



AN INTRODUCTION TO BASIC PEST MANAGEMENT:

RODENTS



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INTRODUCTION

Pest Control is a vast subject and those operating as Pest Management Professionals need an increasing array of knowledge to continue to remain effective.

From Pest biology to environmental awareness, from insecticide and rodenticide product knowledge to resistance management techniques and a comprehensive understanding of all legal obligations – it is all essential for safe, effective pest management.

RODENT BACKGROUND

Rodents are thought to have originated in central and southeast Asia and since then found human shelters accommodating since they provide them with warmth, shelter from predators, food and nesting materials.

Due to the close association with humans, resulting in the rodent parasitising people by stealing valuable resources, the survival rate of the rodent is increased, especially certain times of the year.

A rat can consume up to 28kg of food each evening and can inflict serious damage to structures, appliances, furniture and vehicles. Approximately 2% of rats and mice's daily activities are spend gnawing on materials and manmade objects.

It is the contamination of foods by rodents that is the most serious wide scale problem. One rat can excrete between 40 to 100 droppings per day as well as depositing up to 14ml of urine per day. In 1982, the United Nations reported that rats destroyed more than 42 millionof tons of food.

Worldwide, the mammalian order rodentia comprises the largest order of mammals consisting of 1700 species. The family Muridae (meaning to "share the table") to which the commensal rats and mice belong represents around 500 species. The commensal rats and mice includes, the house mouse, the Norway rat and the black rat.

RODENT SPECIES

As with all pests, it is important to understand the biology and behaviour of rodents in order to develop an effective control program.

There are 3 species of rodents which are of concern for food processors and / or handlers:

House mouse

Characteristics

◆	COLOR:	DUSTY GREY WITH A CREAM BELLY
⊗	SHAPE:	ROUND
≡	SIZE:	6 – 10 CMS
⊗	HABITAT:	BUILDING INTERIORS & CUPBOARDS



Norway rat

Characteristics

◆	COLOR:	BROWN WITH SCATTERED WHITE HAIR
⊗	SHAPE:	LONG, HEAVY BODIED. SMALL EYES AND EARS
≡	SIZE:	17 – 25 CMS
⊗	HABITAT:	OUTDOOR AREAS & BURROWS



Roof rat

Characteristics

◆	COLOR:	BROWN WITH BLACK BLACK/WHITE UNDER
⊗	SHAPE:	LONG, THIN WITH SCALY TAIL. LARGE EYES AND EARS
▮	SIZE:	15 – 20 CMS
⊗	HABITAT:	CLIMBING AREAS & ROOFS



INTERESTING RODENT FACTS

- Most rodents are herbivores. That means they eat plants, nuts and seeds. Some rodents are omnivores. They eat plants and other animals like insects, frogs and birds.
- Rodents usually only live 3 – 4 years.
- Rodents are smart. Rats for example can learn tricks.
- Some rodents dig underground tunnels while others live in trees.
- Rodents' teeth never stop growing.
- Rat's teeth and jaws can gnaw through substances as hard as lead sheeting and cylinder block.
- Rats can squeeze through openings as small as 13mm in diameter.

RODENT DANGERS

Rodents co-exists with humans and adopt an investigative behaviour. They are well adapted to live where humans relax, sleep and store our food and clothing and we do not even realize it. Rodents fly with us, drive with us and live on ships, busses, trucks, etc. that transport us and food around the globe. A hitchhiking rodent with its hitchhiking parasites and pathogens can go from one end of the planet to another in the time it takes to fly aboard our super jets.

Both rats and mice regularly bite people, especially in areas where rodent populations are high and where they live close to people. Most times, the first bite awakens the victim and the rat runs away, however cases of infants being fed on repeatedly are not uncommon in the lower socio-economic areas of cities.

We are highly vulnerable to the potential spread of pathogens and parasites through the co-living with or in close proximity to rodents. A Pathogen is defined as bacterium, virus or other micro-organism that can potentially cause disease. A parasite is an organism that lives on or in a host organism and gets its food from or at the expense of its host.

Pathogens such as bacterial organisms found in the saliva, gums and within mucous membranes of rats and occasionally mice transmits harmful bacteria. Symptoms generally develop within 10 days following the bite from an infected rodent and include chills and high fever followed by rashes. Victims may be subject to a relapsing type of fever for weeks or months.

Since rodents can move relatively easy between sewers and garbage dumps, livestock facilities etc. they must always be considered a potential health threat. They can cause food poisoning through the spread of salmonella amongst other bacteria.

There are three main classes of parasites that can cause diseases in humans:

- protozoa
- helminths
- ectoparasites

Rodents harbour a wide range of parasites such as mites and ticks that carry lethal pathogens. Even without parasites, rodents can directly transmit deadly germs excreted in their urine and faeces which is a danger to human health.

In one week's time, rodents produce hundreds of faecal pellets and deposit urine in thousands of areas. The pathogens may also be deposited via saliva and blood spewed during rodent fights. Rodents shed their hair daily and lose an entire coat twice a year. In this way, millions of rodent hairs and hair fragments, possibly containing pathogens, are also deposited into our environment and products we produce and distribute.

