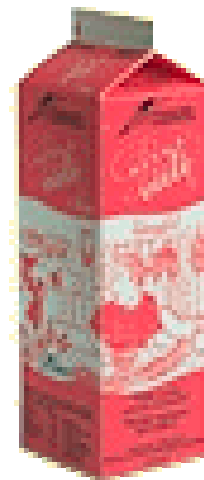


Modifying yoghurt texture by exopolysaccharide producing lactic acid bacteria

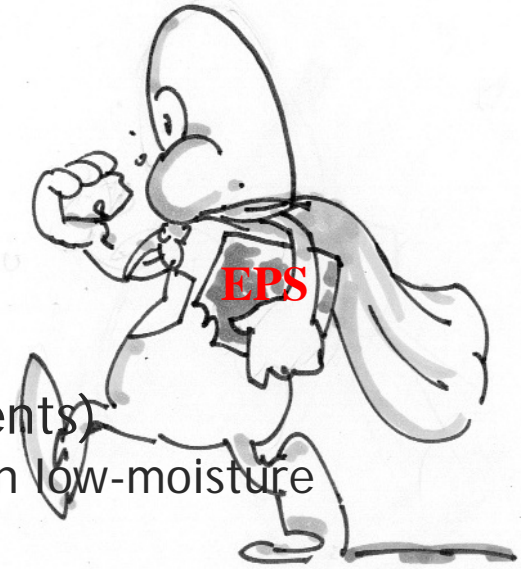
Anne Skriver & Renat Karychev
Chr. Hansen A/S



EPS: Why do bacteria bother?

CHR HANSEN

- Cell protection (against toxic or limiting environments)
Water-binding properties of EPS: May protect bacteria in low-moisture environments
- Sequestering of essential cations
- Colonization
A wide array of distinct surface polysaccharide combinations exists on bacteria and may have implications on how bacteria are maintained in a specific ecological niche such as the intestinal tract
- Cellular recognition
- Inhibit amoebic attack or protect against phages



Polysaccharides (PS)

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Produced by a variety of LAB

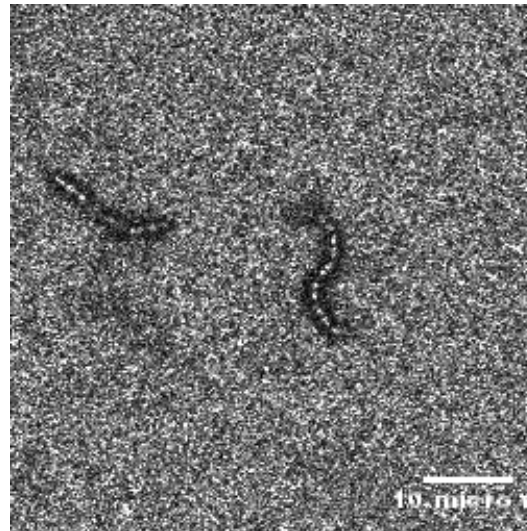
Strain dependent!

Large and branched
molecules (Mw 10^4 - 10^7 Da)

Produced in relatively
low quantities (50 - 800
mg/L fermented milk)

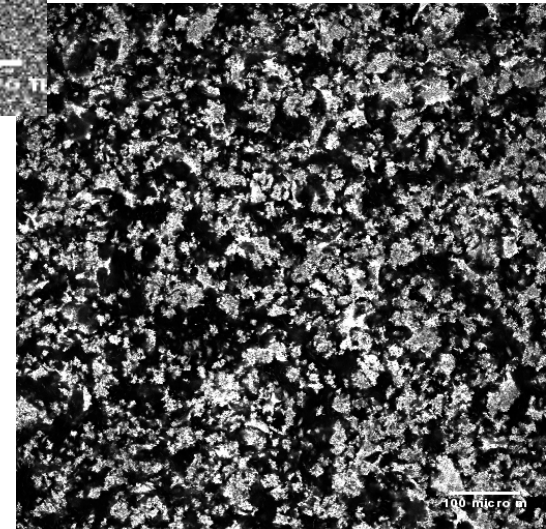
Build up of repeated subunits of
monosaccharides: glucose,
galactose, rhamnose and mannose
(phosphate, glucuronic acid and
others)

Attached to the bacteria cell
(CPS) or released (EPS)



