

Influence of heating processes on the antioxidant capacity of spinach (*Spinacia oleracea* L.)

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Abstract

Spinach is a vegetable noted for its substantial content of antioxidants. It has been found that these substances contribute to various biological functions, for example protection against mutagenesis, carcinogenesis and aging. Vegetables account for a small part of our daily caloric intake; however, their benefits to health surpass their caloric contribution. The contributory factors are due to the presence of vitamins and provitamins, such as ascorbic acid, tocopherols and carotenoids; and, in addition to that, vegetables are also rich in a wide variety of phenolic substances. Phenolic substances are a category of phytonutrients that exert strong antioxidant properties. They can be classified into: simple phenols, phenolic acids, hydroxycinnamic acid derivatives and flavonoids. The ability of some of the phenolic substances to act as potent antioxidant components has been reported. However, due to conservation, safety and sensory aspects, spinach is usually submitted to thermal processes that can affect the composition and availability of these substances. The objective of this study was to evaluate the effects of two common thermal operations: blanching and pasteurization on the antioxidant activity of a commercial sample. In the blanching step, the cleaned and disinfected samples were subjected to steam at 100°C for 3 min. and immediately subjected to cold water. In the pasteurization operation, the blanched material was heated to 75°C for 13 min. in closed, stainless steel container. Then, the vegetable was packaged and submerged in cold water. At each stage, the total phenol content was analyzed by the Folin-Ciocalteu method. The total antioxidant capacity was measured by means of TEAC and FRAP assays. The results indicate differences among the evaluated thermal operations: blanching did not significantly alter the antioxidant properties and pasteurization increased the values of both antioxidant capacity and total phenol content.