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STUDY OF THE KINETICS OF SPINACH DRYING

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Every year, the preservation of nutrients and energy resources becomes increasingly important in the processing of plant raw materials worldwide. Today, vegetables are crucial to human nutrition, and those containing folates are essential throughout the entire life cycle. Folic acid is a form of folate that occurs naturally in high concentrations in leafy vegetables, fruits, legumes, nuts, yeast, mushrooms and animal products. Spinach is a vegetable that spoils quickly after harvesting and is only consumed during the growing season. Drying is a preservation method that not only extends the shelf life of spinach but also preserves its vitamin content.

Spinach was used for the research. The spinach was processed as follows: it was washed and soaked in water at a temperature of 20–25°C for 10–15 minutes. The kinetics of material drying were studied on an experimental convective bench equipped with an automatic information collection and processing system [1].

Fig. 1 shows changes in moisture content and temperature in the layer during spinach drying. As can be seen from Fig. 1, the longest drying time is at 55 °C and is 190 minutes. The shortest drying time is at 80 °C and is 91 minutes, but this spoils the quality of the material and impairs the taste. Spinach has a high chlorophyll content of approximately 120 to over 500 mg per 100 g. The use of high temperatures during drying accelerates the destruction of chlorophyll, which leads

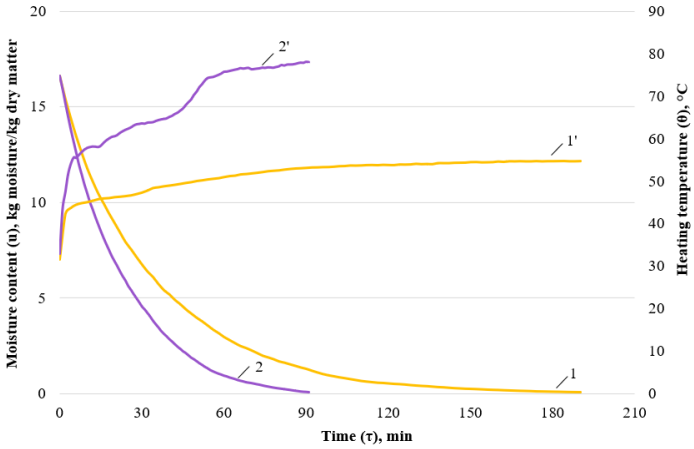

Fig. 1. **Change in moisture content (1, 2) and temperature inside the layer (1', 2') of spinach in the layer at different coolant temperatures (δ ≈ 10 mm, V=3 m/s): 1 – 55 °C; 2 – 80 °C**

to discolouration of vegetables [2]. Therefore, further studies were conducted at a heat transfer fluid temperature of 55 °C.

Conclusions. The work studies the kinetics of spinach drying. It was determined that the drying time for this spinach is within 190 minutes at a heat transfer fluid temperature of 55°C. The use of high temperatures during drying accelerates the destruction of chlorophyll and folates, so it is advisable to use lower heat transfer fluid parameters.

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