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Optimization of probiotic yogurt production applying different concentration of vitamin D₃, Cuminum cyminum and different fermentation times using response surface methodology

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In recent years, functional benefits of probiotics, vitamin D₃ as well *Cuminum cyminum* essential oil have been considered for diabetes management, each, in separate. In this study, production of yogurt with the highest counts of probiotic strain as an adjunct culture and containing different concentrations of vitamin D₃ and *C. cyminum* essential oil and applying different fermentation times was investigated in order to develop a new probiotic product with additional health benefits for diabetes individuals. Central composite design with response surface methodology was used to analyses the effect of different factors (essential oil extract, vitamin D₃ and fermentation time) on the probiotic population in the product. *C. cyminum* essential oil in four different levels including 0.01'0.02' 0.03' and 0.05% vitamin D₃ in five different levels including 20'40' 400' 1000 and 2000 IU and fermentation time in five different levels including 3' 6' 9' 12 and 24 hours were considered as different variables. According to the used model, 15 experimental designs in 20 replications were defined by software and the results were analyzed in SAS software, the effect of each factor was counted as significant at P< 0.05. The combined effect of concentration of *C. cyminum* essential oil and fermentation time had the most significant effect on the LA7 population followed by the combined effect of *C. cyminum* essential oil and then with less significant effect, vitamin D₃ was effective on the final results with both the power of two and one. Optimized formulation was characterized as the median dose of each factor. The optimized formulation with vitamin D₃ and *C. cyminum* essential oil allows probiotic survival above 10⁷cfu/ ml in yogurt. This functional product can be considered as a functional food for individuals suffers from diabetes.

Biography

Maryam Mirlohi has completed his PhD at the age of 37 years from Isfahan University of Technology. She has been working as an academic in Isfahan University of Medical Sciences n. She has published more than 40 papers in the international journals and has been serving as an the head of Food Sciences and Technology department in the school of nutrition and food sciences in the Isfahan university of medical sciences.

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