

Title Evaluation of bioprocesses to improve the antioxidant properties of chickpeas
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Abstract

Chickpea seeds (*Cicer arietinum* cv. *Blanco lechoso*) were submitted to different bioprocesses; i) germination of seeds for 2 and 3 days, ii) natural fermentation of flour or cracked seeds, and iii) induced fermentation of flour or cracked seeds with *Lactobacillus plantarum*, in order to improve the antioxidant properties. Determination of vitamins C and E, reduced glutathione (GSH) and total phenolic compounds (TPC) were carried out. Antioxidant capacity was measured by SOD-like activity, peroxy radical-trapping capacity (PRTC), lipid peroxidation inhibition (LPI) and trolox equivalent antioxidant capacity (TEAC). Vitamin C and E increased after germination, whilst fermentation caused a decrease in vitamin E. Both bioprocesses caused an increment in TPC content while GSH decreased. Germination increased SOD-like activity (47–41%), PRTC (16–55%) and TEAC (12–23%) and a slight inhibition of LPI was observed. After fermentation, SOD-like activity suffer a drastic reduction. The LPI decreased between 11.3 and 21.3%, while an increase of TEAC (29–57%) and PRTC (27–44%) was observed, except in flour natural fermented seeds where decreased the PRTC. TPC contributed highly to total antioxidant capacity (TEAC). Results indicated that with the bioprocesses studied the antioxidant properties of chickpea flours are enhanced and they can be used as desired ingredients for new functional food formulations.