
Bio refinery and Target Component Functionality

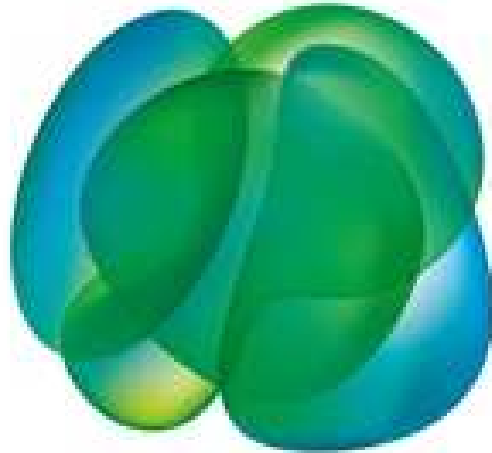
Mild Fractionation of Ingredients

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EFFoST 2016, Vienna



Acknowledgements

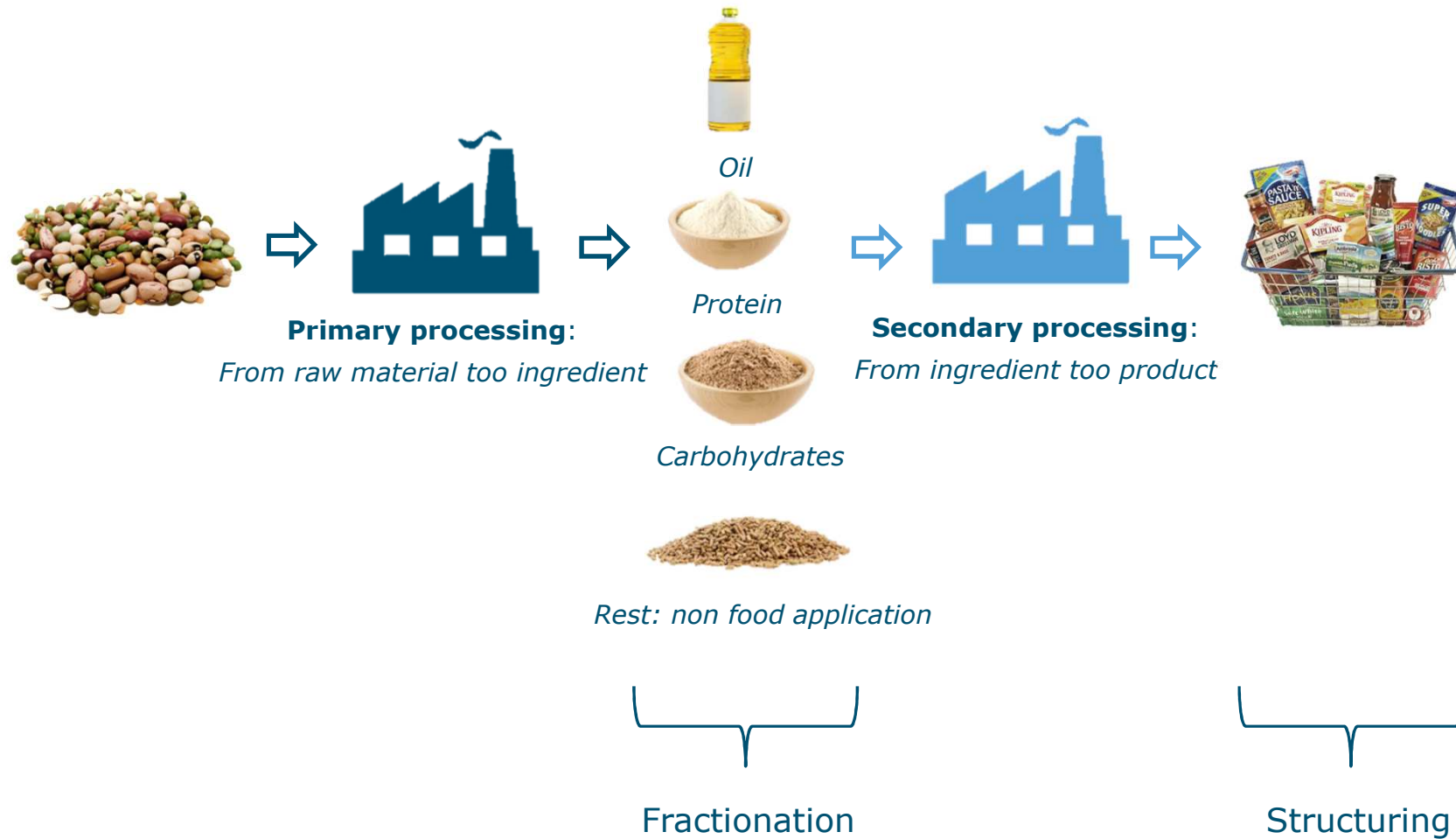


ISPT

**Institute for Sustainable
Process Technology**

