

Abstract

The objective of this study was to use mechanical and acoustic methods developed in our laboratory to monitor the changes in crispiness of a Crackerbread biscuit following equilibration at different water activities (a_w). Crackerbread samples were equilibrated at a_w of 0.113–0.98. The equilibrated Crackerbread samples were punctured with a cylindrical probe (5 mm) using an Instron Universal Testing Machine. The force and acoustic signals were simultaneously captured using Labview software. Changes in parameters associated with crispiness were modelled using Fermi's equation. The number of sound peaks, force and sound curve lengths and area under sound amplitude–time curve decreased with increasing a_w . The sound frequency decreased linearly ($R^2 = 0.926$) with increasing a_w . The critical water activity (a_{wc}) of Crackerbread ranged between 0.51 and 0.59. Acoustic parameters were more sensitive to a_w -induced changes in Crackerbread occurring at a_{wc} than mechanical parameters.