

## **Determination of Viability of Probiotic Bacteria in Garlic (*Allium sativum L.*) and Red Onion (*Allium cepa L.*) Incorporated Prebiotic Butter**

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Dairy products have a large market share, of which butter is an important product. Butter is the most popular fatty spread all over the world. Nowadays people are looking for convenient food with functional properties. For health purposes, they tend to buy beneficial products which contain prebiotics and probiotics together. Garlic and red onion are a natural source of prebiotics. This study was conducted to develop garlic and red onion incorporated probiotic butter and to investigate the effect of garlic and red onion on the survival of lactic acid bacteria (CHN 22) during long term refrigerated storage. Dried garlic and red onion powder were incorporated into butter at the level of 3% (w/w) and 5% (w/w). Then, 3% (w/w) of powder mix (1.5% (w/w) garlic powder and 1.5% (w/w) red onion powder) incorporated butter sample and 0% (w/w) of powder incorporated butter samples were prepared and chemical, microbiological and proximate analysis was done. Starter culture [CHN 22, 3% (w/w)] was inoculated into cream (40% fat) before churning. The viability of lactic acid bacteria in the butter was evaluated weekly to ensure the values were above 10<sup>6</sup> cfu/g up to 28 days of storage at 4 °C. Lactic acid bacteria enumeration was carried out by pour plating on MRS media. Sensory characteristics, proximate analysis, physicochemical properties and microbiological parameters were analyzed in all four butter samples. The highest scores in the sensory assessment were obtained by 3% garlic powder incorporated butter and 3% red onion powder incorporated butter. Results obtained from chemical (pH, titratable acidity and peroxide value) and microbiology analysis (probiotic count and E. coli count) did not deviate from SLS specifications of butter. Viability of lactic acid bacteria was increased up to 14 days of storage in all samples, and then reduced during 28 days of refrigerated storage. Lactic acid bacteria count was increased with increasing garlic and red onion percentage compared to 0% powder incorporated butter sample, may be due to the prebiotic compounds in garlic and red onion such as crude fiber and inulin, which promoted the growth of probiotic bacteria. Therefore, garlic and red onion can be used successfully as a prebiotic source for the production of butter.

*Keywords:* Functional butter, *Allium sativum*, *Allium cepa*, Probiotic, Lactic acid bacteria