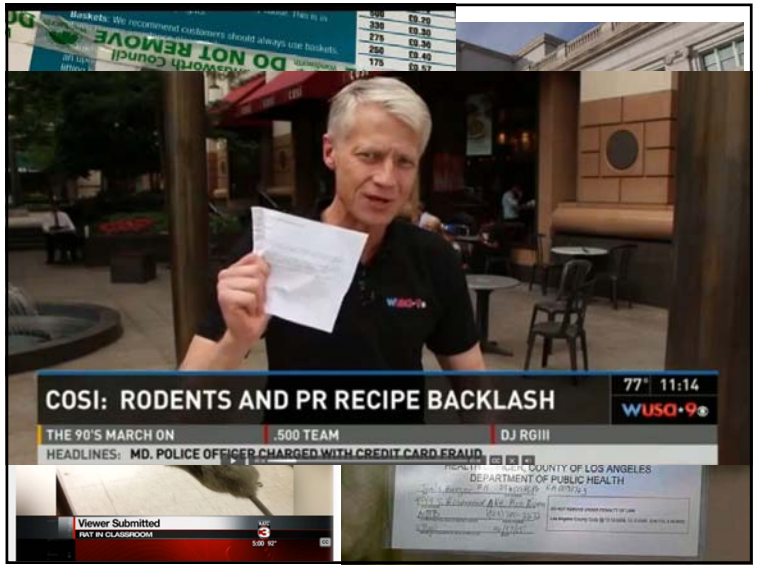
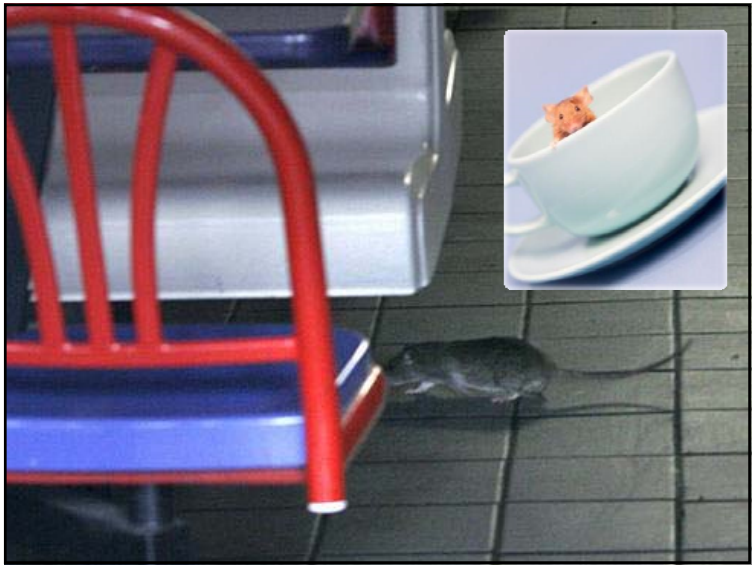

RODENTS
44% of all mammalian species are rodents
SUCCESS


DO NOT REMOVE
COSI: RODENTS AND PR RECIPE BACKLASH
77° 11:14
WUSA·9
THE 90'S MARCH ON
.500 TEAM
DJ RGIII
HEADLINES: MD. POLICE OFFICER CHARGED WITH CREDIT CARD FRAUD
Viewer Submitted
RAT IN CLASSROOM
DEPARTMENT OF PUBLIC HEALTH




Homo sapiens !
12,000 – 15,000 rodenticide incidents per year
d-CON
KILLS MICE
Can Kill In One Feeding


GOPHER GETTER
"Willie Wilco"
TYPE 1 BAIT
READY TO USE
ACTIVE INGREDIENT:
STRYCHNINE ALKALOID 0.50%
INERT INGREDIENTS 99.50%
TOTAL 100.00%
KEEP OUT OF REACH OF CHILDREN
DANGER POISON
FIRST AID
IF SWALLOWED:
• CALL A PHYSICIAN OR POISON CONTROL CENTER
WILCO
GOPHER GETTER
TYPE 1 BAIT
NET WT. 1 LB.


