RAT (*Rattus norvegicus*)

**Natural history**

The Norwegian or brown rat is originally from Asia where it lived in burrows on the plains of northern China and Mongolia. The rat arrived in Europe in the early 18th century and had reached America by the late 18th century. The brown rat was the first species to be domesticated for scientific purposes.

**Taxonomy**

- Class Mammalia
- Order Rodentia
- Suborder Myomorpha
- Family Muridae (rats, mice)

Muridae is the largest and most diverse family of mammals.

**Breeds**

A variety of breeds, colors, and markings are recognized.

**Diet**

Rats are omnivores. The bulk of the diet should consist of a rodent block or pellet containing a minimum 16% crude protein and 4-5% fat. Seed-based diets promote obesity and should be avoided. Longevity is increased by feeding a low fat, vegetable protein-based diet.

**Husbandry**

Rats are social creatures, although females are more likely to fight. Rats are primarily nocturnal, but they will have cycles of activity during the day and night. Avoid bright lighting in albino rats. Adult brown rats tolerate cold well when allowed to acclimate. Provide rats with items and materials for burrowing, climbing, and chewing.

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<th>Normal physiologic values</th>
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<td>Target environmental temperature:</td>
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<td>Target relative humidity:</td>
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**RAT**

**Gestation** 21-23 days  
**Litter size** 6 to 13  
**Birth weight** 5-6 g  
**Weaning** 21 days  
**Water intake** 22-33 ml/day

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**Anatomy/Physiology**

The harderian gland lies behind the eye and fills a large part of the orbit. The harderian gland secretes lipids and a red porphyrin pigment which fluoresces under UV light. Secretion increases with stress or disease.

Rats have a well-developed sense of hearing, touch, and smell, but poor vision. Eyesight is especially poor in albinos. Rats can hear high frequency sounds so take care with high pitched and ultrasound noises emitted from equipment like TVs and computers.

Dental formula Incisor 1/1 canine 0/0 premolar 0/0 molar 3/3. Iron pigments create the yellow-orange color of the incisors. The lower incisors are normally 3X longer than the upper incisors. Incisors are open-rooted but molars stop by growing by Day 125.

All rodents are obligate nasal breathers.

Testicles are evident by 3-4 weeks. In addition to 6 mammary glands on each side of midline, mammary tissue extends from the neck to elbow and down into the inguinal region.

**Restraint**

Rats are generally docile and are easy to handle. For manual restraint, grasp the rat over the back and place a thumb in the axilla pushing a foreleg up towards the chin.

**Venipuncture**

Collect blood samples from the lateral tail vein, ventral tail artery, femoral vein, jugular vein, or lateral saphenous vein. Warm the tail first to promote vasodilation.

**Important medical conditions**

- Mammary tumors
- Mycoplasmosis

**References and further reading**


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