

# Functional Ingredients from Norwegian marine by-products

Rubin conference 2007

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Cognis Germany GmbH & Co.KG



## Overview

- Introduction Cognis
- Chitosan
  - Production process
  - Products and applications (cosmetics, pharmaceutical)
- Omega-3
  - Production process
  - Products and applications
  - Market situation
- Regulatory aspects of food products
  - For chitosan
  - For omega-3
  - general





- ✍ Midsize“ Global Chemical Player
- ✍ Established in 1999 as carve out from Henkel
- ✍ High leverage buy out. Owners since November 30, 2001: Permira, GS Capital Partners, and Schroder Ventures Life Sciences
- ✍ 160 years experience in oleochemistry
- ✍ Business following mega-trends:  
**Sustainability & Wellness**

functionalproducts processchemicals nutrition&health carechemicals

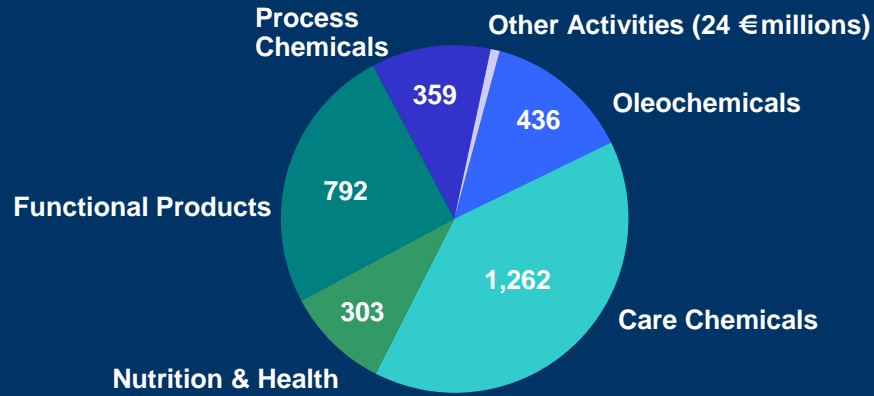


## Cognis in Brief

- Leading global specialty chemicals company headquartered in Monheim, Germany
- Sales 2005: €3,176 billion  
Adjusted EBITDA 2005: €356 million
- Approximately 8,000 employees operating production sites and/or service centers in about 30 countries
- Over 160 years experience in oleochemicals



## Sales breakdown 2005, by SBU Net sales €3,176 billion



in € millions



## Our strategic portfolio: business structure



**carechemicals**

- Hair/Body/ OralCare
- Skin Care
- Home Care
- Industrial & Institutional Cleaning
- Silicates

**nutrition&health**

- Dietary Supplements
- Pharmaceuticals & Healthcare
- Food Technology
- Functional Food & Medical Nutrition

**functionalproducts**

- Polymers, Coatings & Inks
- Synlubes Technology
- AgroSolutions, Specialty Solutions
- Mining & Ion-Transfer Technology

**processchemicals**

- Textile Technology
- Leather Technology

**Oleochemicals\***

- Fatty acids
- Glycerin/Triacetin
- Ozone Acids
- Plastics Technology
- Oilfield Chemicals

\* 50:50 global Joint Venture with Golden Hope



## Working with Nature...

- To offer you the broadest range of natural-source, health enhancing ingredients

## ... and Science

- To provide high-quality, research-based products that are safe and effective



 nutrition&health

 cognis

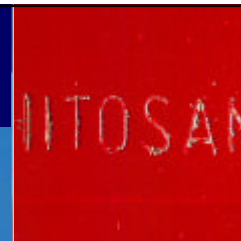
## Chitosan - something special from the sea

