

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

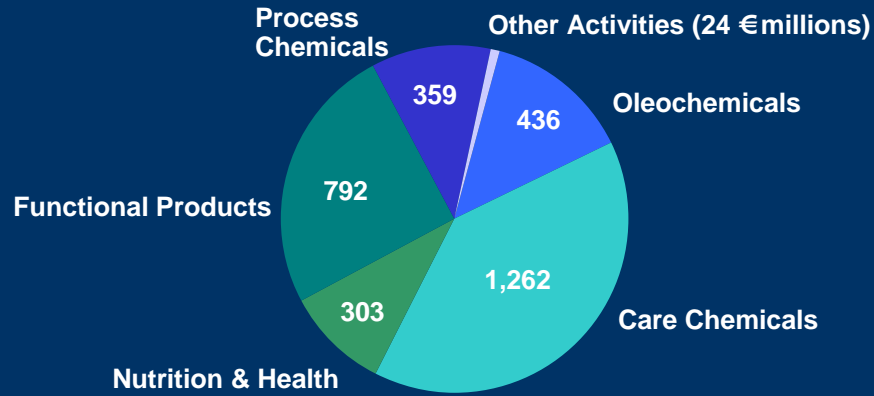


Cognis in Brief

- 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



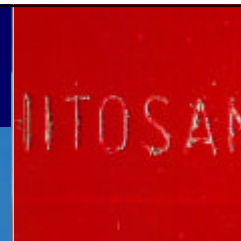
Chitosan - something special from the sea

**Biomaterial for medical
applications**

Chitopharm[®]

