

Pest Control: Rats & Mice

Reprinted from The City of New York Department of Housing Preservation & Development: Housing Education Program on Pest Control

This section discusses rats and mice, the problems associated with them, how to avoid infestations, and what to do about getting rid of them once you have them. Rats and mice have accompanied man to most areas of the world he has settled. They are responsible for more human illnesses and deaths than any other group of mammals. They have been given the name "domestic" rodents because man's carelessness in handling food and garbage has resulted in populations of rats and mice close to his home and work.

What are some rat borne diseases?

Rats are dangerous to man for many different reasons, including causing human disease, biting people, destroying property, causing fires, contaminating areas, and causing economic losses. Each rat destroys \$10.00 worth of food and other materials a year by gnawing and feeding, and contaminates 5 to 10 times more. This equals 1 billion dollars a year in the United States. Some of the rat borne diseases are listed below.

Salmonellosis – Bacterial food poisoning – most common disease transmitted by rats in United States

Murine Typhus – Transmitted from rodent to rodent and to man by scratching infected flea feces into skin

Leptospirosis – (Weil's Disease) – Transmitted from rodent and to man by contact with infected urine

Plague – Highly fatal bacterial disease for mammals transmitted from field rodent to man by bites of infected fleas (*Pasturella Pestis*)

Rat Bite Fever – Bacterial disease – bite infected rat

Trichinosis – Endo Parasite – pork infected with parasites by ingesting rat contaminated garbage/food. Vicious cycle – rat – pig – man

Rabies – Non existent or reported cases

Rat Biology – Norway Rat

The New York City rat is called *Rattus Norvegicus* (Norway Rat) or sewer rat or water rat. It has a life span of about one year. It is 12 to 16" long including the tail. It weighs one pound. The female gives birth 5 to 8 times a year and has 6 – 12 babies or pups. The gestation period is 22 days. The rat is a burrowing, gnawing, nocturnal (night time) creature of habit. It burrows in the ground, under buildings, and in rubbish. It will travel from 100 to 150 feet from its resting place. It requires one ounce of food daily and one ounce of water. It feeds on animals and vegetables and prefers meat and fish.

Signs of Rats

The following are some of the indications of rats:

- 1. Rat droppings:** They are $\frac{3}{4}$ " and look like capsules. They are shiny, black and soft. If they are grayish and dry, this indicates an old infestation. Rat droppings have blunt ends.
- 2. Rub Marks:** The rat has a coating of grease so when it follows the walls (in this way it is only vulnerable on one side) the grease rubs off. If the rub marks are dry and flaky, this indicated they are not current.
- 3. Rat Holes:** If there are ridge marks and hairs around the hole, the rat is using it currently. If it is smooth and has cobwebs, it is an old hole.

4. Tracks: The rat's trackmarks have four toes in front, five in back. At a 45° angle, prints can be noticed with a flashlight.

5. Burrows: Since rats camouflage their burrows, you probably won't find them.

What can you do to prevent rats?

The most important thing is to clean up and remove garbage. The Department of Sanitation cleans up the streets and picks up garbage left at the curb. It does not go beyond the building line because backyards and empty lots are the responsibility of the property owners.

What to do about rat holes?

In order to cut off the rat's entrance you can effectively seal it off by the following method.

- 1. Place the top** of a can over the hole. Hammer it on.
- 2. Place steel wool and cement** in the hole. The rat will try to pull it out and will irritate his gums. This will deter but won't prevent him from getting in.

Rodenticides/Poisons

New York City uses anticoagulant poisons which are the safest on the market. In emergency situations, zinc phosphide is used. This kills within hours by causing heart seizures. This is prohibited; its use is restricted to special circumstances approved by the Bureau of Pest Control of the Health Department. Although poisons used are effective against rats, there is always the danger of accidental poisoning of babies and pets in apartments. Bait used by qualified New York City Pest Control exterminators are carefully placed, noted and reinspected on a

regular basis as a safety precaution. In addition, even though each bait box is marked "POISON" tenants and superintendents are advised of the potential danger. All Health Department exterminating service technicians must now take and pass examinations before they receive a certificate. In addition Federal and State laws have been enacted placing further restrictions on the use of rodenticides. Except for those poisons that have been completely outlawed and removed from the market, all others can be used only by qualified personnel licensed by the Bureau of Pest Control.

