

# Caring for Rats

## (*Rattus norvegicus*)

The species of rat available today in pet shops and used in biomedical research is *Rattus norvegicus*. Prior to use in research or as pets, rats were bred for use as prey for gaming purposes in the 1800s. From this early domestication, albinos and various-colored mutants were selected by individuals. The albino rat is the predominant rat used in research today. An albino animal is recognizable by its white fur and pink eyes. However, there are a variety of non-albino rats sold in pet shops that have varied hair coats, such as white with black or tan coloration over their shoulders and chest (hooded rats) and solid-colored animals that may be blond, tan, or black.

Rats are nocturnal, so they eat and reproduce at night and sleep or rest during the day. Rats are social animals and usually will not fight when group housed in cages. They groom and play together and tend to sleep close to each other.

### Housing Requirements

Rats are best housed in cages with solid floors and walls. Plastic cages made of materials such as polycarbonate allow easy visualization and prevent damage by chewing, although other materials may be used if they meet these guidelines. Secure cage lids are necessary to prevent rats from escaping; lids are usually made of wire mesh and often contain slots for placement of a water bottle and pelleted feed holders.

The desired temperature is 65–80°F and humidity is 30–70%.

Bedding should be used within cages to absorb urine and to allow the animal a means to modify its environment. Useful bedding materials are wood shavings or chips, cellulose chips, and corncob pellets. Cedar and pine shavings contain potentially toxic resins and should be avoided.

Bedding should be changed several times a week. Cages, water bottles, and feed containers should be cleaned at least weekly with detergents and water, and then rinsed well and dried. Vinegar can be used to remove scale, a residue from rat urine.

The cage environment for rats may be enhanced by the introduction of hard plastic or metal toys, such as balls, bones, and tubes, that are resistant to chewing. Cardboard nesting boxes can also be used.

### Food and Water

Commercial rat feed provides a balanced diet that is specifically formulated for the nutritional needs of rats, and it usually is manufactured in a pelleted form. Food should be available at all times in an elevated hopper or in a dish on the cage floor. Young rats at weaning age can easily chew pelleted feed; an

intermediate form of diet between nursing and regular feed is unnecessary. Oil-rich sunflower seeds may be given occasionally as a treat, but very sparingly. Obesity is a common problem with rats and is worsened by oil-rich and high-fat diets or treats. Rats have incisor teeth that grow throughout life, and pelleted feed helps prevent overgrowth. Rats are naturally coprophagic (they eat their own feces), and derive a nutritional benefit from this practice.

Water should be available at all times. Water is best provided in a bottle with a sipper tube. Sipper tubes should be checked daily to make sure they are not clogged. If there are young rats in the cage, care must be given to ensure that water and feed are within reach of the animals. The water bottle must be well-stoppered so that water does not leak into the cage, potentially chilling the animals.

### BIOLOGICAL INFORMATION

- Life span: 2-3 years
- Adult body weight: males: 400-600 g (14-21 oz); females: 250-300 grams (9-11oz)
- Sexual maturity: 7-8 weeks
- Estrous cycle: 4-5 days
- Gestation: 20-22 days
- Litter size: 6-12
- Weaning age: 21-25 days
- Adult daily food intake: 15-30 g (1/2-1 oz)



## Handling

Rats will bite; however, frequent and gentle handling or stroking will greatly reduce the likelihood of being bitten. It is thought that male rats are more likely to bite than females. As with most animals, rats respond well to being approached in a manner that does not cause startling and anxiety. A rat well-conditioned to gentle handling will rarely bite.

The best method for picking up rats is to gently but firmly grasp the rat around the chest with the thumb and forefinger of one hand, being careful to not compress the chest wall. The forefinger should be behind the elbows of the rat to help ensure that the rat is not accidentally choked. An alternative way to pick up rats is to grasp the rat at the base of the tail (not at or near the end of the tail). Picking up a rat by grasping the tip of the tail will usually cause the skin to separate from the bone. Another way to pick up a rat is to grasp the scruff of the back, lift the animal, and then transfer it to a solid surface. Females should not be disturbed for 2–3 days before and 2–3 days after they have given birth to avoid cannibalism.

## Diseases

Rats are hardy animals, but they may become ill due to viral, bacterial, or parasitic infections. Whenever possible, obtain rats from sources with a known history of having disease-free animals. It is a good idea to visually check the animals daily to look for signs of sickness, such as rough coat, dull eyes, hunched appearance, sitting back, and decreased activity.

At least weekly, physically handle the rats to feel for unusual bumps (rats are prone to developing tumors), kinks, scabs (which can mean mites), cloudy eyes, or other problems.

Many of the infectious diseases of rats affect the respiratory tract, causing rhinitis and pneumonia. Symptoms associated with respiratory infections include a nasal discharge, sniffing, and labored breathing. Infections of the intestinal tract are infrequent but can cause diarrhea.

Rats have large incisor teeth that continuously grow throughout their lives. If rats are fed soft food, have a broken incisor, or a genetic malocclusion (misaligned teeth), the teeth will not



wear down properly. If this occurs, the incisor teeth continue to grow and curl until the animal can no longer effectively chew food. Consult a veterinarian who can trim the teeth.

## Human Health Concerns

Although very infrequently seen, rats can harbor two bacterial species that cause a human disease called rat bite fever. As the name indicates, the disease is transmitted to humans by rat bite. This is one reason to know the disease status of any rats obtained for use in the classroom or as pets.

Rarely, pet rats may harbor the virus lymphocytic choriomeningitis virus (LCMV), which may infect people. Wild rodents are the primary carriers of this virus, and could contaminate classroom rodents. Washing hands with soap and water after handling pet rodents is recommended.

People may develop an allergy to rats.

Seek the advice of a physician if a human disease is suspected due to contact with rats.

## Resources

1. Rats, chapter in *Assistant Laboratory Animal Technician Training Manual*, 2008, American Association for Laboratory Animal Science, Memphis, TN.
2. Contact your veterinarian or a local veterinary school or veterinary technology program to get more information about this animal species.

*Some of this material has been adapted from the Assistant Laboratory Animal Technician Training Manual, American Association for Laboratory Animal Science, Memphis, TN.*