

Abstract:

Methods for the improvement of the quality of Finnish frozen strawberries and jam strawberries are being studied in a joint research project between VTT and the Finnish strawberry industry during 1997–2000. The aim of the project is to promote the industrial use of domestic strawberries by developing the quality and quality management of Finnish frozen strawberries and jam strawberries, and to develop different prefreezing treatments for strawberries. In the experiments carried out with Finnish 'Jonsook' strawberries grown in summer 1999, a calcium chloride (CaCl₂) and pectin methylesterase (PME) prefreezing treatment was performed in a vacuum. Structural changes in strawberry tissues after the prefreezing treatment were studied by means of instrumental texture analysis and by bright-field microscopy. The firmness values of thawed strawberries and jam strawberries, treated with CaCl₂ and PME in a vacuum, were significantly greater than those of untreated reference strawberries. According to microscopical studies, the CaCl₂ and PME pretreatment in a vacuum affected the microstructure of strawberry tissues. The pretreatment seemed to stabilise, in particular, the cortical tissue. The use of the pretreatment affected the effective absorption of CaCl₂ and PME into the cortex providing a more stable structure during freezing by reducing freezing damage.