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Optimization of the sensory characteristics of butter fortified with liposoluble sea buckthorn (*Hippophae Rhamnoides* L.) extract

Optimizarea caracteristicilor senzoriale ale untului fortificat cu extract liposolubil de cătină albă (Hippophae rhamnoides L.)

Valorization of bioactive compounds from plant sources in dairy products represents an innovative direction in food science, with direct implications for the

development of functional foods. In this context, the present study investigated the influence of liposoluble sea buckthorn extract (*Hippophae rhamnoides* L.) on the sensory characteristics of butter, with the aim of identifying the optimal fortification level that ensures both functional benefits and sensory acceptability. Liposoluble sea buckthorn extract is recognized for its high content of carotenoids, tocopherols, and bioactive fatty acids; however, its incorporation into dairy matrices may be limited by the intense and specific taste and aroma inherent to the extract. Therefore, the primary limiting factor in the development of enriched butter was the expression of the characteristic flavor and odor imparted by the extract.

Sensory evaluation of the butter samples was performed using descriptive analysis by a trained panel of expert assessors. The main sensory attributes- appearance, consistency, odor, taste, and color- were examined for experimental variants obtained by incorporating liposoluble sea buckthorn extract at concentrations of 0.5%, 1.0%, 1.5%, 2.0% and 2.5%. Comparative analysis revealed that the level of fortification directly influences the overall sensory profile of the product. Samples containing 0.5% and 1.0% extract demonstrated the most balanced sensory characteristics, preserving the typical sensory profile of butter while harmoniously integrating the distinctive aromatic note of sea buckthorn. In contrast, increasing the extract concentration beyond 1.5% resulted in a decrease in sensory acceptability, particularly with respect to consistency and odor. These samples exhibited a pronounced aroma, described as woody, associated with an intensified perception of sea buckthorn oil, which negatively affected the overall evaluation. The observed changes are attributable to the increased carotenoid content, contributing to a more intense yellow hue and enhancing the perception of the product as natural and functionally enriched.

Consequently, the results demonstrate that the fortification of butter with liposoluble sea buckthorn extract is both technologically and sensorially feasible; however, the optimal concentration for maintaining desirable organoleptic quality ranges between 0.5% and 1.0%. Exceeding this interval leads to an excessive intensification of olfactory and gustatory attributes, thereby reducing overall product acceptability.

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