

INVESTIGATION OF THE INFLUENCE OF THE COMPONENT COMPOSITION ON THE RHEOLOGICAL CHARACTERISTICS OF PEAR FRUIT JAM

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Abstract

The aim of this research was to design a new functional pear jam with dietary fibers and to evaluate the influence of the component composition on the rheological characteristics and texture properties of the final product.

A puree from pears, variety "Santa Maria" was used as the raw material for the jams. Sodium alginate and low esterified amidated citrus pectin were used as gelling agents. Calcium dichloride dihydrate and calcium lactate pentahydrate were used as the sources of calcium ions. Moreover, cellulose fibers at various concentrations were incorporated in the fruit jams. Aspartame and potassium sorbate were used as a sweetener and preservative, respectively. The rheological characteristics (the rupture force, rupture deformation, compressive strength and firmness) of the fruit jams were determined by penetration tests using a Stable Microsystems Texture Analyzer in uniaxial deformation mode at an initial set voltage of 60% with a constant deformation rate 2 mm/s by an aluminum cylindrical piston with diameter 5 mm. The compressive strength was determined by the ratio between the rupture force and the piston area. The firmness indicated the penetration resistance. It was determined by the slope of the first peak of the force and the depth penetration.

It was found that with a reduction of the fruit content and the increase in the cellulose fiber concentration, the rupture force increased by a logarithmic relation. The added cellulose fibers in the fruit jams demonstrated a minimal influence on the rupture force. The compressive strength increases in logarithmic dependence with increasing the concentration of sodium alginate and cellulose fibers in fruit jams. The firmness of the jams varies according to the polynomial dependence without the major changes in the rheological index values. Cellulose fibers improve the rheological characteristics of pear fruit jams. Additionally, it was found that at certain concentrations of gelling agents the maximum firmness values was obtained.

In conclusions, it was found that the addition of cellulose fibers improved the rupture force and compressive strength of pear fruit jams. With a reduction of the fruit content and the increase in the cellulose fiber concentration, the rupture force increased by a logarithmic relation. Gelling agents also improved the jam firmness.

Key words: *Component composition, Rheological characteristics, Fruit jam, Pears.*