
Effect of Heat Treatment in A Fermented Milk Product Naturally Bio-Enriched in Folate Using Lactic Acid Bacteria

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Resumo

Heat treatment is a key step in food processing to ensure the microbiological food safety before human consumption. Even though folates are present in a wide range of foods, conventional yogurts are not considered a good source of folates. Many species of lactic acid bacteria, including some starter cultures, can produce folates; however the use of novel folate producing strains could be limited since their effects on humans have not been evaluated. Heat-killing them is an option but no information is available on the effect of this treatment on folate concentrations. The aims of this study were to evaluate: a) the capacity of the strain *Lactobacillus* (L.) *amylovorus* CRL887 to grow in a folate-free culture medium and to produce this vitamin; b) its capacity to produce folate in milk when grown as a co-culture with other folate producing strains, c) the effect of heat treatment on folate levels in the folate bio-enriched yogurt, and d) the stability of folate levels on heat treated fermented milk during storage. *L. amylovorus* CRL887, was able to grow in a folate-free culture medium (reaching 8.1×10^8 CFU/mL) and produced high concentrations of the vitamin ($76.3 \pm 1.8 \mu\text{g/L}$). This vitamin production was dependent of growth. This strain was then combined with folate producing starter cultures *L. delbrueckii* subsp. *bulgaricus* CRL871, CRL872, and *Streptococcus* (S.) *thermophilus* CRL803 and CRL415 to elaborate different yogurts. One combination

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produced a yogurt with the highest folate concentration ($263.1 \pm 2.4 \mu\text{g/L}$), one portion of which could provide 14 % of the Recommended Dietary Allowance. Heat treatment was applied to eliminate *L. amylovorus* CRL887 since this strain was never used for the production of fermented foods for human consumption. This treatment was applied on this bio-enriched yogurt and was effective in eliminating all viable bacteria without affecting the folate concentrations. Also folate levels were stable during 28 days of storage at 4 °C. This is the first report that described the capacity of a strain of *L. amylovorus* to grow and produce folate in a folate-free culture medium. This strain was successfully used to elaborate a bio-enriched in folate, and heat treatment process did not decrease the folate levels even after 28 days of storage at 4 °C.

Palavras-Chave: FOLATE, HEAT TREATMENT, LACTIC ACID BACTERIA, FOOD SAFETY

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