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

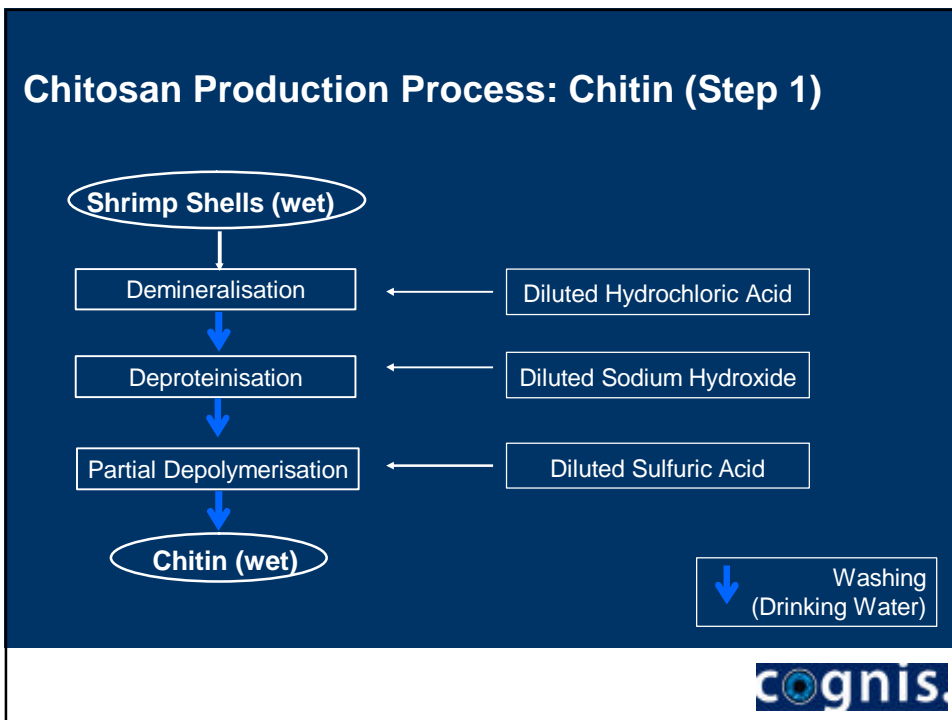
Hydagen[®] Chitosan



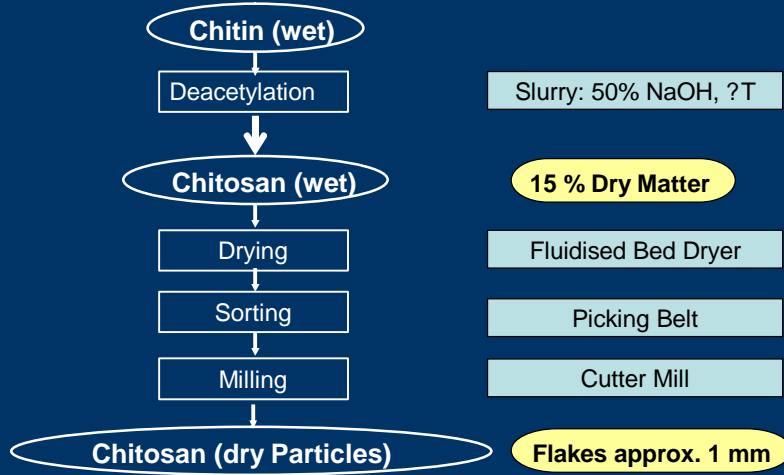
BioHenk
Tromsø, Norway

"Not just any Chitosan will do!"

Consistent high quality due to advanced production technology

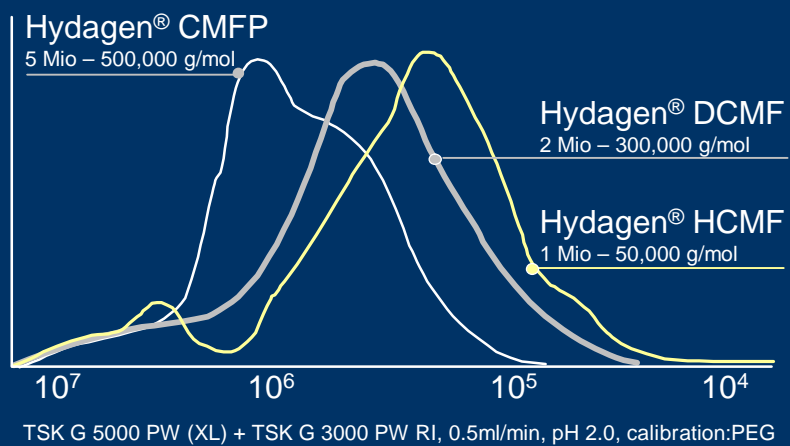


Chitosan Production Process: Chitosan (Step 2)



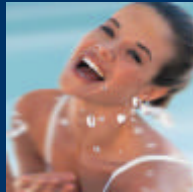
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Molecular Weight Distribution



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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

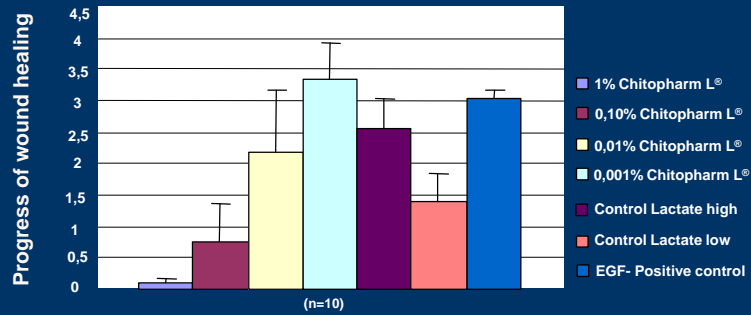
- ? Light colour
- ? No odour
- ? Free of contaminants
- ? Completely soluble
- ? Very low heavy metal content
- ? Very low endotoxin content
- ? only one species



Pandalus Borealis

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Chitopharm L[®] improves wound healing



Chitopharm L[®] 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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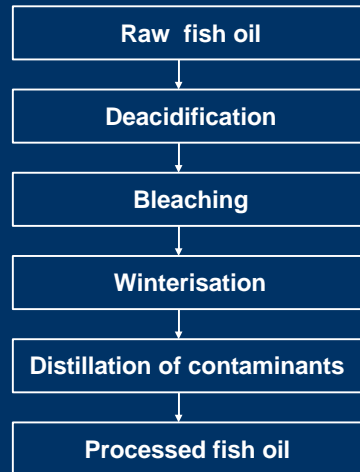
Omega-3: Natural oils and omega-3 concentrates