**Biomaterial for medical  
applications**

**Chitopharm<sup>®</sup>**

**New Dimensions of Care  
for Skin and Hair**

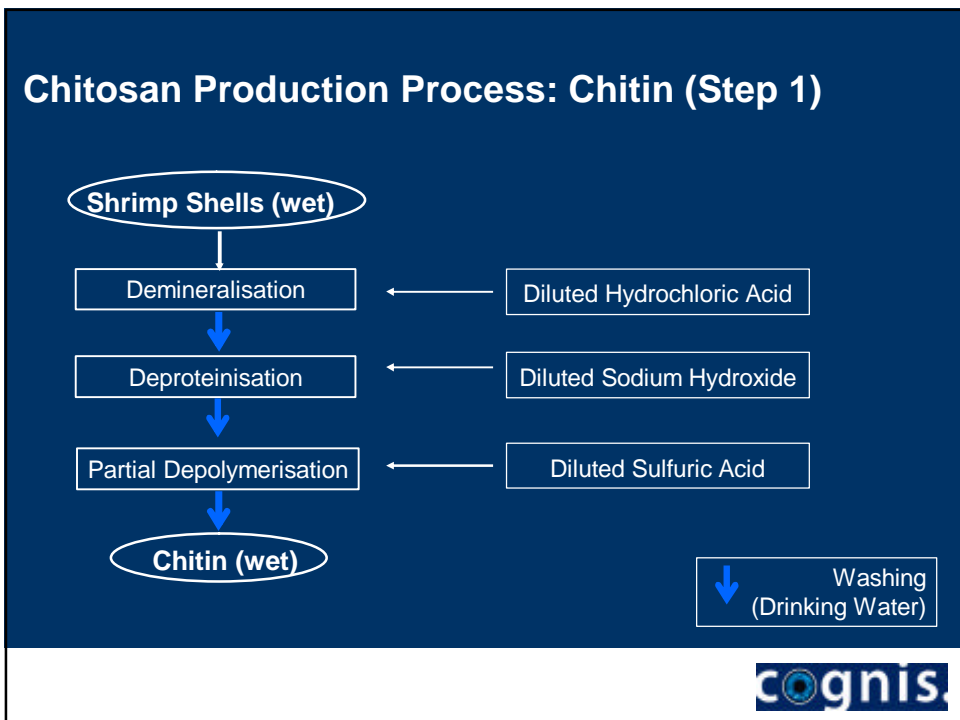
**Hydagen<sup>®</sup> Chitosan**



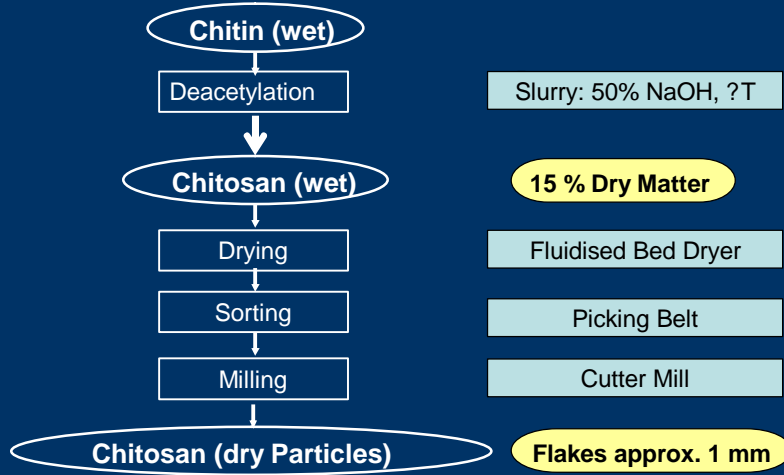
**BioHenk**  
Tromsø, Norway

"Not just any Chitosan will do!"

Consistent high quality due to advanced production technology

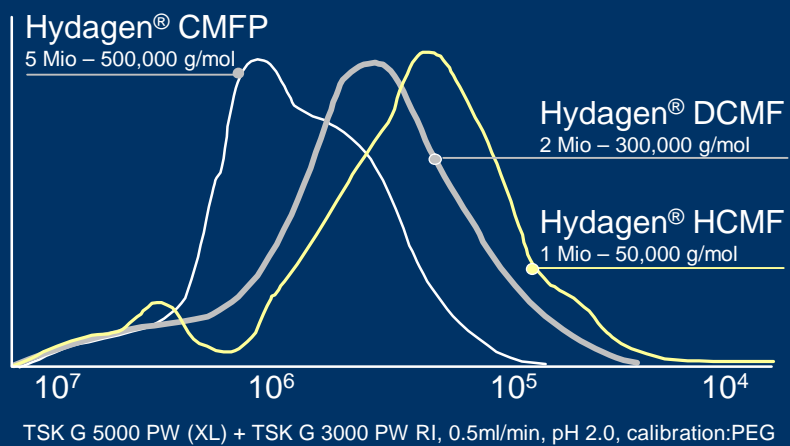


## Chitosan Production Process: Chitosan (Step 2)



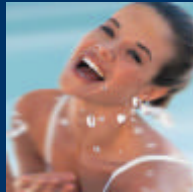
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## Molecular Weight Distribution



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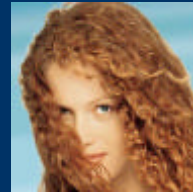
## Hydagen® Chitosan Product Portfolio



Skin



Deo



Hair

Powder	CMFP	DCMF	HCMF
Solution	CMF	-	HCMS-LA

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## Chitopharm® - Analytical data accord. Pharm.Eur.

