

Stability of a Lyophilized Milk enriched with Microbial CLA/CLNA

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Conjugated linoleic (CLA) and conjugated linolenic (CLNA) acids have been described with potential bioactive properties. Due limited availability in their natural sources (e.g. ruminants' milk and meat or vegetable oils), *in situ* microbial production in dairy products may potentially improve CLA/CLNA daily intake.

Several probiotic strains have been reported to produce CLA/CLNA isomers using linoleic (LA) and alpha-linolenic (α -LNA) acids as precursor substrates, respectively. Previous work by this research team led to the formulation of a CLA/CLNA-enriched lyophilized milk, using *Bifidobacterium breve* DSM 20091 and hydrolysed flaxseed oil (FSO; rich in α -LNA). Since CLA, CLNA, LA and α -LNA are polyunsaturated and prone to oxidation, this research aimed to investigate if this new functional milk product is stable at conditions mimicking shelf-life.

Pasteurized cow milk (100 mL) inoculated with *B. breve* DSM 20091 and hydrolysed FSO or not (control) was fermented for 22 h at 37 °C under anaerobic conditions. Afterwards, samples were lyophilized and stored at room temperature in an exicator, being air- and light-protected. Samples were taken at the beginning (T0wk) and every 4 weeks until the end of the assay (T12wk) for further microbial counting and fatty acid (FA) analysis.

Concerning to *B. breve* DSM 20091 viable cell counting, counts remained below the countable range during the entire study, so as total microbial counting. As for FA analysis, in the non-esterified fraction, the CLA and CLNA contents in the enriched milk product increased after 4 weeks (up to 1.80 and 11.12 mg/g, respectively) and, thereafter, no significant differences were detected. The same was observed for total polyunsaturated FA, but, in the esterified fraction, its level increased significantly after 8 weeks (up to 6.01 mg/g) and then reduced to 5.18 mg/g at the end of the study.

In conclusion, a lyophilised milk enriched with microbial CLA/CLNA is not entirely stable, including its CLA/CLNA content, which was inclusively enhanced.