

SELECTION OF *LACTOBACILLUS* STRAINS FOR IMPROVEMENT OF ANTIOXIDANT ACTIVITY OF DIFFERENT SOY, WHEY AND MILK PROTEIN SUBSTRATES

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Abstract

Due to the health benefits and potential food preservative applications, natural antioxidants were recently attracted great attention of many food manufacturers which tend to produce healthy foods. The special challenge in this field is production of antioxidants on food matrixes that can be suitably used for a wide range of products. In that sense, soy, whey and milk substrates have a great potential as a carriers for delivery of antioxidants into the many food products. The aim of this study was selection of appropriate strain-substrate combination that allows the production of high level of antioxidant activity.

Soy, whey (cow's and goat's) and milk substrates were fermented with *Lactobacillus acidophilus* ATCC 4356, *Lactobacillus rhamnosus* ATCC 7469 and *Lactobacillus reuteri* ATCC 23272 strains at 37 °C during 24 h. The antioxidant activity of the substrates was determined using 2,2-diphenyl-1-picrylhydrazyl (DPPH) and ferric-reducing antioxidant potential (FRAP) assays that evaluate antioxidant activities by different reaction mechanisms.

Based on the results, increased antioxidant activity was reached in all tested strain-substrate combinations. High levels of antioxidant activities, in the range 29.7-72.2%, were reached in all substrates fermented with *Lb. rhamnosus* strain. Among all combinations, goat whey fermented with *Lb. rhamnosus* exhibited the highest increase of DPPH scavenging activity (for 21.1%) as well as FRAP antioxidant activity (for 0.761 mmol Fe⁺² L⁻¹) compared to the unfermented substrate.

Thus, the study introduces the *Lb. rhamnosus* as highly effective in production of antioxidants during the fermentation of goat whey. Furthermore, goat whey fermented with *Lb. rhamnosus*, used in liquid or lyophilized form, represents an excellent carrier for delivery of antioxidants into the different dairy and confectionery products.

Key words: Soy, Whey, Milk, Antioxidant activity, DPPH, FRAP, *Lb. rhamnosus*.