"Tools for Eliminating Mice in Multifamily Housing"

December 14, 2017

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Urban Rodentologist
RMC Pest Management Consulting.

Twitter: # Rodentologist

Controlling this *public health* urban rodent takes cooperation:

StopPests in Housing
Northeastern IPM Center

HUD's Office of Healthy Homes and Lead Hazard Control
&
USDA's National Institute of Food and Agriculture.

Special Thanks

Susannah Krysko Reese

StopPests in Housing
Northeastern IPM Center


COURT TOWERS
973-373-4266


PHARMACY

Are we overlooking mice because it is so common, so ubiquitous?

(so Disney ?)


PULL TO OPEN
TOMATO FRENCH DRESSING
1 can Campbell's Tomato Soup
½ cup salad oil
½ cup vinegar

When mice are present , they scurry over our floors, chairs, beds, kitchen, appliances, plates, toys and clothes

constantly urinating and defecating all the while.....

.....we constantly touch with our hands and fingers (the primary human appendages in which we collect and then ingest or absorb microbes that give us colds, flu, and worse).

The House Mouse as a Potential Health Pest in Homes and Apartments

Meerburg et al. (2009) in their critical review paper referencing over 600 scientific papers published during the past two decades:

"Rodents play a significant role in transmission of a large number of diseases to humans and their livestock".

Pathogen	**Estimated number /potential of rodent-borne diseases**
Virus	17
Rickettsial	9
Bacterial	20
Protozoan	3
Cestodes	3
Trematodes	1
Nematodes	3

Mice Inside Buildings:

Mechanical vectors and reservoirs of pathogenic microbes

Allergens
Congenital Toxoplasmosis
Leptospirosis
Murine Typhus
Food borne illness bacteria
Rat bite fever
Lymphocytic choriomeningitus
Others……

Mice Inside Buildings:

Ectoparasites:

Tropical rat mites
House mouse mite
(Rickettsia)

Urine droplets

- *3000 per 24 h.*

- *MUPs*

REVIEW

Allergy to rodents: an update

H. Jeal and M. Jones

Department of Occupational and Environmental Medicine, Imperial College (NHL

Clinical & Experimental Allergy

Summary

Allergy to rodents in the work
research, pharmaceutical and
employees working in this are
in the workplace, there are few
Rodent allergens are well char

Summary

Allergy to rodents in the workplace is an important occupational health problem affecting research, pharmaceutical and toxicological sectors and can have a serious impact on employees working in this area. Despite measures to reduce aeroallergen exposures to rodents in the workplace, there are few signs that this occupational health problem is declining. Rodent allergens are well characterized and exposure–response relationships have been demonstrated to be complex. More recently, the importance of rodent allergens outside of the workplace has been demonstrated in several studies of individuals with asthma. This review focuses on rodent allergy both in the workplace and in the home and examines the complex exposure–response relationships between allergen exposure and sensitization and asthma. Risk factors for rodent allergy and mechanisms of tolerance to rodent allergens are discussed.

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that sensitization to inhalant aller-

exposures in settings outside of the workplace, allergy to rodents has become increasingly important. This review

Published in final edited form as:
Ann Allergy Asthma Immunol. 2009 February ; 102(2): 125–130.

Mouse Allergens in Urban Elementary Schools and Homes of Children with Asthma

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levels, low dog allergen levels, and primarily undetectable levels of dust mite allergens in our sampled schools. In classrooms of a subset of students with asthma, we found significantly higher levels of MUP compared to their bedrooms.

The difference in MUP levels was the most important finding of this study. These data indicate that, in our study, there was a subset of children with asthma who were exposed to significantly higher levels of mouse allergen in schools compared to their homes. It does not appear that students were bringing this allergen from their homes as it was found in very low levels throughout all homes in this area. This demonstrates that school 3 provided an exposure of mouse allergen that was independent of homes. This may play an important role in asthma morbidity for students with asthma attending this school. This study was not powered to evaluate allergen exposure and asthma morbidity, but we found that in a school with higher

Indoor Air 2005; 15: 228–234
www.blackwellpublishing.com/ina

INDOOR AIR
doi:10.1111/j.1600-0668.2005.00363.x

Mouse and cockroach allergens in the dust and air in northeastern United States inner-city public high schools

