

## **Antioxidant, mutagenic, and antimutagenic activity of frozen fruits.**

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[Spada PD](#), [de Souza GG](#), [Bortolini GV](#), [Henriques JA](#), [Salvador M](#).

Instituto de Biotecnologia, Universidade de Caxias do Sul, Caxias do Sul, Brazil.

Many studies have focused on the effect of fresh fruits on the risk of developing cancer and other diseases involved with reactive species and free radicals. The intake of frozen fruits has spread widely in the last years, but, until now, their biological activity is not completely known. In this study, 23 samples of frozen fruits were analyzed for their nutritional composition, total polyphenols, total carotenoids, and vitamin C content. Antioxidant, mutagenic, and antimutagenic effects were also evaluated. Antioxidant assays included 2,2-diphenyl-1-picrylhydrazyl radical (DPPH(.)) scavenging activity and determination of superoxide dismutase (SOD)- and catalase (CAT)-like activities. Mutagenic and antimutagenic evaluations were performed in eukaryotic cells of *Saccharomyces cerevisiae* yeast. Most samples (74%) showed antioxidant activity similar to vitamin C in the DPPH(.) assay, and this activity was positively correlated ( $r = 0.366$ ;  $P \leq .01$ ) with carotenoid contents. All samples showed CAT-like activity. SOD-like activity was detected in 56% of samples assayed. Only four fruits (acai, cashew apple, kiwi fruit, and strawberry) showed mutagenic activity when tested in high (5%, 10%, and 15% [wt/vol]) concentrations. Twelve samples presented antimutagenic effects against hydrogen peroxide, and this effect was positively correlated with CAT-like activity ( $r = 0.400$ ;  $P \leq .01$ ). Evaluation of polyphenols, carotenoids, and ascorbic acid showed considerable levels of these compounds in frozen fruits, even after freezing. These data suggest that frozen fruits contribute to the prevention of biological damages.