

Importance of fat crystallization

Crystallization and Physical

Koen Dewettinck

to market

18 – 19 June 2008, SCI Oils and

Fats group and Ghent University





FACULTY OF BIOSCIENCE ENGINEERING

LABORATORY OF FOOD TECHNOLOGY AND ENGINEERING



Food Technology and Engineering at the Department of Food Safety and Food Quality
Prof. Koen Dewettinck

Mission of FTE

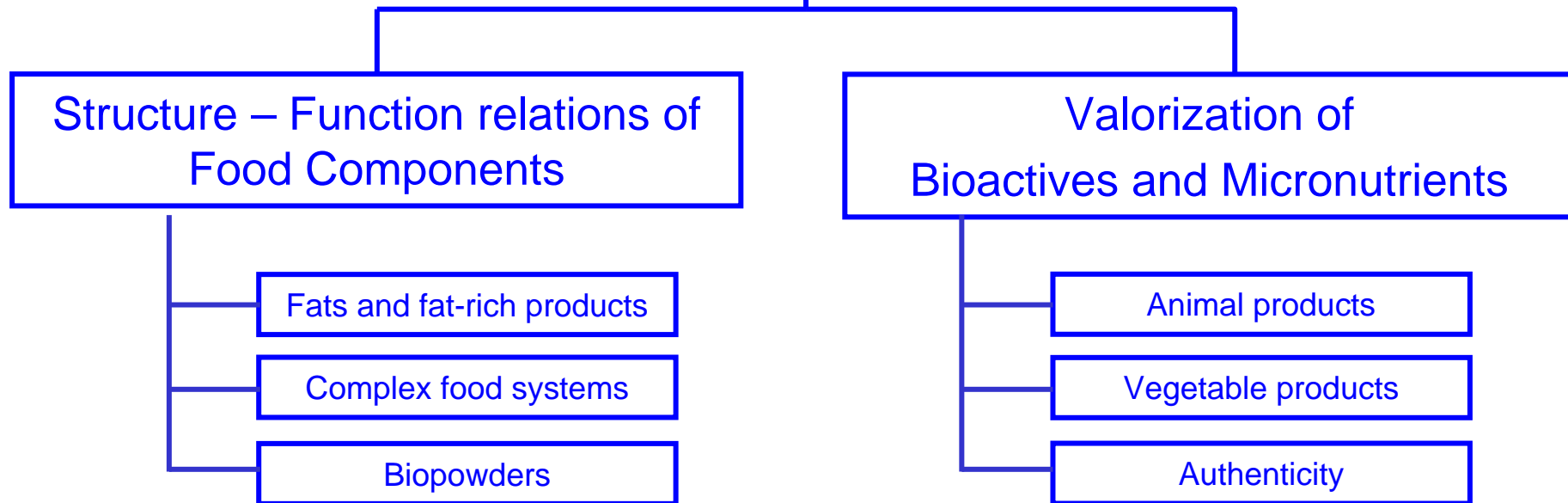
Designing foods on a nano- and microscale which is the answer to the consumer demand for new products that are tasty, satisfying, healthful, convenient, and inexpensive. Moreover it may create added value to by-products and contribute to overall socio-economic welfare.

‘Sustainable Creation of Tasty and Healthy Foods’