Abstract Considering that high school students spend a large proportion of their waking hours in the school environment, this could be an important location for exposure to indoor allergens. We have investigated the levels of mouse and cockroach allergens in the settled dust and air from 11 schools in a major northeastern US city. Settled dust samples were vacuumed from 87 classrooms, three times throughout the school year. Two separate air samples (flow = 2.5 lpm) were collected by 53 students over a 5-day period from both their school and their home. Mouse allergen (MUP) in the dust varied greatly between schools with geometric means ranging from 0.21 to 133 μg/g. Mouse allergen was detectable in 81% of the samples collected. Cockroach allergen (Bla g 2) ranged from below limit of detection (<0.003 μg/g) to 1.1 μg/g. Cockroach allergen was detected (>0.003 μg/g) in 71% of the dust samples. Bla g 2 was detected in 22% of airborne samples from the schools. By comparison, mouse allergen was only detected in 5%. These results indicate that the school may be an important location for exposure to allergens from mice and cockroaches and is an indoor environment that should be considered in an overall allergen intervention strategy.

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Key words: School; Mouse; Cockroach; Allergen; Airborne; Dust.

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Received for review 18 February 2005. Accepted for

The house mouse is an important public health pest in housing.....

Not any less so than cockroach (allergens) or bedbugs.....


Ehrlich

The “Types” of Mouse Infestations Inside MFH Properties:

naming mice according to where they are harboring within apartments.

Mouse nests inside apartments

1. Warm floor voids beneath radiators
2. The canyons and caves of the kitchen
3. Furniture voids (couches, chairs)
4. Wall voids
5. Cluttered boxes in closets
6. Pantry boxes out of reach and forgotten.

(like bed bugs…… only a bit more space).

Kitchen Mice

1. Kitchen appliance mice

Stoves (broiler voids/bases, insulated walls, burner plate void
Refrigerator (mostly compressor motor void)
Dishwasher (same as refrigerator mice)

2. Kitchen sink cabinet base (below all components of the "sink" cabinets.

3. **Kitchen wall mice** (Usually behind any warmth-generating appliance above and esp. where unsealed plumbing lines, gas lines and electrical lines enter walls as the mice used the gaps around the unsealed lines to invade and nest within the wall voids.

4. **Pantry mice** (walls, ceilings, old unused food boxes, etc.).

Appliance Canyons and Caves

Stove
Dishwasher
Refrigerator
Sink Cabinet Base
Void


Bat Rabies Alert


It's raining
cats&dogs
And 84 more weather words!
Pancake Syrup
Reynolds Wrap
HEAVY DUTY


