

Witnessing a Heat Treatment

Workshop participants get inside look at how extremely hot temperatures kill insects

Talk about a heat wave. Thousands of insects inside the pilot flour and feed mills at Kansas State University (KSU) found that being outside in the scorching Kansas sun was nothing

compared to being trapped inside a mill during a heat treatment.

During the Fourth Heat Treatment Work-

shop, Aug. 5-7, at KSU's Department of Grain Science and Industry, more than 50 participants observed what happens



"I thought this was a flour mill, not a bakery!"

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to flour beetles when they are exposed to 120-degree temperatures for more than 24 hours.

They witnessed thousands of baked beetles – not to mention dozens of cockroaches and other insects – lying motionless on the floors of KSU's two pilot mills, having succumbed to the 36-hour heat treatment.

On the first day of the workshop, as the heat treatment was just beginning, participants were given two cups containing a small amount of flour and a dozen or so red flour beetles, and told to place one inside the flour mill and the other inside the feed mill. Cups were placed in all parts of the mill to see if there were any "cool spots" where bugs could survive.

On the final day of the workshop, participants retrieved their sample cups. Most reported that their beetles had died. Several, however, found the beetles still moving inside their cups.

A Few Survivors

Using infrared thermal imaging guns, workshop leaders found that, without exception, the temperatures in the cups where beetles survived were below 120 degrees. In the cups where the beetles died, the temperature was 120 degrees or higher.

The heat treatment methods in the feed and flour mills were different.

The feed mill used TEMP-AIR's (800-836-7432/www.temp-air.com), Burnsville, MN, patented Thermal Remediation process, in which natural gas heaters forced hot air into the building.

Armstrong-Hunt, Inc.'s (269-279-3129/www.armstrong-intl.com), Milton, FL, steam-based heat treatment was used in the flour mill as well as a Chromolox electric heater, distributed by Carlton Co. (913-642-6655), Overland Park, KS.

On average, the temperatures in the feed mill were about 10 to 20 degrees higher than in the flour mill, where the temperature leveled off at about 130 degrees. However, both treatments appeared to be effective.

Arvin Donley, editor