26 4 year-olds

RAT BITES

- Intangible cost of rat-associated injury and illness
- Over 10,000 rat bites

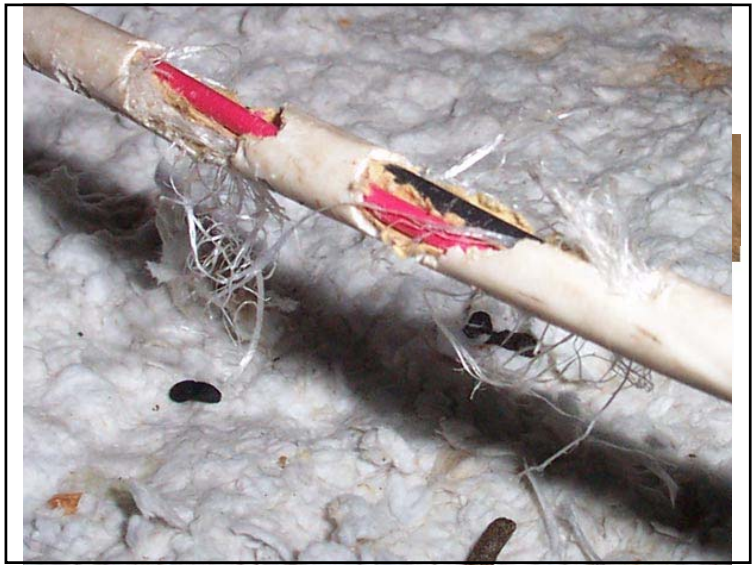
  per year in the U.S.
- Infants and defenseless adults

Allergen issue
Asthma

RODENT-BORNE DISEASES

RAT-BITE FEVER –transferred by the bite of a rat

- **LEPTOSPIROSIS** –direct or indirect contact with urine
- **SCRUB TYPHUS** - bite of mites living on rodents
- **MURINE TYPHUS FEVER** – rats are hosts of flea vectors
- **SALMONELLOSIS** –gastroenteritis pathogens spread through food or water contaminated with rodent feces
- **PLAGUE** and **HANTA VIRUS**



A few types of rodents

- Rats
- Mice
- Squirrels
- Chipmunks
- Woodchucks
- Voles
- Gophers

RECOGNIZING RAT AND MOUSE SIGNS

GNAWINGS:
Rat **incisor teeth grow 4 to 6 inches a year**
Must gnaw each day to keep their teeth short

ROOF RAT
(*Rattus rattus*)

- Smaller than Norway rat
- Agile climber
- Originated in tropical Asia where they ate mostly fruits and seeds

ROOF RAT

- Young, 6 -8 per litter
- 4 -6 litters per year
- Live ~ 1 year
- Range, 100 – 150 feet

- Indoors – attics, between floors and ceilings, in walls and enclosed spaces
- Outdoors – in trees and dense vine growth, can burrow

- **Food** – vegetables, fruits, cereal - require ½ to 1 oz dry food, more if moist
- **Water** –1 oz per day

NORWAY RAT
(*Rattus norvegicus*)

NORWAY RAT

- Originated China, Japan, mainland Asia, India, and other Indo-Malayan countries
- Burrow, but can climb
- Large droppings, up to ¾ inch long
- Sexual maturity in 3 – 5 months
- Gestation period, 22 days
- 12 – 18 per litter
- 4 – 7 liters per year
- Life span about 1 year
- Range is about 100-450 feet

NORWAY RAT

Outdoors – burrows in ground and under foundations, in rubbish, garbage dumps and sewers

Indoors – between floor and ceilings, in walls, enclosed spaces, shelving, appliances, piles of rubbish, and other spaces concealed from view

