



DEVELOPMENT OF WHEAT BIOPOLYMER COMPOSITES FOR INDUSTRIAL AND FOOD APPLICATIONS

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GOALS: Make starch-based polymer composites for food and non-food products using wheat starch or other cereal starches. Develop methods of processing starch composites into powders, granules, sheets, ribbons, foams, or molded articles. Assist in technology transfer to facilitate the development of new markets.

APPROACHES: Flours, starch-rich flours, or pure starches will be blended with other polymers to produce resins with desirable functional properties for making degradable products. Starches will be made compatible with other polymers by utilizing starch derivatives and/or copolymers as compatibilizers. The resins will be processed into powders, granules, foams, or molded items using current and new processing methods. The physical and mechanical properties of the samples will be tested to ensure desired functional properties are achieved.

ACCOMPLISHMENTS: Produced a low density starch-based foam panel of high compressive strength and lower thermal conductivity than polystyrene. Developed a starch/fiber plastic of similar tensile strength as polypropylene. Developed a microcellular starch foam that adsorbed polar compounds. The compounds were released when the starch foam came in contact with water. The foam is being tested for flavor encapsulation properties. Starch-based polymers were studied as soil flocculents to reduce soil erosion. Starch-based aggregate was shown to reduce the density of concrete and was tested in a commercial product.

PLANS: Process starch and other renewable agricultural materials such as fiber into foams for use in degradable containers.