The main objective of this work was to study the physical qualities, chemical quality and physico-chemical quality of rice during in-store drying. The prediction results of moisture content and whiteness of rice were compared to the experiment results using a near-equilibrium drying mode including whiteness kinetics of rice kernel. The long grain rice (Suphanburi 1), containing of amylose content of 27%, was used for all experiments. The experiments were set up at the average ambient temperature of 30±4 °C, average relative humidity of 76±8% with a fixed bed depth of 1.0 m. Specific air flow rates of 0.65 and 0.93 m³/min-m² of paddy were forced through the paddy bulk at an initial moisture contents of 18.5% and 20.1% wet basis. The final moisture content of paddy was about 3.3±0.6% wet basis.

The results were shown that the drying rate and the whiteness predictions were in good agreement with those from the experiments. For determination of energy consumption, the consumption by this drying technique consumed low energy input and did not produce notable effect on those of qualities of rice. For the physical quality analysis, was indicated that the rice whiteness, head rice yield and the percentage of paddy germination were insignificant affected by the low-temperature drying. The hardness and stickness after drying were slightly increased.