



Best Practices for Pest Prevention and Exclusion Restaurants

Facilities preparing and serving food include a wide range and type of establishments from the full-service restaurant to the quick serve diner. The amount of space dedicated to preparation and storage will vary greatly, but regardless, there are some key pests that will make their way into all these food-serving sites.

Although chemical treatments and mechanical traps can be used to help battle these pests, experts agree that the most successful pest management programs will use a combination of techniques aimed at prevention, recognition and suppression. This is often called integrated pest management or IPM. The program requires not only the services of a qualified pest management firm but input and participation from restaurant staff. Pest management does not begin with the pest management firm. Pest management begins when the site is selected and continues as part of the facilities operation each and every day. Cleaning, building maintenance and exclusion will play a key role in keeping pests out and preventing pests from becoming established.

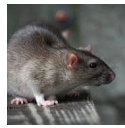




Site Selection

The neighboring environment and attached structures can impact future pest problems and should be contemplated before the structure is even built, purchased or leased. Pest pressures at the site should be a consideration in determining site suitability for the facilities location. If the restaurant is located near a neighboring horse stable, you can expect problems with birds, flies and rodents. Sometimes, a desirable location for a restaurant will be selected for the view like a beach, lake or woods. However, one would expect issues with gulls at a beach, spiders and aquatic insects at a lake and wildlife at forested areas. At the very least, designing the building with those pest pressures in mind should be understood. For example, if problems with spiders and aquatic insects are expected because the facility is on a lake, the proper placement and selection of exterior lights will be critical. Bird issues can be anticipated at the outdoor eating area of an ocean front restaurant. The view may be spectacular but few people like to sit amongst bird droppings and be required to protect their meals from scavenger birds. Design of that outdoor eating area can help mitigate bird activity.

There are some considerations regarding the leasing of buildings. If the building is old with deteriorating infrastructure, cosmetic redesigns to hide these issues will not prevent pests. Major renovations may be required to prevent structural flaws from allowing pests to prosper. This is especially important when the structure is attached to neighboring businesses and residences. A poorly sealed building will allow their pests to be your pests. There should also be the expectation that pest defense costs will be higher for structures where pest pressures are greater.

Exclusion Methods

Selecting the right building will help with exclusion. A well designed and constructed building will help prevent pest entry. Maintaining the buildings integrity is required as long as the building is in use. An active program of pest proofing to stop pest entry is required. Many pest management professionals offer pest proofing services and should report areas which require pest proofing when gaps in the building defenses are observed to their client. Pests do not require much space to enter a building. When sealing to prevent pests, keep in mind the target pest and the size opening it can fit through. Although pests like rats and mice may look fairly large, they do not require much space to enter through at the base of a door or at the opening around a pipe/wall juncture. It only takes a gap, the size of a quarter inch for a mouse to enter a building. If they can get their heads through the opening, their bodies will compress to fit. Use the following chart as a guide in pest proofing the exterior and interior of the building.

PEST PROOFING EXCLUSION CHART		
		
NORWAY RAT 1/2" OPENING	FERAL PIGEON 2" OPENING	ENGLISH HOUSE SPARROW 3/4" OPENING
		
HOUSE FLY 5/64" OPENING	HOUSE MOUSE 1/4" OPENING	ADULT GERMAN COCKROACH 1/16" OPENING

Proper Door Seals

Having the proper door seals and keeping doors closed when not in use are key steps in pest prevention. Many pests can be found outdoors. Gaps around the door itself can allow pests to enter and pest proofing materials like door sweeps and guards should be used to seal openings around the base and sides of doors. Automated doors should remain open only as long as necessary for staff and guests to enter and exit. A general rule is for the door to remain open for six seconds, after the pedestrian passes through the range of the electronic door sensor. The proper functioning of the door's sensor should be checked regularly to make sure it is operating properly. Doors that are staying open too long or even worse, sticking open, will allow pests like flies, and rodents to enter the building. Hospitality staff should not be permitted to prop open doors for extended periods of time. Dock doors used for deliveries should be closed when not in use.

