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Impact of hydrocolloid addition and microwave processing condition on drying behavior of foamed raspberry puree

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1 **Impact of hydrocolloid addition and microwave processing**
2 **condition on drying behavior of foamed raspberry puree**

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8 **Keywords:** Raspberry foam, potato protein, maltodextrin, freeze-drying, microwave freeze drying,
9 drying kinetics

10 **Abstract:**

11 In this study, foamed raspberry puree was dried by microwave-assisted freeze drying (MWFD).
12 The combined use of microwaves and a foamed structure was intended to accelerate the drying
13 process, while creating an innovative product structure with intense aroma impact for consumption
14 as a snack. The influence of potato protein as foaming agent, maltodextrin as foam stabilizer and
15 microwave (MW) power on the drying characteristics of raspberry foams during MWFD was
16 investigated. conventional freeze drying (FD) experiments were performed as a reference. MD
17 concentration was shown to significantly influence product temperature. As higher MD
18 concentrations yielded smaller bubbles and a more uniform bubble size distribution, lower drying
19 temperatures were needed to reach the same final moisture content.

20 Varying MW power did not did not significantly influence the drying time. MWFD at 1.0 W g⁻¹
21 yielded a 3 to 4-fold decrease in total drying time as compared to FD. The addition of 10% protein
22 led to the most gentle drying at high MW power input due to structural changes enabling a lower
23 resistance against water vapor mass transfer. There was a high correlation between the foam

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