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### **Starch Applications for Delivery Systems<sup>1</sup>**

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Starch is one of the most abundant and economical renewable biopolymers in nature. Starch molecules are high molecular weight polymers of D-glucose linked by  $\alpha$ -(1,4) and  $\alpha$ -(1,6) glycosidic bonds, forming linear (amylose) and branched (amylopectin) structures. Octenyl succinic anhydride modified starches (OSA-starch) are designed by carefully choosing a proper starch source, path and degree of modification. This enables emulsion and micro-encapsulation delivery systems for oil based flavors, micronutrients, fragrance, and pharmaceutical actives. A large percentage of flavors are encapsulated by spray drying in today's industry due to its high throughput. However, spray drying encapsulation faces constant challenges with retention of volatile compounds, oxidation of sensitive compound, and manufacturing yield. Specialty OSA-starches were developed suitable for the complex dynamics in spray drying and to provide high encapsulation efficiency and high microcapsule quality. The OSA starch surface activity, low viscosity and film forming capability contribute to high volatile retention and low active oxidation. OSA starches exhibit superior performance, especially in high solids and high oil load encapsulations compared with other hydrocolloids.

<sup>1</sup>The submission is based on research and development of Ingredion