



Best Practices for Addressing the Challenges and Consequences of Pests in Worker Housing



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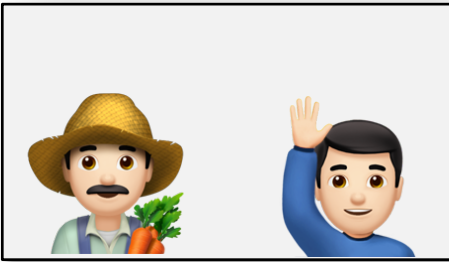
New York State IPM Program at Cornell University



Human environments offer food, water, warmth and shelter that are attractive to - and sustain pest populations. Worker housing may be particularly susceptible to pest problems due to a lack of understanding about pest biology, a lack of communication about cleaning responsibilities, a lack of time and resources to implement effective cleaning, or 'inheriting' housing with existing sanitation and pest problems. Cockroach and rodent pests are considered sanitation pests because they feed primarily on food spillage and refuse, but can contaminate packaged items too (especially rodents).



Pest infestations can have health and economic consequences in housing. Rodents are destructive pests that can chew through a variety of materials. In fact, it is estimated that 25% of building fires of unknown origin are caused by rodents chewing on wires in walls. Rat burrowing in the soil can cause buildings above to shift, affecting the integrity of structures. Importantly, feces of cockroaches and rodents can cause and sustain allergic reactions and asthma in people. This can affect worker performance and attitudes regarding job safety and satisfaction. Rodents, including mice and rats, are reservoirs of human pathogens that can lead to illness and even death following exposure. Finally, pest populations at worker housing can spread to other buildings and cause damage to crops.



Steps to address pests in worker housing:

1. Communication! Workers may not understand the cause of pest problems or their role in resolving them. Start with communication to clearly define roles. This may require farm managers to create a detailed cleaning schedule with tasks for each worker.

2. Sanitation. This refers to the elimination of water sources, cleaning up food spillage, making sure that refuse is not easily

accessible to pests, and is promptly removed. Provide education and tools for proper cleaning, and build cleaning time into worker schedules. Sanitation or housekeeping is pest management.

3. Exclusion. Help keep pests out of the structure by sealing openings that lead indoors. Our website on pest exclusion has resources to help you identify entry points and select the right materials to perform the work. <https://nysipm.cornell.edu/community/homes-and-other-buildings/scientific-coalition-pest-exclusion/>

4. Pest Management. If pest infestations are found, gaining control of the population may require the assistance of a pest management professional that has access to specialized baits and training on where/how to utilize them. Traps are available to capture both rodents and roaches.

Resources: *What's Bugging You?* is a series of web pages that provide information about pests and how to manage them, including links to factsheets. <https://nysipm.cornell.edu/whats-bugging-you/>



Uninvited Hitchhikers: What you Need to Know about Bed Bugs to Help Eliminate Them

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Bed bugs are socially transmitted insects that are moved on belongings (rarely on people) from one site to another. This can include luggage, but also furniture and packages. It may take weeks to months for introduced bugs to become an infestation, providing an opportunity for intervention. In the case of bed bugs, prevention is easier and less costly than elimination of an established infestation.



Learn to recognize bed bugs and the evidence they leave behind. Note that all stages of bed bugs are visible, with the smallest nymph stage measuring about the size of a poppy seed. Fecal stains, small black specks (processed blood) near cracks and crevices on furniture and bedding, are one of the first indicators that bed bugs are present. Shed exoskeletons and live bugs may also be observed and accompany complaints of bites. Keep in mind that workers may not complain about bugs for fear of retaliation or negative stigma.



Pitfall traps are **monitors** that can be used under beds and other furniture (legs go into center of device), or placed throughout the living space. Bed bugs crawl into the outer well, get stuck because they cannot climb up the smooth surface and subsequently die. Different traps types are available, and a comparison can be found in *How to Get Bed Bugs Out of Your Belongings* referenced below. Pitfall traps are ideal for early detection, and can be used to reduce bed bug numbers. Traps can also let you know if a problem was eliminated after a treatment was completed.



