ABSTRACT

The aim of the study was to test and select thin layer drying models for egg drying under forced convection. To achieve it, an experimental forced convection was used to provide airflow rate of 0.15m3/s with temperature ranging from 35-45 oC to dry a 0.03m thick layer of hardened eggs. The eggs were dried and retrieved every 20 minutes to determine the moisture content and moisture ratio respectively. The resulting experimental moisture ratios were fitted to Newton, Page, Modified page, Henderson and pabis, Logarithmic, Simplified Fick's diffusion Equation modified page equation11, Demir et.al, and Aghbashlo et.al. Among the nine models, the Page model best described the forced convection hot air drying of hardened egg slices. It was also observed that an increase in air temperature significantly reduced the drying time with falling rate period. The average values of effective diffusivities of hardened egg in the drying process at 35–45 oC varied in the range of 3.10 x 10-07 to 6.38 x 10-07 m2/s with increase in temperature. An Arrhenius relation with an activation energy value of 58.729kJ/mol for the whole drying process of eggs was found. This showed the effect of varying temperature on moisture diffusivity in eggs increased with temperature.