Air Curtains

Air curtains can be used to supplement a tight fitting door especially in areas where pest pressures from flying insects are high. The air curtain must be properly installed and maintained. Air curtains are not something that can be simply installed once and then forgotten. Just like an automatic door closure, overtime, they may need readjustment. A poorly functioning air curtain can be worse than no air curtain at all. If improperly installed or adjusted, they may suck insects into the building versus keeping them out. The blade to the air curtain should be set at a 20 degree angle, so the air flows away from the door. The velocity of the air should be 1600 fpm of air when measured three feet from the floor as a test for proper air curtain operation.

Monitoring Devices

Strategically placed pest monitoring and control devices are necessary on the exterior of the building as part of the exclusion process. Key areas for placement include dumpster/ compactor areas, exterior eating areas and areas of dense vegetation which are close to the building. Neighboring properties which might have higher pest pressures should also be considered when placing exterior control devices. Pest pressures may be higher on the side of the facility which borders a shopping center versus the side which borders a residential neighborhood.

Employees

In addition to the exclusionary methods, pests can be introduced by employees, a program for responding to such issues needs to be in place too. Since pests like cockroaches have been introduced into facilities on employee belongings, it is important to have designated areas for the storage of employee belongings to help minimize the spread of these pests. These areas should be inspected and monitored for pest activity.

Minimize Pest Attractions Outdoors

In addition to pest proofing the structure to deny pest entry, we want to make the exterior of the structure as unattractive and uninhabitable to pests as possible. Because we cannot keep all doors closed at all times, pests will still have the opportunity to enter the building when doors are opened for guest and deliveries. Making the exterior less desirable to pests can mean fewer pests numbers around the exterior which then can make their way indoors.

Eliminate Survival Resources

All animal pests need food, water and shelter for survival. Included in the shelter category are preferred temperatures. Pests like insects are cold blooded and cannot regulate their body temperature. They will seek warmer and cooler temperatures as appropriate to maintain a favorable body temperature. This means warmth in the cold winters and cooler air on a hot summer day. Flies, rodents and other pests will seek buildings for protection and comfort. Food and garbage odors, water and favorable indoor temperatures can all provide attractants for pests. Pest proofing to seal the structure helps reduce air leaks which may signal to pests a more favorable temperature indoors. Keeping lids closed on dumpsters and trash receptacles is important for reducing access and odor plumes from these areas. Water leaks and proper drainage of areas should be

maintained to reduce access to water by rodents, birds and other insects. Insects like mosquitoes breed in standing water. Reducing water sources can help reduce mosquitoes and other pests.

Consider the Landscaping

Landscaping is another important consideration. An attractive property and landscaping can contribute to the total guest experience. However, certain landscaping materials and plants can be attractive to pests. For example, mulch used in landscaping can encourage certain pests like sowbugs, termites, millipedes and earwigs. One inch or larger rock is preferred for pest prevention. The rock should extend ½' deep and at least 2' out from the structure when installed around perimeters. Ground covers like ivy can provide harborage for rodents and insects. Flowering plants can attract bees, wasps and ants. Keep vegetation trim and do not allow tree or shrub branches to touch the structure. The recommended spacing for trees and shrubs is for a 6 foot clearance between the branches and the structure.

Proper Lighting to Reduce Attraction

In addition to satisfying needs for survival, pests may be attracted to structures due to light. Many insects use light to navigate and can be attracted by lights for this reason. Certain types of lights are more attractive to insects than others. Insects are more attracted to lights in the blue spectrum and less attracted to lights in the yellow range. Selecting lights towards the yellowish spectrum will help reduce the buildings attraction to insects. Mercury vapor lights are a common type of lighting which emits light more in the blue range (450-550 nm). Mercury vapor lighting should be avoided when possible, especially when lights are mounted directly on the building. High pressure sodium vapor lights are preferred (575-600 nm). Mercury vapor lighting can be 112 times more attractive to insects than sodium vapor lights. Many facilities are switching to LED lights because of energy savings. When selecting LED lights, look for lighting in a similar spectrum as sodium vapor lights.

