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## Single-Layer Drying Behaviour of Longan (*Dimocarpus longan* Lour.)

SARAWUT PHUPAICHITKUN<sup>1</sup>, BUSARAKORN MAHAYOTHEE<sup>2</sup>, SERM JANJAI<sup>3</sup>, JOACHIM MUELLER<sup>1</sup>

<sup>1</sup>University of Hohenheim, Agricultural Engineering in the Tropics and Subtropics, Germany

<sup>2</sup>Silpakorn University, Department of Food Technology, Thailand

<sup>3</sup>Silpakorn University, Department of Physics, Thailand

### Abstract

Dried longan (*Dimocarpus longan*) is a commodity with increasing volume in Thailand. Since 2004, percentage of dried longan increased from 20 to 40% of total longan export. Due to rising energy prices production costs are rising. Furthermore, quality is limited by poor drying procedures. Only limited information about optimum drying conditions is available in literature. Objective of this work is to investigate the influence of fruit properties and drying conditions on drying time and quality of longan. In this work, drying behaviour of longan in single layer was observed to eliminate the intrinsic temperature and moisture gradients in multiple layer bulks. Longan was classified in big, medium and small size. Drying air condition was varied in five temperatures from 50 to 90°C, five relative humidities from 8 to 20% and three air velocities from 0.2 to 0.5 m s<sup>-1</sup>. The results showed that drying kinetic was strongly effected by temperature and size of the fruits, whilst there was no significant effect of air velocity and relative humidity. Water diffusion process inside longan fruit was modelled by using Fick's law. Based on the single layer model, it will be possible to develop a multi-layer model of the drying processes for simulation, design and optimisation of practice drying operations.

**Keywords:** Drying, energy saving, modelling, single-layer experiment, value adding