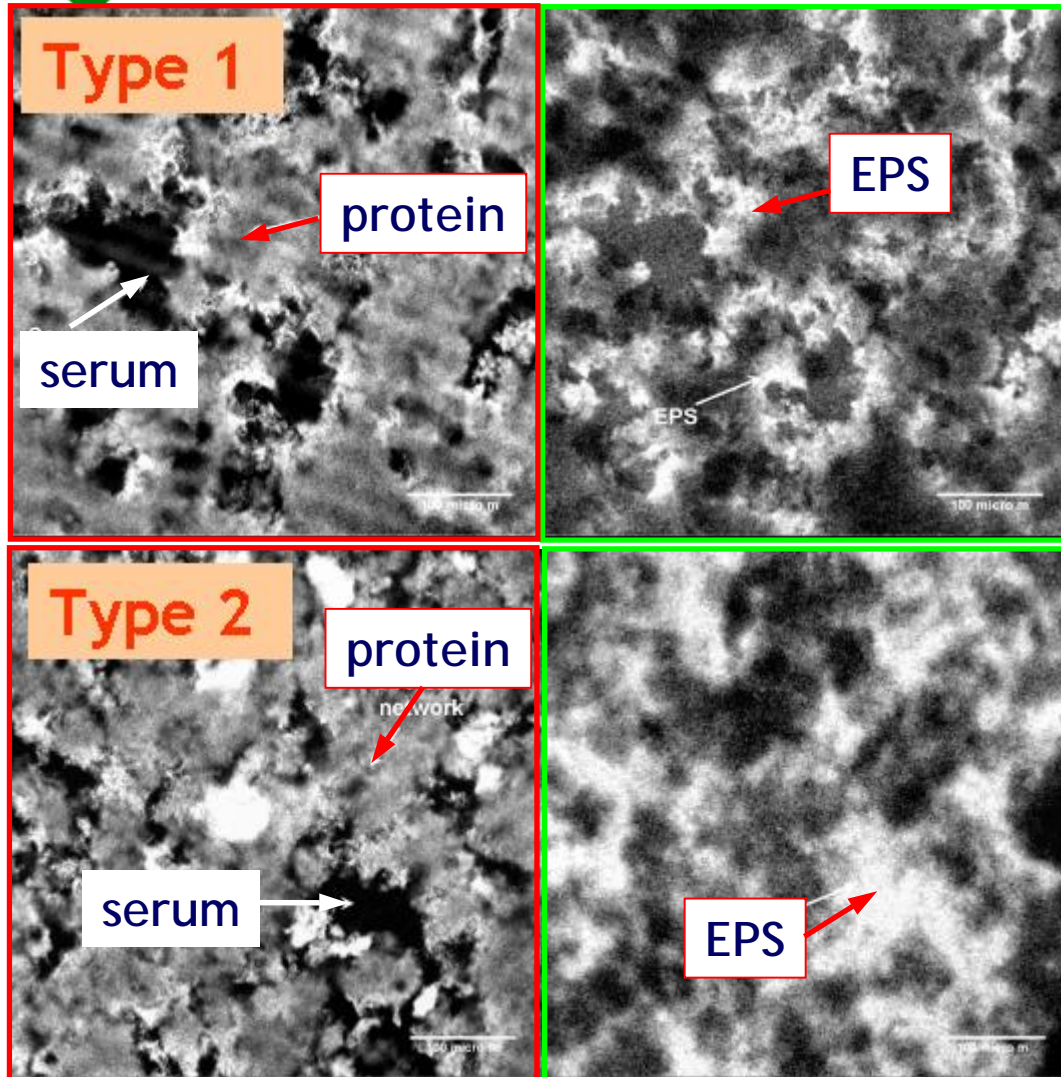
CPS produced by an ST
visualised by CLSM