scientific staff: 20

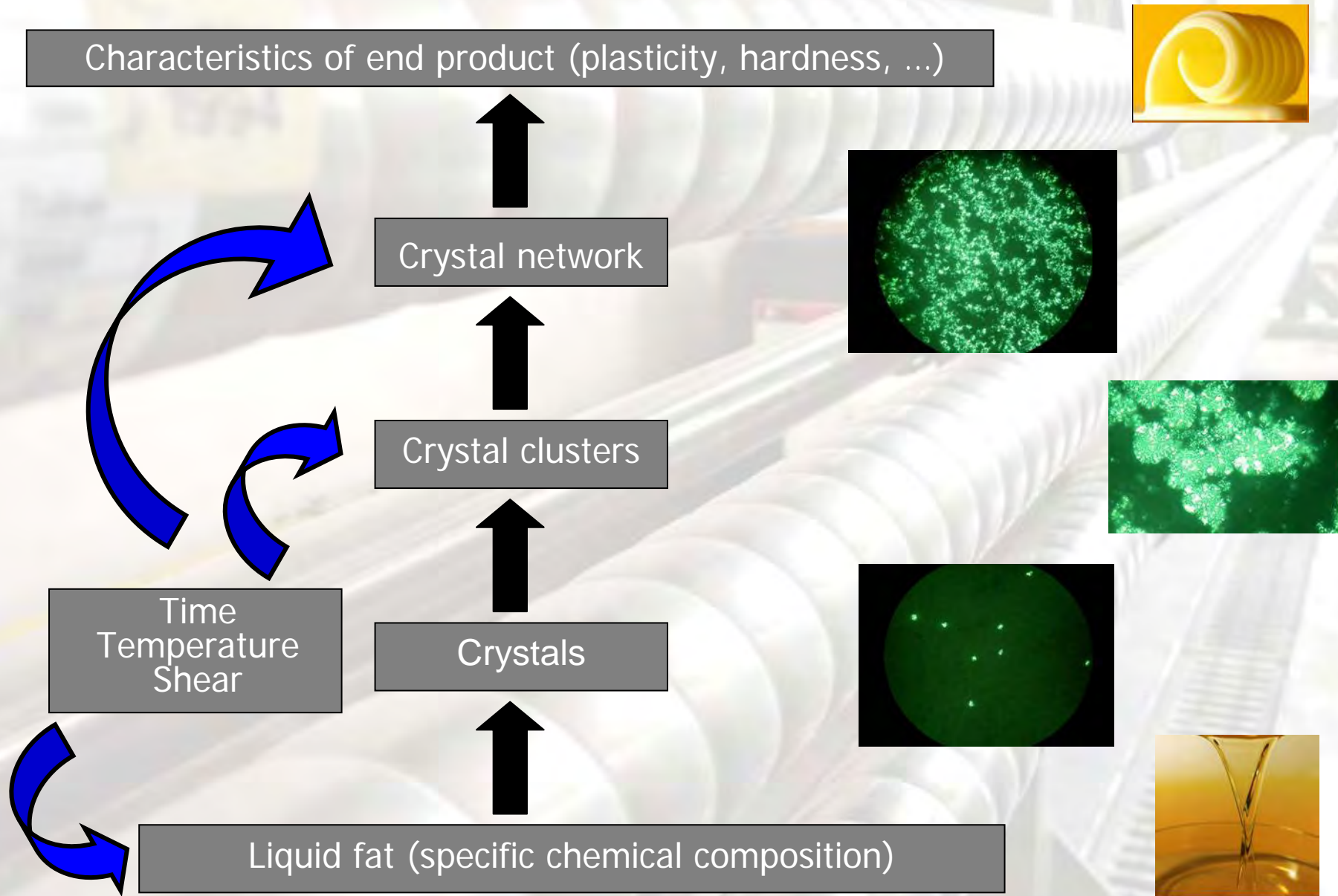
techn./adm. staff: 7

Research groups



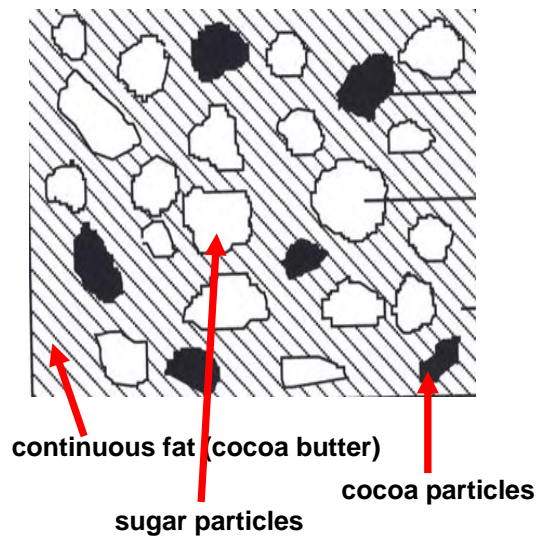
Structure – Function relations of Food Components