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Introduction



Drawbacks

Primary processing

High input to obtain highly pure ingredients

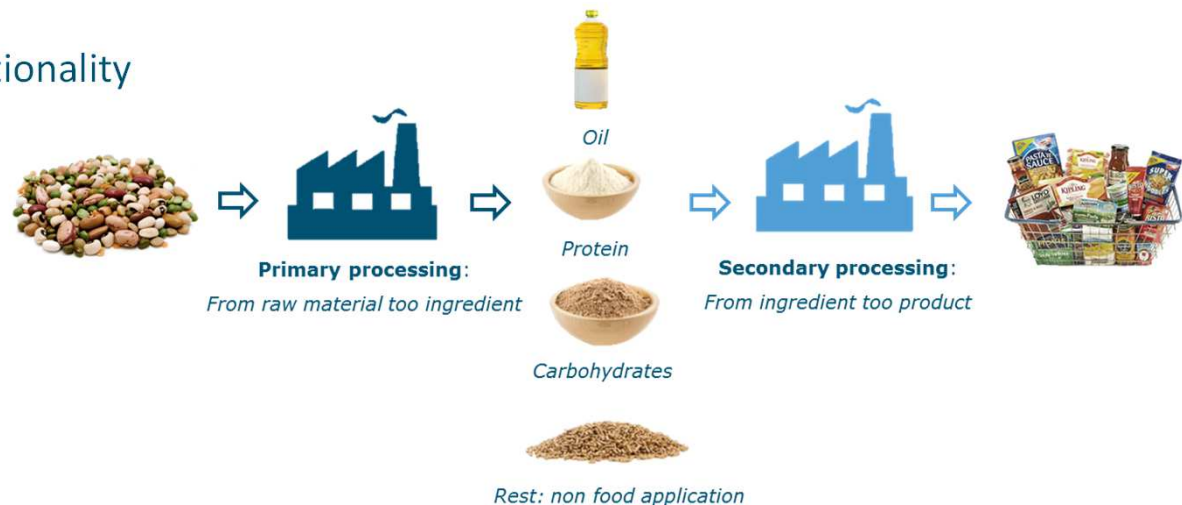
- Chemicals
- Temperatures
- Water

Secondary processing

Is high purity needed to obtain the desired functionality?