EPS produced in yoghurt
visualised by CLSM



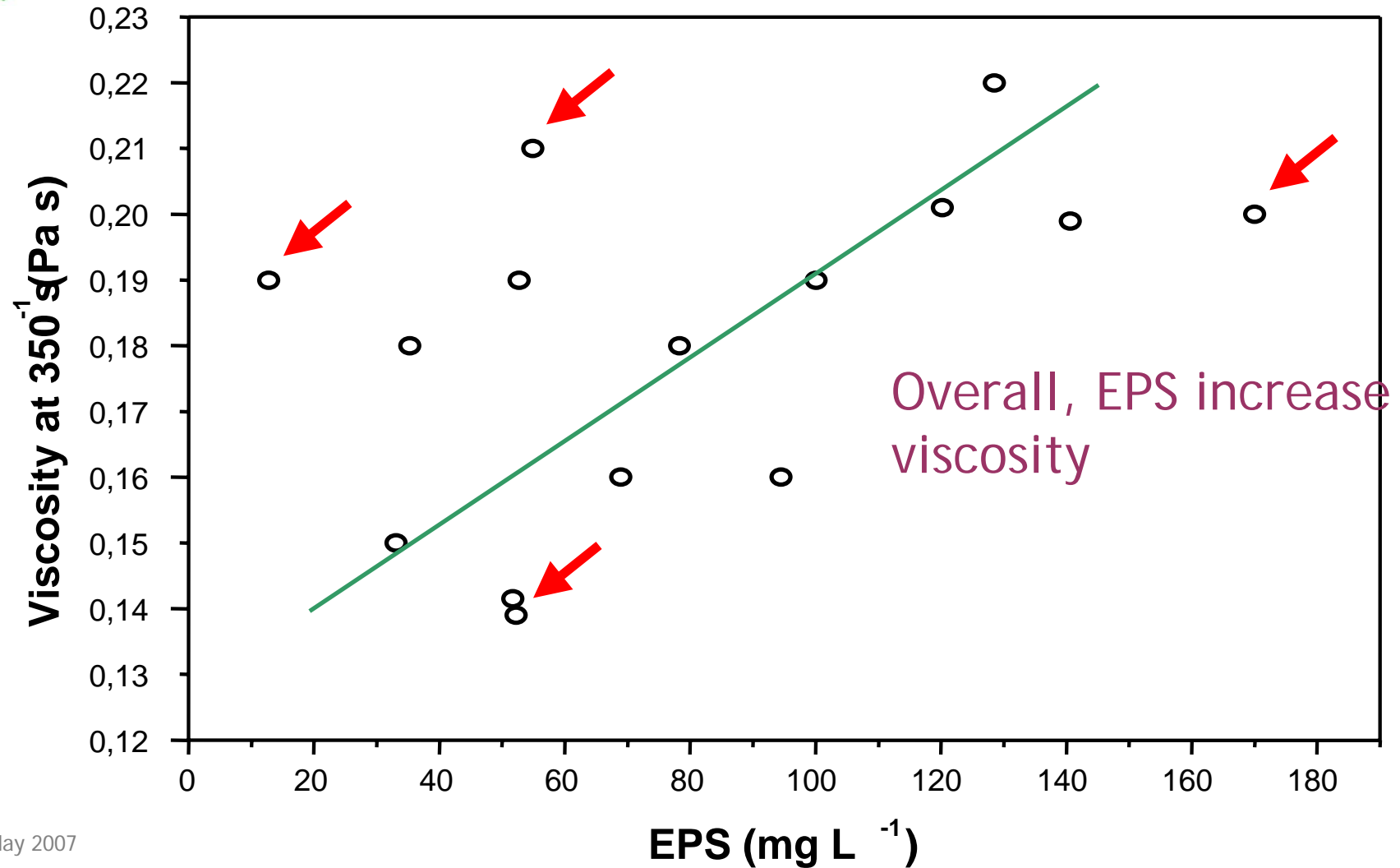
Protein-EPS Interactions in Yoghurt

CHR. HANSEN



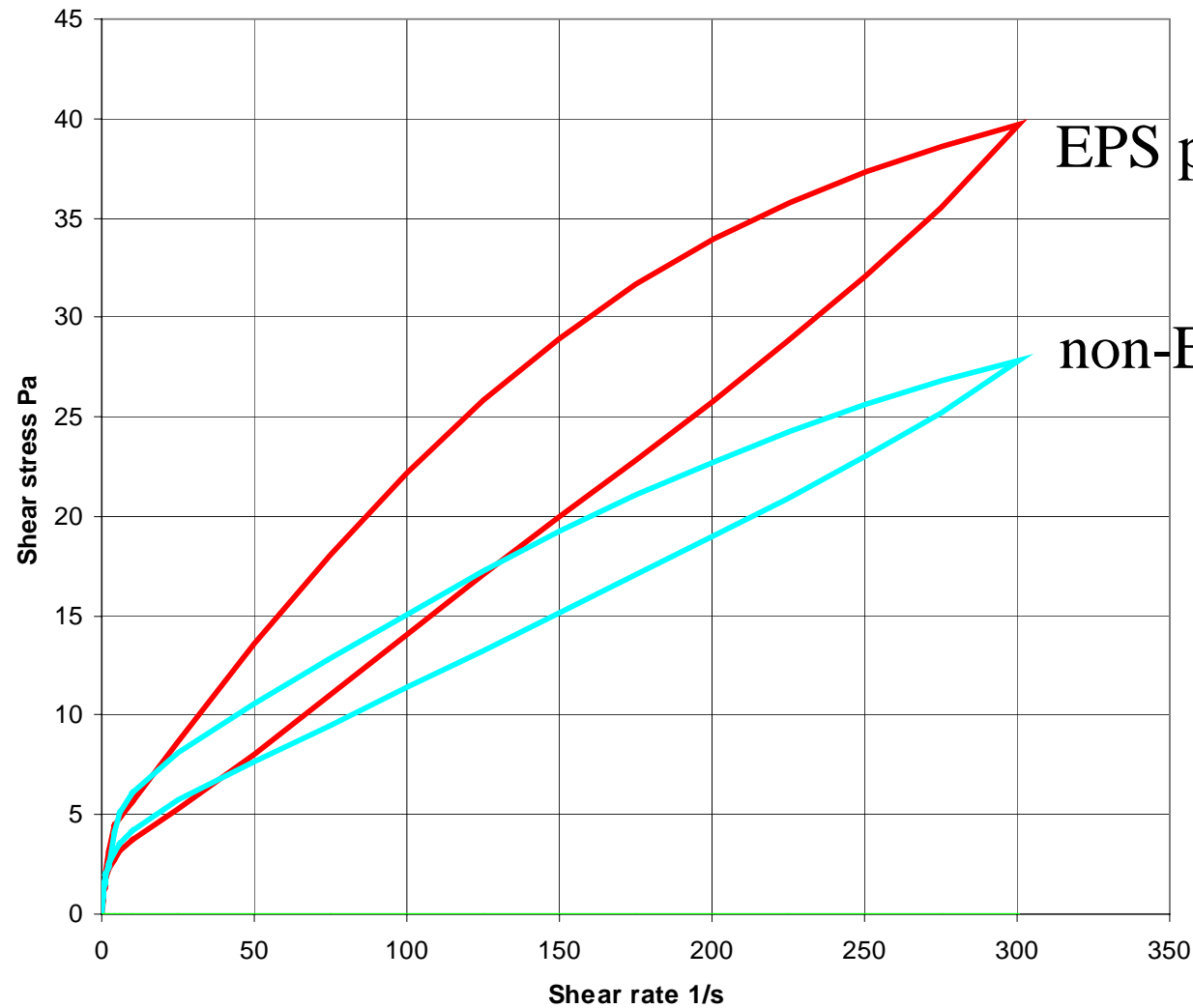
Viscosity as a function of EPS-concentration

