**FLOW BEHAVIOR OF CONCENTRATED TRICALCIUM PHOSPHATE SUSPENSIONS IN OIL THROUGH INJECTION**

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**Extended Abstract:**

Understanding the flow behaviors of concentrated nutrient suspensions during injection into a mold can help to improve the formulation and the process of softgel encapsulation for dietary supplements and pharmaceutical products. The flow of material into a mold is similar to that encountered in some coating and printing processes. We studied the flow behavior of concentrated tricalcium phosphate (TCP) suspensions in soybean oil with and without lecithin through shear and oscillatory rheology testing, capillary breakup extensional rheometry (CaBER) measurement and high-speed visualization of the injection process. All samples were shear thinning at room temperature and 35°C. Surprisingly, the addition of 0.5 wt.% lecithin to the 55.6 wt.% suspension reduced the shear viscosity more than 10 times and the storage and loss moduli, G’ and G”, more than 60 times. This correlates with the shorter filament break time observed in extensional CaBER measurement for the sample with lecithin (0.069 s) compared to that without lecithin (0.174 s), and the nozzle tip residue observation post-injection which included a dome shape for the sample with lecithin from dripping off tear shaped droplets and a tail shape for the sample without lecithin from jet breakups. Compared with the sample of 55.6 wt.% TCP and 0.5 wt.% lecithin, reducing the amount of TCP to 27.8 wt.% further reduced the viscosity, G’ and G” and resulted in a shorter filament break time (0.018 s) and a similar post-injection dome shape residue from dripping off spherical droplets.