Heat treatment of grain-processing facilities for management of the warehouse beetle

*Trogoderma variabile* Ballion

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**Cooperators:**

Abbott Nutrition

**Graduate Student:**

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**Goals:**

- Expose life stages of *T. variabile* to constant temperatures between 42 to 60°C to determine the most heat tolerant stage by examining time-mortality relationships.
- Verify heat tolerance of all stages during heat treatment of facilities.
- Development of heat treatment calculator to calculate the amount of heat required for heat treatment of facility.

**Statement of Problem:**

In September 2010, 5 million cans of Similac, an infant formula manufactured by Abbott Nutrition (Chicago, IL) was recalled due to the possibility of having insect parts of the warehouse beetle, *Trogoderma variabile* Ballion or their larvae. The presence of beetle was detected in the product produced at a manufacturing facility in Sturgis, Michigan. The plant was fumigated for about three days to kill warehouse beetles and other insects. Health risks to infants consuming the products contaminated with the beetle or its parts may include stomach ache or refusal to eat. Kansas State University was contacted (Dr. Bh. Subramanyam) about the possibility of using heat at a new facility soon to be built by Abbott Nutrition. A review of literature showed limited information on heat susceptibility of *T. variabile* life stages to heat.

**Current Activities:**

1. Rearing and culturing *T. variabile* to collect all the stages required for determining the most heat tolerant stage.
2. Characterize biology and reproduction of *T. variabile* on ground feed.
3. Temperature and relative humidity measurement of the growth chamber.
4. Determining flour equilibration time.