MODEL NO.
SERIAL NO.
J B255D J1WW
GG264255P
120/ 240V 60 Hz
120/ 208V 60 Hz
KILOWATTS
11,7
8,8
INPUTS @ 240 V
WATTS
6" TOP UNIT
1 500
8" TOP UNIT
2 600
BAKE UNIT
2 585
BROIL UNIT
3 410
General Electric Company
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LISTED
HOUSEHOLD ELECTRONIC RANGE 28TW
MADE IN MÉXICO
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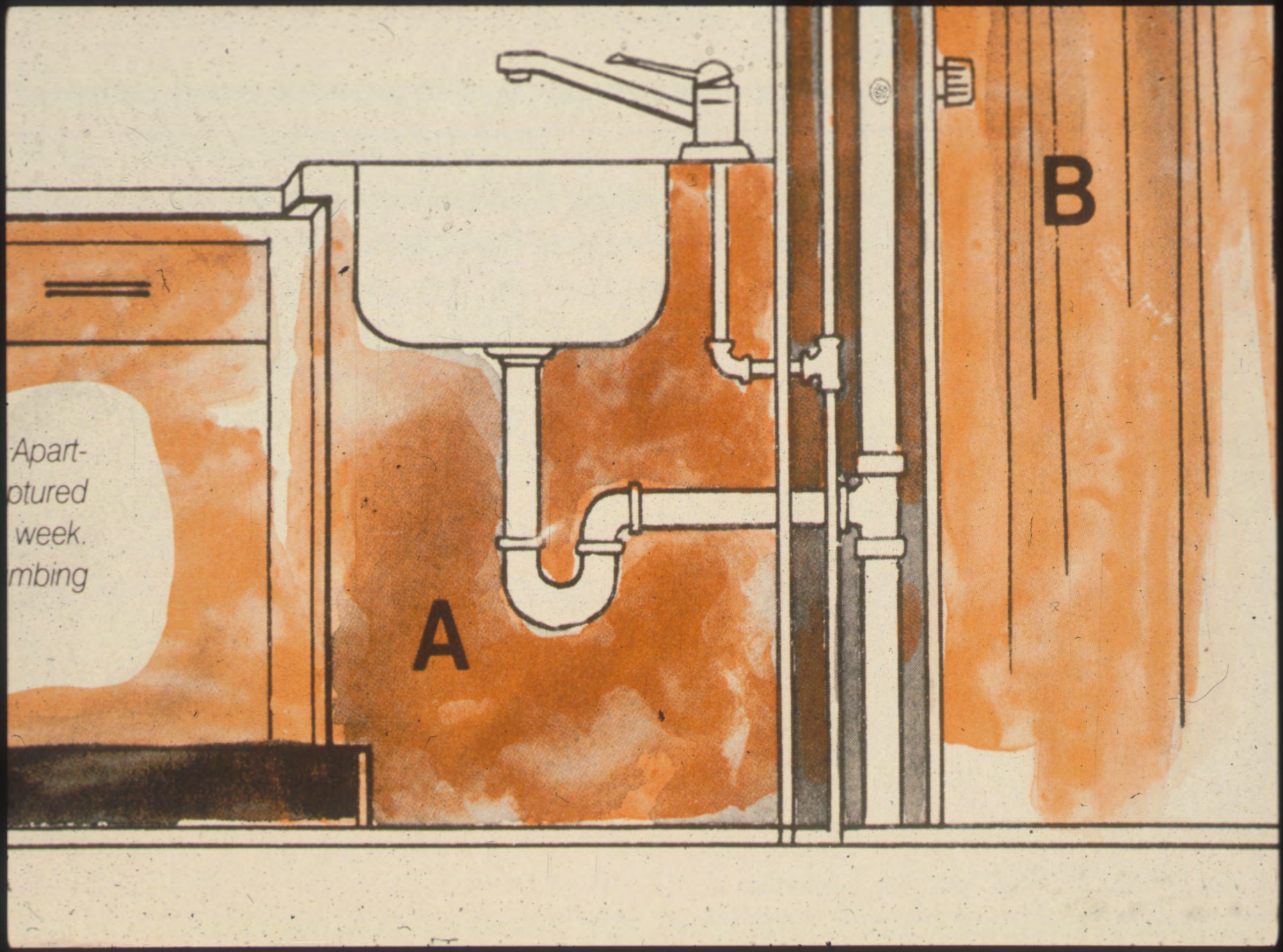
MADE IN MEXICO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Heating register mice

3. Box Clutter Mice

3.


Greenies Pill Pockets
Vet Script
Prescription Vials
VET-08
8 GREEN DRAM
PULL DOWN ACCESS WINDOW
WINGLID FILE BOX
Fecal Diagnostic Kit
MANUFACTURED FOR & DISTRIBUTED BY
FIVE STAR SUPPLIES CORP
1301 WEST ELIZABETH AVENUE LINDEN NJ 07036
Made in China
Baxter

4. Furniture Mice

Refuse room mice


PREMIER
MARK IV.
NJIT

Control (IPM)

Controlling this *public health* urban rodent takes cooperation:

And it truly is integrated among affected parties:

1. Property Owner
2. Building Supers / Maintenance
3. Apartment Tenants
4. Contracted Pest Professionals.

Pest Exclusion is Pest Prevention

and……

Pest Prevention is Public Health.

1. Mouse exclusion is smartest ....
and not difficult nor expensive

Correctly excluding mice;
Door Sweeps
Good high quality caulks (sealants)
Not foam

(e.g., Xcluder, Sealeze brushes).

A weather strip is not a pest strip!!

Rodents gnaw; air currents do not.

XCLUDER
RODENT AND PEST CONTROL

and 3/4in/19mm in width. **(Figure 9-2)** Note:

