

## SOME THERMODYNAMIC CHARACTERISTICS OF BEET PULP

Nataliia Ivashchenko, Oleksiy Bulyandra, Inna Tryhub

Sugar industry of Ukraine has a long-standing tradition for sugar production and export due to favorable soil, climatic and economic condition. Along with a primary market of sugar there is a market of its by-products such as molasses, sugar beet pulp, sugar liquor.

According to the results of sugar refining season in 2012-2013, 17.08 million tons of sugar beet roots were processed by the sugar refinery in Ukraine. Taking into account that the yield of raw sugar beet pulp from weight of the treated beet roots consists 85% (totally 14.5 million tons of product was produced), it is clear that the treatment of raw sugar beet pulp is a significant problem.

Nowadays, the main way for sugar beet pulp using is its use in feeding of farm animals. The use of sugar beet pulp for pectin production is considered as a promising direction for its utilization. There are a lot of new technologies and technological decision for production of pectin-contained substances from sugar beet pulp. However, lack of technological step "raw-dry" of the certain quality is one of the major obstacles for application of these technologies. The soft temperature mode for the thermal treatment of raw sugar beet pulp with application of heat transfer agent purified from products of fuel burning should be applied.

With the aim of determination the optimal regime for drying of sugar beet pulp at a low temperature, studies of effective thermophysical characteristics for different kinds of sugar beet pulp in temperature range from 60°C to 100°C were performed. The results of study allow to control the process of drying more effectively for the materials with different moisture content. The generalized graph of sugar beet pulp drying was obtained as a result of studies of drying kinetics, as well as a value of complex  $N$ , which gives the possibility to draw the graphs for drying for any other regime. Air with the movement rate in the range from 1 to 4.5 m/s was chosen as a drying agent for the temperature from 60°C to 100°C. Under the study of total heat-mass-transfer of sugar beet pulp, the database was created. It took into account four changeable parameters. Empirical relationship between volume coefficient and heat interchange of drying were developed as a result of analysis of dynamics of total heat-mass-transfer.