

# APPROACHES TO GUINEA PIG CARE

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**Lesa Longley** provides an overview of husbandry and diet, and explains the common issues that may present in veterinary life, such as pruritus and heat stroke

## Introduction

- **Common title.** Guinea pig.
- **Scientific title.** *Cavia porcellus*.
- **Origin.** South America – domesticated (guinea pigs) and wild (cavies) strains are kept as food animals.
- **Environment in the wild.** Guinea pigs' natural habitats are mountain and grasslands. They live in small social groups of five to 10 individuals. Domesticated species do not exist naturally in the wild.
- **Diet in the wild.** Guinea pigs are herbivorous, and they mainly feed on herbs and grasses.
- **Captive enclosures and environments.** Hutches are usually wooden with a mesh front to permit ventilation. A large run should be connected directly to the hutch, or a separate pen for exercise and grazing. Ensure a sheltered area is provided, thus protecting the guinea pigs from the elements. Guinea pigs are prey species and require bolt-holes (such as boxes or plastic pipes), with at least one per animal, to allow escape from intra-specific aggression. The enclosure should be predator proof. Ideally, it should also be protected from wild birds and their droppings, which may transmit *Yersinia* and *Salmonella* species.

In the UK, pens are usually outdoors during the summer months, although many are moved into sheds or other outbuildings in cooler months. The preferred environmental temperature is 16°C to 24°C. Flooring should be smooth – wooden is a good example. Straw, hay, wood shavings or shredded paper are commonly used as substrate ([Figure 1](#)). Latrine areas should be cleaned at least twice weekly. Guinea pigs are often kept in groups, particularly females. Care should be taken if youngsters are mixed with several adults, as injuries may occur if they are startled. Entire males housed together are likely to fight when sexual maturity is reached.

- **Captive diet.** Good-quality meadow grass (such as Timothy) or hay should form the basis of the diet. Commercial diets are usually either a muesli-type mix of crushed grains, pellets and dried vegetable matter, or just pellets. The latter are preferable to prevent selective feeding (usually of grains, resulting in carbohydrate overload and insufficient fibre intake). Fresh vegetables are also offered. Since guinea pigs lack L-gulonolactone oxidase, they cannot synthesise vitamin C. Therefore, they have an absolute dietary requirement for this vitamin – of 10mg/kg/ day (30mg/kg/day during pregnancy). Although commercial diets are usually supplemented, the vitamin is rapidly degraded during storage, and it is advisable to supplement by other means – either by providing fresh vegetables or by adding vitamin C to drinking water. Water is provided in either a sipper bottle or sturdy water bowl. Drinking water should be changed daily; this is particularly necessary if the water container is metal, as it will oxidise any vitamin C supplement.

## Anatomy and physiology

Guinea pigs belong to the Hystricognathi suborder of rodents, in the Caviidae family.

- **Longevity.** Four to eight years.
- **Bodyweight.** Female 750g to 1kg, male 1kg to 1.2kg.
- **Rectal temperature.** 37.2°C to 39.5°C.
- **Blood volume.** 70ml/kg to 75ml/kg. Kurloff cells (a type of leukocyte) are mostly seen in pregnant females.
- **Heart rate.** 190bpm to 300bpm.
- **Respiratory rate.** 90/min to 150/min.
- **Temperature.** Guinea pigs' compact body shapes mean the animals conserve heat well, but dissipate it slowly, making them susceptible to heat stroke (often fatally).
- **Tympanic bullae.** Guinea pigs have a large tympanic bulla, and four toes on each forelimb, three on each hindlimb.

## Digestive system

- **Dental formula.** I 1/1, C 0/0, PM 1/1, M 3/3. All teeth grow continuously.
- **Caecum.** The large sacculated caecum contains 65 per cent of gastrointestinal contents.

## Reproductive information

There is a single pair of inguinal mammary glands on both the males and females.

- **Sexual maturity.** Female four to six weeks old, male nine to 10 weeks old.
- **Gender specifics.** Males have lateral scrotal swellings either side of the anus, and the inguinal ring is permanently open. The bilateral seminal vesicles are large (10cm) in the caudal peritoneal cavity.

Females have a Y-shaped perineum, and a vaginal membrane that is open during oestrus and at parturition. There is a bicornuate uterus, short uterine body and single cervix into the vagina. There is lots of fat in the broad ligament. Guinea pigs are polyoestrus. A vaginal plug is formed after copulation. The pubic symphysis dilates 2cm to 3cm to allow the foetus through at parturition. This separation can be palpated less than two weeks before parturition. The symphysis fuses in females at nine to 12 months of age, and nulliparous females should not be bred after this age as the risk of dystocia is high.

- **Gestation.** Fifty-nine to 72 days.
- **Litter.** One to six.
- **Nourishment.** Guinea pigs are precocial, with both fur and open eyes at birth. Weaning starts at three weeks old.

## Behaviour and training

Guinea pigs are generally calm in a routine environment, but they are a nervous prey species in novel situations. Well-handled individuals are usually quiet during examination, but others are likely to be flighty and run at high speed before capture.

