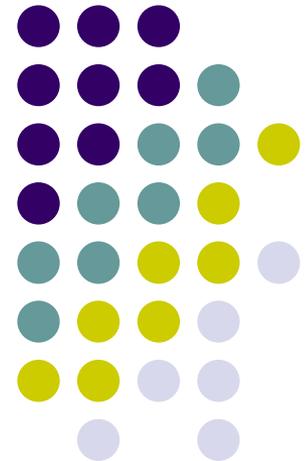


Pet control and food sanitation

By

Assoc.Prof.Dr.Narumol Matan





Rodents

- Rats and rodents are known to be carriers of several types of diseases

Plague	<i>Yersinia pestis</i>
Typhus fever	<i>Rickettsia typhi</i>
Weil's disease หรือดีซ่าน	<i>Leptospira spp.</i>
Rat-bite fever	<i>Streptobacillus moniliformis</i>
Trichinosis	<i>Trichina spiralis</i>
Lassa	
Salmonellosis	<i>Salmonella spp.</i>
Rickettsialpox	<i>Rickettsia akari</i>

Rattus rattus



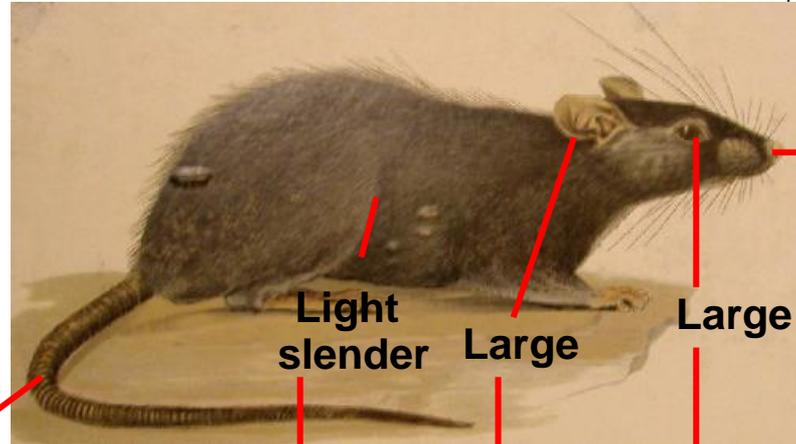
Types of rat

1 *Rattus norvegicus*

(Norway rat)

2 *Rattus rattus*

(Roof rat)



Pointed

Light slender

Large

Large

Longer than head and body

Tail

Body

Ear

Eye

Nose

Heavy thick

Small

Small

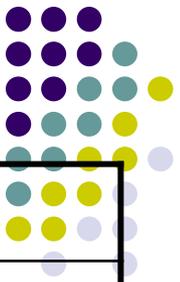
Shorter than head and body



Blunt

Rattus norvegicus

Comparison between 2 types of rat



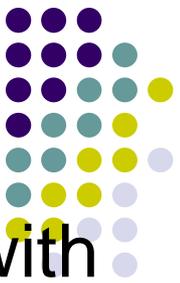
	Norway rat	Roof rat
Fur	Black, Brown	Black
Weight	350-454 g	227-351 g
Body conformation	Thick	Thin
Tail	Shorter than head and body	Longer than head and body
Muzzle	ปลายทื่อ	ปลายแหลม
Ear	Medium	Big
Sexual maturity	3-5 months	3-5 months
Gestation period	22 days	22 days
Number of young/litter	8-12	6-8

Behavior



- Norway rat live in ground but Roof rat live in roof





- Norway rats live in close association with people. In urban or suburban areas they live in and around residences, in cellars, warehouses, stores, slaughterhouses, docks, and in sewers. On farms they may inhabit barns, granaries, livestock buildings, silos, and kennels. They may burrow to make nests under buildings and other structures, beneath concrete slabs, along stream banks, around ponds, in garbage dumps, and at other locations where suitable food, water, and shelter are present. Although they can climb, Norway rats tend to inhabit the lower floors of multistory buildings.



