Title: Nutrient utilization and value-added products with black soldier fly treatment of swine and dairy waste

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Abstract:
Agriculture producers are looking for affordable technologies that utilize the true value of nitrogen and phosphorous rich swine and cattle manure. The black soldier fly is one potential answer to manure management. This species is native to many parts of the Americas and is common in the southeastern United States. The reproduce quickly and are capable of producing three or more generations per year between April and November. These insects are not considered pests because the adults do not feed and are not attracted to human habitation. Larvae, on the other hand, are voracious feeders ideally suited for nutrient recovery. Larvae incorporate nutrients into their biomass at 8-16% dry basis and are capable of reducing manure accumulation by 42-56%, and nitrogen and phosphorous concentrations by up to 75%. They can also reduce house fly populations by 94-100%, subsequently suppressing *E. coli* and *Salmonella* bacteria. Larval biomass is comprised of approximately 42% protein, 35% fat and favorable fractions of essential amino and fatty acids. This makes them a suitable replacement for soybean or fish-based feeds used in poultry, pigs, catfish and tilapia diets. Larvae self-harvest using the system outlined by Sheppard, which utilizes the natural tendency for larvae to migrate away from their substrate before pupation or adulthood. Our team has proposed new systems for managing mating behavior to allow greater ease in manure inoculation with larvae eggs. We believe that black soldier flies have excellent potential in creating a reliable nutrient recovery system that helps manage agriculture waste and produce value-added products.

Keywords: Nutrients, black soldier fly, larval, manure reduction, self-harvest