Chemoenzymatic Conversion of Linoleic Acid into Conjugated Linoleic Acid

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Abstract

Conjugated linoleic acid (CLA) is a collective term that refers to a mixture of the positional and geometric isomers of linoleic acid (LA) with conjugated double bonds [1]. In recent years interest in CLA has markedly because of its discovered physiological activities, such as the reduction of cancer incidence, decrease in body fat content, profitable effects on atherosclerosis, and strengthening of the immune system [2-4]. Herein we have described an efficient chemoenzymatic method for preparing conjugated linoleic acid (CLA) using free linoleic acid (LA) as a substrate. In the first step, LA was transformed into 10-hydroxy-cis-12-octadecenoic acid (HA) by the whole cells of Lactobacillus plantarum after 48 h of incubation. The preincubation of whole cells with 0.03\% LA resulted in a better yield of HA (480 mg/g) compared to cells grown without LA. In a second fast microwave step, HA was converted to cis-9,trans-11-octadecadienoic acid in the presence of iodine as a catalyst over a silica gel surface. The advantage of this method in preparing cis-9,trans-11 CLA is simple via the whole cell bioconversion of LA into HA via L. Plantarum followed by the fast microwave-assisted synthesis of cis-9,trans-11 CLA in higher yields.

RESOURCES