**Tuning Cellulose Microfibrill Containing Plant-Protein Gels by Shear**

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Cellulose microfibrils (CMFs), derived from plants waste material offer a unique fibrillar structure1 and serve as sustainable, natural and functional ingredients for dietary-rich, clean-label food products contributing to the texture and stability of these products.2,3 However, the dispersion of CMFs is challenging due to their tendency to aggregate via OH-driven hydrogen bonding and van der Waals interactions.4 While previous studies demonstrate that high-energy treatments of CMF dispersions in the presence of biopolymers improves homogeneity and reduces aggregation, the role of processing conditions in controlling these interactions and the resulting microstructural changes remains underexplored.1,4 Understanding the influence of shear induced microstructural changes in these composite systems is crucial to tailor the texture of plant-based food products.

This study investigates the impact of processing conditions on the rheological and structural properties of composite CMF plant-protein systems. Model systems were prepared by dispersing CMF in presence of plant-proteins, followed by controlled shear treatments using a Microfluidizer varying the applied energy density. The findings demonstrate that alternating the processing conditions significantly influence the structural and rheological properties of CMF – plant-protein systems. These results provide a foundation for tailoring the continuous phase in plant-based food systems, optimizing texture and mouthfeel.

*References:*

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