Exterior Checklist

Use this as a quick auditing checklist for your site.

Trash Handling Areas

- » Use trash receptacles with self-closing lids on the exterior.
- » When possible, place dumpsters away from the structure. This can be dependent on the volume of generated by the facility.
- » Make sure trash pick frequency is sufficient for the volume of garbage generated.
- » Empty out recycling containers at least once per week.

Landscaped Areas

- » Make sure water drains properly around the exterior including parking lot areas and the area along the foundation.
- » Avoid using mulch for plant beds. Use rock instead.
- » Prune vegetation so that it does not touch the structure. Tree and shrub branches should be six feet or more from the structure.
- » Avoid the use of ground covers in landscaping plant choices. Rodents can burrow in the soil and go undetected. It can also be difficult to clean these areas of litter, including food containers.
- » Keep leaf litter to a minimum around the structure including gutters and roofs.

Exterior Lighting

- » Use sodium vapor lights versus mercury vapor lights for exterior lighting. If possible, direct lights onto the building versus mounting them directly on the building.
- » Avoid mounting lights directly over commonly used doors unless it is required for safety and security purposes

Doors

- » Make sure that all doors are well sealed at the base and sides.
- » Instruct staff not to prop open doors or leave doors open when not in use. If a door needs to be open for ventilation purposes, it should be screened.
- » Check timing mechanisms on doors for proper operation.
- » Check air curtains for proper flow and velocity.

Patio and Deck Dining Areas

- » Keep food spills to a minimum.
- » Promptly remove food from tables as diners finish their meals. This will help discourage pests like flies and birds.
- » Consider the use of outdoor ceiling fans to assist in keeping some pests like mosquitoes from the outdoor area.

Reducing Survival Indoors

The same basic needs which may attract pests to the exterior of our structures, contribute to survival indoors. We aim to reduce available food, water and shelter indoors to prevent pest reproduction and development. Key pest prevention methods are as follows:

Small Flies (Phorid flies, drain flies, small fruit flies and dark eyed fruit flies)

Small flies like fruit flies need moist organic material for development. Removal of the breeding source is essential for controlling these pests. These flies will most commonly be found in food preparation areas, bar areas and restaurants. Helpful tips on small fly management include:



- » Seal walls and floors where cockroaches may harbor.
- » Place floor drains on a regular cleaning schedule to remove organic debris which may support small flies like phorid flies and drain flies. This extends to restrooms as well as food preparation and service areas.
- » Use specially designed caps for drains which allow water movement down the drain but do not permit insects to emerge from the drains. These types of devices are especially useful in areas like restrooms where floor drains may not receive large volumes of water and drains may go dry, permitting pests to easily move from deeper in the drain system up through open drains
- » Use fans to help dry floors in kitchens and food serving areas where moisture may accumulate. Flies can breed in organic material deposits in floor cracks. High pressure washing and caustic cleaners can help deteriorate tile grout and epoxy floors providing areas where organic material and moisture can sit. Floor repair is ultimately the required fix but drying floors can be helpful in the interim until floor repairs are completed.
- » Pick up floor mats in kitchens to help permit drying of mats and floors after cleaning.
- » Empty recycling containers frequently to prevent small fly development in containers containing juice residue or other sweet liquids.
- » Keep floors clean, and pay particular attention to areas underneath prep tables and counters where it may be difficult to access for proper cleaning but food debris may accumulate.
- » Clean garbage disposal units thoroughly, including screens, which may be present and be areas where organic material may accumulate.
- » Repair leaky pipes to prevent unwanted moisture accumulations on floors or counters.
- » Check elevator pits at least once per year to make sure they are clean and not supporting flies.
- » Keep refuse containers clean, including underneath the liners. Have a program in place for the cleaning of dumpster carts which may be used to move garbage from the kitchen and food service areas to the dumpster. These carts can get dirty when bags leak or are torn. Make sure they are placed on a cleaning schedule.
- » Clean beverage dispenser trays and drain lines on a regular basis. This include beer tap trays in bars and lounges.
- » Regularly clean underneath tray conveyors when present. These can be challenging areas to clean due to typical construction practices.
- » Clean and wring out mops prior to storage on wall mounted racks. Dirty, souring mops can attract and support small flies.

