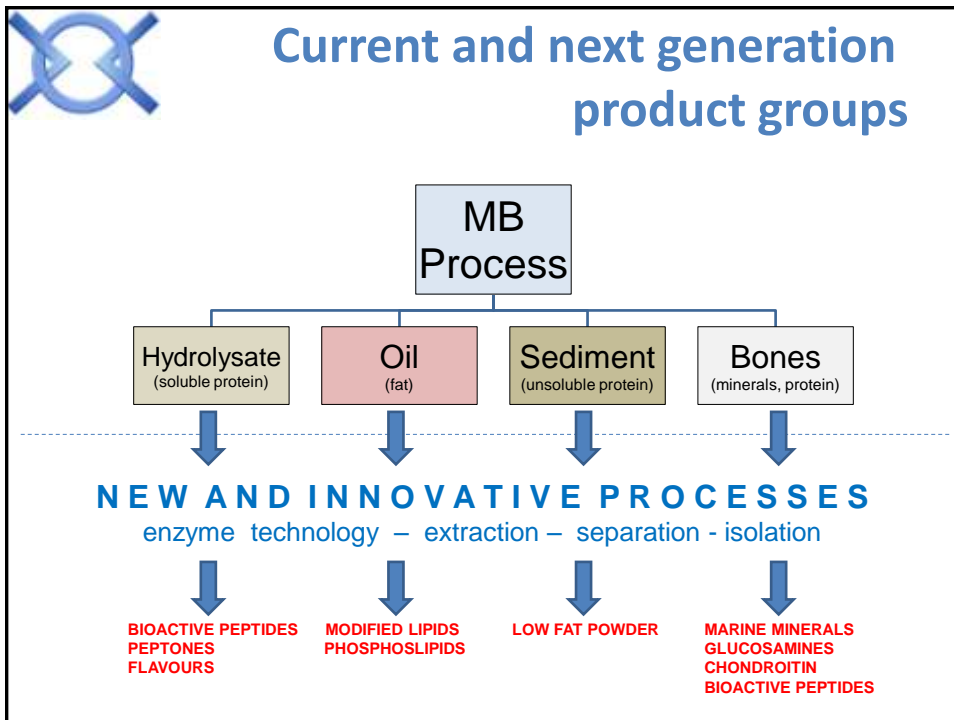
Water and enzymes

Exact time and temp

Oil

Water soluble protein

Sediment



**Searching for bioactive components**



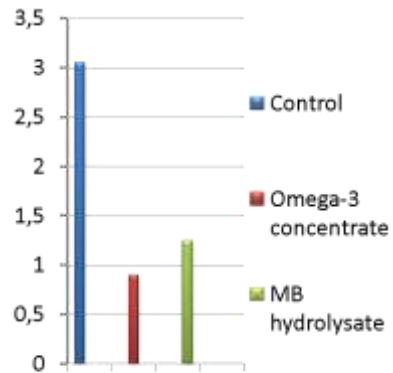

**Peptides from Marine Bioproducts AS**

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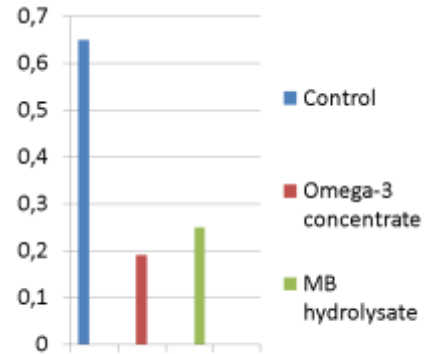


## MB peptides reduce blood lipids

mmol/L plasma TG



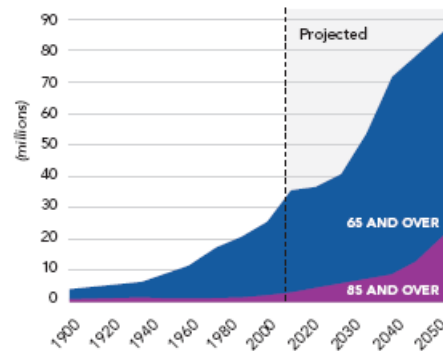
mmol/L plasma non-HDL cholesterol



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## Age development (US)



Source: Federal Interagency Forum on Aging-Related Statistics 2004, Older Americans



# Peptones for fermentation

**Marine protein in industrial fermentation.**

Marine protein sources are excellent substrates for microbial growth. This is well documented in the scientific literature, and is experienced by many users. The reason to choose marine protein sources as nutrient for microorganisms are:

- high level of protein
- high levels of amino acids
- high levels of essential amino acids
- vitamins
- minerals
- nucleotides

In addition, marine raw materials are known to contain additional growth components. Salmicro® in industrial fermentation may induce the lag phase of the growth curve, increase growth rate and reach its higher maximal density in the fermenter.

