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Carnitine-rich yoghurt as a promising functional food

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-carnitine expressed by cai operon was known to play a significant rule in transferring long-chain fatty acids inside the mitochondria. Subsequently, β-oxidation and degradation of such fatty acids can be performed. L-carnitine was reported to perform different vital physiological effects on humans since it helps obese patients to lose body weight significantly, improves body performance, enhances recovery from exercise, improves insulin activity and reduces diabetes type 2 risks, prevents atherosclerosis and helps angina patients to exercise without chest pain, reduces the progression of life-threatening diseases including cancer, AIDS, CHD, and lung diseases, treats the symptoms of hyperthyroidism disorders, slows down the progression of mental deterioration in Alzheimer's disease, prevents osteoporosis through aging, improves male fertility and reduces the oily skin and gives a smooth overall appearance. Furthermore, L-carnitine is a quaternary ammonium compound with a wide antimicrobial activity that inhibits most G (+), G (-) bacteria, different yeasts and molds; whereas, it was found to improve some G (+) beneficial bacteria such as lactic acid bacteria. The expression of L-carnitine by lactic acid starter is the target of the present study. This could be performed by cloning cai operon into Lactobacillus bulgaricus DSM20080 and/ or Streptococcus thermophilus 425. This approach can be accomplished using pLEB590; a multicopy expression vector derived totally from lactococcal DNA. The heterologous expression of L-carnitine by latter lactic acid starters could be a promising strategy to produce carnitine-rich yoghurt that gains all the former mentioned vital physiological benefits and improves the shelf-life of yoghurt itself. Furthermore, L-carnitine over-expression by lactic acid bacterial transformants can be a cheap source for L-carnitine production as a promising food additive used generally in food industries.

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