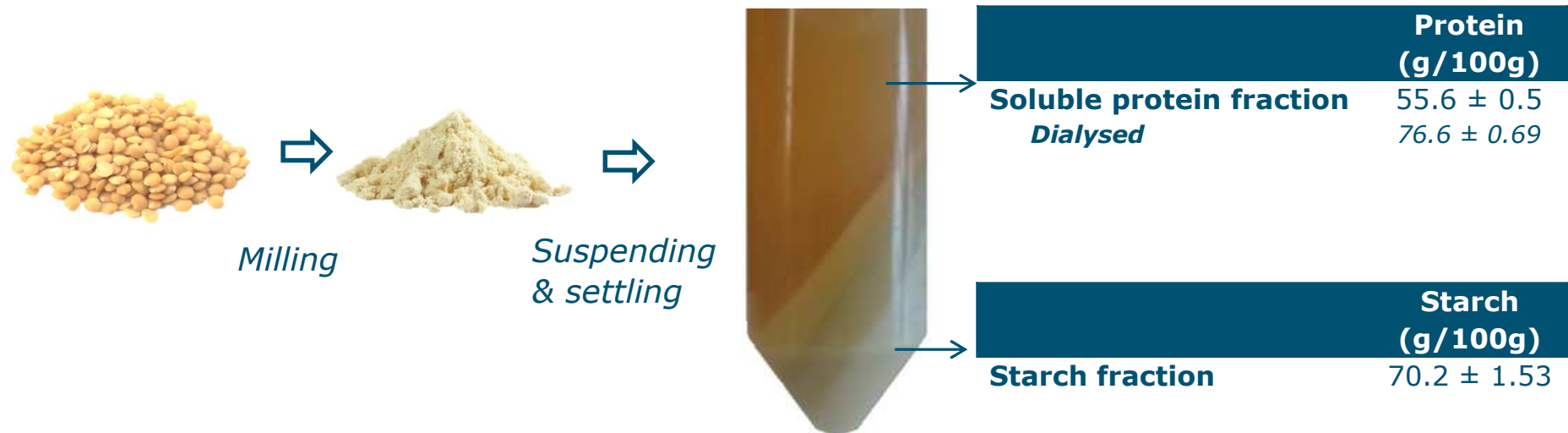
Not necessarily

- Dependent on targeted functionality



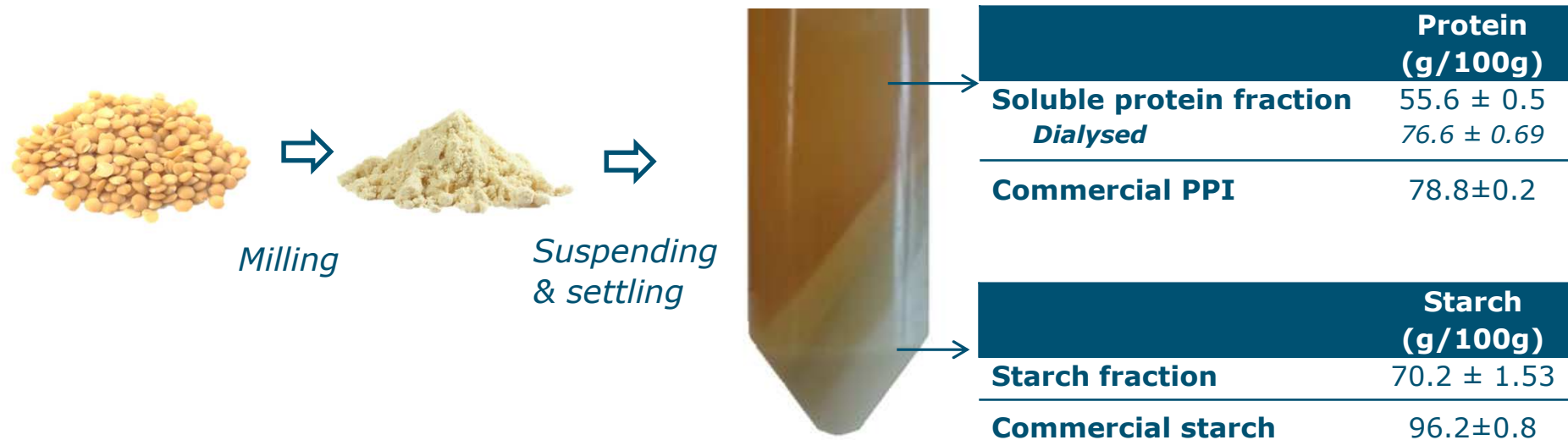
Mild fractionation approach: *Functional fractions*