Bed bugs and other insects are extremely susceptible to dry heat. Farm managers may choose to treat worker items during onboarding to kill pests that may have traveled with them. Temperatures must reach 122F to be immediately lethal to all stages of bed bugs. Due to concerns about drying time and temperatures, it is recommended that dry items be placed in the dryer for 20 minutes on high heat [note – not all items can be treated with heat, so follow cleaning label details].

See the resources below for detailed management information.

Resources:

- What's Bugging You? Bed Bugs: <https://nysipm.cornell.edu/whats-bugging-you/bed-bugs/>
- Bed Bug Frequently Asked Questions: <https://bit.ly/2FkwnEQ>
- How to Get Bed Bugs Out of Your Belongings: <https://hdl.handle.net/1813/55760>
- Bed Bugs Illustrated (also available in Spanish): <https://bit.ly/2uevf37>
- Bed Bugs are Back! An IPM Answer: <https://hdl.handle.net/1813/43824>
www.nysipm.cornell.edu



Understanding Pest Management Regulations in Packing Houses

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The Food Safety Modernization Act (FSMA) of 2011 is an attempt to proactively *prevent* food-borne illness in the United States. This act was signed into law with the recognition that food-borne illness is a major risk to the US economy and the health of its' citizens based on recent food recalls. A foundational rule that applies to all facilities and pest management programs is the "Preventative Controls for Human Food."



This rule sets explicit expectations for the identification and mitigations of risks that could lead to the adulteration of food and subsequent food-borne illness. Pests, such as rodents, cockroaches and flies that contaminate food items are a risk that would require a written plan under the new law. Compliance dates for most food facilities began in 2017 to 2018, and programs include these three main components:

Updates to Current Good Manufacturing Practices

- Education and training are required for employees involved in manufacturing, processing, packing or holding food to ensure that it is clean, safe, and allergen-free.

Hazard Analysis

- This must be a part of the food safety plan and consider any and all possible biological, chemical or physical hazards to food items. Identified hazards must be addressed by a preventative control measure – described in a written plan.

Risk-Based Preventative Controls

- Sites are able to devise their own preventative controls that address hazards. Plan components are described by FDA and preventative controls must be implemented as written to reduce risks.

Resources:

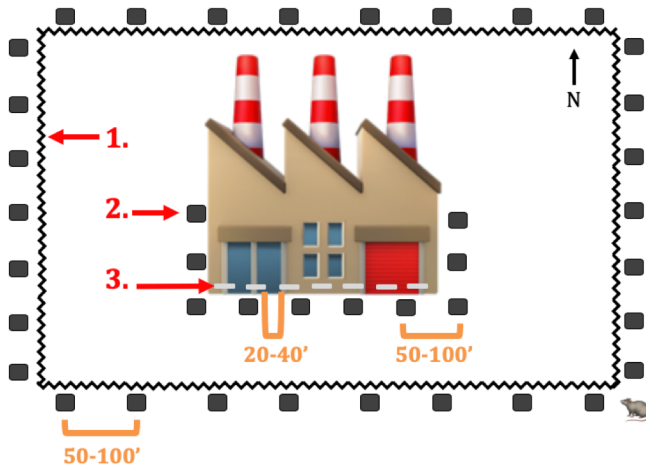
- FDA Website: <https://www.fda.gov/food/guidance-regulation-food-and-dietary-supplements/food-safety-modernization-act-fsma>



Science-Based Rodent Management

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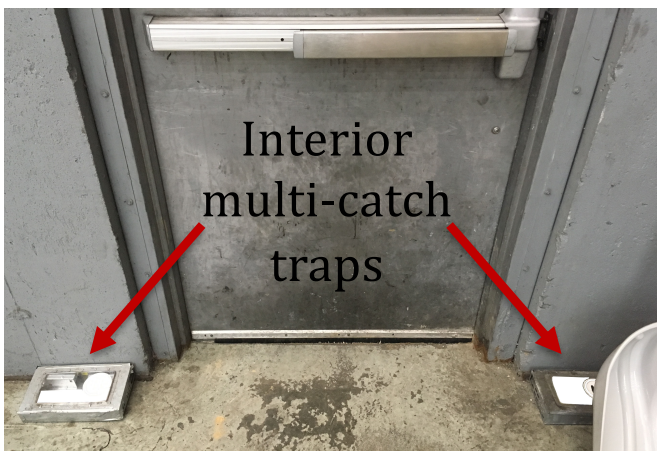
Many rodent management programs at food distribution centers adhere to a “three lines of defense” strategy. Rodent bait stations are placed along fencerows at 50 to 100 foot intervals (as long as the fence is within 100 feet of the building, as per the rodenticide label instructions). The second line of defense are similarly-spaced bait stations along the outside perimeter of the facility, and the third line of defense are multi-catch traps on the interior perimeter. Despite its ubiquitous use and adoption by third party auditing agencies, there is no research evaluating the efficacy of this approach.