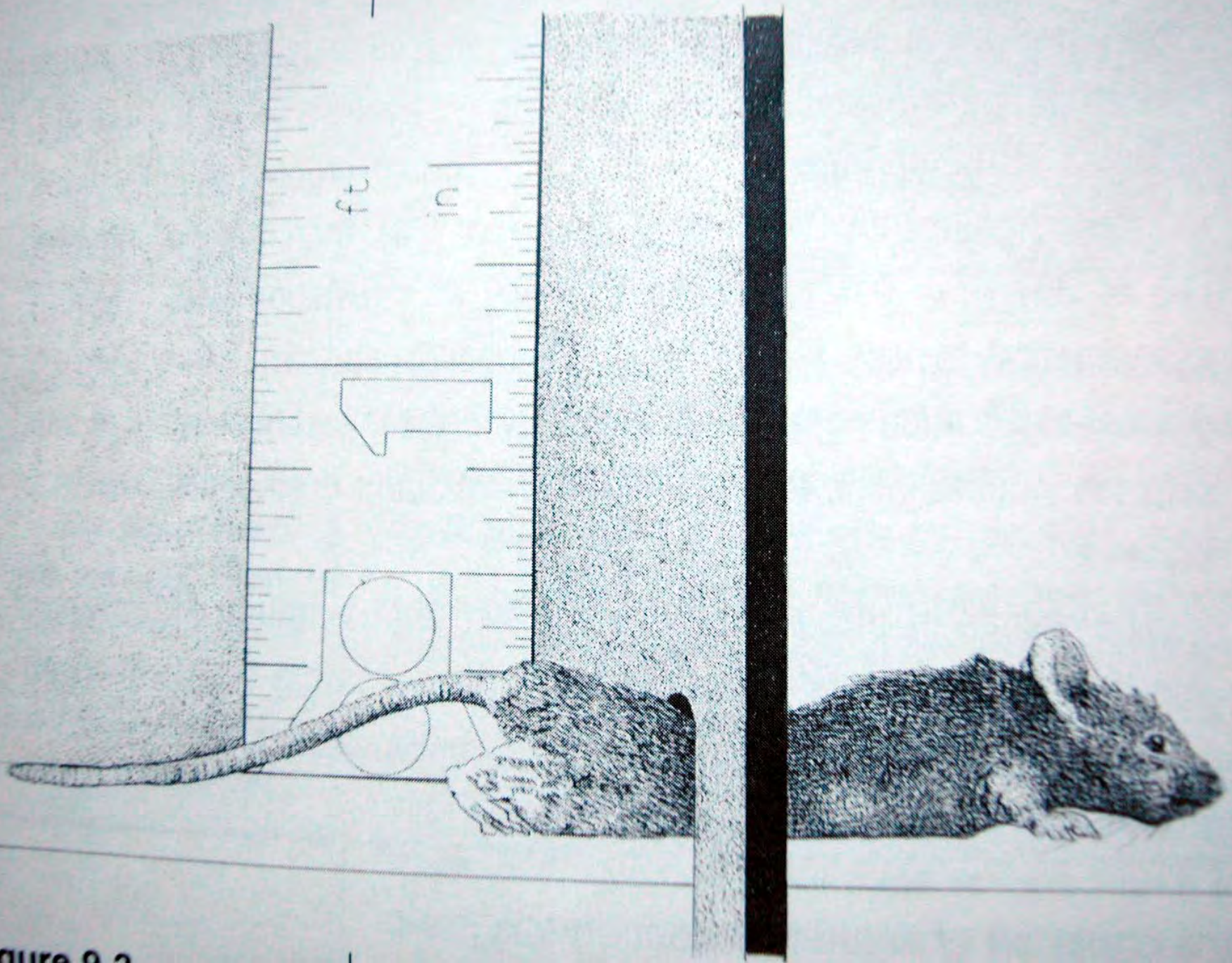


Figure 9-2


PLEASE
USE
REVOLVING
DOORS

2. Sanitation and De cluttering and general clean up (detail cleaning to zero crumbs)

Boxes are key
Furniture in all rooms
All appliances in kitchen

3. Mouse traps are effective for minor infestations but are best done by an experience pest professionals

homeowners can set traps and catch a few ; but may not be experienced to do more than “harvest” a few.

Maybe , 1 to 2 mice under the kitchen sink could be done by a DIY.....
Maybe.....

(but if one mouse is pregnant female, and the DIY misses.....

..... Mice reproduce very quickly.