**SALMICRO®**  
The cost effective marine peptone

**Salmicro®** is produced from fresh sea-GMO salmon by a continuous enzymatic hydrolysis process using endoglucuronase (GDE) enzymes. The process is food certified, and the fermenter conditions ensure the high quality products. Salmicro® is suited to a:

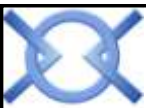
- protein level of 92 % of DM
- low of lipids and phosphorus
- no additives are used during processing
- totally soluble
- homogeneous quality due to freshwater material
- no seasonal variation
- no batch variation
- continuous supply all year

The product is produced from reliable supplies of sustainable raw material. Salmicro® may be certified according to Kosher and Halal. Salmicro® can be delivered as a paste (90-92 % DM) or spray-dried.



Good performance is demonstrated for Lactobacillus, Streptococcus, Bacillus, Yeast, Xanthomonas, E. Coli and Saccharomyces.





# Ambitions

Marine Bioproducts AS — Commodities (Generation I) — Industrial Biotechnology (Generation II)

Towards next generation products →

**Key words:** Process competence    R&D    Innovation    IPR

**Plans:** New processing plant – with pilot for next generation products



## MB – Skaganeset, Sotra



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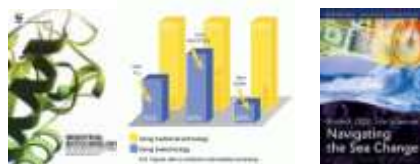
## Knowledge-Based Bio-Economy (KBBE)



Where food and feed, and industrial goods such as fuels, plastics, chemicals, lubricants, pharmaceuticals,

...are produced in a more sophisticated and environmental friendly manner

...by incorporating life sciences and biotechnology innovations.



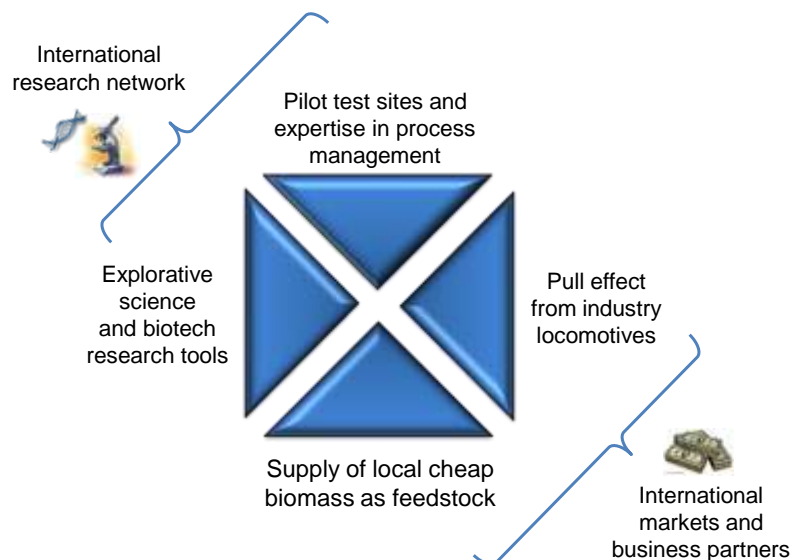
## Innovation Norway: 9 prioritized sectors

