

Abstract

Sugar reduction policies play an important role in improving population health. However, reformulating foods with complex structures remains challenging. Custard pudding is a semi-solid dairy dessert where sucrose contributes not only to sweetness but also texture, viscosity, stability, and water retention. This study evaluated the effects of partial sucrose substitution using erythritol and erythritol-inulin blends on the properties of custard pudding. Formulations (0%, 10%, 30%, 50% and 70% sucrose substitution) were prepared with either erythritol or erythritol-inulin blend. The effects of formulation and storage time were analyzed through texture profile analysis, syneresis, viscosity, water activity, and color measurements. Consumer acceptance was assessed using 9-point hedonic, JAR and penalty analysis. The results indicate that the type and concentration of sugar replacers significantly affected product quality ($p < 0.05$). Low concentrations of erythritol showed a hardening trend similar to the control during storage, while erythritol-inulin formulations demonstrated a softening trend. Syneresis increased in all formulations throughout the storage, reaching values up to 17.80% after 14 days ($p < 0.05$). All Formulations showed shear-thinning characteristics, while water activity values remained similar ($p < 0.05$). Color analysis further showed that sugar reduction resulted in lighter puddings with reduced a^* and b^* values ($p < 0.05$). Sensory evaluation results highlighted that all selected formulations were generally well accepted, with overall liking scores ranging from 6.74-7.20 on the hedonic scale. This suggests that partial sucrose substitution using erythritol and erythritol-inulin blends is an achievable approach to reducing sugar. However, the concentration and type of sugar replacers must be further optimized to achieve balanced properties.

Keywords: *custard pudding, erythritol, inulin, product reformulation, sugar reduction*