Effects of inulin and xanthan gum on the modification of the rheological properties of dairy custard

Caciano P. Zapata Noreña, Sara Bayarri, Elvira Costell. Federal University of Rio Grande do Sul, Food Science and Technology Institute, Zip code 91540-000, Porto Alegre, Brazil; Institute of Agrochemistry and Food Technology, Zip code 46100, Valencia, Spain.

Dairy custard is a dessert of semisolid consistency, whose main ingredients are milk, sugar and a gelling component and recently have been added prebiotic components, such as inulin. The aim of this work was to study the effect of adding different concentration of xanthan gum and inulin on the rheological properties in systems similar to custard desserts containing skimmed or whole milk, starch and sucrose as main components. Rheological measurements were carried out in a controlled stress rheometer and mechanical spectra of all samples were obtained at a range of frequency values between 0.01 and 10 Hz. Particle size distribution analysis was determined using a laser diffraction particle size analyzer. The results indicated that magnitudes of storage modulus and loss modulus (G' and G'' respectively) increased with in frequency. Skimmed milk sample without xanthan and inulin, showed a fluid like behaviour with values of G'' above those G'. For all the others samples, in general, mechanical spectra were typical of weak gels with values of G' higher than G'', being that xanthan and inulin led to increase in elastic characteristics of samples. The ANOVA showed a significant interaction with combination of both inulin and xanthan ingredients on viscoelastic properties. When it was used multivariate analysis, the dendogram of similarity realized among the ten different custards studied showed that it was possible to classify them into three groups. Mean diameter values (D_{4,3}) of particles for samples were in the range from 34.2 and 42.7 microns.