Napro Pharma AS
Brattvaag



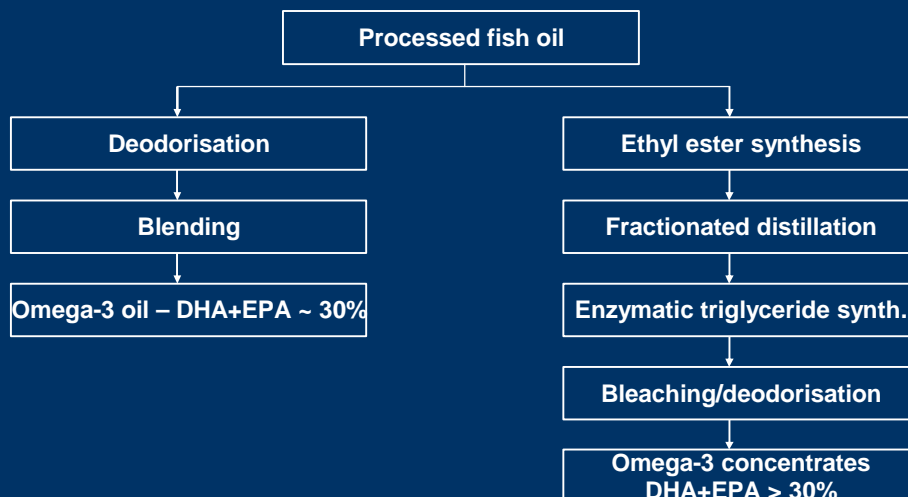
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Processing of fish oil



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Omega-3 oils and concentrates



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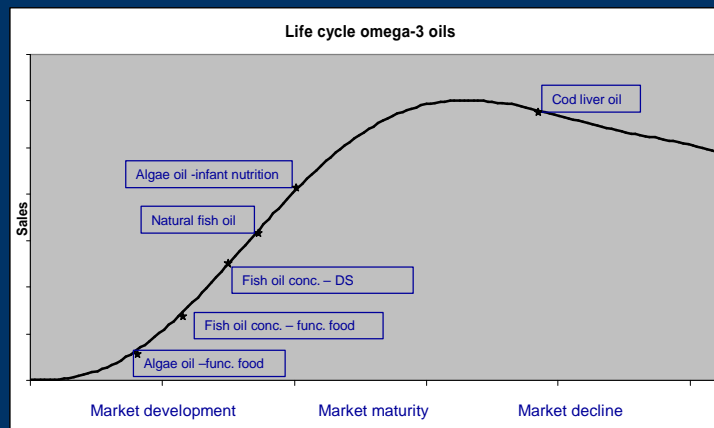
Omega-3 – application fields

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)



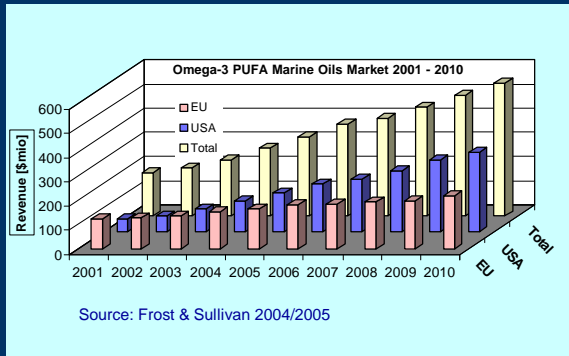
Product Life Cycle Analysis - Europe



Frost & Sullivan, Cognis analysis



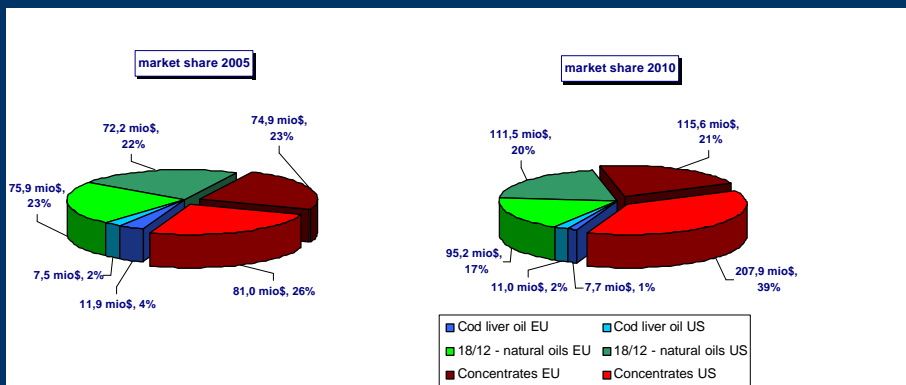
Omega – World market



	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