Appearance of powder	Off-white granular powder
Appearance of solution	Clear colourless
Molecular weight	Different distributions
Loss on drying	? 10%
Degree of Deacetylation	? 80%
Insolubles	? 2%
Sulphated ash	? 1%
Heavy metals	? 5 ppm
Hg	? 0,1 ppm
Pb	? 0,1 ppm
Protein content	? 0,2%
Endotoxin content	? 150 I.U./g
Microbiology	Conforms to Eu Pharm 5.1.4 category 2 and 3a

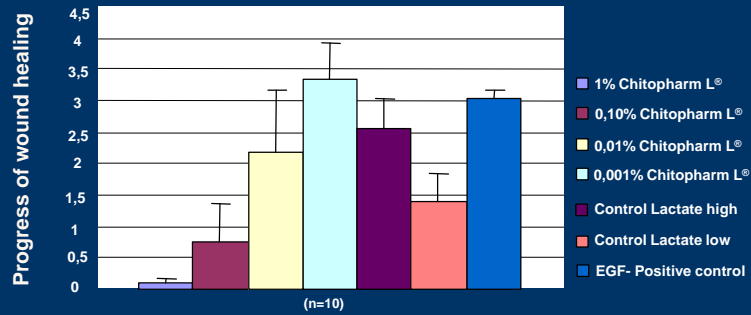
- ? Light colour
- ? No odour
- ? Free of contaminants
- ? Completely soluble
- ? Very low heavy metal content
- ? Very low endotoxin content
- ? only one species



*Pandalus Borealis*

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## Chitopharm L<sup>®</sup> improves wound healing



Chitopharm L<sup>®</sup> improves wound healing at low concentrations (wound healing model with pig skin – patented by the UKE Hamburg; EGF epidermal growth factor, lactate for adjusting pH)

Cognis (2004)

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## Omega-3: Natural oils and omega-3 concentrates

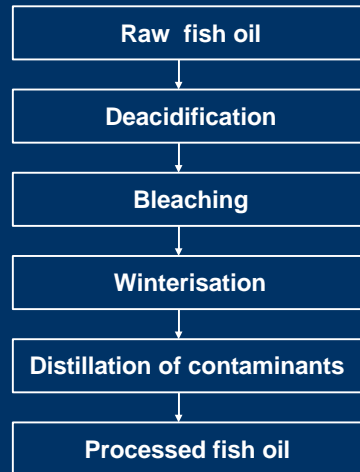
Napro Pharma AS  
Brattvaag



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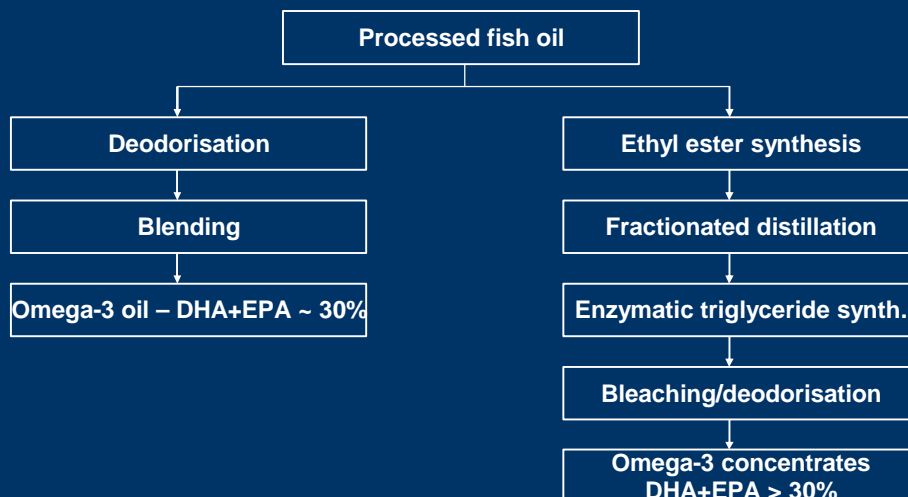


## Processing of fish oil



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## Omega-3 oils and concentrates



