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Impact of Endogenous Phenolics in Canola Oil on the Oxidative Stability of Oil-in-Water Emulsions

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Canola oil is low in saturated fat, high in monounsaturated fat and has a favourable omega-6:omega-3 ratio. Therefore, Canola oil has a healthier fatty acid profile compared to other plant oils such as soy oil. Therefore, canola oil is also an ingredient in many food products. However, the content of unsaturated lipid makes canola oil susceptible towards lipid oxidation. Many food products are lipid containing emulsions and a lot of efforts have been put into developing methods to protect the lipids against oxidation. Since lipid oxidation has a negative influence on the shelf life of the foods, efficient antioxidants will result in increased shelf life and thereby increased quality of the food products. Besides tocopherols, Canola oil contains different compounds with antioxidative properties. These compounds are Sinapic acid, Sinapine and Canolol; all belonging to the group of phenolic compounds. However, the effect of these endogenous antioxidants on lipid oxidation in o/w emulsion is yet unknown.

Hence, the aim of this study was to evaluate the effect of the endogenous phenolics in Canola oil on lipid oxidation in o/w emulsion. For this purpose individual phenolics were extracted from defatted grinded canola seeds. Fractionated extracts of Sinapic acid, Sinapine and Canolol was used as well as a non fractionated extract. These extracts was added (100 and 350 μM) to 10% o/w emulsion with stripped canola oil in order to evaluate their effect on lipid oxidation in emulsions. For comparison, the antioxidative effect of phenolic standards for Sinapic acid and Sinapine (as Sinapine thiocyanate) were also evaluated in the emulsions, and BHT was used as a positive control. Emulsions were stored at 3°C and sample was taken at different time point. Evaluation of the antioxidative effect was based on Peroxide Value (PV) and secondary volatile oxidation products by headspace GC supported by evaluation of the properties of the extracts and corresponding phenolic standards in 3 different *in vitro* antioxidant assays.