- Roof rats are more aerial than Norway rats in their habitat selection and often live in trees or on vine-covered fences. Landscaped residential or industrial areas provide good habitat, as does riparian vegetation of riverbanks and streams. Parks with natural and artificial ponds, or reservoirs may also be infested. Roof rats will often move into sugarcane and citrus groves. They are sometimes found living in rice fields or around poultry or other farm buildings as well as in industrial sites where food and shelter are available.
- Roof rats frequently enter buildings from the roof or from accesses near overhead utility lines, which they use to travel from area to area. They are often found living on the second floor of a warehouse in which Norway rats occupy the first or basement floor. Once established, they readily breed and thrive within buildings, just as Norway rats do. They have also been found living in sewer systems, but this is not common.

Food Habits



- The food habits of roof rats outdoors in some respects resemble those of tree squirrels, since they prefer a wide variety of fruit and nuts. They also feed on a variety of vegetative parts of ornamental and native plant materials. Like Norway rats, they are omnivorous and, if necessary, will feed on almost anything. In food-processing and storage facilities, they will feed on nearly all food items, though their food preferences may differ from those of Norway rats. They do very well on feed provided for domestic animals such as swine, dairy cows, and chickens, as well as on dog and cat food. There is often a correlation between rat problems and the keeping of dogs, especially where dogs are fed outdoors. Roof rats usually require water daily, though their local diet may provide an adequate amount if it is high in water

- หนูทั้ง 2 ชนิดจะนำพวกกระดาศ , เศษ **Cotton**, เศษผัก, ขน นก และวัสดุอื่นๆเพื่อสร้างรัง ของมัน ปกติวัสดุที่ใหม่ไฟได้จะ เต็มไปด้วยรอยฟันของหนู
- ปกติมันจะหาอาหารห่างจากรัง ของมันประมาณ 100-150 ฟุต อย่างไรก็ตามมันก็มักจะอพยพ โดยมันสามารถว่ายน้ำได้ อพยพ ตามท่อน้ำ ถนนระหว่างตึก





- **Reproduction and life cycle**
- -A female rat will have six to 10 babies at one time. They are born blind and without fur. The gestation period for rats is quite short – around three weeks for most species. The young rats are weaned about three weeks later and are sexually mature at 3 months old.
- Rats tend to mate close to where they were born, but will also move to new territory if the space is crowded.
- The average rat in the wild will live for around one year, with female rats often outliving the males.



-Water

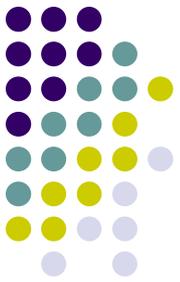
- **Free water** 15-50 ml per day

-Food

- 18-22.5 kg

- Capabilities

- crawl through or under any opening higher or wider than 1/2 inch (1.3 cm)
- climb the outside of vertical pipes and conduits up to 3 inches (7.6 cm) in diameter; climb the outside of larger pipes attached to buildings by bracing themselves between the wall and the pipe; climb the inside of vertical pipes, wall voids, or earthquake safety seams and joints between 1 1/2 and 4 inches (3.8 and 10.2 cm) in diameter;
- jump from a flat surface up to 36 inches (91 cm) vertically and as far as 48 inches horizontally;
- drop 50 feet (15 m) without being seriously injured;
- burrow straight down into the ground for at least 36 inches (91 cm);
- reach as high or wide as 13 inches (33 cm);
- swim as far as 1/2 mile (800 m) in open water, dive through water traps in plumbing, and travel in sewer lines against a substantial water current. In areas where high rat populations exist, it is common for both roof rats and Norway rats to enter buildings through toilets and uncovered drains.





- **Instinctive behavior**

- it's the smell of danger.

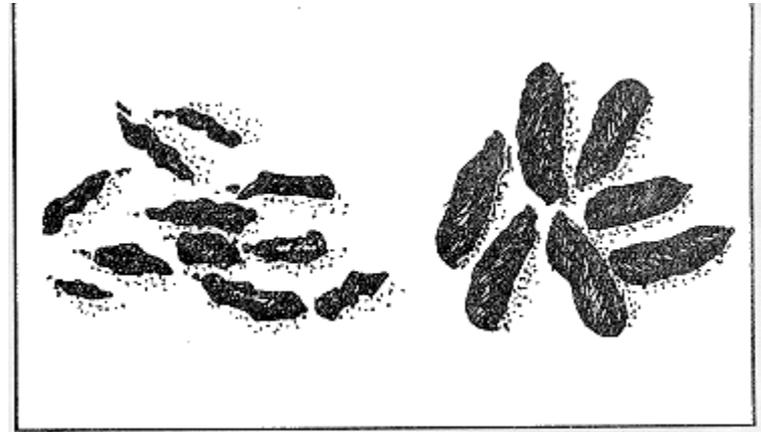
- It's been known so long that predator odors are great