CHR. HANSEN



Rheological effects of EPS

CHR



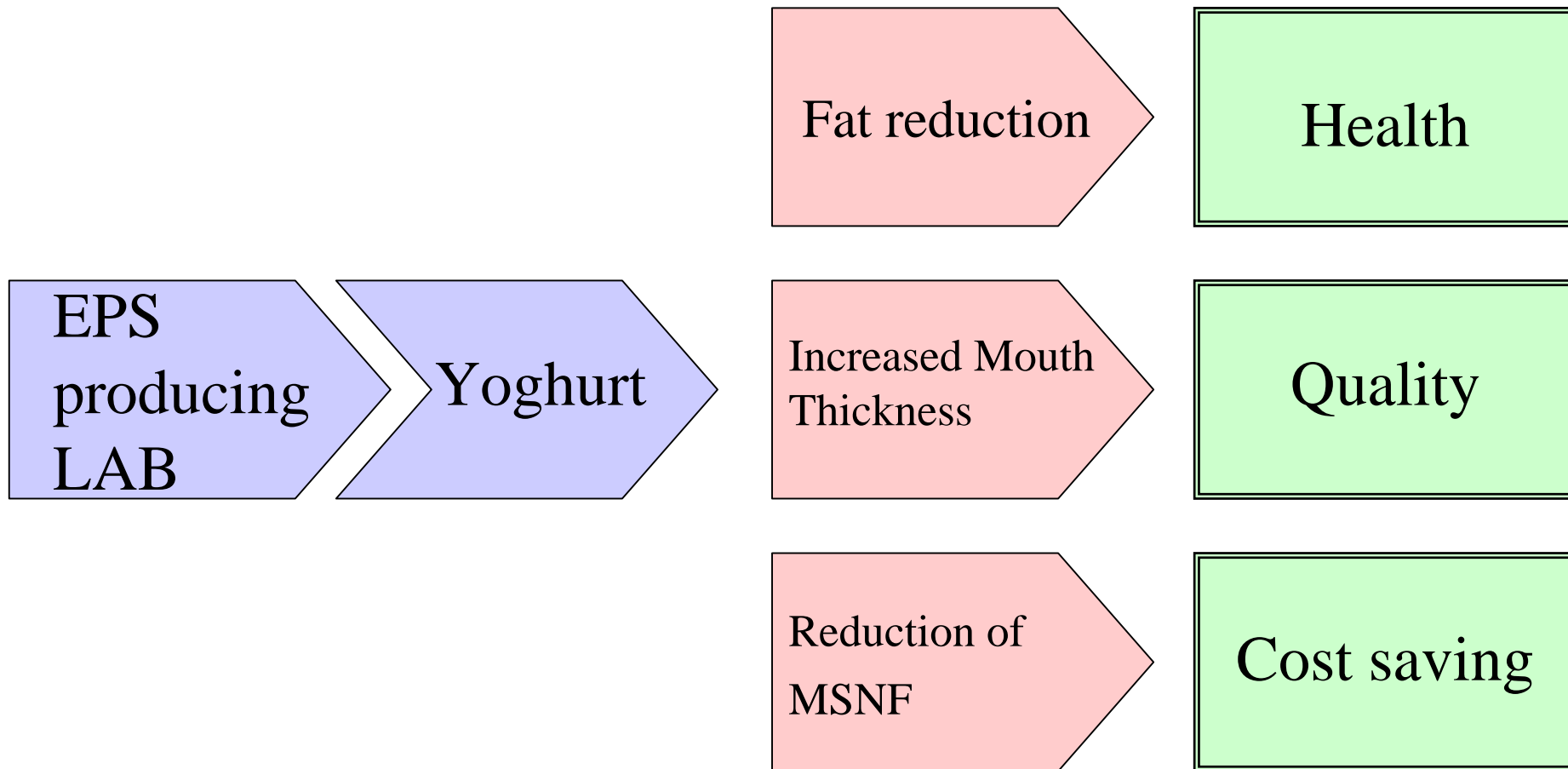
EPS producing culture

non-EPS producing culture

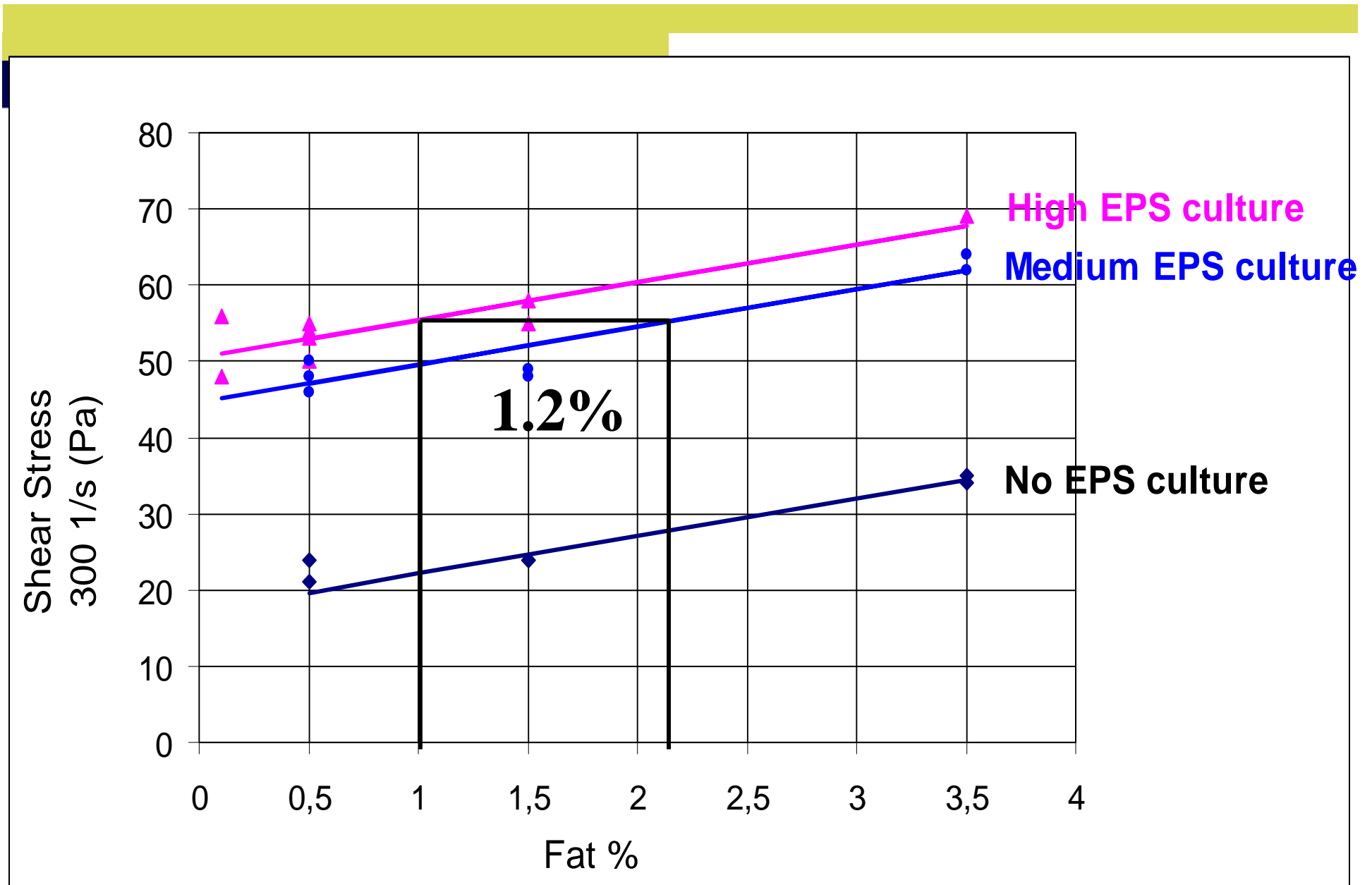
- Higher mouth thickness
- Lower gel firmness
- More ropy/filant