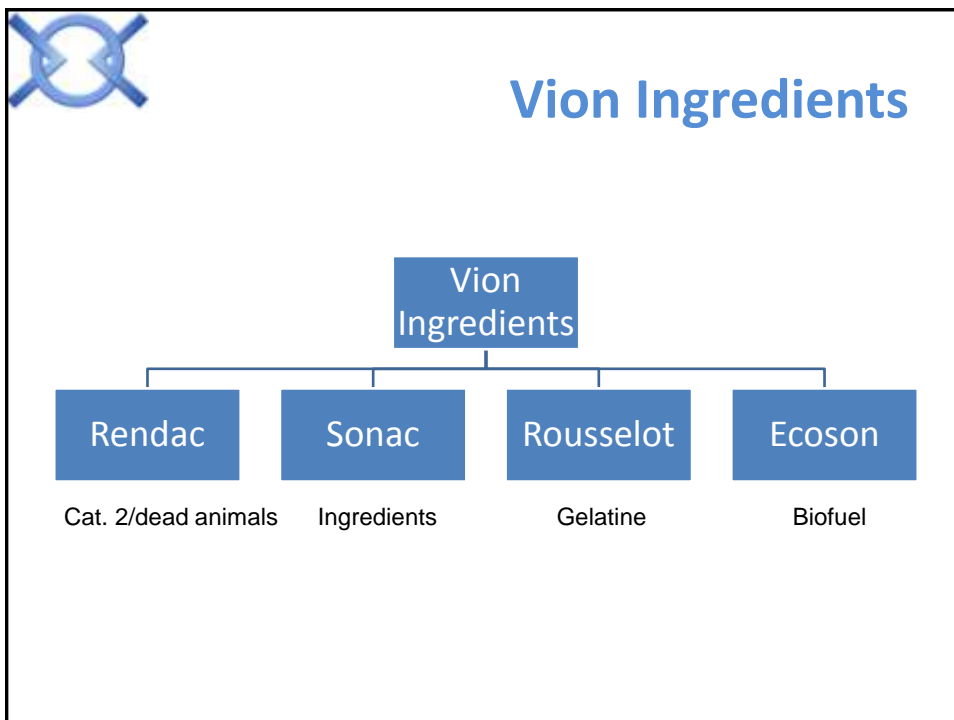
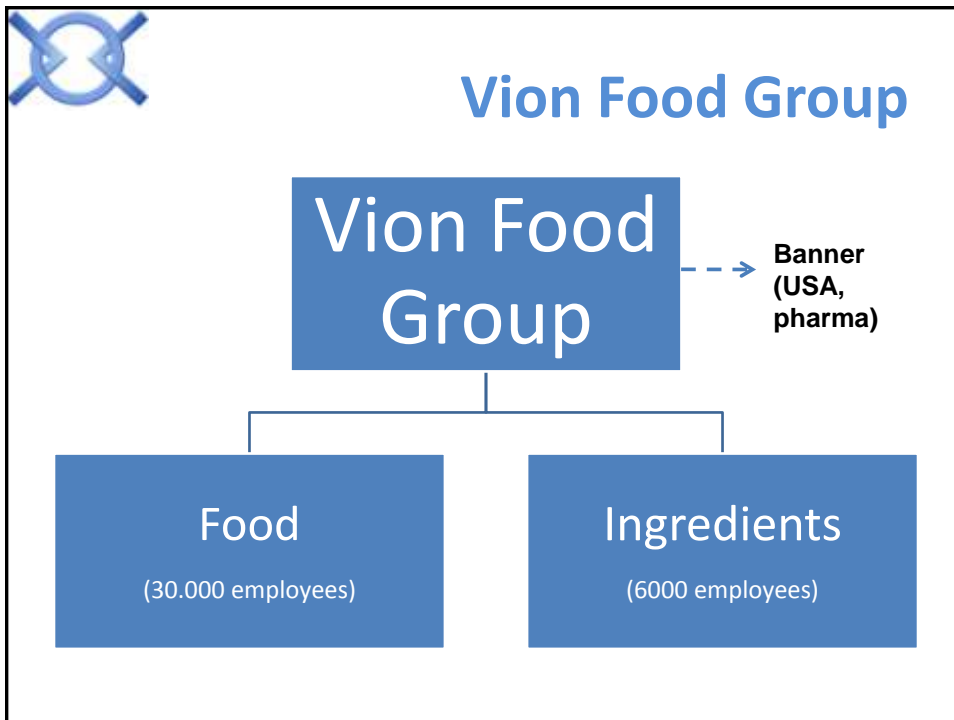


### OECD 2009: "The Bioeconomy to 2030; Designing a Policy Agenda"

Application	Share of total OECD business expenditures on biotech R&D in 2003	Estimated potential share of total biotechnology gross value added (GVA) <sup>1</sup> in the OECD area <sup>2</sup> for 2030
Health	87%	25%
Agriculture	4%	36%
Industry	2%	39%
Other	7%	-
	100%	100%

## Innovation Norway plan







First International  
Marine Ingredients Conference  
Norway  
Oslo 20 - 21 September 2010

The conference will address challenges and perspectives facing the international marine ingredient industry. This will include marine innovations and developments of bioactive and nutritional ingredients for use in foods, functional foods, food supplements, feed supplements, biotechnology and pharmaceuticals. Proteins, peptides, omega -3 oils, phospholipids, biopolymers and minerals will be addressed.

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# END

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