Stick-All
Victor
ROACH TRAP
& Monitor
VICTOR

Black Widow


VICTOR

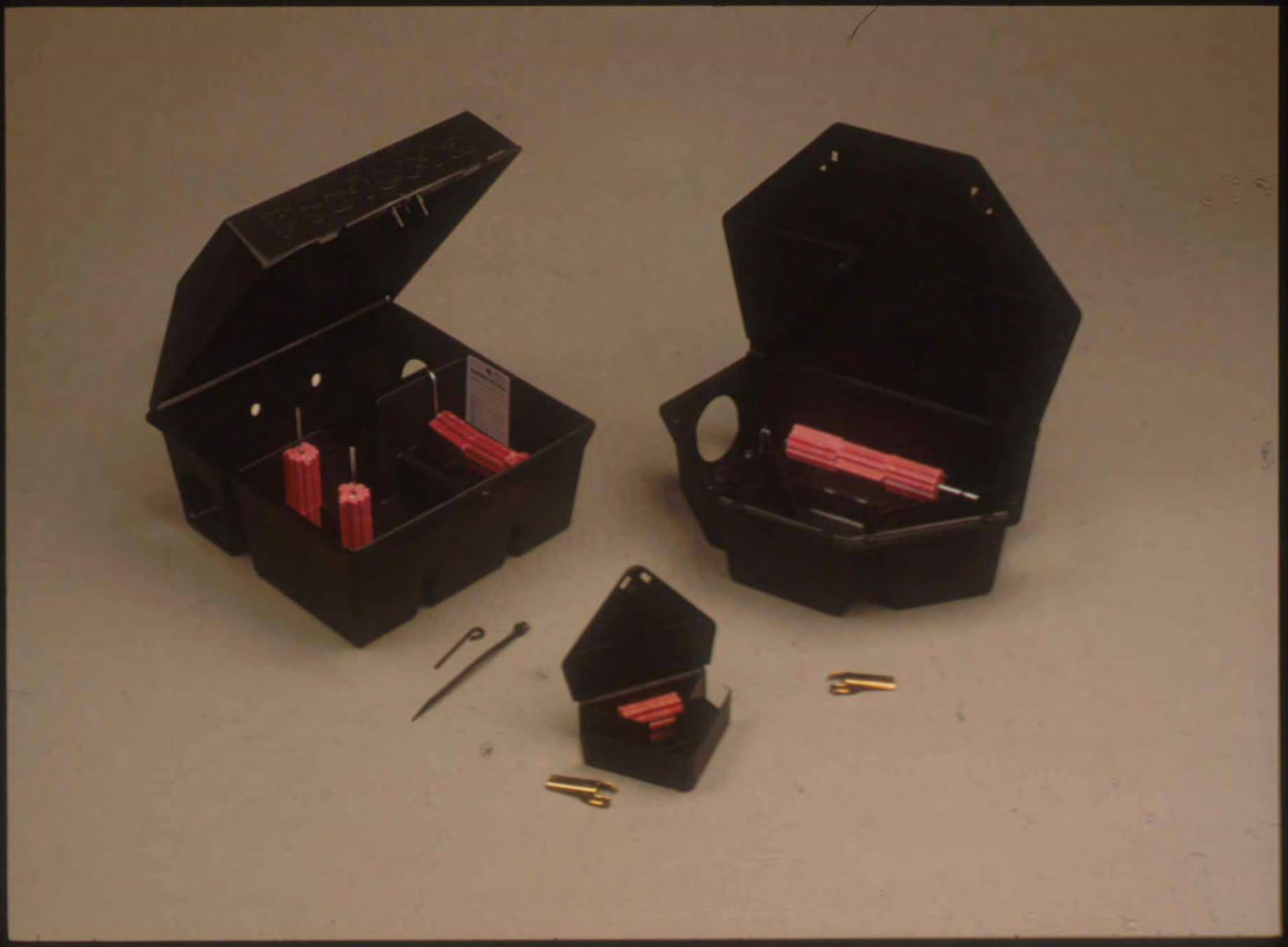
A few mice in a house:

- 1. 2 beneath sink
- 2 behind stove
- 2 behind refrig
- 4-6 garage (nearby w. heater)
- Sill plate in basement (feces inspection)
- Attic within arms reach


POISON BAIT
Victor
PROFESSIONAL BAIT STATION
Victor
MOUSE
GLUE TRAPS


CATCHMASTER

3. Mouse baits are appropriate for the more on-going chronic infestations.
And if used professionally with professional bait stations are safe and efficient strategies.




