

Effect of Linoleic Acid Incorporation in the Culture Media of Lactic Bacteria on its Cellular Fatty Acid Profile

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Acidolactic bacteria are good microorganisms, which are widely found in the nature and in the digestive apparatus. They are utilised to produce fermented foods such as cheese and yogurt. Also, they are recognised as probiotics and they promote the biotransformation of fatty acids, producing long chain polyunsaturated fatty acids (PUFA). Among them, conjugated linoleic acid (CLA) is one of the most attractive.

The aim of this work is to evaluate the effect of different quantities of linoleic acid (LA) used in the culture media of three lactic bacteria on the cellular fatty acid profile.

Two strains of *Lactobacillus* (*L. plantarum* NRRL B-4496; *L. reuteri*, NRRL B-14171), one of *Bifidobacterium* (*B. breve*, DSMZ 20091) and one of *Propionibacterium* (*P. freudenreichii*, DSMZ 4902) were cultivated in 75 mL of MRS media at 37°C during seven days. The culture media included 0,1 to 0,4 mL of 60% LA. After the culture time, the samples were centrifuged and the microorganisms were used to determine their cellular fatty acid profile. The fatty acids were methylated and measured in a gas chromatograph with a FID detector, using an Omegawax 320 column.

For all strains it was possible to observe that a high amount of LA in the culture media promoted the synthesis of long chain fatty acids. In the case of *B.breve* and *P.freudenreichii*, it was possible to obtain about 50% of linoleic acid only when 0,4 mL of LA were applied. With respect to the CLA content, the values obtained were between 1% to 8%, depending on its *cis-trans* configuration and the microorganism strain.

In conclusion, a high quantity of linoleic acid as substrate allows increasing the long chain polyunsaturated fatty acid content in the cell, and the profile of cellular fatty acids depends on the microorganism strain.

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