Mild Fractionation of Pea



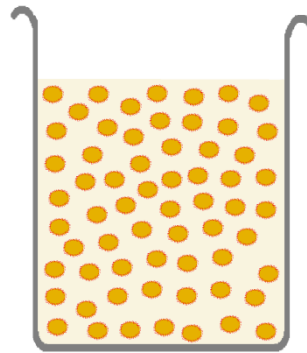
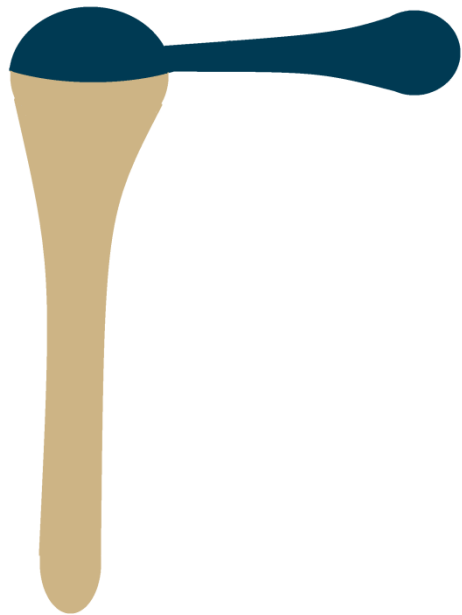
Mild fractionation approach

Mild Fractionation of Pea



Functionality needed?

Mild fractionation approach

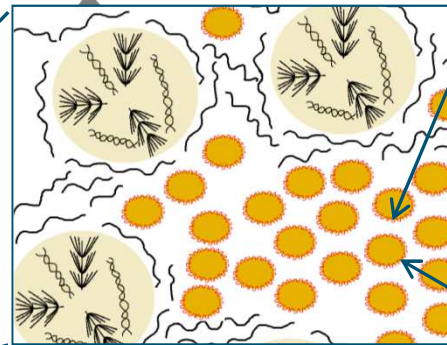
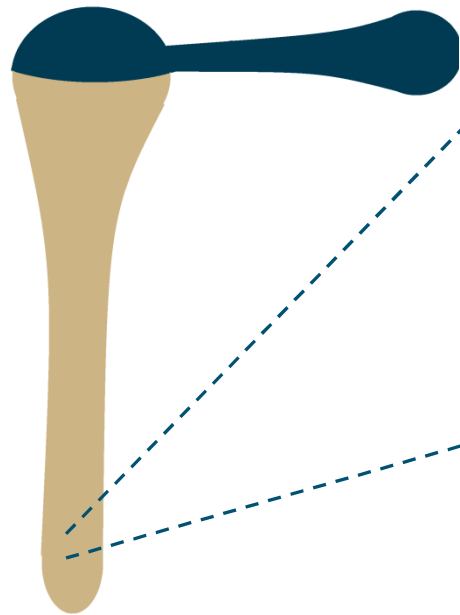


Target functionality:
• *Emulsification*

Protein (g/100g)	
Soluble protein fraction	55.6 ± 0.5
<i>Dialysed</i>	76.6 ± 0.69
Commercial PPI	78.8±0.2

Starch (g/100g)	
Starch fraction	70.2 ± 1.53
Commercial starch	96.2±0.8

Mild fractionation approach



Target functionality:

- *Emulsification*
- *Viscosity*

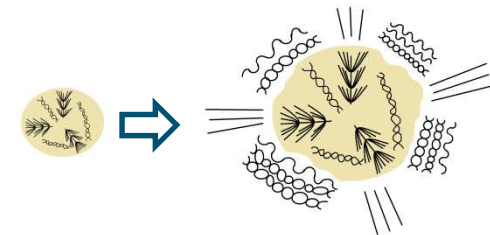
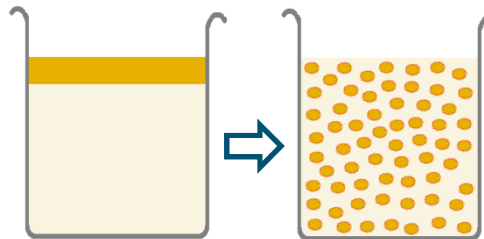
	Protein (g/100g)
Soluble protein fraction	55.6 ± 0.5
<i>Dialysed</i>	76.6 ± 0.69

Commercial PPI 78.8±0.2

	Starch (g/100g)
Starch fraction	70.2 ± 1.53
Commercial starch	96.2±0.8

Processes involved:

