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Determination and modeling of desorption isotherms of Maria biscuits from different brands

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Biscuits (sweet, strongly sweet, semi-sweet biscuits, crackers, wafers) are characterized by a low moisture content in the final product and high levels of fat and sugar [1]. Dehydrated foods, such as biscuits, are very sensitive to gain moisture from the surrounding atmosphere, resulting in a consequent deterioration. When, at constant temperature, the product's moisture increases from the atmosphere, is obtained the adsorption isotherm and when it loses moisture is obtained the desorption isotherm. These curves are very important when studying the storage of dehydrated foods and the specification of packaging that is best suited for them.

This study aimed to determine the adsorption curves of Maria biscuits from different brands at temperatures of 25 °C and 40 °C. The equilibrium between the sample and the atmosphere was achieved by placing the samples inside flasks containing saturated salts, at temperatures of 25 °C and 40 °C, for a period long enough to let reach equilibrium (5 days). Though the determination of moisture content (W) and water activity (aw) the adsorption isotherms were plotted. Moisture was determined by a Hallogen Moisture Analyser (HG 53 from Mettler Toledo) and the water activity was determined by a hygrometer (Hygroskop Bt-RS1 from Rotronic). The results obtained were later fitted to the Guggenheim-Anderson-deBoer (GAB) model [2-4], one of the most frequently used to describe sorption isotherms of foods, using the software SigmaPlot, v8.0.

From the results obtained, it was possible to observe some important differences among the samples tested for both temperatures and also that increasing temperature increases stability of the product, since for the same moisture content water activity is greatly reduced (Figure 1).

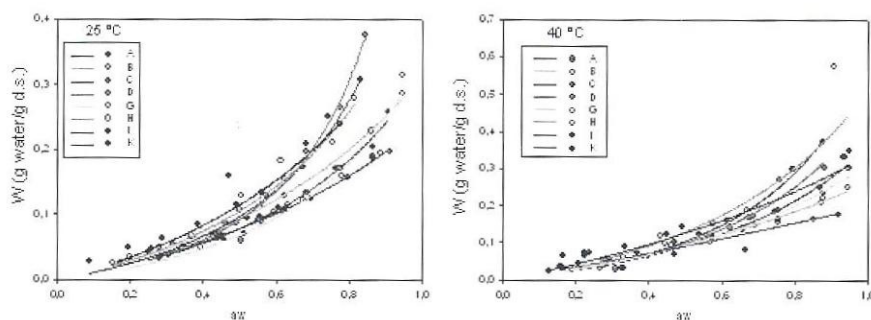


Figure 1. Adsorption isotherms of Maria biscuits at 25 °C and 40 °C.

References

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