DANGER
DO NOT TOUCH
POISON

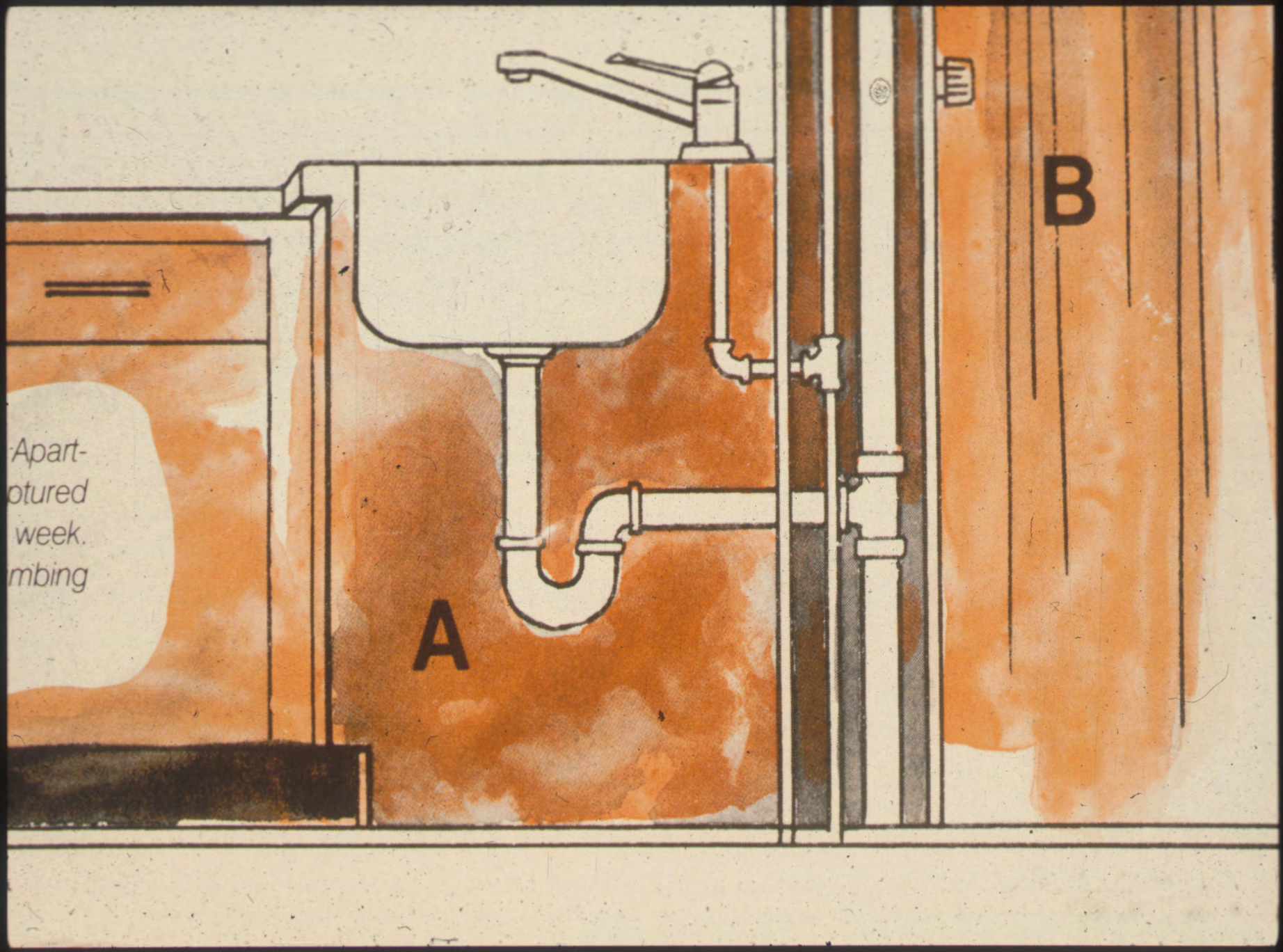
Anyone (homeowner, super, or exterminator, custodian, etc.) that “tosses” poison mouse baits around anywhere is **illegally** applying a pesticide, and of course posing hazards to children, pets and/or wildlife .


INSTALLING THE WATER LINE
This refrigerator will accept
ice maker IM-G5. Use
sheet

Not massive applications of the Restricted-use -Pesticides
e.g., mouse "dusts".
(i.e., tracking powders)

be very careful of any exterminator touting they will apply liberal amounts to walls, floors, voids.....
Ask to review labels and amounts....


PURINA
Friskies
Chicken, Beef & Liver Flavors
FOR CATS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The monies we've come to realize we must spend to remediate for bed bugs, we must also spend for chronic mouse infestations.

Avoid off-the-shelf gizmos or sprays or repellents that promise to rid a premises of pests just by plugging them in....or a simple spray-on

.

If there are no formal scientific data published to support it...

Buyer beware.

Check with .edu sites and pest scientists when in doubt.

When multiple apartments are complaining.....

It is about building populations and apartment infestations as part of those building populations.