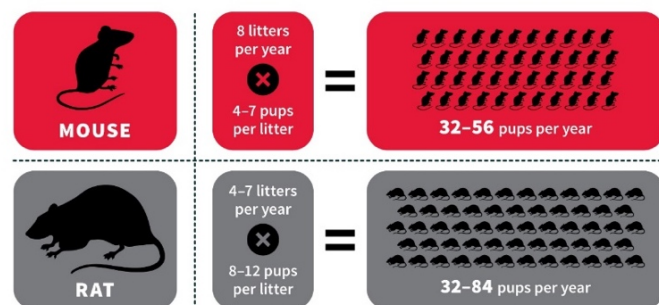
PROLIFIC BREEDERS

Under favourable conditions, mice populations can expand rapidly.

Inside our buildings where food, water and harbourage are readily available, rodents can breed prolifically. This results in tens or hundreds of rodents living and moving about in our homes.

Diseases and organisms present within these populations can spread rapidly to infect areas, people and pets.

Rodents reproduce rapidly, meaning a rodent problem can easily go from bad to worse before you know it.



Unlike most pests, rodents don't hibernate during the winter. They'll actively seek warmth and quickly begin reproducing, so be vigilant.

PHYSICAL SENSES OF RATS AND MICE

Rodents have well developed anti-predator strategies and well developed senses.

Their sense of vision is relatively poor compared to their other senses. Their vision is adapted to night times and can detect movement at considerable distances and can detect and identify objects from 15 meter away.

They are colour blind but can distinguish between different shapes and can therefore distinguish the general shapes of objects such as bait boxes or traps in their normal pathways. Should they experience a reward, they may return there. Should they experience pain, i.e. near miss with a trap, they will avoid the shape.

Touch and smell are the two most important and useful senses for the rodent. For touch, the pelage and the hair of the rodent play an important role. Guard hairs located on the face, legs, belly and other places provides the rodent with a "touch feedback" system of their surroundings.

Rodents prefer to travel along walls and between objects. They also gravitate towards corners and other protected areas for harbourage. This activates the guard hairs and provides them with security

Rodents secrete pheromones which are used to mark new objects and the paths leading on to these objects. and in the case of "marking" of food objects, Feeding activities at "marked" food and objects subsequently increases.

The sense of taste in rodents is also well developed and although odours are important in locating and sampling food, taste may very well be the determining factor as to whether the food is consumed or not. It is therefore important that rodent baits do not get contaminated with the odour of insecticides, cleaning agents or other types of chemical contaminants.

METHODS OF CONTROL – THE 5 STEP PROCESS

1. Inspection and identification
2. Exclusion
3. Sanitation
4. Baiting and trapping methods
5. Harbourage reduction and proofing recommendations
6. Monitor and maintenance baiting

WHY IS CONTROL DIFFICULT?

- Ability to survive
- Opportunistic feeders
- Behaviour
- Environment
- High reproduction rates
- Omnivorous creatures
- Require little or no water
- Mice – explorers (High metabolic rate)
- Rats – neophobic (scared of new environment)

POTENTIAL ENTRY POINTS

- Open doors & windows
- Air conditioning compressor lines
- Gas line
- Electric meters
- Meeting points of different housing materials
- Inside & outside corners
- Bay windows and foundation overhangs
- Window wells
- Roofline and cedar shakes
- Decks and landscaping
- Burrowing beneath the foundations of building
- Doors and sills with more than 9,5mm clearance

- Openings into hollow walls



IDENTIFICATION MARKS & DAMAGE

- Chew marks on materials such as furniture, food containers, electrical wiring and even concrete
- Unexplained holes in walls, clothing, insulation or other materials
- Droppings / urine inside cabinets, kitchen drawers or wall corners
- Scratching noises in the walls
- Squeaking or scampering
- Oily hair marks in corner wall areas where rodents frequently travel

SANITATION & HOUSEKEEPING

Make sure to wipe off food spills, drink spills and food crumbs. Clean stoves, table tops and kitchen sinks. Keep your food in sealed containers. Also make sure that your trash cans and garbage bins are well covered, out of the reach of rats. Do not wait for the next day to clean up your mess. By that time, it would have been too late, and the rats may have attacked your establishment already.



CONTROL MEASURES

The backbone of the structural Pest Control industry pivots around the need for continual cockroach control covered by an integrated pest management approach. IPM is a long standing, science-based, decision-making process and provides an effective strategy for managing pests in all arenas from developed residential and public areas to wild lands. IPM serves as an umbrella to provide an effective,

all encompassing, low-risk approach to protect resources and people from pests and consists of the following:

- Regular inspection of high risk areas
- Implementation of preventative measures
- Accurately identifying the pest and assessing the degree of infestation, taking into account biology and habits of pests
- Using the entire spectrum of available control measures
- Carry out effective resistance measures
- Evaluating the success of all measures taken

Treatment for rodents should concentrate on the following:

- Eliminate harbourage areas
- Rodent proof structures by closing entrance holes with steel wool and cement
- Bottoms of doors must be closed off with stainless steel stripping
- Rodents must be targeted outside in their burrows before they enter the structure
- Bait stations must be placed along the outside perimeter fence and along the outside of the exterior wall of the structure

*"They fought the dogs, and killed the cats,
And bit the babies sin the cradles,
And ate the cheeses,
Out of the vats,
And licked the soap from the cook's own ladles"*

Robert Browning