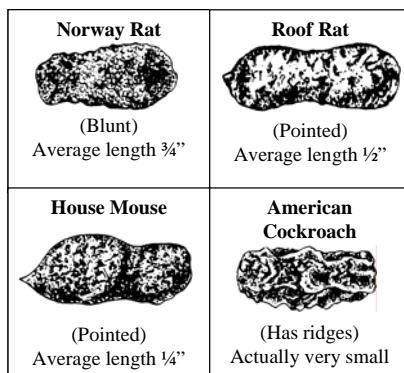
The Bureau of Pest Control: The Bureau of Pest Control has several functions. These include inspections, exterminations, clean-up, education, mosquito program, and window guard program. There are about 8 million rats in New York City. The Bureau of Pest Control attacks the problem by surveys and inspections, an extensive eradication program, conducting and promoting clean-ups and demonstrations, and community education in the schools. A major goal is to orient and educate tenants in order to prevent infestations. The Bureau's success is evidenced by the greatly reduced number of rat bites. In 1964 and the years before that, the City averaged close to 700 reported and confirmed rat bites. In 1979, the number was 255, a drop of over 65%.

The Bureau has offices in Brownsville, Bedford Stuyvesant, lower Manhattan, Harlem, Bronx, and Jamaica because most complaints of rats and rat bites come from these areas. The Central Complaint number to call is 285-9503 if you should suspect rat infestations. The Bureau will investigate within a few days. Rats and mice are habitually nocturnal and secretive, and are rarely seen except when heavy infestations are encountered.

Therefore, it is necessary to interpret signs of their activities properly in order to plan control work. Their signs are found in secluded places, such as along walls, under piles of rubbish, and behind or under boxes, boards, and thick vegetation. From rat signs one can tell the species concerned and whether a rodent infestation is current or old, heavy or light.

Droppings: If fresh, feces will be soft, shiny, and dark. In a few days they become dry and hard. Old droppings are dull and grayish. They crumble when pressed with a stick.

Control of Rodent Infestation and Harborage: In combating rodent infestation the use of cats, traps, and poisons are only temporary expedients and do not



eliminate rodent life completely from your premises. The Department of Health of New York City has proven that the best method of permanently eliminating them is the "build them out." Rodent life exists in buildings because of favorable conditions that permit them to hide, nest and breed. They will not remain where safe shelter or food is not available.

To combat infestation in your premises, it is necessary to be able to recognize rodent harborages or hiding places, both actual and potential as they are the conditions favoring rat life and propagation.

There are three general types of rodent harborages: temporary, incidental, and structural.

Temporary Rodent Harborages: There are conditions arising out of failure to maintain premises in a clean and sanitary condition, or to faulty methods of operation, housekeeping, or storage of stock.

Examples: Mass storage of office supplies and old records, materials for repairs, food products or other store merchandise; boxes, crates or cartons that are left undisturbed for periods of time and not rotated in use (using up older stock first). Unused or obsolete fixtures or equipment, especially those having drawers, compartments or other hollow enclosures. Miscellaneous junk, trash, odds and ends placed in closets, cellars, boilers rooms and out-of-the-way-places, or portions of premises not in daily use having very little or no light. Garbage cans left uncovered overnight or having poorly fitting covers, or in a defective leaking condition. Passageways used in transporting or storing garbage cans for removal, with spilled particles of food on floors, especially in corners. Accumulations of rubbish at bottom of airshafts, dumbwaiter or elevator shaft pits, under sidewalk or cellar window gratings, or other parts of premises not cleaned regularly.

Prevention: Unused materials should be stored neatly and away from walls, allowing enough space for a man to pass around in cleaning and should preferably be stored sufficiently high above the floor to permit cleaning underneath. The amount should be minimized as much as possible, and should be disturbed or position changed at least every three weeks (to prevent nesting). Avoid mass storage by arranging in rows with 2' wide aisles. If placed on shelves, raise the lowest shelf about 10" above the floor.

