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The effectiveness of combined infrared and hot-air drying strategies for sweet potato

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1 **The effectiveness of combined infrared and hot-air drying strategies for sweet potato**

2 **Running Title:** Combined infrared and hot-air drying strategies

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13 **Abstract**

14 This study examined the performance of different combined infrared (IR) and hot-air drying
15 (HAD) strategies for sweet potato. Experiments were conducted for simultaneous infrared and
16 hot-air drying, two-stage sequential hot-air and infrared drying, two-stage sequential infrared
17 and hot-air drying, and intermittent infrared and hot-air drying in a laboratory scale combined
18 infrared and hot-air dryer. The drying air temperature varied between 50 – 70 °C, the infrared
19 intensity was 1100W/m², the air-velocity was 1.5 m/s, and the pulse ratio (PR) ranged from 1
20 – 3. Results indicated that the drying rate, drying time, effective moisture diffusivity,
21 shrinkage, specific energy consumption (SEC), colour attributes and phytochemical
22 compounds of sweet potato were affected by the different drying combination strategies. The
23 drying kinetics, product shrinkage, and sample temperature were also influenced by drying
24 time and air temperature. The two-term exponential model adequately explained the drying
25 behaviour of sweet potato for all the different combination strategies. The intermittent IR and
26

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