Crystallization of fats in food (components)

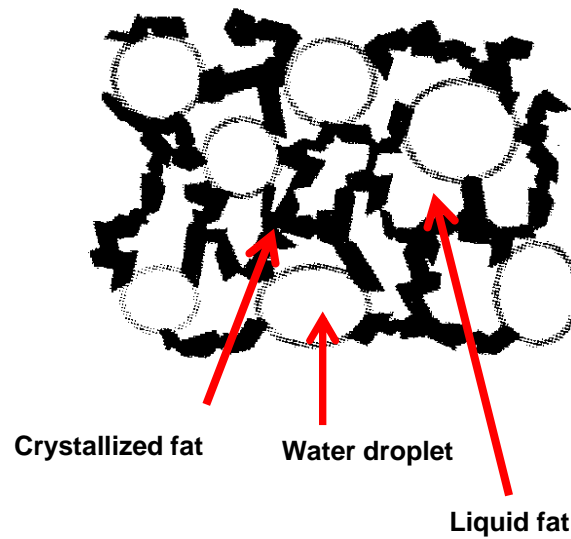


(MICRO)STRUCTURAL FUNCTIONALITY OF FATS

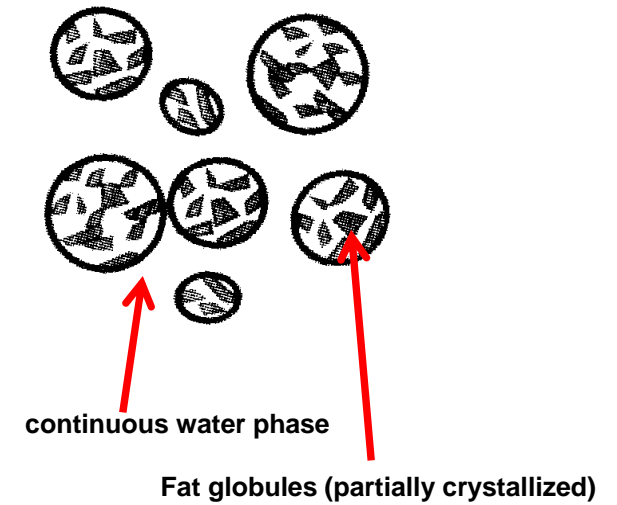
Chocolate



Margarine



Cream



Role of fat crystallization in structure formation of whipped (ice) cream

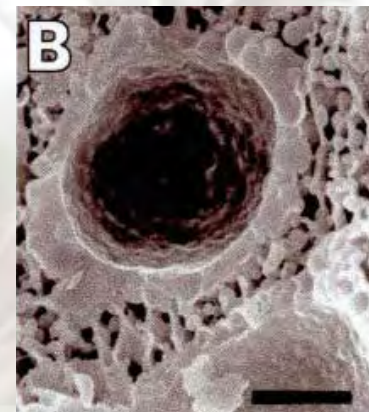
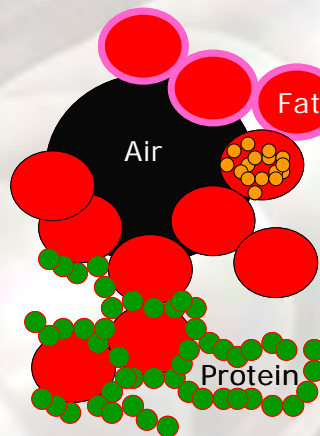
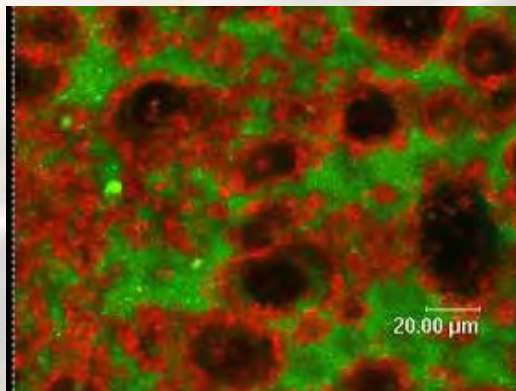
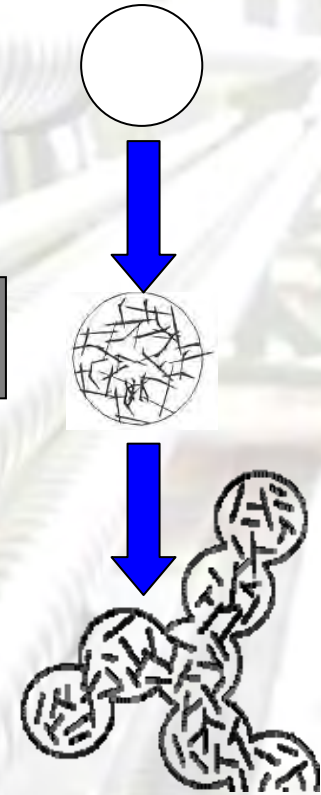
Cream = oil-in-water emulsion

