

NEW TRENDS IN THE VALORISATION OF DAIRY BY-PRODUCTS (WHEY)

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Whey is a by-product of the cheese, casein and protein co-precipitators manufacture. World whey production resulting from the production of cheese is more than 90 million tons per year. Only half of the amount of whey produced globally is used for human consumption or feed. The rest, discharged into the environment, that has serious pollution implications, because of whey has high biochemical oxygen demand (BOD) (~40–60 g/L) and chemical oxygen demand (COD) values (~50–80 g/L) due to the concentrations of lactose, proteins, and mineral salts. The most rational form of whey recovery is its use in the food industry as beverages, deserts, powder, because of its nutritional and biological high values. Whey contains about 55% of the dry matter of milk: 20% of the milk protein (β -lactoglobulin and α -lactalbumin), traces of fat, most of the lactose and practically all the amount of minerals and water-soluble vitamins. The purpose of this research is to obtain a new dairy product, using whey as a raw material, namely whey flan according to the classic technology of milk flan with some modifications and appreciation of its quality.

Cow's milk from local farms, and whey obtained in the manufacture of hard cheeses were used for the study. Appreciation of sensory quality ISO 6658: 2005. Protein content by Kjeldahl method SM EN ISO 8968-1:2014. Fat content by butyrometric method SM ISO 11870:2014. Dry matter using standard method GOST 3626-73.

In the Republic of Moldova, operators in the field produced in 2020 about 2865.5 tons of cheese, which resulted in about 11460,0 tons of whey. Given the limited use of whey in the local food industry and the lack of a well-defined assortment of whey dairy products, the handling of this by-product is little known. Flan is a gel-structured dessert made from milk and/or eggs. Agar, gelatin, carrageenan, starch or their mixture are used as gelling agents. In this case, carrageenan was used, because it interacts with positively charged milk / whey proteins. This interaction is also favored by the presence of calcium ions (Ca^{2+}), which form bridges with the negative groups of carrageenan. Sensory whey flan samples compared to the control sample were rated as very good (the product has positive, specific, well-defined sensory properties. It does not show any noticeable defects), sweetish smell and taste, whey-specific, well-formed consistency, with a syneresis degree of 1.3 ... 2, values provided in the normative documents. This kind of product allows the recovery of all whey nutritional components, which has a dry matter content of 5.8%, fat - 0.5%, a protein content of 1%. The pH value of whey flan samples varied in the range of 5.2 ... 5.06 compared to the milk flan sample which has a pH of 7.79.

The organoleptic properties and the physico-chemical characteristics of the whey flan-dairy dessert fall within the limits of those stipulated in the normative documents for similar products and support the possibility of valorization the whey in this new food formula.

Keywords: *dairy by-products, flan, milk, whey, whey dessert*

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