**Structure formation and gel-properties in pea-protein based yoghurt-alternatives**

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In the light of increasing life expectancy, improvement of health and well-being in general and healthy aging in particular are key challenges. It is known, that plant proteins may be beneficial in the prevention of chronic degenerative diseases1. A suitable – and widely accepted – product-category for incorporation of relevant amounts of plant-derived proteins are yoghurt-type gels2. In comparison to traditional milk based yoghurts, plant-protein based systems may show very different structuring behaviour due to differences in protein structure and course of fermentation.

The presented work aims to characterise structure formation and gel properties in pea-protein based yoghurt-alternatives via rheological measurements during and after the fermentation process as well as by microscopy and selected analytical tests. It was found, that pea protein was able to form gels upon fermentation by following a two-phase gelation process consisting of initial association of charged pea protein units into a linear and overall percolated network structure followed by condensation of small aggregates at the gel walls. Overall, the gels showed partly weak and partly strong gel properties. Further investigations focused on the impact of molecular modification of the pea protein and addition of further nutritionally valuable ingredients such as dietary fibre and Ω-3 rich oil on structure formation and gel properties. In supplemented samples the protein network remained the dominating structure, even though incorporated oil increased the elastic proportion of the system and added fibre significantly increased the complex shear modulus.

Overall, pea-protein was found to be a suitable raw material for plant protein based yoghurt alternatives. Moreover, the attained gels could be further supplemented with nutritionally valuable dietary fibre and Ω-3 rich oil, making them a promising approach for nutritional strategies related to improvement of health and well-being in general and healthy aging in particular. From a consumer’s point of view, sensorial shortcomings of the pea protein yoghurt alternatives are the most important issue to be addressed in the future. Besides this, it is worthwhile to further investigate the material scientific properties of the system concerning clarification of the types of interactions involved in forming fermented pea protein gel systems and their respective contributions to the network.

*References:*

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