

Effect of ingredients on the mass loss, pasting properties and thermal profile of semi-sweet biscuit dough

ABSTRACT

The drive to utilise different lipids, both for health benefits and for commercial reasons, in bakery goods has been extensive. However, the roles of the lipid plays in many products, let alone the influence of the level of saturation, are uncertain. The objective of work carried out is to understand how the typical ingredients in biscuit would impact on the thermal profile of semi-sweet biscuit dough. Three different techniques have been used namely gravimetric analysis (TGA), rapid visco analyser and differential scanning calorimetry (DSC). Wheat flour, sugar and fat/oil were the main ingredients used to produce basic dough of semi-sweet biscuit for this study. Semi-sweet biscuit dough formulations with varying types of oils namely palm oil, palm olein, palm stearine, sunflower oil and butterfat were developed. The final mass (i.e. the total amount of moisture lost) for the samples showed significant differences between the doughs; with the control dough, dough contained palm stearine and butter falling into one group and the butter, palm oil, palm olein and sunflower oil forming the second group that showed less mass loss. Doughs containing low levels of saturated fatty acids (palm olein, palm oil and sunflower oil) showed significant difference on the drying properties of samples compared to doughs containing high saturated fatty acids (palm stearine and butter) as revealed by TGA. Pasting properties result showed that oil with different saturation influenced peak viscosity obtained. The DSC results showed that sugar and oil increased the gelatinisation peak temperature up to 2 and 6 °C, respectively. Oils with low saturated fatty acids have more capability to make contact with starch granules during the mixing processing as compared to oil with a high level of saturated fat. It is suggested that the oil presence in the system was delaying the drying process by coating the wheat flour particles hence slowing the drying process as compared to a sample without oil.