

Bioprocess Engineering

P-005 - CHARACTERIZATION OF POTENTIAL CLA-PRODUCING STRAINS ACCORDING TO LA TOLERANCE

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Background

Conjugated linoleic acid (CLA) isomers are naturally produced from dietary linoleic acid (LA) by ruminal bacteria. However, strains of lactobacilli, bifidobacteria and propionibacteria have also demonstrated the ability to produce those bioactive fatty acids. *In vitro* studies normally test CLA production at 0.5 mg/mL of LA, but possibly some strains can tolerate higher concentrations and if they are producers, CLA yields may probably be higher. This work aims to determine the maximum LA concentration that potential CLA-producing strains can tolerate in an *in vitro* production assay.

Method

Thirty five lactobacilli, 17 bifidobacteria, 1 propionibacterium and 1 lactococcus strains were submitted to a modified method described by Romero-Pérez et al. [1]. Activated strains were inoculated in MRS agar plates containing 1, 2 or 5 mg/mL of LA for 48 h at 37 °C. Strains from the agar plate at the highest LA tolerated concentration were then spiked into MRS broth with LA in a 96-well microplate and subsequently incubated at 37 °C for 48 h; growth curves were recorded at 600, 620 and 660 nm in a microplate reader. Cultures without substrate were used as control. Agar plates experiment was carried out in duplicate and microplate experiment in triplicate.

Results & Conclusions

Among the strains tested, 18 (~33%) could not grow at the lowest LA concentration assayed, having considered their tolerance below 1 mg/mL. A group of 16 strains showed growth at 1 mg/mL of LA, 8 tolerated up to 2 mg/mL and 12 up to 5 mg/mL. At 5 mg/mL lactobacilli was the dominant group, whereas at 2 mg/mL was bifidobacteria. At <1 mg/mL and 1 mg/mL the distribution of lactobacilli and bifidobacteria was similar. The propionibacterium and the lactococcus strains could grow at 1 mg/mL. In conclusion, potential CLA-producing strains exhibit different LA tolerance degrees. This is a parameter to consider in future production tests.

References & Acknowledgments

[1] G.A. Romero-Pérez, R. Inoue, K. Ushida, T. Yajima, *Biosci. Biotechnol. Biochem.* 77 (2013) 648–650.

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