Why do we let pests into our building and then try to kill them after they are in ?

Lice, fleas, viruses, bacteria, etc.

If we aren't organized first,
its not happening.....
No matter what trap, bait,
pest professional,
is used.

Finger pointing is pointless.

When mice are present , they scurry over our work desks, kitchen, appliances, plates, beds, toys and clothes. In only one week, a single mouse can deposit thousands (literally) of micro-droplets of urine and hundreds of fecal pellets in our living spaces and/or onto the furniture and equipment in which we constantly touch with our hands and fingers (the primary human appendages in which we collect and then ingest

Pest Exclusion is Pest Prevention

and……

Pest Prevention is Pubic Health.

1. **Each apartment is independent of the whole**

1. **Privacy rights at rodent reservoirs**

2. **Rarely are pest control services addressing the population; but rather the complaints (should there be regulations since these are public health pests and it is a case of second hand disease threats???).**

S

4. **Difficult to get the property owners to maintain the building and grounds as needs to be done to prevent rodents.**

5. **Rodent proofing is not done at the building level nor at the apartment level.**

6. **Ceiling and wall floor rodents are often not addressed due to time restraints due to low pest control markets**

Always a slow boil: decades

“Maintenance” rodent programs

vs

Infestation management and population tracking

Most mouse infestations inside multi-family housing are harvested not eliminated.

Mouse proofing an apartment

1. Door sweeps
2. Plumbing lines in kitchen (3)
3. Bathroom (3)
4. Gas lines
5. Any floor / wall cables
6. Radiator steam lines.

It is neither difficult nor expensive to mouse proof the average apartment.

(if it is done by someone that truly understands/experienced in pest proofing (Scope).


COLUMBIA UNIVERSITY POLICY
SMOKING IS PROHIBITED OUTDOORS
WITHIN 20 FEET OF ALL UNIVERSITY
BUILDINGS

Escutcheon plates

Quality sealants not caulks (shrinkage/ gnawable edge)

Stainless steel fabric for holes and sweeps (e.g. Xcluder brand).

Mouse Elimination (2)

1. Snap Traps in mouse highways
2. Block baits in RTUs
3. Glue trap moats/dis-assemble clutter

Acceptable but not the best:

Caulks
Foam
“Brillo” pads
Copper mesh

The rodents use all the risers and utility chases as inter-floor highways.

These areas must be addressed to gain control.

Preventing future infestations

A. Building envelope

B. Mouse-proof the apartment

C. Clutter control and detail clean

The prep work necessary for bedbug jobs is nearly identical to mouse jobs

Second Hand Mice

Feces (and micro-flora) onto food or food items.

Urine (and allergenic proteins)

Gnawing on items and wires

Ectoparasites onto humans

Hairs onto foods

Rodents move relatively easily and quickly between filthy streets, alleys, sewers, garbage cans, and dumpsters into…….

homes, multi-family hi-rise bldgs., restaurants, food plants, schools, hospitals, office buildings and hotels.

Obviously, urban mice (and rats) cannot be ruled out as public health threats.

The house mouse as a health pest:

Allergens

Rickettsialpox

Lymphocytic choriomeningitus

Congenital toxoplasmosis

Food borne illness (Salmonella, campylobacter, etc.)

Rat bite fever

Others……..

The house mouse mite, *Liponyssoides sanguineus* common on mice, readily attacks people in buildings in which mice are living; causing dermatitis.

