**Formation and characterisation of pectin microgels**

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A method for fabricating pectin microgels has been developed to efficiently produce microgels with consistent physical properties, including density, particle size, and uniform morphology. Low methoxy and amidated pectins have been used with calcium cations as the cross-linker at three concentrations (40, 80, and 200 mM) and two different pH values (2.0 and 7.0). The microgels have been characterised for their physical characteristics (yield, density, particle size, particle morphology and surface properties) and arrangement of pectin chains at the nanoscale via transmission electron microscopy (TEM) and small-angle X-ray scattering (SAXS). The fabrication protocol yielded microgels with consistent properties from batch to batch for each pectin type and pH. Microgels prepared at 80 mM and 200 mM calcium showed higher density, smaller particle size, and more uniform morphology than those prepared at 40 mM due to the faster gelation kinetics and higher crosslink density. Contrary to what is frequently reported in the literature, pectin microgels are not interfacially active. TEM revealed a more compact network microstructure at higher calcium concentrations as it enhances junction zone formation. The amidated pectin showed aggregated clusters because the amide group disrupts junction zone linearity. SAXS quantified the structural changes and the impact of crosslinking on modulating microgels’ microstructure. In conclusion, this spray gelation method generated pectin microgels with consistent and tunable properties that can be used in a broad range of food, pharmaceutical and biomedical applications.

ORAL PRESENTATION