**Carrageenan and waxy corn starch mixture: an innovative stabilizer for custard desserts stability**

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**Abstract**

Custard is a popular dairy dessert with low stability and fast structural breakdown caused by its high surface evaporation and phase separation, attracting the attention of both academic and industrial research. Applying hydrocolloids might be a safe and appropriate solution to stabilize the structure, and diminish surface evaporation, phase separation, and retrogradation; as they can trap water through binding with starch and other ingredients as a complex and strong network. Waxy corn starch has higher thermal stability than the native type and can build a viscous network with high creaminess and near-zero syneresis. Therefore, the present study aimed to investigate the effect of using waxy corn starch (4%) and kappa-carrageenan (0.02, 0.2, 0.25, and 0.3%) on the physicochemical and rheological properties of custard desserts. The findings indicated that 0.02% hydrocolloid was not useful in providing a semi-solid dessert, while 0.3% carrageenan made a hard and brittle structure. Accordingly, 0.25% kappa-carrageenan was the optimum concentration for building a soft gel structure with the highest consistency (28.7 ± 4.52 mJ) and lowest syneresis (1.77± 0.01%). Also, the rheological behavior of this dessert fitted the Weltman (RSME: 0.05± 0.02, R2:95.87±0.00%) and Sisko (RSME: 0.04± 0.02, R2: 99.68±0.00%) model perfectly, presenting the pseudoplastic nature of custard similar to its commercial products.

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