

Effect of functional plant extract from grape seeds on the quality of boiled cream with milk

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Abstract

Cream semi-finished products usually limit the shelf life of cakes and pastries due to the susceptibility of the fat phase to oxidative processes and microbiological deterioration.

The aim of the work was to use grape seed extracts in custards to prevent and retard oxidative reactions and microbiological spoilage processes.

Grape seed extract is a by-product derived from grape (*Vitis vinifera*) seeds that is extracted, dried and purified to produce an extract rich in polyphenolic compounds. The antimicrobial properties of grape seed extract have been evaluated against *Listeria monocytogenes*, *Salmonella typhimurium*, *Staphylococcus aureus*, *Bacillus cereus*, and other foodborne pathogens, both in vitro and, to a limited extent, in food.

The effect of different concentrations of dry grape seed extracts (0.05-0.1%) as antioxidant and bioprotectant in custards has been investigated. Main physico-chemical parameters and microbiological indicators of custards are determined in accordance with standard procedures. The sensory quality of the cooked cream was evaluated using the 30-point scale method. The cream has a viscous and homogeneous consistency, light creamy colour, the smell and taste was defined as pleasant creamy, sweet, aromatic, with a pronounced buttery, balanced taste, the samples of cream with grape seed extract added had a light and pleasant nutty flavour, according to the results of the quality rating, corresponding to the highest quality. The amount of dry matter in the boiled milk cream samples does not change significantly and averages $38.80 \pm 0.03\%$ for all samples. This indicates that the additions of functional plant extracts do not influence the change in the amount of dry matter, i.e. they do not reduce the shelf life. Determination of titratable acidity showed that all samples of boiled cream with milk were within the permissible limits (1.84-2.15% depending on the amount of extract), but during storage for 24 hours the acidity decreased significantly (1.10-1.15% depending on the amount of extract). The peroxide value of the cream sample without added grape seed extract during storage increases in 3.2 hours, while the samples with the extract were more resistant to oxidation (1.5 times higher and within the permissible range).

In terms of antioxidant activity, all samples show increased antioxidant activity. The best result is shown by the sample with 0.1% dried grape seed extract - in 55 hours higher compared to the control sample.

The antibacterial potential of the functional plant extracts used against gram-positive and gram-negative bacteria showed that antimicrobial compounds are present in the extracts used. The functional plant extracts used are in close agreement in inhibiting bacterial growth.

Grape seed functional extracts were tested against fungi and bacteria and revealed significant antibacterial and antifungal potential. The plant functional extracts used are extracts with numerous innovative acts that increase the shelf life of the cream.

Keywords: Antioxidant activity, Antimicrobial properties, Boiled cream, Extract, Grape seed.

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