Sign

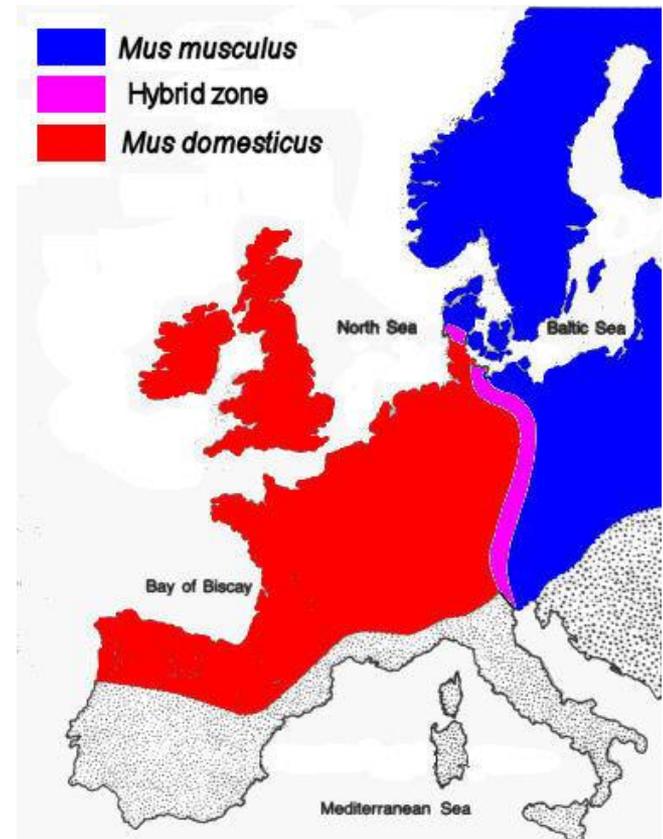


- 1 Droppings
- 2 Visual sightings
- 3 Noises
- 4 Smudge
- 5 Tracks
- 6 Gnawing
- 7 Urine stains
- 8 Odors
- 9 Burrow openings



Mice

- *Mus musculus domesticus*
- *M. musculus brevirostris*
- **Size:** House mice measure 12 to 20 cm in length, including the tail, and weigh 12 to 30 grams.
- **Color:** They may be white, brown or grey in color.
- **Head:** Their snouts are triangular and feature long whiskers.
- **Tails:** Mice have large, floppy ears and long, thin, hairy tails.



Control chart

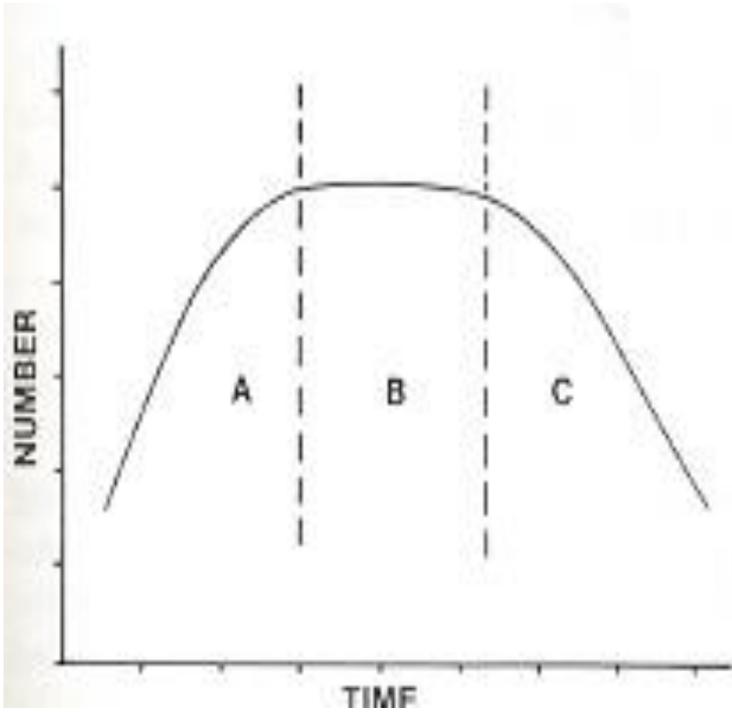
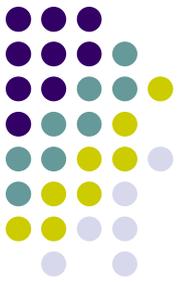