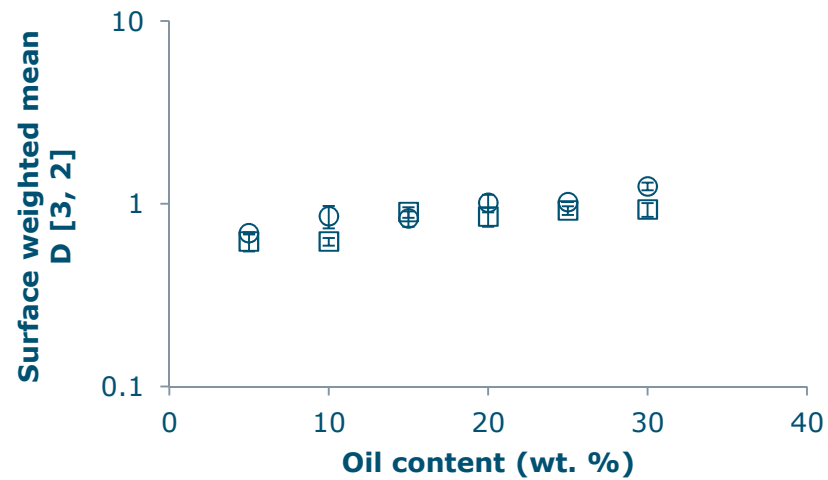
- *Homogenisation*
- *Heating*



Functionality: Primary Emulsion

- Functional fraction
- Commercial PPI

■ Droplet size distribution

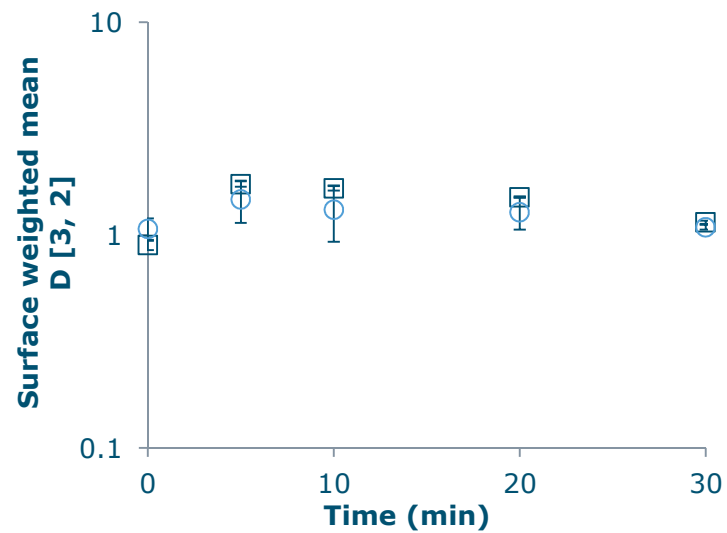


■ Bulk viscosity

Functionality: Heated Emulsion

- Functional fraction
- Commercial PPI

■ Droplet size distribution



■ Bulk viscosity

Functionality: Heated Emulsion

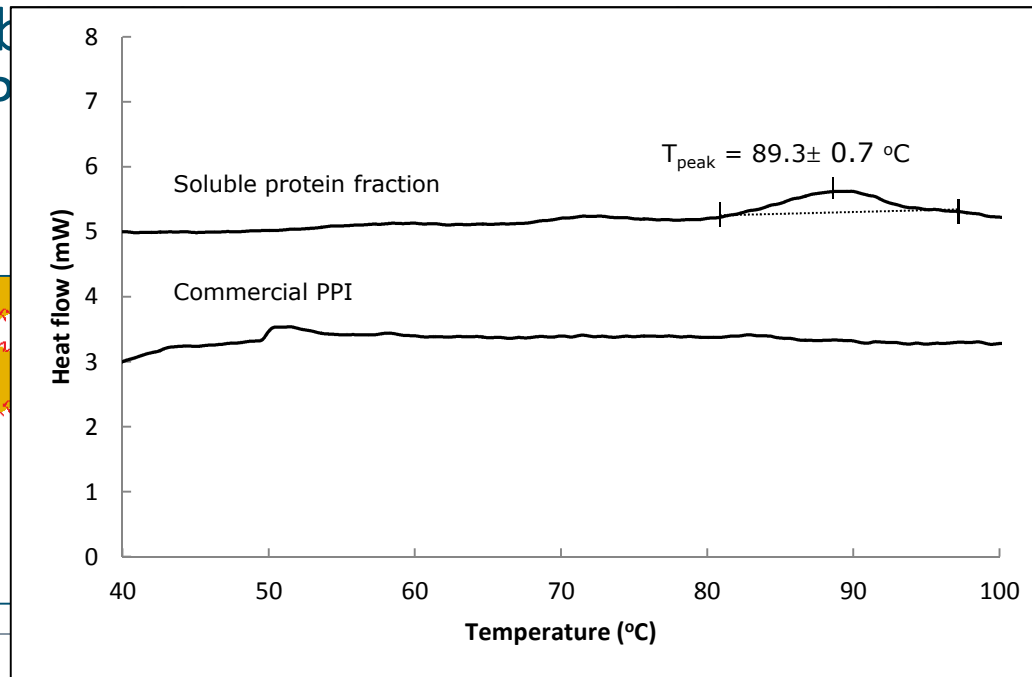
□/○ Initial emulsion
■/● Heated emulsion

