

METHOD OF INCREASING THE SAFETY AND FUNCTIONAL VALUE OF CUSTARD

Natalia Netreba*, Angela Gurev, Veronica Dragancea, Olga Boestean

Faculty of Food Technology, Technical University of Moldova, 168, Stefan cel Mare Bd., MD-2004, Chisinau, Republic of Moldova

*Corresponding author: natalia.netreba@tpa.utm.md

The functional value and safety of custard can be improved by using natural biocompatible additives, which will protect the product from microbiological risks and fat oxidation. The research conducted by the authors provided a strong justification for the application of grape seed extracts as antioxidant and antimicrobial agents in confectionery creams.

Hydroalcoholic extracts from grape seeds are rich in polyphenolic, which have antioxidant properties and therapeutic effects for the human body. Research has proven that the significant antimicrobial activity against *Escherichia coli*, *Salmonella spp.* and *Staphylococcus aureus* of grape seed extracts is attributed to the properties of polyphenols to affect the integrity of the cell membranes of microorganisms, to inhibit the activity of extracellular microbial enzymes that interfere with microbial growth and replication. Therefore, these biologically active compounds can protect food products from oxidation, preventing the degradation of fats and other sensitive components, can inhibit the development of fungi and microorganisms, and as a result, increases the quality and shelf life of food.

The custard was fortified with different concentrations of dry extracts (from 0.05% to 0.1%) and the sensory properties were evaluated, the basic physicochemical parameters, the antioxidant activity and the resistance of the custard to microbiological degradation were determined. From the point of view of sensory qualities - the custard had a viscous and homogeneous consistency, light creamy color, pleasant smell and taste creamy, sweet, balanced, pronounced taste of butter; grape seed extract gave the cream a light and pleasant nutty flavor. Humidity did not change significantly, with average values of 62÷63% for all samples.

The titratable acidity was within the allowed limits of 1.84÷2.15%, depending on the concentration of the added extract. The value of the peroxide index of the control sample during storage increased 3-3.5 times, while in the fortified samples it increased 1.2-1.5 times and remained within the acceptable limits, the latter being more resistant to oxidation. It was noted that the DPPH antioxidant activity of the cream fortified with 0.1% grape seed extract (55.12 $\mu\text{M TE/L}$) was 45 times higher compared to the control sample (1.23 $\mu\text{M TE/L}$).

Research has shown that the bioactive compounds in the extracts exhibited antifungal properties and inhibitory effect against gram-positive and gram-negative bacteria. The quantity of mesophilic aerobic and facultative anaerobic

microorganisms in the control sample was 2×10^4 , and less than 5×10^3 CFU in the cream with natural additives.

It was concluded that fortifying the cream with natural antioxidant extracts improved its functional value. The quality and shelf life of pastry cream have increased, thanks to the properties of grape seed extracts to inhibit free radicals and protect against microbiological decomposition.

Keywords: custard, grape seed extract, quality, safety, antioxidant

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