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Modulating the physical state and functionality of phytosterols by emulsification and organogel formation: Application in a model yogurt system

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ABSTRACT

The size of phytosterols crystals affects their bioactivity, with smaller crystals exerting a more competitive action against cholesterol absorption. The aim of this study was to decrease their crystal size by incorporating phytosterols in emulsion droplets along with γ -oryzanol (organogel formation) and thus hindering phytosterol crystallization, which could result in an increased efficacy of these bioactives. Phytosterols crystallization commences at concentration of 3% (w/w) in oil. However, in emulsions containing phytosterols, no crystals were formed up to 15% (w/w). Addition of γ -oryzanol to phytosterol-oil solutions further inhibited crystal formation. The mechanical properties of the emulsions and yogurt products containing phytosterols were found to be dependent on the extent of phytosterol crystallization. Emulsification of phytosterol-oryzanol oil solutions can be an expedient method to tune the rheological properties, increase phytosterol solubility in the food matrix, and likely enhance their physiological function in the gut environment.