Emulsion stability
commercial PPI

Viscosity (Pa.s)



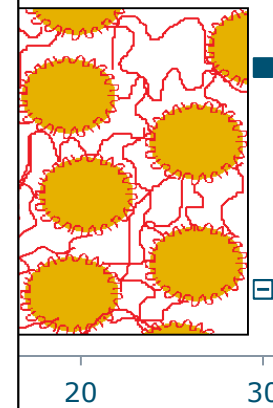
Oil concentration % (w/v)



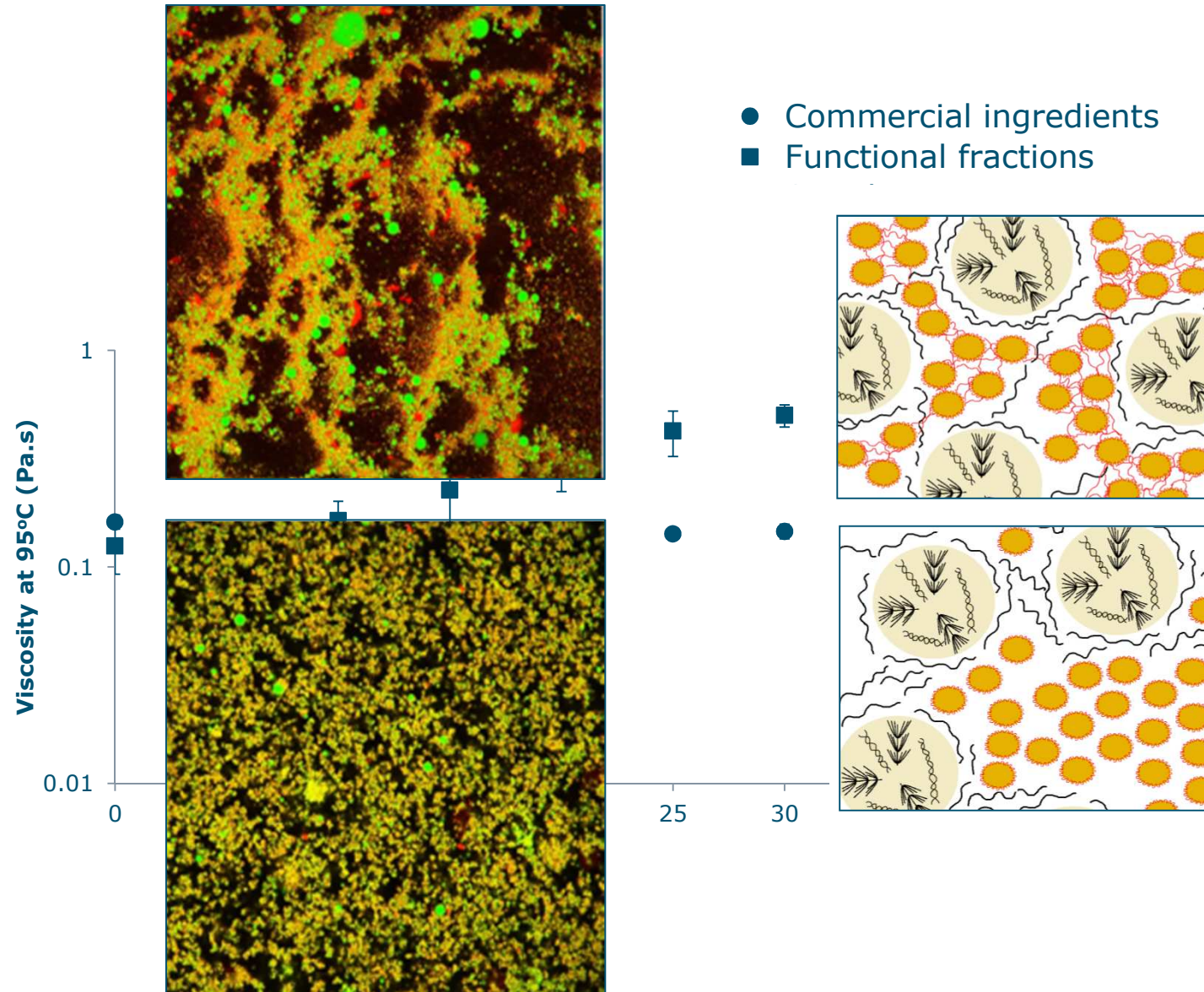
Temperature (°C)

