

MATHEMATICAL MODELLING OF HOT AIR DRIED APPLE AND EFFECTS OF VARIETY, SHAPE AND TEMPERATURE ON DRYING BEHAVIOR AND QUALITY CHARACTERISTICS

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Abstract— In this study, drying kinetics and quality characteristics of apple cv. *Starking*, *Gala* and *Granny Smith* circles and squares were studied at two different drying temperatures, 60 °C and 70 °C. Drying times were varied between 85-165 min. Depending on variety, shape and temperature. The falling rate period was observed and drying rate changed depending on the drying parameters. Four mathematical models were fitted to experimental data and Logarithmic model was found to be the best for all the samples. Total phenolic contents and antioxidant capacities of dried apple samples varied in the range of 4.11-8.36 mg GAE/g dry matter and 4536.43-7370.47 mmol AEAC 100/g dry matter, respectively and showed a tendency to increase or decrease after drying depending on the variety and shape interaction. Shape had also significant effect on antioxidant capacities of samples as well as the variety ($p < 0.05$). The results of variance analysis demonstrated that there were significant differences among color values of apple samples dried at 60 °C and 70 °C.

Keywords— apple, drying kinetics, antioxidant capacity, total phenolics