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STUDY OF DRYING TOMATO PASTE

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Formulation of the problem. Tomato powder is a powdered concentrate of tomato paste, which is used as a food additive in cooking to give dishes a characteristic smell and color. The development of the technology of dried food products from vegetable raw materials, its use in the composition of other food products opens up great opportunities for the development of the direction of the production of organic products for long-term storage in Ukraine and abroad [1]. A significant influence on the quality of the obtained organic vegetable powders is directly exerted by the structural and technological component [2]. Modern methods of production of vegetable powders are freeze-drying and spray drying [3]. Freeze drying is considered to be the most effective in preserving nutrients in powdered products, but its industrial application is hampered by high equipment costs and high energy consumption, as well as low productivity. Ensuring the quality of vegetable powders requires constant improvement of appropriate drying technologies, which will allow to significantly reduce the duration of processing. At the same time, there are no recommendations for drying tomato paste without adding impurities (from the point of view of energy saving) in modern technologies. Solving the problem of tomato powder production is possible by improving the technological scheme and drying by spraying.

Statement of the problem. Analyzing modern research on methods of drying pureed products, the authors decided to investigate the technology of drying tomato paste (30% dry matter) by spraying. Spray drying is the most economical technique that maintains quality through rapid dehydration. This method provides a large surface area in the form of small liquid droplets by spraying in the drying chamber, which leads to the production of regular and spherical powder particles.

The aim of the study is to investigate the technological scheme of drying tomato paste by spraying to obtain a powder with improved consumer properties due to the preservation of vitamins, valuable macro- and microelements.

Basic materials. The technological scheme involves heating the tomato paste to 80 °C, which reduces the drying time of the product and reduces energy consumption.

The spray drying process reduces the moisture content of tomato paste from 70% to 7-9%, increases the concentration of lycopene in the dried product (powder) from 5 to 10-15 mg%, and preserves the nutritional value and organoleptic properties of the powders.

The use of new energy-saving equipment will ensure the preservation of the original properties of raw materials (semi-finished products) and make the finished product more competitive. In turn, this will provide thermal and stabilizing effects of the process and energy efficiency of the process equipment, which will allow to obtain a high-quality finished product.

The developed flowchart for controlling the production process and the HACCP (hazard analysis and control) plan for tomato paste powder with the establishment of control and critical control points (5 CCPs in total) allow for full control of the entire process of producing a safe food product in accordance with the principles of HACCP.

Further research is needed to study the effect of drying processes on the lycopene content of the finished dry product, to determine the loss of lycopene depending on the temperature at the inlet to the dryer.

References

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