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Mathematical modelling of ultrasound pretreated kumquat (*Citrus japonica var. margarita*) in freeze dryer

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ABSTRACT

Kumquat (*Citrus japonica var. margarita*) is a citrus fruit that resembles a tiny orange and is rich in flavonoids [1-3]. Kumquat, which can be consumed raw and processed, was dried in a freeze dryer with ultrasonic pre-treatment and its mathematical modelling were investigated in this study. Ultrasound pretreatment was applied for 30 and 60 seconds and the drying process was proceeded at -68.6 C and 0.9 Pa for control and pretreated samples. The experimental drying data is fitted into Hendersen & Pabis, Jena & Das, Lewis, and Two-Term Exponential drying models, and the data-model compatibilities were compared. The most suitable model was determined as Jena & Das model with the highest R^2, and the lowest χ^2, and *RMSE*. It was observed that the R^2 values of all the models applied varied between 0.994740 and 0.998673.

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