Remove all rubbish that usually accumulates about unused materials. Promptly clean up food scraps spilled from garbage cans, or that falls under, or behind slop sinks, equipment, and stock bins. (Rodents feed more readily on these than on bagged or packaged food supplies). Store all garbage in non-leaking metal receptacles with tight-fitting covers. Place soiled linen into suitable containers. Maintain clean and sanitary conditions at all times.

Incidental Rodent Harborage
There are conditions arising from installing of fixtures or equipment incidental to their use on the premises, in such a manner that hollow spaces, enclosures, and inaccessible places are formed.

Examples: Fixtures, refrigerators, ovens, etc., not installed flush against walls but leaving a small space that is too narrow for proper inspection and cleaning. Narrow spaces left between bottoms of counters, back bars, or other fixtures or equipment, and the floor. Small spaces existing between ceiling and tops of fixtures, clothes lockers, refrigerators, closets and cabinets, larger overhead pipes and ventilating ducts suspended a few inches from the ceiling. Hollow partitions (double wall space). Hollow furniture or fixtures with inaccessible enclosures. Boxed-in casings or sheathing around pillars, pipes, radiators, etc., forming hollow enclosures. Bottom shelves, stock platforms or skids that are not set directly on the floor but allow a space of a few inches to exist underneath. Defective insulated sections of large refrigerators or pipe coverings (hollow enclosed spaces formed by damage to cork or asbestos). Loose foods stored in low, thin, wooden food bins, boxes, cartons, burlap bags, etc. Partially enclosed spaces behind open metal grilles used on housings of motors or other mechanical equipment.

Prevention: Eliminate narrow, inaccessible spaces behind fixtures or equipment by placing flush against wall or leaving a space wide enough

for inspection and cleaning. Solidly block out narrow spaces underneath, or install flush on floors or raise high enough for cleaning. Avoid providing undisturbed rat runways in narrow spaces between ducts or long hoods, and the ceiling. Ducts should be placed flush against ceilings and preferably be found in shape, instead of square. Remove decorative boxing-in around radiators, columns, etc., to avoid hollow enclosures, or protect gnawing margins with metal flashing extending at least 6" above the floors. If they must be sheathed for appearance, use sheet metal. Repair and securely close all breaks in insulation around pipes, refrigerators or cooling cabinets. Line interiors of wooden bins with sheet metal, or store foods in rodent-proof metal containers with tight covers to prevent fouling with rodent excreta or urine. (resulting in condemnation of the food and possible court prosecution). Protect openings of ducts or grilles against entry with rodent proof screening (mesh openings not greater than 1/4"). Eliminate hollow spaces formed by false bottoms in counters, lockers, cabinets, back bars, etc. Alter hollow fixtures so that enclosures are exposed for easy cleaning.

Structural Rodent Harborage
These are conditions due to design or construction of a building that are defective from a rat proof standpoint, or that developed during occupancy from failure to make proper repairs or use rat proof materials.

Examples: Openings made in outside buildings walls, around beams, or in interior walls, floors, or ceilings for installation of pipes, cables or conduits. They are made by plumbers, electricians, or other workmen, and are, usually larger than necessary and unused portions of holes are not closed up. Holes, large cracks, loose bricks, or other openings in floors, walls, or ceilings. Hollow spaces in double walls, between floor and ceiling of lower story, and in double ceilings of cellars. Enclosed hollow spaces

formed by sheathing the undersides of stairways, by installation of false floors in toilets, or by raised wooden floors over earthen floors of cellars. Entrance and cellar doors that are not tight-fitting or not provided with a proper door sill or saddle, permitting openings over 1/4" to exist and not protected around gnawing edges with metal flashing at least 6" about floor level. Openings around ceiling or floor beams, or risers, where they pass through partitions. Openings of fans, ventilators, and louvers on the outside of buildings, or fancy metal grilles with openings over 1/4", not protected by rodent proof screening. Floor drain and sewer trap pits not kept clean and not provided with solid metal covers with perforations not exceeding 1/4". Cellar floors of earth, enabling rodents to burrow underneath.