Filth Flies

Unlike the small flies like phorid and small fruit flies, the larger filth flies are not commonly breeding indoors. Typically these flies are coming in from the exterior and exclusion and reduction of attractions are key to their management.

- » Keep doors closed when not in use. Make sure doors are properly sealed around the sides and base. If it is desirable to keep doors open for ventilation purposes, they should be fitted with screens. Make sure vents are properly screened to exclude flies and other insects.
- » Keep dumpster and dumpster pads clean. Ask waste hauler to clean dumpsters, especially during the warm months of the year. If they do not provide this service, make arrangements for facility staff to perform the cleaning.
- » Make sure vents are properly screened to exclude flies and other insects.
- » Utilize insect light traps in the interior to intercept flies which may have gained access.



German Cockroaches

The German cockroach is classified as a domestic cockroach because they rarely live outdoors. When German cockroaches infest a facility, they typically have been carried in on goods or employee personal belongings. The one exception is when there are attached structures where the cockroaches may move through wall voids from one unit to the next. German cockroaches are omnivorous and will feed on a wide variety of foods. It can be difficult to limit all potential food sources for this insect so a major focus is denying harborage through sealing of cracks and crevices. German cockroaches prefer areas where there is moisture and warmth. Concentrate on these preferred harborage areas when inspecting for cockroaches and sealing cracks.

- » Inspect incoming shipments to prevent introductions of the pest into the facility. This not only includes food shipments but other items like linens. Quick removal from cardboard cartons can be helpful in finding stowaway cockroaches and limited harborage. Minimize the use of corrugated cardboard for long term storage of items. German cockroaches like the corrugations and folds that a cardboard box provides. Cardboard is not cleanable. It is better to use clear plastic totes or bins with lids. The clear plastic will allow you to see inside and the lid and help prevent pest access.
- » Have a dedicated area for employees to keep personal belongings and monitor the area for pests like the German cockroach.
- » Seal cracks and crevices in food service and preparation areas to reduce shelter. The less available harborage, the fewer cockroaches. However, if you can't effectively seal them out of an area, keep the area open and allow for easy inspection and treatment.
- » Make sure leaks are repaired promptly. These are insects that like high humidity and moisture. Reducing moisture and water can be helpful in reducing their ability to survive.
- » Reduce clutter. Clutter makes it difficult to inspect areas for pests like cockroaches.
- » The importance of keeping areas clean and dry extends to lounge areas as well. Seal cracks and crevices and maintain a high level of sanitation in fighting cockroaches.



American Cockroaches

Unlike their close relative the German cockroach, the American cockroach is considered a peridomestic species which can commonly be found indoors and outdoors. In the northern part of the United States, it is most commonly associated with sewers and cutting off entry into the structure through the sewers as part of the control process. In the southern U.S, it can come from the exterior or through the sewer system. Tips for managing this pest include:

- » Place caps or screens on drains if they are known entry points for cockroaches. Specialized drain caps are described under the small fly section.
- » Keep doors sealed to prevent entry in the geographic locations where these pests can be found outdoors. Use screens on doors which are left open for ventilation purposes.
- » Seal openings around pipe/ wall junctures to prevent access.



Rodents

Rodents are most likely to enter from the exterior, so keeping the appropriate exterior lines of defense are required for prevention and management. Dumpsters are one of the most common attractants as well as harborage created by poor landscaping choices. Tips to help reduce rodent issues include:

- » Mice can enter a structure through openings as small as ¼" or approximately the diameter of a pencil. Seal the structure to make sure all openings are less than these measurements to exclude mice or rats. the small fly section.
- » Keep dumpster areas as tidy as possible. Keep lids on dumpsters and other exterior trash receptacles.
- » Manage exterior eating areas appropriately to quickly remove food crumbs and spills. Promptly take dirty dishes and food service items away for cleaning or disposal. These procedures will also help minimize issues with another vertebrate pest, birds.