NORWAY RAT

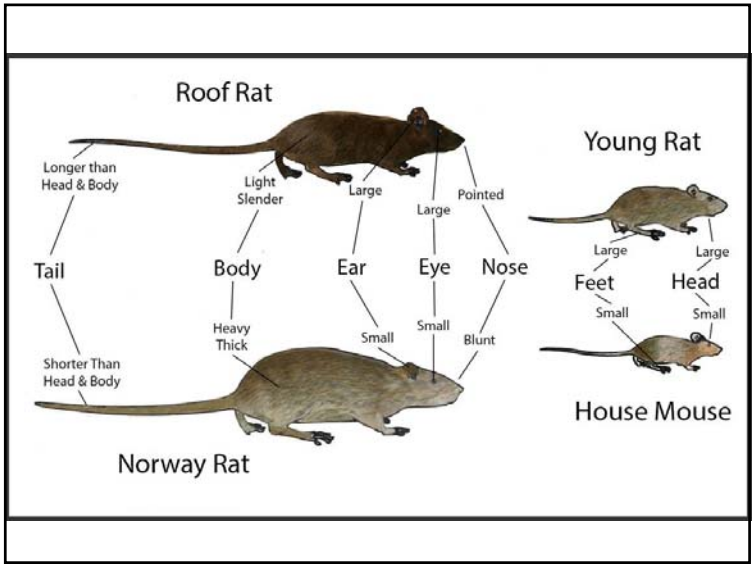
- **Food**
  - Omnivorous historically
  - Garbage, meat, fish, vegetable, fruit, and cereal baits are well accepted; daily requirement, ¾ to 1 oz of dry food, more moist food

- **Water**
  - ½ to 1 oz per day

RATS CAN:

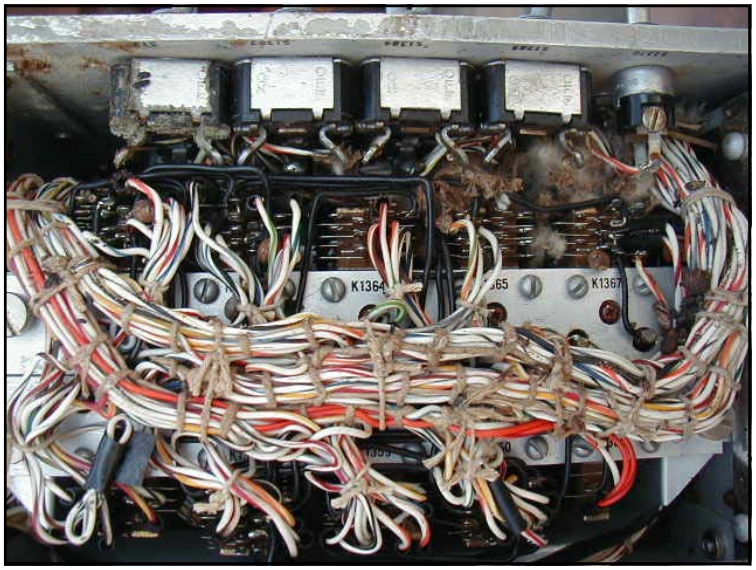
- Pass through quarter-sized opening (½")
- Use wires, conduits or pipes to gain access
- 180 fecal pellets/day
- Survive a 50' fall
- 13" reach

- 36" vertical jump
- Tread water 3 days
- Swim underwater for 30 sec.
- Swim 1 mile in open water
- Gnaw on wood, lead pipes, cinder blocks, asbestos, aluminum, sheet metal, glass, and sun-dried adobe



– Throughout the world

HOUSE MOUSE
(*Mus musculus*)



HOUSE MOUSE

- Droppings: small, <¼ inch
- Sexual maturity: reached 1 ½ to 2 months after birth
- Young: 5 – 6 per litter
- Number of litters: <8 per year
- Length of life: < one year

