



Antioxidant effects of mono- and diacylglycerols in non-stripped and stripped soybean oil-in-water emulsions

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ABSTRACT

Antioxidant activity of mono- and diacylglycerols (0.01–2.50% of oil) was observed in 1.0% non-stripped and stripped soybean oil-in-water emulsions by monitoring lipid hydroperoxides and headspace hexanal formation. Addition of 1-monooleoylglycerol only had a slight impact on the oxidative stability of non-stripped soybean oil-in-water emulsions but did inhibit lipid oxidation in emulsions prepared with stripped soybean oil. A strong antioxidant activity was observed upon addition of 1,2-dioleoyl-*sn*-glycerol to stripped soybean oil-in-water emulsions. However, the addition of the diacylglycerol to oil-in-water emulsions made with non-stripped oils had much less of an effect on oxidation rates. To determine if the ability of mono- and diacylglycerols to impact lipid oxidation was due to their capability to alter the physical properties of the oil-in-water emulsions, zeta potential and interfacial tension were measured. Both 1-monooleoylglycerol and 1,2-dioleoyl-*sn*-glycerol reduced interfacial tension. Both 1-monooleoylglycerol and 1,2-dioleoyl-*sn*-glycerol were also able to raise the zeta potential of the emulsions, although these increases were small (<4 mV). The ability of diacylglycerols to only impact lipid oxidation rates in oil-in-water emulsions made with stripped oil suggests that either the concentration of endogenous diacylglycerols in refined oil is high enough to provide maximum protection against oxidation, or that other minor components in non-stripped oil can interfere with the antioxidant activity of diacylglycerol.

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