

Starch-soybean Oil based Ultraviolet Absorbing Composites.

Preparation, Chemistry and Potential Uses.

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Excess steam jet-cooking aqueous slurries of starch and vegetable oils or other hydrophobic materials can produce stable aqueous starch-oil composites from renewable resources. Herein, ferulate-based ultraviolet absorbing lipids were synthesized by the lipase catalyzed transesterification of soybean oil with ethyl ferulate to give feruloylated monoacyl- and diacylglycerols (FMDG) lipids. The FMDG was subsequently co-jet cooked with starch to give the corresponding starch-FMDG composites. The UV transmittance and irradiance (300 to 400 nm) properties of these starch-FMDG composites, containing 1 to 10 μm FMDG droplets, were examined and shown that the composite retained its ultraviolet absorbing efficacy after jet cooking. Furthermore, the starch-FMDG composite enhanced the ultraviolet absorbance of the feruloylated lipids relative to neat FMDG. The FMDG-starch composites needed only half of the coverage (mg/cm^2) of FMDG to block the same amount or more UV radiation as the neat FMDG. This technology allows aqueous dispersions of FMDG to be formulated without the need for surfactants. This presentation will examine the jet cooking process, chemistry, and utilization of these composites.