Fig 1 Population growth measured in number of rats per unit area versus time

Chemical

1 Foods

- Red squill
- Anticoagulants
 - * Bromadiolone
 - * Chlorophacinone
- Alpha-naphthyl thiourea (ANTU)
- Zinc phosphide
- Sodium fluoroacetate
- Thallium sulfate
- Others



Red squill



Bromadiolone



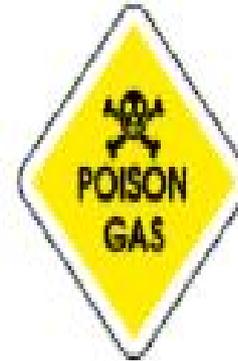
Zinc phosphide





2 Gas

- Calcium cyanide
- Methyl bromide
- Sulfur dioxide
- Carbonmonoxide

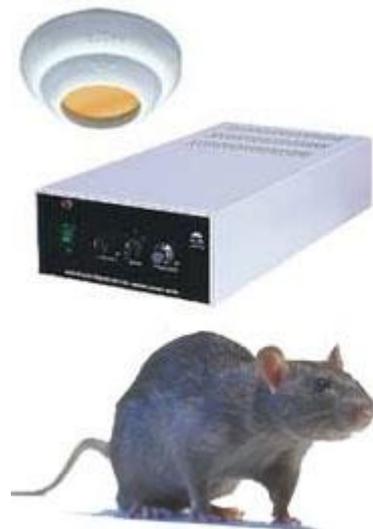


3. Natural



4 Physical

-Ultrasound



Bird

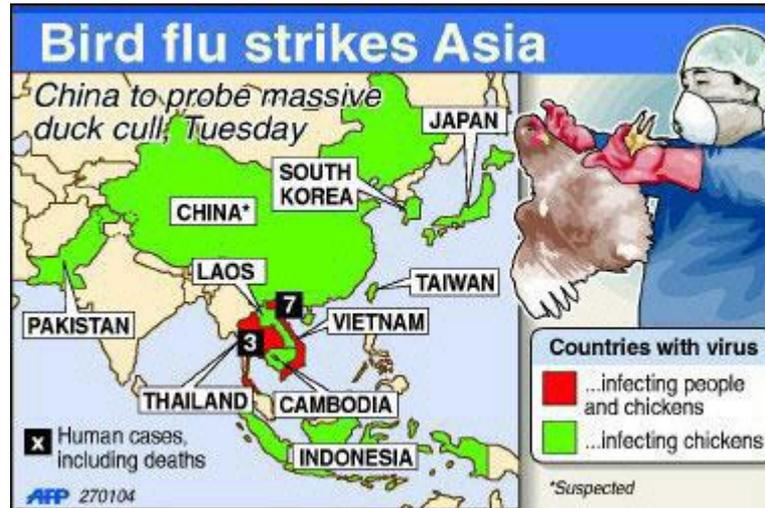


- **Carrier**

- *Psitticosis*
- *Histoplasmosis*
- *Toxoplasmosis*
- *Cryptococcosis*
- *Pseudotuberculosis*
- *Coccidiosis*
- *Campylobacteriosis*



Salmonellosis from *S. typhimurium* and *Campylobacter jejuni*



Pigeon

- *Salmonella*
- Spore of *Histoplasma* and *Cryptococcus*



Control



1 Using control program

2 Climate

3 Chemical

3.1 Strychnine

3.2 Avitrol[®]

3.3 Starlicide[®]

3.4 Ornitrol[®]

3.5 Rid-a-bird[®]

4 Physical

- Mimicry
- Pyrotechnic and sound devices
- lights
- Shooting
- Sticky chemical
- Netting
- Trapping