How can we use EPS?

CHR. HANSEN

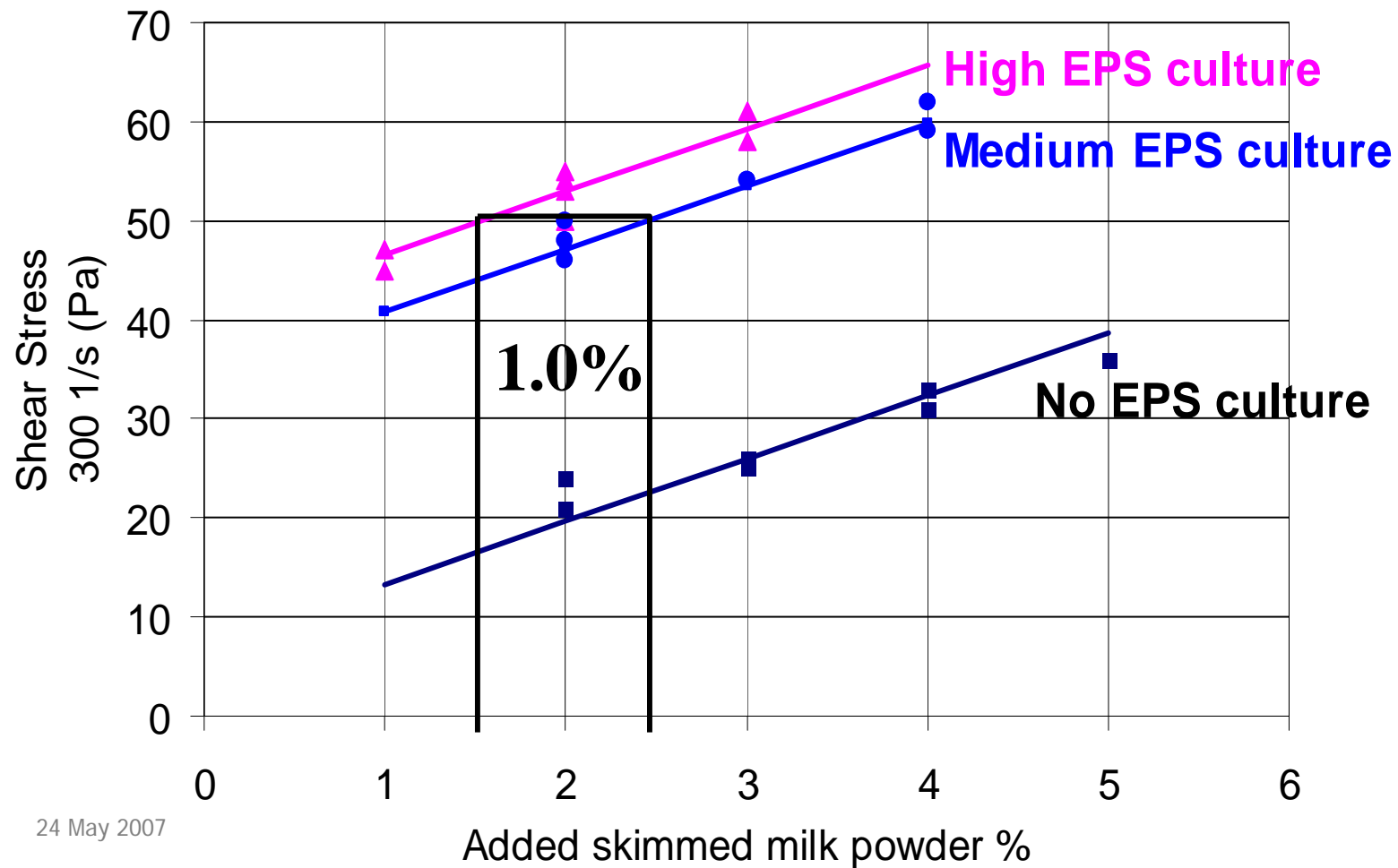


Health: Shear Stress vs Fat %





Cost: Saving Skimmed Milk Powder



How can we influence the texture properties by EPS production?

