

Evaluating the Stability of Lutein as a Functional Ingredient in Reconstituted UHT Milk

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Abstract

To increase the functional benefits, lutein as an active compound must be stable towards high temperatures used during UHT processing. The objective of this project was to determine the stability of lutein in UHT-processed milk. Therefore, the experiments were carried out to identify the effect of heat treatment in particular UHT processing on lutein stability. Lutein was incorporated into three formulations of 6, 8 and 10 mg per 250 ml of reconstituted milk and subjected to heat treatments ranging from 70 - 140°C using water/oil bath. Lutein fortified milk was also subjected to a temperature of 140°C for 5 seconds using a UHT pilot plant. The stability of lutein to heat was determined by estimating the amount of lutein in milk before and after heat treatment. Lutein in milk samples was separated and quantified using Ultra Performance Liquid Chromatography (UPLC). Results of heating simulation showed that the higher the heating treatment applied, the greater the degradation of lutein. The amount of lutein decreased by about 13 to 15% for three formulations at 140°C for 15 seconds compared to the control. On the other hand, the amount of lutein in milk decreased by ~ 8% as a result of heating to 140°C using the UHT pilot plant. The addition of lutein had no effect on pH of the lutein enriched milk, and resulted in a minor increase in relative density of milk. To sum up, it is quite probable that lutein is feasible as a functional ingredient for UHT milk product since in this present study, lutein exhibited good stability after UHT treatment meaning that lutein can retain its activity in the final product.

Introduction

The growing interest in foods containing functional ingredients has led to the development of new functional foods. However, the focus has shifted from products intended to enhance daily health to products for controlling