Prevention: Promptly seal up all holes or openings around pipe lines or cables where they enter the building, the concrete mortar or cement mortar to which ground glass may be added for better results. Place tight-fitting metal collars or flanges around pipes and risers. Provide escutcheon plates for all risers where they pass through floor slabs, unless same are waterproofed by pockets of mastic. Seal up all openings around beams. Avoid using double-wall type construction with hollow interior spaces, or hollow tile block, hollow cement block, or similar material for partitions or walls of storage compartments or in cellars. Inspect all parts of premises for holes and seal every opening in walls and ceilings with cement plastered smooth. Move away fixtures and stock that may hide holes in floors and use a flashlight so as not to miss any. Look for loose bricks, cracks or other openings in cellar foundation walls. Find all openings before rodents do. Inspect regularly and repair weak spots before actual breaks occur. Eliminate enclosed hollow spaces existing within the structure from failure to use rodent proof design; or protect gnawing

margins with metal flashing extending at least 6" above the floor. Repair possible points of entry or breaks with metal patches or metal strips. Block out hollow spaces under raised wooden floors with concrete. Refrigerators, ranges, ovens, etc., should be solidly based on concrete. Protect entrance, cellar doors, and windows with metal flashing around gnawing edges, and maintain in good repair. Replace earthen cellar floors with a floor of concrete at least 3" – 4" thick and tied securely into foundation walls. Securely anchor window and door screens to the frames.

Rodent Infestation Surveys: In addition to trapping, surveys by operators will indicate presence and approximate extent of infestation, of which the following are some signs:

Excrete or Pellets: Physical state will indicate recent or old infestation. Soft moist droppings indicate live rats or mice present, while hard and dry ones indicate old. Amount of droppings indicate heavy or light infestation. The size of pellets will show if rodents are large or small; and if different sizes are present, it indicates litters of young are being reared.

Gnawings: If recent, will show fresh appearance of gnawing, shavings, debris, or marks on food bags or containers, or damage to other merchandise, supplies or fixtures.

Rat Run: Difficult to tell by appearance if new or old. Use white chalk or paint on suspected rat run. The rat is a creature of habit and will continue to use same pipe or beam. It will leave marks caused by dirt or grease on feet or fur.

For Permanent Control Measures: Try to maintain permanent freedom rather than resort to temporary reduction of rat population by periodic drives employing trapping, poisoning or fumigation. After carrying out all rat stoppage measures, a reliable

employee should inspect entire premises weekly to insure cleaning and upkeep, and to repair any temporary breakages in windows and doors to the outside. Allow no accumulations of rubbish to form. Watch sky-lights, air shafts, dumbwaiter and elevator shafts, and all other means of ingress from outside, for breaks. Immediate repairs to be made to eliminate openings and harborages, with rat-proof material (impervious to gnawing). Relocate or alter fixtures with hollow enclosures. Prevent careless employees or workmen from leaving lower windows or cellar doors open overnight or weekends to rodent ingress from outside sources. Include in the specifications for all new construction and repair contracts a specific provision that work to be done is to leave the building in a rat proof condition. Specifications may read as follows:

"This building is planned and detailed, and it is the intent of these specifications, to provide a structure that will prevent the penetration by rodent vermin of any vacant space where they might find a harborage. The contractor will be held responsible for securing this condition by the closing of all points of access to such spaces, including the passage of piping and conduits through all walls, partitions, ceilings and furred off spaces, the closing of access to voids in hollow tile blocks, etc. There shall be a special inspection of the building with regard to this matter before final acceptance."

All permanent measures are aimed at eliminating the rodents' food supply and shelter. Architects need to be made more cognizant of conditions that prevent rodent harborage and infestation, so as to change design of new buildings to eliminate unnecessary enclosed spaces. Ratproof construction should receive greater prominence in the future.

Editors Note: To attend a seminar on Pest Mgmt., please log onto www.nyarm.com/NYARM_seminar.pdf and FAX registration form to **(212) 216-0680**