HOUSE MOUSE

- **Food** - historically seed-feeders
- Cereal grained preferred, but most types of edible materials; a nibbler - daily requirement - 1/10th ounce
- **Water** - Can utilize metabolic water in food to survive

MOUSE FACTS

- Survive an 8' fall
- Runs at 12 ft /sec
- 50 fecal pellets/day
- 12" jump vertical
- Swim
- Resurface after being flushed down toilet
- Thrive in cold storage room 14F
- Enter structure with ¼" opening (dime)
- Eats 4 lbs of food and makes 18,000 fecal pellets / 6 mo

MOUSE FACTS

- Several hundreds to thousands of microdroplets of urine/day

GENERAL RODENT FACTS

- Poor vision, color blind
- Keen smell, taste, touch, hearing
- Mostly active evening, early morning
- Omnivores
- Hoarders
- Territorial
- Do not go beyond home range easily
- Provision nest with any soft material
- Reproductively prolific; may be pregnant while nursing pups
- Kinesthetic memory, orient via touch

VIBRISSAE (WHISKERS)

RECOGNIZING RAT AND MOUSE SIGNS

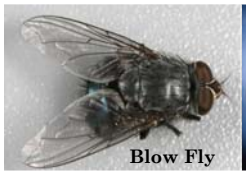
- **Visual sightings**
- **Rodent Sounds:** High pitched squeaks
- **Rodent Odors:** Odors produced from urine and body glands

RECOGNIZING RAT AND MOUSE SIGNS

Rub Marks:
Dark markings rodents make with their bodies along runway walls

INDICATOR PESTS

Found near dead animals or trash



Blow Fly

Hide Beetle

Found near grain or bait stored in walls

Indianmeal Moth

Grain Beetle

Key *Conditional* Words for finding rats and mice in and around buildings:

*Warmth

* Near food

* Stationary items

* Let droppings be your roadmaps (trap placement)

Bobby Corrigan, RMC PMC ©

Evidence of Clutter Bugs

PREVENTION AND CONTROL: DUMPSTERS

RODENT MANAGEMENT

- Repair holes in outside walls

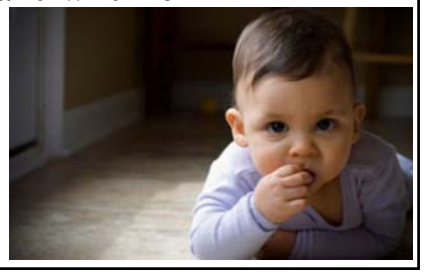
<u>IMPORTANT</u> - RODENT BAITING WITHOUT ENVIRONMENTAL IMPROVEMENTS AND GOOD SANITATION WILL BE INEFFECTIVE

- Poisons and Baits
  - –Multi-Dose Poisons
  - –Single-Dose Poisons
  - –Sterilants

- **EPA ban aluminum and magnesium phosphide pesticides** in residential areas, including homes, nursing homes, day care facilities, hospitals and schools, (except on school athletic fields)

http://www.epa.gov/rodenticides/rodent-control-pesticide-safety-review

- EPA changes Mouse and Rat Control Products
- Rodenticide products that reduce exposure to children, pets and wildlife



Rodenticides
- **First-generation anticoagulants**: warfarin, chlorophacinone and diphacinone
- Multiple-dose
- Inability to produce essential blood-clotting factors
- Shorter elimination half-live
- Less toxic

Rodenticides
- **Second-generation anticoagulants**: brodifacoum, bromadiolone, difenacoum, and difethialone
- Single-dose
- Used at lower doses due to higher toxicity
- Vitamin K1 antidote for both 1st and 2nd generation
- Not easily excreted
- May be stored in liver

