The Economic and Health Significance Of the Commensal Rodents

CDC/NEHA
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“Nature loves to hide”
Heraclitus, Greek Philosopher
(c.a. 535-475 BC)

Rodents: A case of planetary success.

Rodentia: 44% of all mammals

2009 Three New Rodent Species Discovered!!
About 500 species in just Family Muridae alone.

In Oregon:
1. *Mus musculus* (domesticus)
2. *Rattus norvegicus* (brown)

A visit to New York City:
Empire State Building, Theatre District, Statue of Liberty, etc.

Fe getta bout it.

No. 1. Pestropolis
“They are diabolically clever animals”

A History of British Mammals

1918
Daily foraging of
R. norvegicus in exterior city
environment:
90-450 ft. from nest


Complete
nutritional
balance.

Nutritional Returns
Subadult (200g/7oz)
requires 1.4 oz of high caloric food
Adult: 400g/14 oz: 2.8 oz
The relationship between rodents, human health, city health inspectors and pest professionals.

Mice and rats are wild mammals. Just prior to or during their interactions with us, they may be in sewers, drainage ditches, muddy fields, earthen nests, building voids, and so on. All of which may contain significant amounts of animal excrement and decay. They may be interacting with other wild animals and livestock where blood, saliva, and other fluids are present or exchanged.
Table 1: Pathogenic Bacteria and Protozoa carried by Norway Rats in Rural and Urban Areas

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Estimated number /potential of rodent-borne diseases</th>
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</thead>
<tbody>
<tr>
<td>Virus</td>
<td>17</td>
</tr>
<tr>
<td>Rickettsial</td>
<td>9</td>
</tr>
<tr>
<td>Bacterial</td>
<td>20</td>
</tr>
<tr>
<td>Protozoan</td>
<td>3</td>
</tr>
<tr>
<td>Cestodes</td>
<td>3</td>
</tr>
<tr>
<td>Trematodes</td>
<td>1</td>
</tr>
<tr>
<td>Nematodes</td>
<td>3</td>
</tr>
</tbody>
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For the most part, an accurate rodent-associated disease potential is unclear in any given area until it is studied in that area.

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Be especially alert to ectoparasites associated with rodent infestations occurring within attics, suspended ceilings, insulated walls, and crawl spaces.

There are several mouse-borne diseases that are overlooked and ignored by people, or misdiagnosed by physicians.

Why?
Because these illnesses closely resemble common everyday ailments. Or, they are ailments that are not severe in their symptoms or duration, so people fail to seek the further medical diagnosis necessary to correctly identify the specific illness.

The Johns Hopkins research estimates that about 18% of asthmatic children nationally test positive for mouse allergen sensitivity. In just New York City alone, this equates to about 54,000 asthmatic.

Hay Fever or........ Mouse Allergens?
Pests and Food Safety

What KFC, Juniors, and the Peanut Corporation America taught us....
Reservoir competence of lesser mealworm beetles for Campylobacter jejuni.

Indistinguishable isolates of C. jejuni have been obtained on the same farm from cattle, flies, rodents, and from the feces of sparrows in a nearby urban area, implying the same source of infection.

"Dead Rodents Found in Peanut Plant". Texas officials shut down a peanut plant at the center of a national salmonella outbreak and ordered it to recall all products ever shipped from the plant after they found dead rodents, rodent feces and feathers in a ceiling crawl space above a production area. Preliminary tests by a private lab indicated salmonella was present.

Doyle, M. P. and M. C. Erickson. 2006
Reducing the carriage of foodborne pathogens in livestock and poultry.
Salmonella can be recovered in feces up to 86 days old. Thus Salmonella longevity in fecal pellets is sufficient to present a potential contamination risk in the absence of an active infestation.


Nature loves to hide....

“And thus, food safety personnel everywhere must remain vigilant”

1. Society’s use of smart phones *is* changing our service obligations and work.

Progressive for Rodents:

*More investigator than applicator.*
A service for a typical rodent or two in a residential kitchen, or store, etc., is usually no big deal.

But when dealing with an rodent infestation that has become established and has history with a building and an area.....be careful.

Caution in Sales

Thoroughness and monitoring in service.

The time spent performing pro-active inspections should be separate from the actual service time, and recorded as such on the service ticket.

Looking vs. Observing

1. Along surfaces--yes, but also:
   Up and Within

Along Surface Areas
Dark Shadowy, corners; out of the way; hard to reach
UP....Its not just for Rattus rattus!
And, within...
Rodents are *natural* void and cavity dwellers

“So, what are you going to do about the pests' pests?”
A New York City client.
The House Mouse as a Potential Health Pest in Homes and Apartments
Check any “specks” you note on your glue traps containing a captured rodent.
(again, a hand lens is mandatory equipment of the quality PMP)

The RVAs of everyday buildings:

How to locate the rodents quickly:

Commercial RVAs

Rodent Vulnerable Areas (RVAs) of Commercial Facilities
1. Equipment Base Voids (warmth, darkness, HTR, close to food).
2. Warm Walls/Penetrations
3. Ceilings above heat
4. Cooler Walls
5. Manager’s Desk /Room
6. Low/high level box clutter
7. Any structural floor/wall gaps
Warm hollow walls within 50 ft. of food
Residential Accounts
1. Warm areas in the attached garage, basement and kitchen
2. Basement sill plate near lines up
3. Stove, refrig, dishwasher, sink cab
4. Attic
5. Attached garage expert.
6. Laundry room; check vent/closets.
7. Out of sight with everything; not ease of placement.
**Favorite Key Structural Words for finding rats and mice**
In and around buildings:
- Shadowy corners
- Ledges (e.g., sill plates)
- Lines (heating, conduits).
- Door thresholds
- Fascia boards
- Voids (furniture, equipment, ceiling, etc.)
- Thick vegetative cover
- Cavernous shrubs (Taxus)

**Key Conditional Words for finding rats and mice**
In and around buildings:
- *Warmth*
- *Near food*
- *Stationary items*
- *Let any droppings be your roadmaps*. To baits and traps place

**Pests and Lines**
Ants
Cockroaches
Mice
Rats
Bedbugs

**Pests Follow Lines**
- Plumbing Lines
- Foundation Lines
- Electrical Lines
- Landscaping Lines
- Expansion joint lines
- Building edge lines
- Air Handl. Duct Lines
- Vegetative lines
- Cement walkway lines
- Heating Lines
By way of a short introduction:

New York City: No. 1 Rodentopolis

The takeaway: To keep annoying (and expensive) rodent callbacks to a minimum, rodent inspections should be targeted to likely population sources within or nearby the building— not superficial wall walk-alongs.

Locate the lines:
Locate the shadows
Locate the crannies and corners:
Be the hunter
Take Home Message
You can not run and gun
rodent service.
Inspect, analyze, and then
install equipment

Mus musculus musculus
Mus musculus domesticus
Homo sapiens sapiens
Wise man

Homo sapiens new yorkus
Questions are the creative acts of intelligence.
Frank Kingdon

In a world that is constantly changing, there is no one subject or set of subjects that will serve you for the foreseeable future, let alone for the rest of your life. The most important skill to acquire now is learning how to learn.
John Naisbitt

The future great PMPs will not be those who are best at using traps, baits or sprays, but rather those who are best at keen observation, source finding, analyzing each (unique) pest situation, and keeping cutting-edge current.