

DEVELOPMENT OF VITAMIN D3-FORTIFIED DAIRY SOUR CREAM DESERT

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Abstract

Recent studies show a correlation between the content of vitamin D3 in the human body and the severity of COVID19. Part of the world's population is deficient in vitamin D3. The solution to this problem is possible by the development and inclusion of foodstuffs fortified with vitamin D in diets. The aim of this study was to develop a D3 -fortified sour cream dessert using an emulsion system as a vitamin D delivery system.

Commercially available raw materials: vitamin D3 powder, sodium carboxymethylcellulose, skimmed milk powder, and sunflower oil were used to create a vitamin D-fortified emulsion. The latter is used in the technology of sour cream dessert production. The emulsion microstructure and stability were investigated using rheology and dynamic light scattering methods. The content of vitamin D3 was determined by coulometric titration and spectroscopy.

Experimentally determined data on the viscosity of emulsions indicate the pseudoplastic behavior of the flow. The use of a structural approach (Casson model) made it possible to determine the emulsion viscosity parameters, which can be used as a quantitative criterion for emulsion stability. This conclusion was confirmed by microstructural data on distribution size of droplets volume of emulsion. Amount of vitamin D in the emulsion and dessert was $1.96 \pm 0.22 \mu\text{g/g}$ (97.8 % of the added amount) and $0.019 \pm 0.005 \mu\text{g/g}$, respectively.

Using the developed stable emulsion as a vitamin D delivery system, a technology for the production of a dessert based on sour cream fortified with vitamin D3 was proposed.

Key words: *Vitamin D, Emulsion Stability, Encapsulation, Fortification, Dairy desert, Skimmed milk powder.*