COMBATING PESTS IN FOOD PROCESSING ENVIRONMENTS: NEW TOOLS AND TACTICS

…but first a few housekeeping items
WEBINAR HOUSEKEEPING

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Questions should be submitted to the presenters during the presentation via the Q & A section at the right of the screen.

It is important to note that all opinions and statements are those of the individual making the presentation and not necessarily the opinion or view of IAFP.

This webinar is being recorded and will be available for access by IAFP members at www.foodprotection.org within one week.
SPEAKERS

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[Logo images]
Focus on post harvest and processing industry problems.

Diverse scientific staff.

Strong collaboration with Kansas State University and its unique resources in grain science, entomology. AIB is also a neighbor.

Collaboration with other universities and research centers nationwide.
Monitoring is a Fundamental Building Block of IPM

- Rodent baiting, rodent traps, and insect light traps serve as both control and monitoring devices.
- Pheromone traps are strictly monitoring devices.
- Captures are always identified, counted and documented.
- *The essence of monitoring is data analysis.*
Monitoring provides early detection and warning of risks

- Thus falls under the spirit of PCHF to identify risks and take preventative measures.

- Most audit schemes require pest monitoring.

- Monitoring programs can vary in their quality so strive to monitor to your best advantage!
Pheromones

- Pheromone - chemical emitted by an individual that sends a message to other individuals of the same species
- Many types have been identified
  - Sex
  - Aggregation
  - Alarm
  - Trail following
  - Food attractants
Pheromone Uses

- Monitoring
  - Attractant to increase capture efficiency of traps
- Reduce Pest Populations
  - Mass trapping
  - Lure and kill
  - Mating disruption – using pheromone as an insecticide
Monitoring Insect Activity

- No single monitoring approach will provide a complete picture of pest activity.
- Pheromone traps are part of a comprehensive monitoring program that includes inspection and other tactics.
- Many questions remain about how to best implement and interpret pheromone based monitoring programs.
Evaluate Factors Impacting Insect Captures in Pheromone Traps Using Small Experimental Chambers

Red Flour Beetle
*Tribolium castaneum*

Confused Flour Beetle
*Tribolium confusum*

320 ft² experimental chamber
Red Flour Beetle: Influence of Light and Sanitation Level
Confused Flour Beetle and Red Flour Beetle: Influence of Light and Temperature
Cigarette Beetle: Influence of Light

![Bar graph showing the total number of cigarettes captured in traps under dark and light conditions. The graph indicates a higher total number of cigarettes captured in light compared to dark.](Image)
Prior Captures can Influence Traps

Dome trap with prior captures of the same species compared to trap without prior captures

Dome trap with prior captures of the other species compared to trap without prior captures
Advances continue in pheromone technology and commercial developments in addition to monitoring

- Additions to insecticide formulations
- Mating disruption for additional species
- Monitoring enhancements for additional species or improved attraction for certain insects.

- Regulation of pheromones varies across the world, and depending on their use for monitoring vs. control.
- Remember that pheromones are generally specific to a species or closely related group. Care must be taken to select and service pheromones appropriately!
Rodent monitoring is a little more straightforward

- Generally food processing plants have a fairly standard and complete set up of bait stations and traps.
- Devices serve a dual purpose for monitoring and control
- Rodent activity – feeding or captures needs to be documented.
- Just as with insects trends and hot spots of activity emerge with the analysis of the documentation.
All pest monitoring is simplified by bar-code systems & software

- Every device is bar coded.
- Scanners recognize type of device and ask technician appropriate questions about details of service.
- Computer generates maps, reports, graphs, etc.
Typical Pest Management Device Deployment as seen on Monitoring Software Map
Rodent management is expensive! Monitoring can help focus efforts and possibly reduce expenses.

- Some devices rarely if ever see activity.
- Adjusting placements according to risk and monitoring history can reduce rodent management labor and rodenticide use!
- Target species could also call for adjustments from old-fashioned device placement schemes.
Analysis is the essence of monitoring

- Service reports have reported current activity for years: “snapshots”

- Software programs manipulate the data into tables, graphs and maps: “photo albums”

- We still need better *analysis*: explanation of why the trends occur, identification of structural deficiencies, etc. that can be corrected.
Discussion Questions?
Remarks by Dr. Campbell or other USDA personnel are not intended, nor should they be construed, as recommendations of particular products or services.
Thank you for your attention!