

OPTIMIZATION OF SUGAR AND PALM OIL FREE NUT SPREADS

ALBANESE D. (1), MALVANO F. (1), MUCCIO E. (1), MARRA F. (1)

¹ Department of Industrial Engineering- University of Salerno, Salerno, Italy

Anhydrous sweet spreads are concentrated suspensions of poly-dispersed solid particles (sugar, cocoa, milk powder etc.) whose continuous phase is palm oil, probably the most widely used vegetable oil for the manufacturing of confectionary and sweet spreads. Despite its excellent technological properties, the use of palm oil is questioned because of issues related to human health and environmental impact, the last due to its intensive cultivation. Excessive consumption of palm oil is associated with cardiovascular risks (due to its saturated fatty acid content). Furthermore, palm oil can contain toxic compounds formed in the refining process, such as 3-monochloropropanediol and fatty acid glycidyl esters. Sucrose is commonly used in sweet spreads thanks to its important energy source; however, its excessive consumption is linked to short- and long-term pathologies (obesity, heart disease, etc.). Therefore, a growing interest in low-calorie sugar substitutes and in alternative plant-based palm oil replacers has been observed in recent years. Edible oleogels seem to be optimal replacers of palm oil in food products as they contain a large amount of edible oil entrapped in a three-dimensional network. Stevia as natural sweetener with a sweetening power 200-300 times higher than sucrose, may offer a good alternative to sucrose. It is worth highlighting that the main characteristics that affect the quality of sweet spreads, like rheological and sensory parameters, depend on the amount and type of fats and sugars employed in it. However, when the sugar and fat content of a food product is modified, the chemical physical and sensory parameters may be affected. Based on the above, the aim of this study was to develop and optimize a sweet pistachio spread formulation sugar- and palm oil-free. Response surface methodology (RSM) was used to identify the optimal pistachio spread formulation with olive oil-based oleogel and Stevia with quality parameters in terms of viscosity, spreadability and oil binding capacity comparable to the palm oil and nut-based spreads available on the market. Results revealed that in sugar-free formulation the oleogel, as well as whey proteins and skimmed milk powder, play a key role in the production of high-quality sweet pistachio spread.