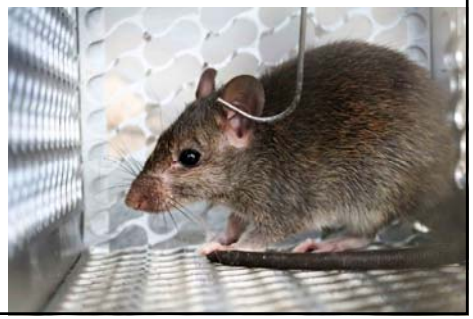
Anticoagulants interfere with blood clotting, and death results from excessive bleeding – relatively humane

Second-generation anticoagulants are:
- Highly toxic, persist a long time in body tissues
- Designed to be toxic in a single feeding
- But time-to-death is several days, and rodents feed multiple times before death
- Carcasses contain residues that may be many times a lethal dose
- Predators and scavengers may die

Rodenticides
- Non-anticoagulants: bromethalin, cholecalciferol, zinc phosphide and strychnine

Non-anticoagulants:

- **Bromethalin** is a nerve toxicant that causes respiratory distress
- Very fast acting
- No antidote
- Highly toxic to some species
- Breakdown products are more toxic
- Single dose



Non-anticoagulants:

- **Cholecalciferol** - vitamin D3
- Causes renal failure
- Multiple-dose
- Time lag between exposure and signs of toxicity
- Few human poisonings, but some pet poisonings

Non-anticoagulants:

- **Zinc phosphide** causes liberation of toxic phosphine gas in the stomach
- Inhalation causes anxiousness, extreme difficulty breathing, and death
- Several human pediatric fatalities have occurred

Non-anticoagulants:

- **Strychnine** causes involuntary muscle spasms in both people and animals
- Death is caused by impaired breathing
- Alkaloid derived from seeds of the tree *Strychnos nux-vomica*

Soooooooo ultimately which will do the least harm to non-targets?

- None will do no harm
- How they are used will affect risk as much as what is used
- 1st generation anticoagulants used in locked, tethered bait stations with blocks secured onto inner pins

Revised Risk Mitigation Decision for Ten Rodenticides
http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPP-2006-0955-0764
Restrictions on Rodenticide Products
http://www.epa.gov/rodenticides/restrictions-rodenticide-products

TYPES OF TRAPS

- Snap
- Metal lever
- Multi-catch
- Live
- Glue boards
- Electrocuting

PLACEMENT SPECIFICS - SNAP TRAPS

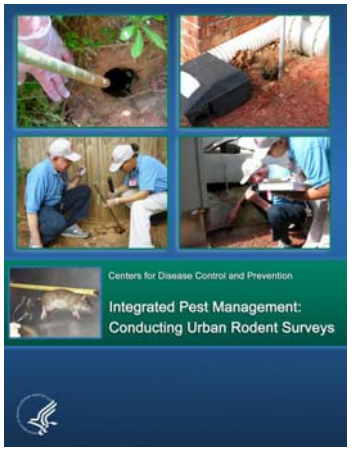
- Place so long axis is perpendicular to the travel route w/ trigger/bait pan across path
- 2 traps side by side ↑ chances of success
- 3 traps in a row – hard to hurtle
- 6 – 10' mice
- 20 – 30' rats
- Pre-bait traps

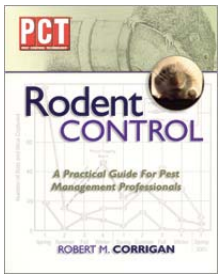
REMOVAL OF DEAD RODENTS FROM TRAPS

- Check traps regularly
- Spray dead rodents with a disinfectant
- Using heavy gloves, remove rodent from trap and place in double sealed bags
- Discard rodent in a sealed outdoor waste receptacle
- Disinfect gloves if they will be reused
- Decontaminate traps before reusing
- **www.cdc.gov/ncidod/diseases/hanta/hps/index.htm**

MY OPINION REGARDING GLUE TRAPS

- Can generate significant problems in occupied buildings
- Trap young mice primarily
- Cause trap shyness





HTTP://WWW.CDC.GOV/NCEH/EHS/DOCS/IPM_MANUAL.PDF

I'm telling you… the rodent was big!!