# DEHYDRATION PROCESS OF TOMATO FRUIT BY FORCED CONVECTION AT THE TUNNEL-TYPE INSTALLATION

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Introduction: The Republic of Moldova being an agrarian country is rich and recognized for the rich assortment of fruits and vegetables it possesses. The problem lies in preservation the product, the number of industrial fridges is limited and the maintenance is quite expensive, an effective solution that would facilitate keeping, storing and transporting would be their dehydration.

Material and methods: Tomatoes harvested from the territory of the Republic of Moldova in 2022 were taken, later they were brought to the DIM – UTM research center as study samples and were prepared for dehydration. Meanwhile, the research facility is connected, the temperature (50 - 70°C) and the air flow speed (0.5 - 2.5 m/s) are set. As a thermal agent, the air from the room was used with an initial temperature of 20 - 25°C, relative humidity 55 - 60%, normal atmospheric pressure, dehydration was studied at different temperatures 50 - 70° ± 1°C, at an air speed of 2.0 ± 0.1m/s, the research was carried out at the GUNT stand, Germany.

Results: Following the investigation of the tomato drying process, the kinetics graph for forced convection at the temperatures of 50, 55, 60, 70 and 80°C was developed, and the drying curves were obtained. When drying with a temperature of 50°C, the maximum drying time of 250 minutes was obtained and at 80°C, 90 minutes was obtained, so the drying time is inversely proportional to the applied temperature; the drying speed was determined, for the temperature of 50°C, (du/dτ) is equal to 0.34, for 55°C – 0.41, for 60°C - 0.52, for 70°C - 0.65, and at 80°C - 0.79 is obtained. Following the dehydration of the tomatoes according to the organoleptic analysis carried out at the IM department, the sample was presented that obtained the maximum score (very good) with parameters: applied temperature 60°C; air velocity of 2 m/s and the shape of the product sliced in half.

Conclusions: Following the research of the tomato drying process, optimal drying parameters were obtained such as: temperature 60°C, air speed of 2 m/s, tomatoes being cut into halves of about 4-5 mm, ambient air temperature of about 25°C, ambient relative humidity of about 55%, normal atmospheric pressure, drying time of about 170 minutes to reach product humidity of about 20%.

**Keywords:** drying, experimental stand, humidity, temperature, drying time, kinetics.

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