CHR HANSEN

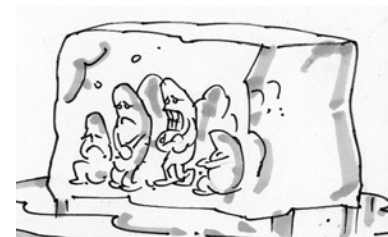
Selection of strains



Culture composition/strain interactions



Fermentation temperature

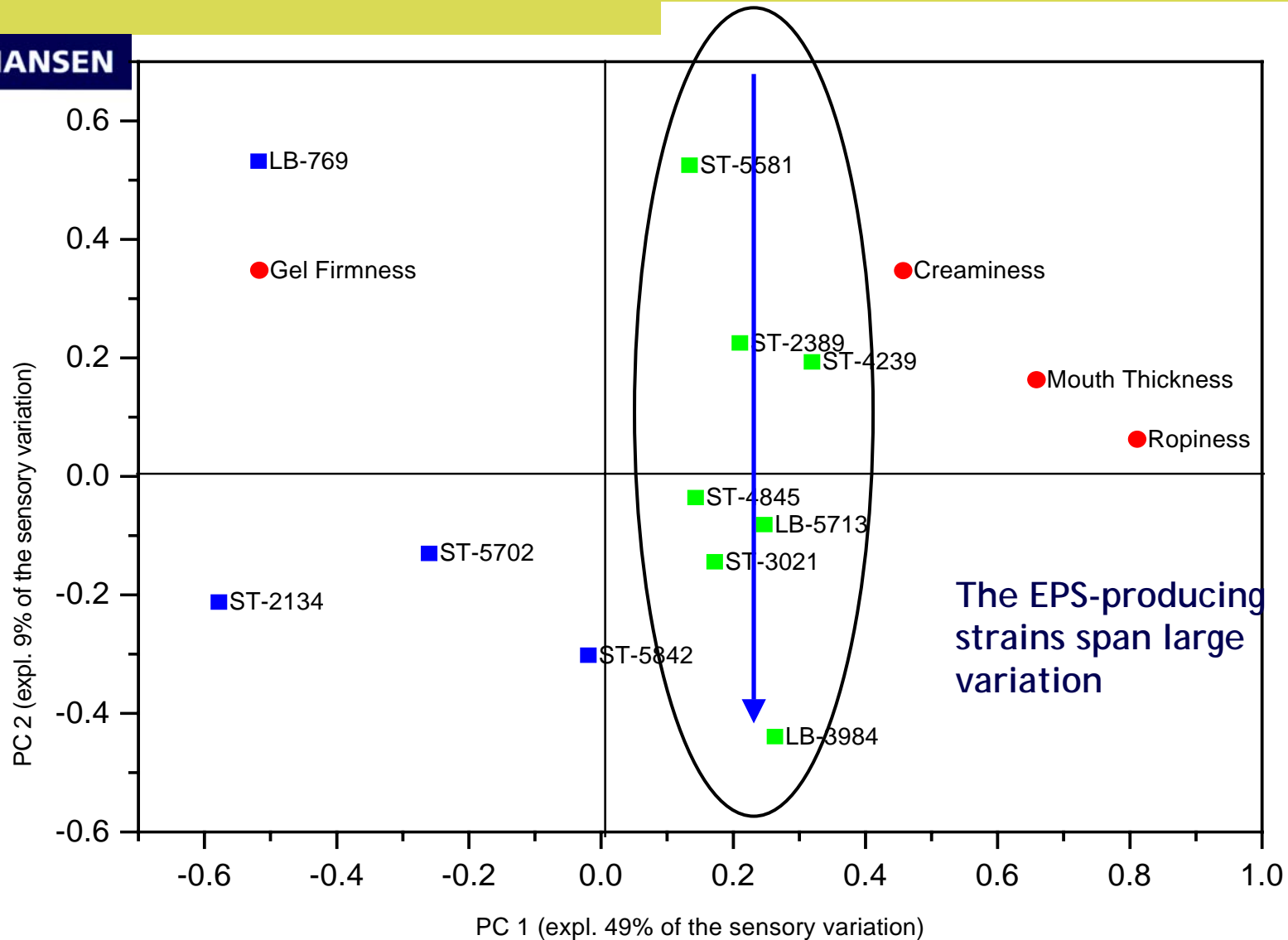


Interaction with protein



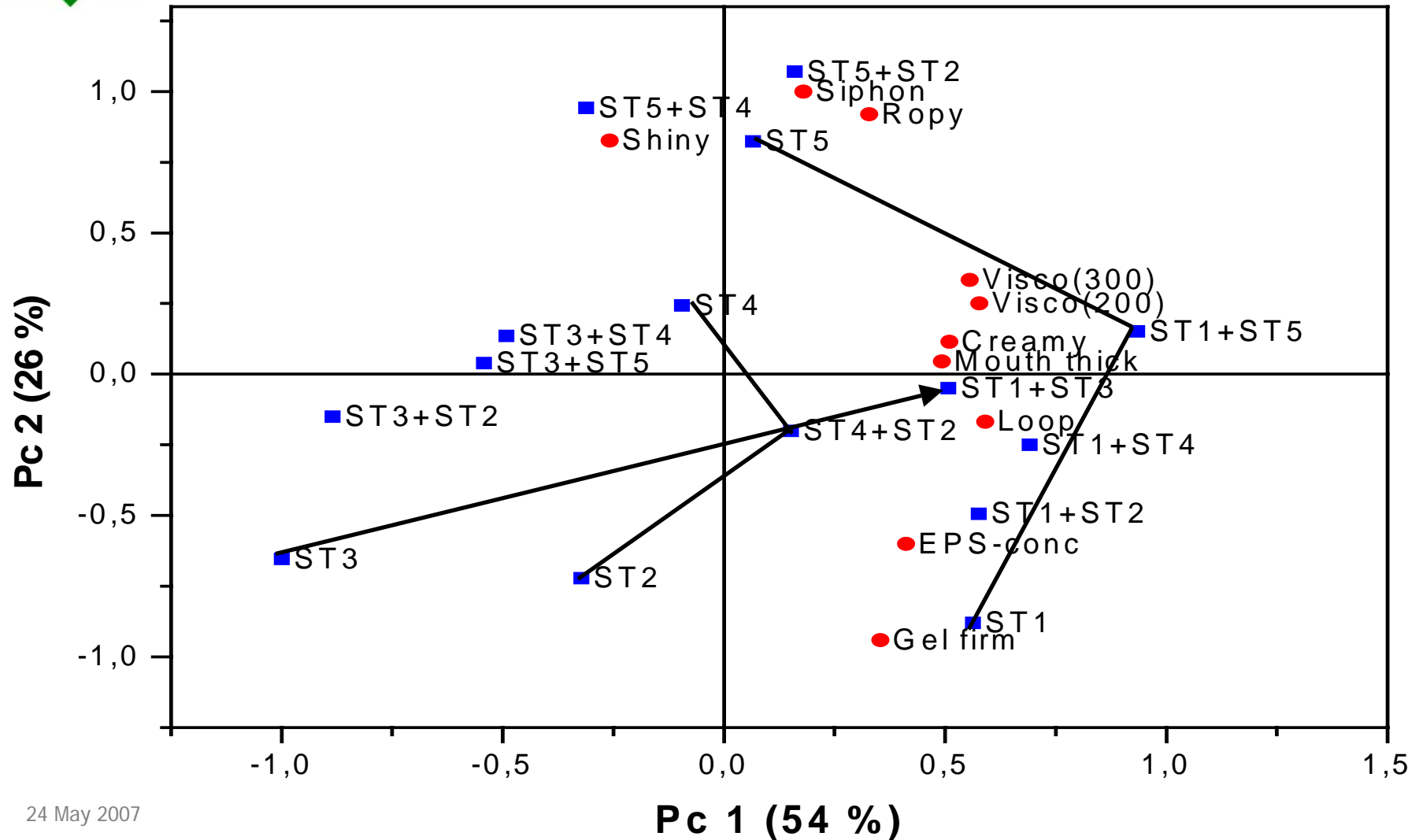
Variations within the EPS-producing strains