$T \downarrow$

Crystallization of milk fat in oil drops

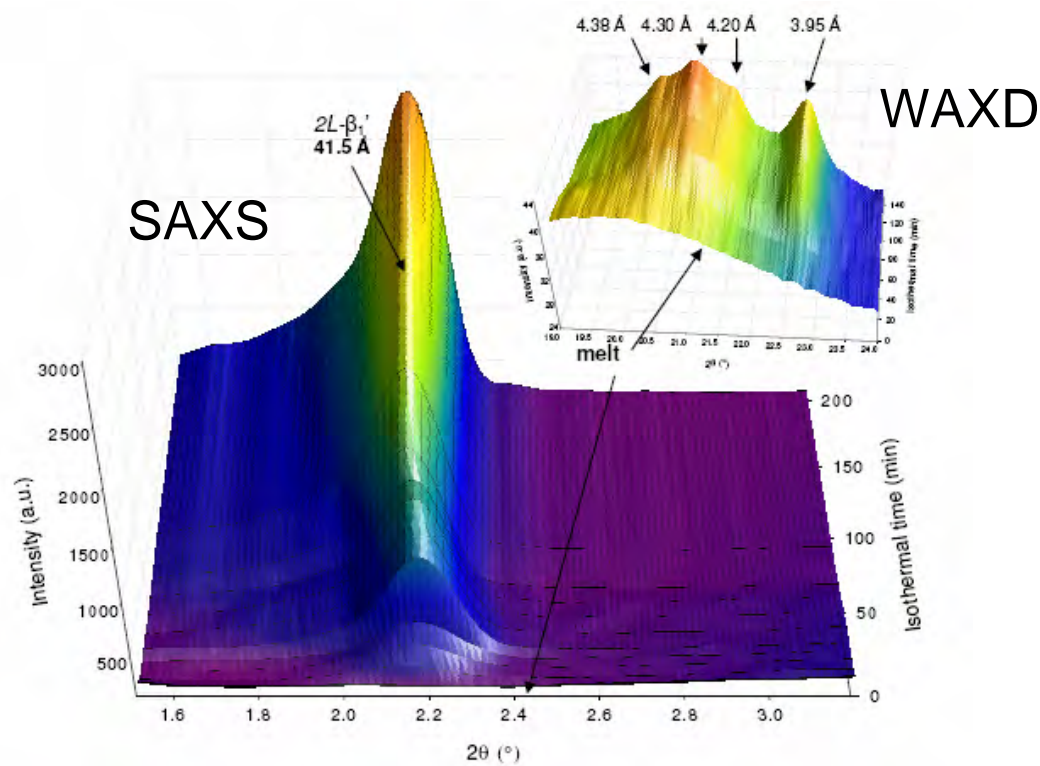
Agitation

Immobilized air in fat network



Influence of DAG on isothermal crystallization kinetics

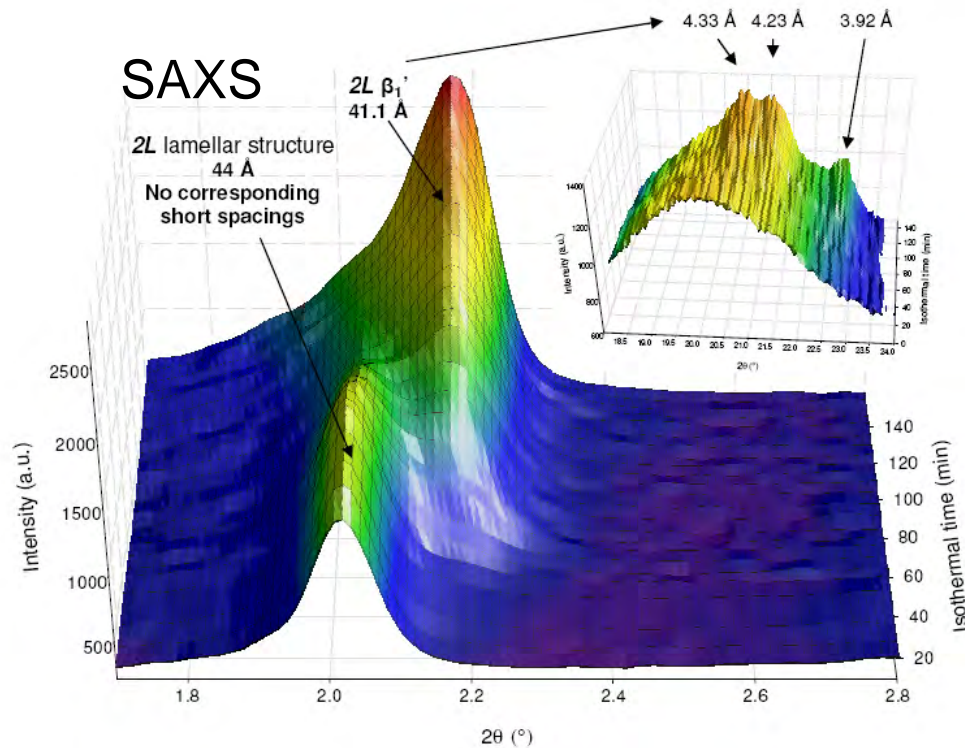
- XRD-pattern of 1% DAG palm olein crystallizing at 13°C



One step crystallization

Influence of DAG on isothermal crystallization kinetics

- XRD-pattern of 11% DAG palm olein crystallizing at 13°C



Two step crystallization

■ European chocolate manufacture industry

- 2,000 companies
- over 200,000 employees
- over 3 billion Euros export value



■ Producing exclusive niche-oriented composed chocolates

- technologically more complicated than plain chocolate bars (filling characteristics)
- bloom on pralines is a major issue (quality problem n° 1) leading to shelf life reduction, export hampering, consumer rejection

More than 20 years of chocolate experience...

■ Flemish technological Advisory Centre for the Chocolate, Biscuits and Confectionary Industries (VLAZ)

- Ghent University – Lab Food Technology and Engineering (FTE)
- Royal Belgian Federation of the Chocolate, Praline, Biscuits and Confectionary Industries – Choprabisco vzw
- ° 2003, in 2007 approved by I.W.T.-Vlaanderen for funding till 2011

■ Since summer of 2005

- increased consultancy related to chocolate bloom problems
- pralines, chocolate bars with hazelnuts, chocolate covered biscuits



MORE INFORMATION ?

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