WASTELESS WHEY PROCESSING: TECHNOLOGICAL ASPECTS

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Wasteless processing of whey requires the use and complex recovery of valuable substances, including serum whey proteins, taking into account ecological factors due to high indices of biological and chemical use of oxygen. Different methods of whey processing are known which allow the production of protein concentrates used as various biologically active food additives. Particular emphasis has been placed in recent years on the development of different infant formulas based on whey protein concentrates. The methods of whey processing, which are developed and improved, possess both definite advantages and disadvantages compared one to another. Analysis of the state-of-the art in this field allows to conclude that the most effective methods for whey processing provide such technologies where combined methods are jointly used. The aim of the performed research was to optimize one of the electrophysical methods of whey treatment based on the electroactivation of liquid media, directed for a wasteless treatment of whey yielding high-quality products.

The electrochemical activation of whey is one of the advanced methods of processing secondary dairy products, which ensures the extraction of protein-mineral concentrate and the simultaneous isomerization of lactose into lactulose with their subsequent application. The main parameters, which determine the process are: the density of electric current, and respectively, the specific energy consumption, the composition of anodic solution, the velocity of liquid flow in cells, the type of heterogeneous membrane, the solid and protein content of used whey, the geometric/constructive parameters of the diaphragm electrolyser. The combination of these factors, which defines the degree of increase in temperature and active acidity in the cathode cell, as well as the state of the membrane and electrical voltage, influences the amount and final composition of mineral protein concentrates obtained by electroactivation of whey. The results of electrophysical and biochemical research show that the use of these methods allows the recovery of approximately 60-80% of the proteins from their total content of the initial whey in the form of protein-mineral concentrate and obtaining deproteinized whey, which contains most amino acids, isomerized lactulose and residual lactose. To optimize the process, the current density, the flow rate of the liquid, the temperature, the type and the state of the diaphragm were varied.

Thus, it was established that the increase of the current density, with other constant parameters regulated in the whey treatment process, leads to the increase of the protein yield in the protein mineral concentrates.

Keywords: *electrochemical activation, secondary dairy products, wasteless, whey processing.*

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