

Analyzing the Effects of House Dust on Growth, Development, and Fat Content in the *T. molitor*

Hetland, Hannah

Hetland, Madison

Our project analyzed the effect of house and school dust on the total lipid content of the blackworm, *Tenebrio molitor*. A study published in Environmental Science & Technology has found that chemicals found in house dust can bind to the PPAR gamma receptor, a protein that can regulate fat metabolism. We hypothesized that exposure to dust in the *T. molitor* food/bedding environment source would contribute to a significant increase in their lipid content. Samples consisting of four test groups with individual larva placed in a separate environments containing mixtures of dust/rice cereal (% w/w) with mass, mortality, and developmental milestones (e.g. pupae and beetle stages) were recorded every week for 8 weeks. Dust was obtained from two different sources: household and a school vacuum cleaner. Groups included a control (0% dust), 3% house dust/cereal, 5% school dust/cereal; and 10% school dust/cereal. After seven weeks, the larvae were euthanized by freezing, heated to a constant dry weight at 90°C, and analyzed for total lipid content using phospho-vanillin colorimetric reagent. Results proved that both the 5% and 10% school dust caused a statistically significant increase in proportion of fat of the *T. molitor* compared to the control. Further testing aimed at lipid composition, its relationship to the PPAR Gamma-1 protein which stimulates body fat in humans, as well as composition of the dust particles is warranted.