

Apple phenolics as inhibitors of the carbonylation pathway during *in vitro* metal-catalyzed oxidation of myofibrillar proteins

Food Chemistry (2016) 211, 784–790

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Abstract

The effect of apple phenolics on the oxidative damage caused to myofibrillar proteins by an *in vitro* metal-catalyzed oxidation system was investigated. Three pure phenolic compounds (chlorogenic acid, (-)-epicatechin and phloridzin) and an apple peel extract were added to myofibrillar proteins in three concentrations (50, 100 and 200 μM), and a blank treatment was included as a control. All suspensions were subjected to $\text{Fe}^{3+}/\text{H}_2\text{O}_2$ oxidation at 37 °C during 10 days, and protein oxidation was evaluated as carbonylation (α -amino adipic and γ -glutamic semialdehydes) and Schiff base cross-links. Significant inhibition by apple phenolics was found as compared to the control treatment, with (-)-epicatechin being the most efficient antioxidant and phloridzin showing the weakest antioxidant effect. The higher concentrations of apple extract showed effective antioxidant activity against protein oxidation in myofibrillar proteins, emphasizing the potential of apple by-products as natural inhibitors of protein oxidation in meat products.