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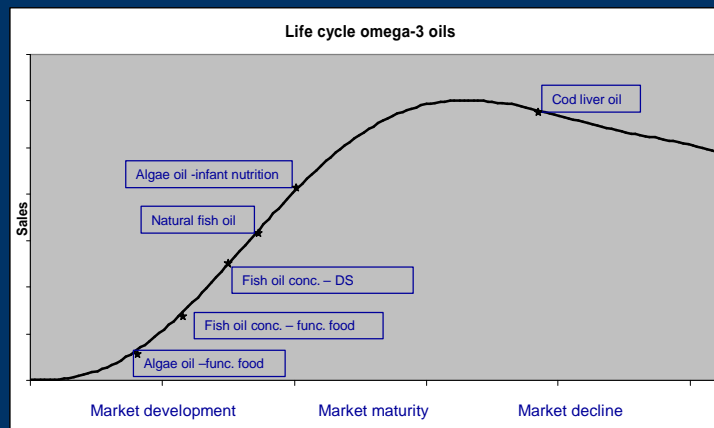
## Omega-3 – application fields

### Adequate intake of omega-3 fatty acids

- lowers triglycerides in blood
- reduces overall mortality
- reduces mortality due to infarction and sudden death of patients with coronary heart disease
- improves brain development in infants
- alleviates Attention Deficit Hyperactivity Disorder (AD/HD)



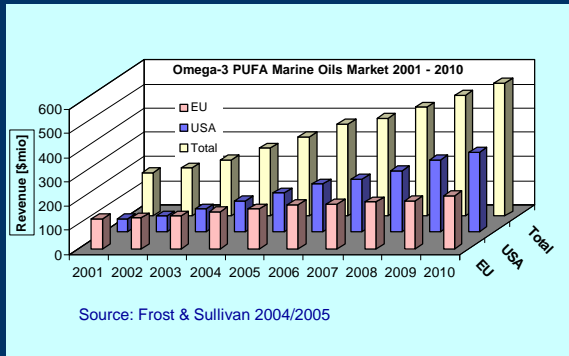
## Product Life Cycle Analysis - Europe



Frost & Sullivan, Cognis analysis



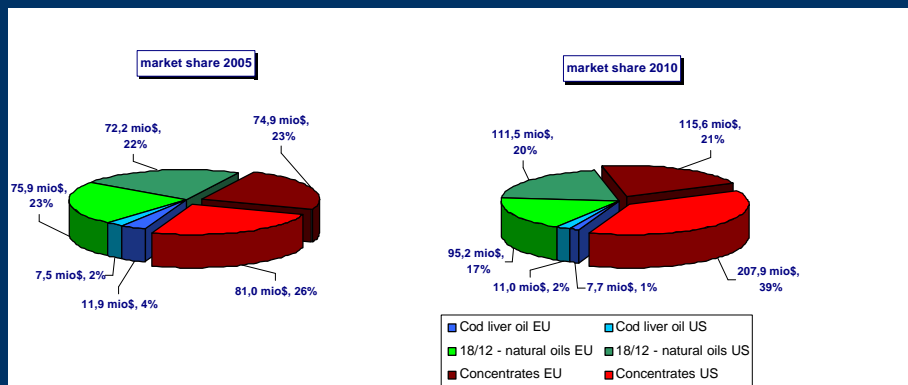
# Omega – World market



	CAGR revenues	
	2001-20010	2006-2010
EU	8,2%	6,0%
USA	27,1%	17,3%
Total	16,6%	12,6%



# Omega-3 market development



## European Regulations applicable to Food Supplements

- ✍ General Food Law: 178/2002/EC (as amended)
  - traceability
  - manufacturing (HACCP etc.)
  - claims
  - safety
- ✍ Food Labeling: 2000/13/EC (as amended)
  - nutritional labeling
- ✍ Food Contaminants: 1881/2006/EC (as amended)
  - heavy metals
  - dioxins, PCB, PAH
  - mycotoxins
- ✍ Food Supplement Directive: 2002/46/EC (as amended)
  - positive lists (vitamins and minerals only)
  - notification (national provisions apply)
  - maximum levels (still to be decided)
- ✍ Novel Food Directive: 258/97/EC
- ✍ (Health Claims Regulation: 1924/2006/EC )



## Chitosan in food supplements

✍ No Novel Food when used as FS (CAFAB decision 2000)

✍ Depending on claims and national legal perception:

- food (supplement) (e.g. UK, P, F, D)\*
- medicinal product (e.g. ES, GR)
- medical device (e.g. D)\*

\* depending on presentation of finished product status may vary

✍ **Check:**

- quality of raw material (contaminants, hygiene\*, traceability)
- packaging
- advertising/claims/presentation
- distribution channel
- notification necessary?

\* specifically Regulation 853/2004



## Omega-3 in food supplements

- No Novel Food
- Generally recognized as food (claims may not be disease related)
- May be used in infant foods and PARNUTS.
- **Check:**
  - quality of raw material (contaminants, hygiene\*, traceability)
  - packaging
  - advertising/claims/presentation
  - distribution channel
  - notification necessary?

\* specifically Regulation 853/2004

