**Comparison of the suitability of different citrus fibres as ice cream stabilisers**

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The structure and functionality of two types of commercial citrus fibre as sources of novel ice cream stabilisers and as combination blends with guar gum were investigated in comparison to a commercial ice cream stabilised with a hydrocolloid blend.

Confocal laser scanning microscopy (CLSM) and Transmission electron microscopy (TEM) investigated the structure of fibres in-situ. Rheological assessment identified differences in the consistency coefficient of aged ice cream mixes containing the different fibres, as calculated using the Power Law Model and was associated with an impact on the rate of meltdown [[1](#_ENREF_1)]. It was found that plant fibres largely impacted on the time of onset of ice cream melting in comparison to hydrocolloid stabilisers.

Spin-spin relaxation NMR (*T*2) identified differences in water (proton) mobility between aged ice cream mixes containing different citrus fibres. However, this reduction in *T*2 was not reflected in control over ice recrystallisation [[2](#_ENREF_2)].

The ability of fibres to control microstructural deteriorations with heat shock was assessed. Cryo-Scanning electron microscopy (Cryo-SEM) identified that differences in control over air cell coarsening [3] differed between fibres and compositional analysis has assisted in explaining why these differences may arise. Blending fibres with guar gum also contributed to improved functionality. The effect of microstructure on sensory properties was also studied and the present investigation identified that citrus fibres show promise as effective ice cream stabilisers.

**References**

1. Alvarez, V.B., et al., *Physical properties of ice cream containing milk protein concentrates.* Journal of Dairy Science, 2005. **88**(3): p. 862-871.

2. Herrera, M.L., et al., *Thermal, mechanical, and molecular relaxation properties of frozen sucrose and fructose solutions containing hydrocolloids.* Food Biophysics, 2007. **2**(1): p. 20-28.

3. Goff, H.D. and R.W. Hartel, *Ice Cream*. 2013: Springer US.