Therefore, a research project to examine rodent management programs at food distribution centers was undertaken. The study took place at 12 sites, 7 in the Metropolitan NY area and 5 in Toronto, Canada. At each site, every exterior bait station and interior multi-catch trap was inspected, and conditions conducive to rodent populations were recorded. Characteristics of devices were grouped into categories, and compared to monthly feeding for exterior bait stations, and monthly trap capture for interior multi-catch traps. Some key results:

Exterior:

- Monthly feeding was higher for devices near *Shelter* (unmanaged vegetation) and near higher *Temperatures* (on the West side of the facility).
- 93.8% of devices were near an access point.
- 100% of devices had some level of feeding over the multi-year study. But, 72.9% of feeding observations were minimal feeding (less than one edge of bait).



Interior:

- Monthly trap capture was higher near *Corners, Edges*, near higher *Temperatures* (mechanical rooms, South and West-facing walls) and *Pest Proofing* (near rodent proof door and concrete walls).

- 45.2% of traps caught a mouse; 29.7% of traps caught more than one mouse over time.

Recommendations: Exterior: Remove vegetation, old equipment and other shelter on building exterior. Install a Vegetation Free Zone to eliminate soil adjacent to facility. Focus efforts on building's West side. Minimize rodenticide waste by using non-toxic detection bait blocks with snap traps.

Interior: Install traps on South and West side, in corners and edges. Many traps were located near access points, highlighting the need for pest exclusion to prevent rodent entry.

Resources: 2018 Rodent Research and Education Report: <https://hdl.handle.net/1813/64556>
www.nysipm.cornell.edu



Not for the Birds! Methods for Keeping Birds out of Packing Houses

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Birds are pests of food facilities. They enter through doors and loading docks, and removal is both difficult and expensive. Once inside, birds consume and damage product, but also contaminate materials with their feces. Considering their ability to carry pathogens that affect humans, birds in packing houses represent a health risk.



In addition to damage imposed by birds inside the facility, roosting birds are a problem for structures. The weight of nest material and birds can affect the structure and function of light fixtures, and nesting in these locations can lead to droppings below. Nest material can also clog gutters, leading to water issues for buildings. Nests may be a source of mites that can enter the facility after birds leave the nest.



Bird management in food facilities takes a number of forms. Lethal approaches (trapping, shooting) and physical removal (trapping) are available for species that are not protected, and/or with the use of special permits obtained by the property owner. Prevention through the use of repellents and exclusion techniques are non-specific and can be used at any time. Importantly, sanitation or habitat manipulation to remove suitable food, water and shelter for pest birds is an important step in limiting their pest status at food facilities. The following exclusion techniques are commonly used to keep birds out and will be discussed in the context of a bird IPM plan:

- **Netting:** Seals access to voids used for nesting & roosting.
- **Spikes:** Long, sharp, plastic or metal spikes to discourage roosting or nesting on ledges (see image at left).
- **Post-and-Wire:** protect ledges and other flat surfaces, are cheap and easy to install, often not observed by public.
- **Electrified Systems:** Tape-like material with wires that cause an electrical shock to birds on ledges. Not dangerous to people, but requires regular maintenance.
- **Suspended Plastic Strips:** Covers doors to prevent entry
- **Fear-Provoking Stimuli:** numerous types that require effort to delay habituation. Best when include some kind of movement, install/uninstall, reinforce with human activity that maintains fear (actual dog and wolf cutout)
- **Repellents:** Saturating the market, but efficacy data that demonstrates consistent repellency is lacking.

Resources: See our birds page for more: <https://nysipm.cornell.edu/whats-bugging-you/birds/>
www.nysipm.cornell.edu