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**Class Standing:** Senior

**Department:** Food Science and Technology

**College:** Agriculture

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**Presentation Type:** Oral presentation

**Project Title:** Development of a fortified rice product using edible insect flours for developing countries

**Synopsis:** Edible insect flours such as from crickets and locusts were utilized in the production of extruded rice products to address food insecurity in developing countries

**Abstract:** As food insecurity persists in developing countries, entomophagy (the consumption of insects) can offer a nutritious and economical solution. With limited industrial-scale processing technologies available, only whole insects are consumed or used for production of animal feeds. Building upon an extrusion-based fortification technology, we developed an insect flour-fortified rice product, Rizquet (riz-kit), aiming to alleviate food insecurity and malnutrition issues for developing countries. Specifically, a single-screw, cold-forming extrusion process was adopted due to its low cost and scalability for commercial production. This research utilized both cricket and locust flours due to their high nutritious qualities. Brown/white rice flour was used as a base binding material alongside tapioca starch due to its gelling and thickening properties. Water was used as a plasticizer to form an extrudable dough mass. Sodium alginate was added as a structural agent that reacts with available calcium ions in the matrix to form a crosslinking network, so to help the extruded rice kernel keep its shape and integrity. The extruded sample was dried and sieved to collect the final product with desirable shape and size. The measurements of water activity and moisture content indicated the fortified rice product had a stable shelf life. Tests on organoleptic and sensory properties suggested the product had acceptable color, appearance, texture, and mouthfeel that are comparable to those of ordinary brown rice. This fortified rice can be also expanded as an effective tool to utilize other natural food resources and to deliver adequate nutrients to a wide range of consumers.