

## **STUDY OF TECHNOLOGICAL PROPERTIES OF COMMERCIAL SWEET WHEY AND WHEY PERMEATE POWDERS**

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### **Abstract**

Sweet whey and whey/milk permeates are raw materials that are formed during milk processing on high protein products: cheese, quark, and dairy protein concentrates. The main feature of whey and permeate dry substance composition is prevalent lactose content. It allows to use of these raw materials for different fermentation processes. On the other hand, high lactose content and availability of nitrogen compounds and other nutrients cause instability of liquid whey and permeate during storage and transportation. That is why sometimes usage of whey and permeate spray-dried powders is preferable. Our researchers aim to compare the main characteristics of whey and permeate powders as potential raw materials for different products, including fermented dairy products.

Duplicate commercially packaged samples of partially demineralized sweet whey and whey permeate powders by local dairy manufacturers have been used for research. The samples' chemical composition (lactose, protein, ash, fat) and physical parameters (bulk density, insolubility index, and wettability) have been determined by GOST and ISO methods. The particle size distribution in the samples has been measured by laser diffraction analysis. The research has been carried out in the scientific laboratory of "Food and Industrial Biotechnology" of North Caucasus Federal University.

The results have shown that the samples' component composition is compliant with typical commercial whey and permeate powders. Other samples' characteristics (bulk density, insolubility index, particle size distributions) are very close. The main differences have been observed in wettability and water-absorbing of the powders, especially whey demineralized permeate. It could result from the lower lactose crystallization of the powder. Its feature should be factored into when the powders are used.

Thus, the results confirmed that lactose has a great influence on the physicochemical and structural properties of whey and permeate powder, as it's present in the product as a continuous phase and can absorb moisture from the atmosphere during storage easily. It could be a reason for the forming of highly viscous liquid, clumping, and caking of the product. These features should be taken into account when the powders are chosen as raw materials for different applications.

**Key words:** *Sweet whey powder, Permeate powder, Bulk density, Insolubility index, Particle size distributions.*