CHR HANSEN



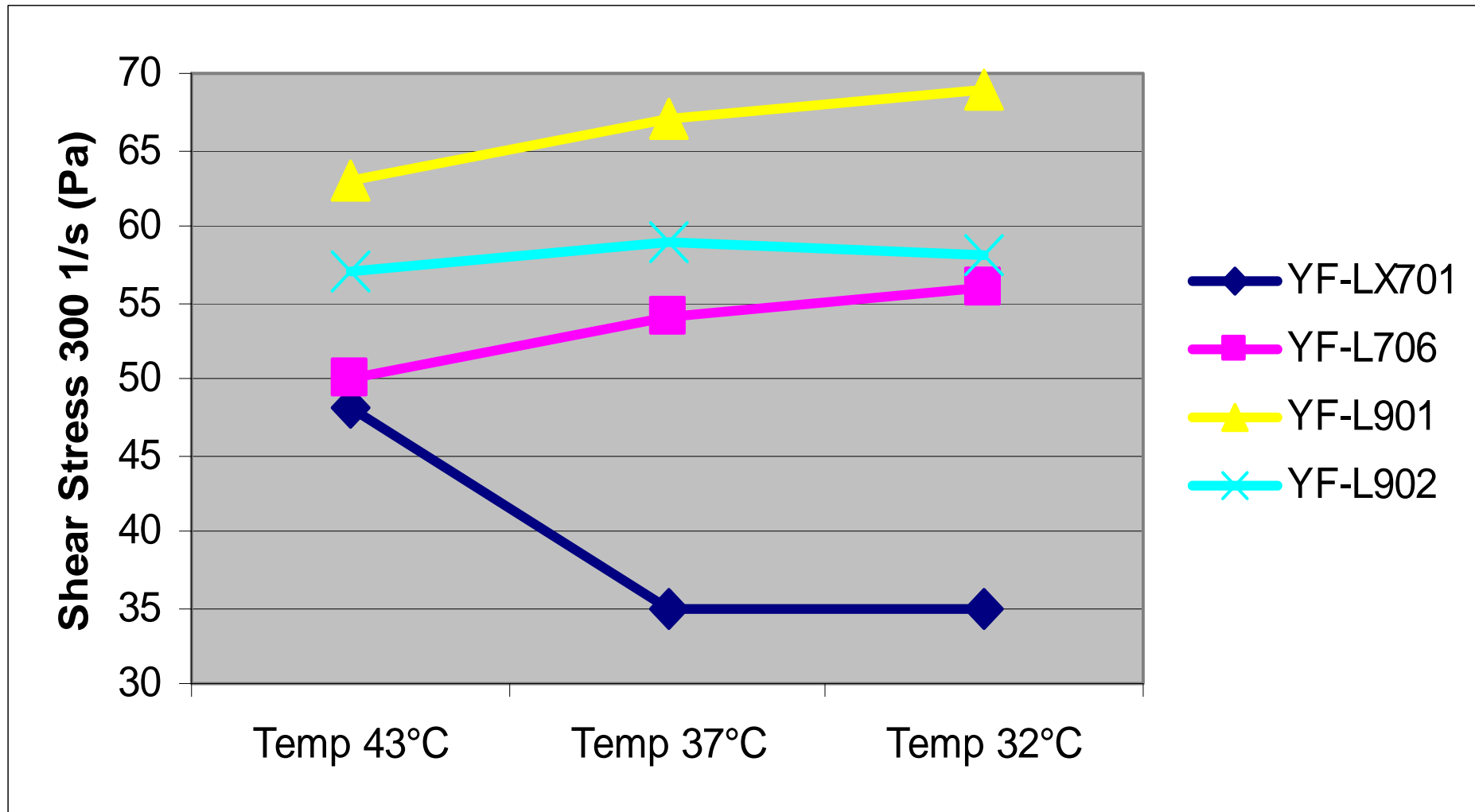
Strain interactions in mixed cultures

CHR. HANSEN



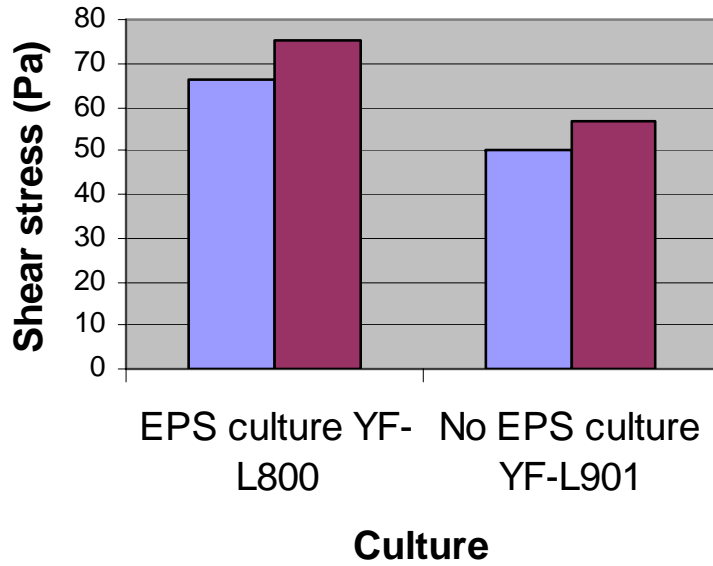
Shear Stress / Mouth Thickness

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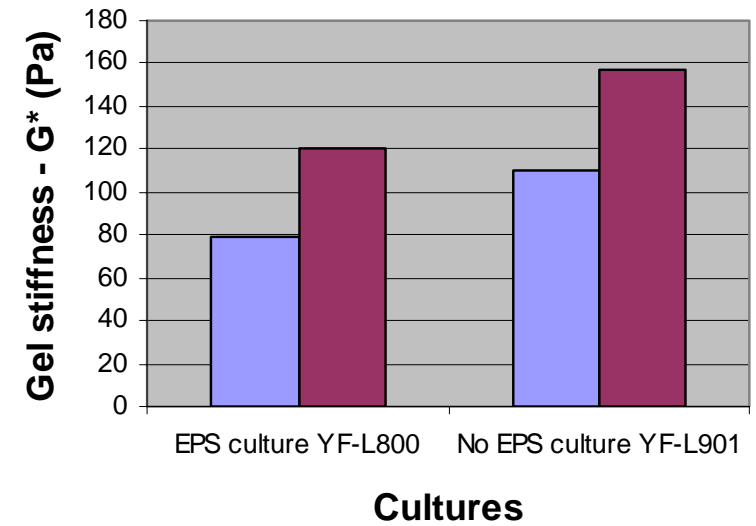


The influence of protein