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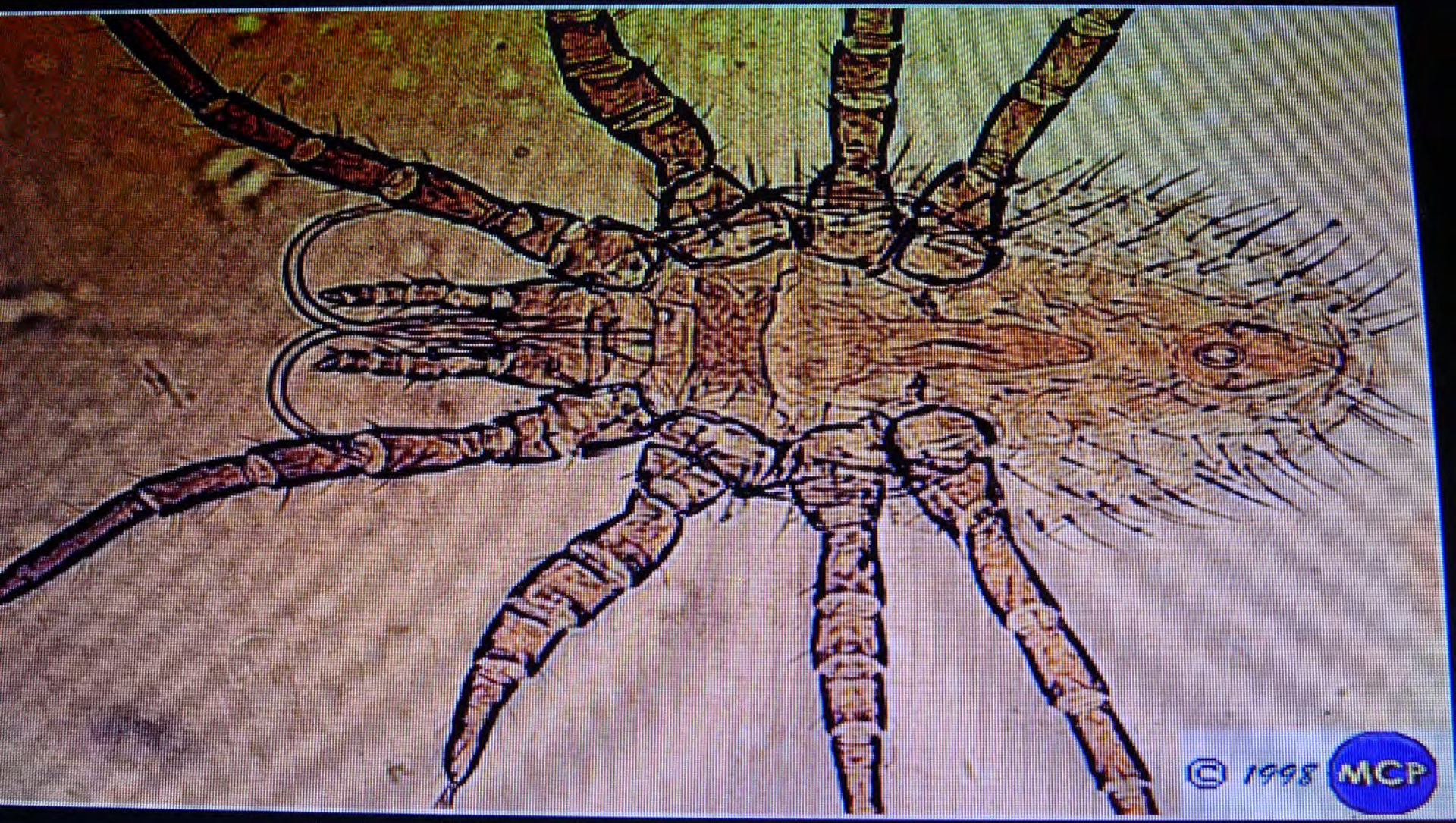
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FOOD-BORNE ILLNESS.

Asked of Dr. Michael Doyle, 2014

(Regents Professor of Food Microbiology, and Director, Center for Food Safety, University of Georgia) at the Nestle Purina 2014 Food Safety Symposium (Denver CO, September 23-25, 2013).

Panelist: "Dr. Doyle, would you eat in a restaurant if there was only *one* mouse in the facility, but it was carrying *Salmonella enteriditus* ? "

Dr. Doyle: "Probably not. Nor would you I presume."

Why do we let pests into our building and then try to kill them after they are in ?

Lice, fleas, viruses, bacteria, etc.

Figure 16. A closer look at Figure 14. Mice living in stoves will drag the batting from the walls and use it for bedding in any nook and cranny of the stove's base –often in the back of the broiler pan's or the bottom pot/pan drawer of stoves. (Red arrow points to a mouse bed. The green arrow points to a amateurish attempt at using cheap foam spray to plug the walls holes that contain the electrical sockets and plugs. Mice actually love the foam for insulations and to make foam beds and the like.

Figure 11. Note the brown mouse smears on top of the radiator in the corner (red circle). Mice love such corners that are hidden behind heavy furniture (e.g., tv consoles, dressers, etc.). The smears contain heavy urine accumulation and thus large amounts of allergens that can affect the children of the apartment. The sticky traps laid down here will capture the occasional young mouse, but are not very effective in eliminating the overall mouse family units that likely are infesting several areas of the living room and surrounding rooms. For that, intensive snap trapping /poison baiting effort are necessary.

Thanks.