Oil concentration % (w/v)

by
η"



Functionality: Heated emulsion containing Starch



Is high purity needed to obtain the desired functionality?

Not necessarily

- Dependent on targeted functionality

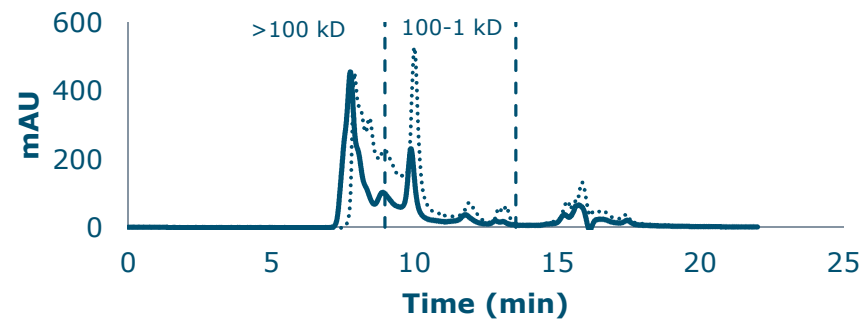
Question or suggestions?

E-mail: marlies.geerts@wur.nl

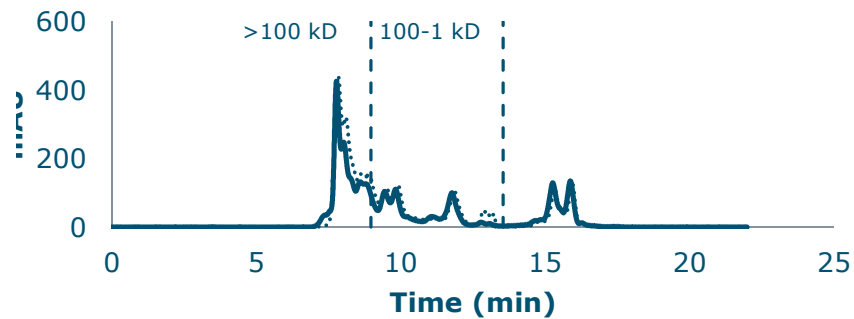


Emulsification characteristics

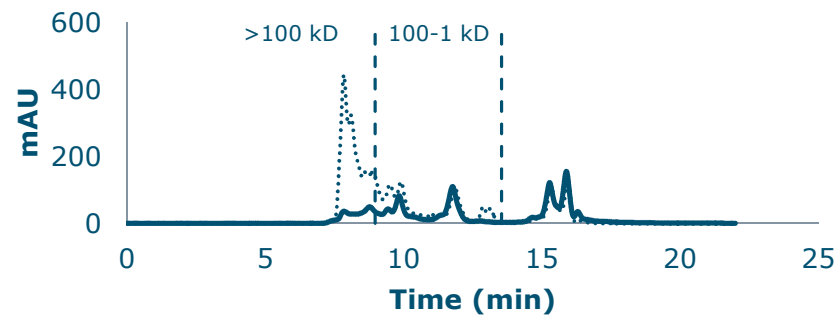
Commercial CPI



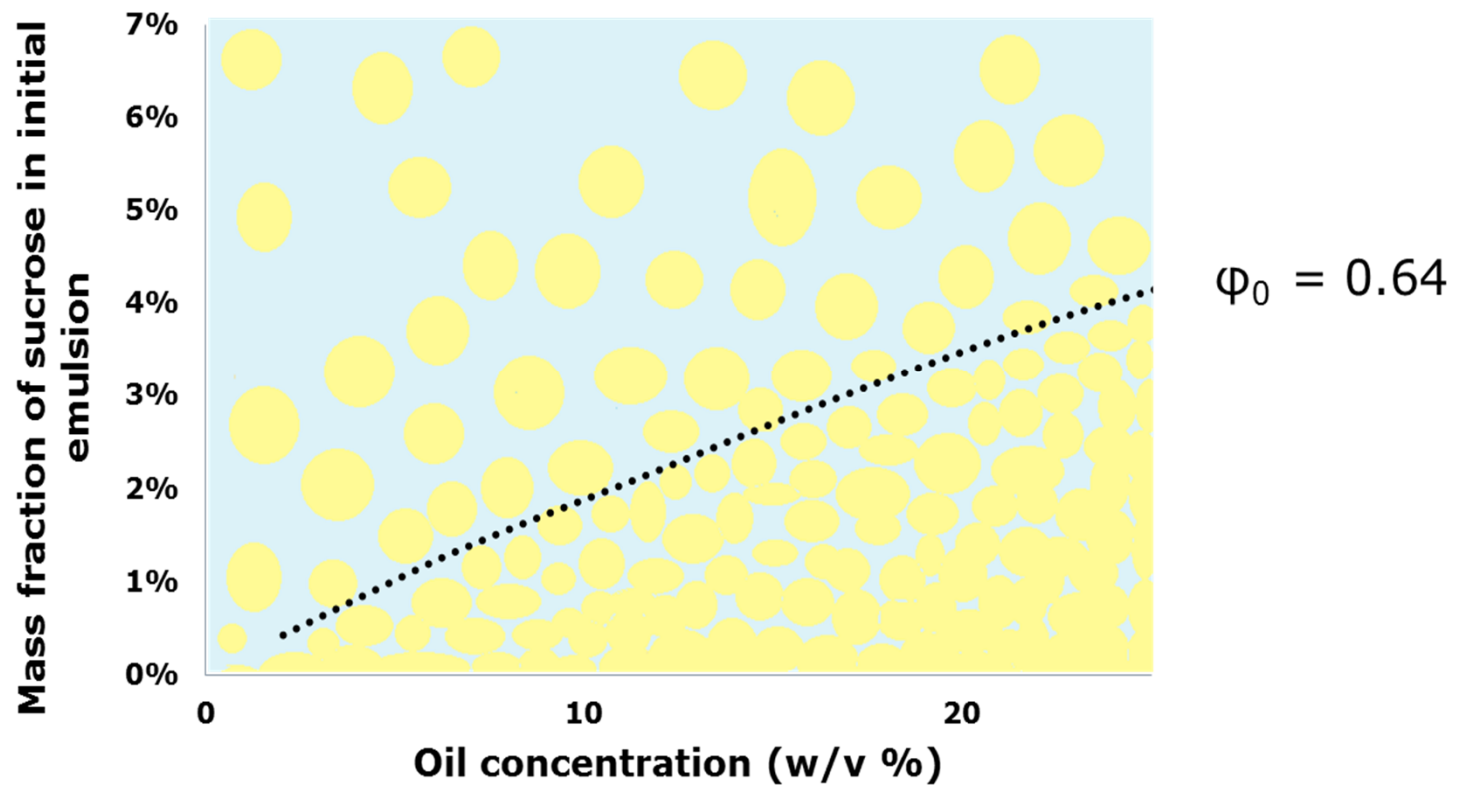
Soluble protein fraction (SPF)



Thermally treated SPF



Freeze-thaw stability



Freeze-thaw stability