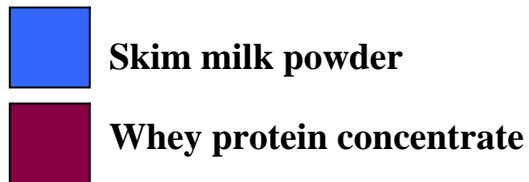
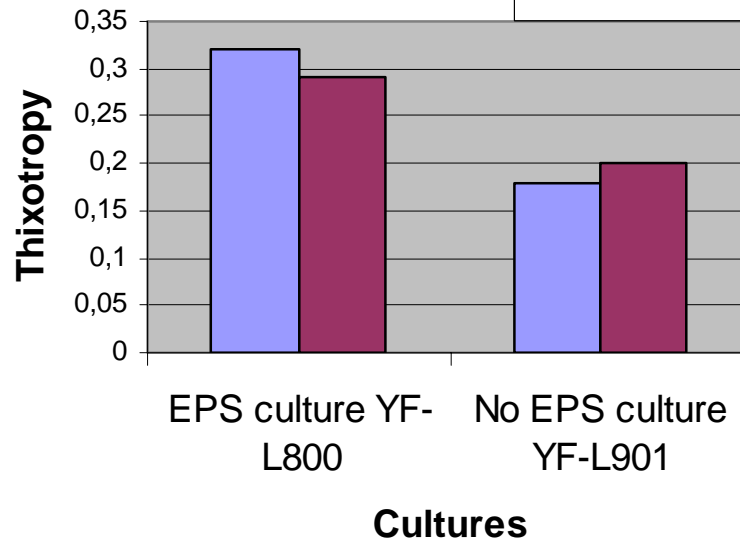
Mouth thickness



Gelfirmness



Ropiness



Conclusion:

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If you need to improve texture,
save money or reduce fat use
EPS-producing CULTURES

