

SORPTION CHARACTERISTICS OF WHEAT AND JERUSALEM ARTICHOKE (*HELIANTHUS TUBEROSUS*) FLOUR MIXES

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In the food industry, there is a more widespread use of Jerusalem artichoke and Jerusalem artichoke flour, thanks to the nutritional value and chemical composition. The aim of the research was to determine the hygroscopic characteristics by constructing the adsorption and desorption isotherms of Jerusalem artichoke flour in comparison with wheat flour. We used two varieties of Jerusalem artichoke Amicu II and Solar and found that the organoleptic characteristics and physico-chemical properties are the same for both types of flour. Jerusalem artichoke flour (Amicu II variety) was obtained with the following organoleptic characteristics: color-light brownish, taste-sweet, pleasant and smell-specific with shades of roasted product. Physicochemical properties: titratable acidity 28.6 degrees of acidity. Moisture 11.4% and ash is 117.6%. Experimental adsorption and desorption isotherms of raw and cooked Jerusalem artichoke flour and wheat flour were obtained. All isotherms were found to be sigmoidal, type II, characterized by specific multimolecular adsorption for a nonporous or macroporous adsorbent. It was found that the sorption properties of three types of flours are different and that the most pronounced are for cooked Jerusalem artichoke flour (38% b.s. at $a_w=0.955$), followed by raw Jerusalem artichoke flour (33% b.s. at $a_w=0.955$) and wheat flour (17% b.s. at $a_w=0.955$). The hysteresis effect was established on all the sorption diagrams, practically in the entire a_w range, but it increases with decreasing temperature. The maximum hysteresis values are: for raw Jerusalem artichoke flour - 7; for cooked Jerusalem artichoke flour - 9 and for wheat flour - 6 (g/100 g dry product at 5°C). It has been found that for the same water content, the activity of water at a temperature of 5°C is greater than that at a temperature of 23°C. The increase in temperature therefore has the effect of increasing the hygroscopicity of flours.

It was recommended to use raw Jerusalem artichoke flour since its hygroscopicity is quite low and can therefore be stored longer, preferably at a temperature of 15-20°C and in a dry environment. The monomolecular capacity of Jerusalem artichoke flour was calculated - 480 $\mu\text{mol}\cdot\text{g}^{-1}$ and the surface a of one gram of adsorbent (Jerusalem flour) which is equal to 65.5 $\text{m}^2\cdot\text{g}^{-1}$. The heat of sorption was determined, and the water content values were found to be inversely proportional to the heat of sorption values.

Keywords: Jerusalem artichoke, Jerusalem artichoke flour, adsorption and desorption isotherms, water content, preservation.

Acknowledgments. The research was funded by State Project 20.80009.5107.09 "Improving of food quality and safety through biotechnology and food engineering", running at Technical University of Moldova.