## Veterinary care

To move the animal, grasp it around the shoulder s t o restrain it on a table. Support the hindquarters and abdomen when lifting ([Figure 2](#)). Guinea pigs rarely bite.

Guinea pigs vocalise profusely when injected. Administer subcutaneous injections just caudal to the mantle of thickened skin overlying the shoulders. Small muscular sites mean correspondingly small volumes can be injected (using more than one site if necessary), such as the quadriceps muscles or lumbar musculature. Blood sampling is difficult – the lateral saphenous and cephalic veins are useful for small samples, but the jugular or anterior vena cava must be accessed under anaesthesia for larger samples.

## Anaesthesia options

- Premedicate with atropine (0.05mg/kg SC), then induce with sevoflurane in a chamber. Guinea pigs often salivate profusely when induced with a gaseous agent, but this is less severe with sevoflurane (in comparison to isoflurane), and after an anticholinergic agent.
- Premedicate with fentanyl or fluanisone (0.5ml/kg SC/IM to 1ml/kg SC/IM), then induce with midazolam (1mg/kg SC/IM to 2mg/kg SC/IM).
- Induce with ketamine (40mg/ kg IM/IP) + medetomidine (0.5mg/kg IM/IP), or ketamine (5mg/kg IM to 15mg/kg IM) + midazolam (0.5mg/kg IM to 1.0mg/kg IM).
- Maintain on oxygen with or without a gaseous anaesthetic (such as isoflurane or sevoflurane) using a closely-fitting mask ([Figure 3](#)).
- Check and clean oral cavity after induction to remove any food material.

## Anaesthesia monitoring

- Check respiratory rate and pattern by observing thoracic excursions and heart rate using a bell or oesophageal stethoscope.
- Use a rectal thermometer to check temperature.
- Pulse oximeters and ECG pads can be applied to feet.
- Pedal withdrawal reflex lost at surgical plane of anaesthesia.

## Supportive care during and post-anaesthesia

Use supplemental heating (such as heat pads, forced warm air blankets or incubators) and monitor the temperature to ensure it is not overheating. Administer fluids, such as Hartmann's SC/IP.

## Surgery

Where possible, use an intradermal suture pattern to reduce the risk of self-trauma and suture removal. Provide analgesia appropriate to the procedure – including local anaesthetic agents (such as lidocaine), NSAIDs (such as meloxicam or carprofen) and opioids (such as buprenorphine).

- **Castration.** Either perform a closed castration or close the parietal tunic after an open procedure.
- **Ovariohysterectomy and caesarean section.** Use a midline approach, as for other small mammals.

## Common problems

Pruritus is usually associated with mange mite (*Trixacarus caviae*) infestation, and diagnosed with skin scrapes and/or a response to treatment with ivermectin (0.2mg/kg topically or SC q2wk). In-contact animals should be treated and the environment cleaned. Lice (*Gliricola porcelli* or *Gyropus ovalis*) rarely result in pruritus.

Females in poor condition that are frequently bred may develop “hormonal alopecia” in late pregnancy and shortly after parturition.

Cheilitis may be associated with abrasive or acidic food, or a poxvirus infection. Topical cleaning and husbandry assessment is usually curative.

Subcutaneous swellings are usually abscesses (often after fight wounds from conspecifics), and usually require surgical excision. Neoplasia is a differential, with trichofolliculoma the most common type in guinea pigs (these also respond to surgical excision).

Cystic ovarian disease was found in 76 per cent of females from two to five years old in one study. It is usually bilateral, and often presents with bilaterally symmetrical non-pruritic alopecia. Ultrasound is the best diagnostic tool, and the treatment of choice is ovariohysterectomy.

Pododermatitis is associated with hard substrate (such as wire mesh) and dirty or wet bedding, particularly in older, obese animals. Ulceration is often followed by infection. The extent of the infection should be determined using radiography, assessing for osteomyelitis. Topical ointments, debridement and husbandry improvements are required to treat the condition.

Dermatophytosis is uncommon. Young animals are more susceptible, or animals with poor husbandry or other stressors.

Cervical lymphadenitis is usually associated with *Streptococcus zooepidemicus*, and treatment is via surgical excision or drainage of the abscessed lymph node(s), with systemic antibiotics. Poor husbandry and diets may predispose the condition.

Heat stroke is common in guinea pigs (in temperatures more than 27°C to 30°C). Treat it by administering room-temperature fluids and minimising stress.

Dental disease occurs frequently, and is usually associated with a lack of dietary fibre, with malocclusion possible in incisors or cheek teeth. Mandibular teeth overgrow lingually (resulting in tongue entrapment), while the maxillary arcade is angled laterally. This is the most common aetiology of anorexia in pet guinea pigs. Any investigation should include oral examination under general anaesthesia and skull radiographs. Dental treatment under anaesthesia often needs to be repeated due to persistent malocclusion. The afflicted animal's diet should be optimised, with an increase in the hay component.

With gastrointestinal disease, clostridial infection is commonly secondary to antibiotic therapy. Coccidiosis may occur in groups. *Yersinia* and *Salmonella* species may originate from wild birds. Supportive care (fluids and assisted feeding) is an important part of the treatment regime. Antibiotics should be administered with care in this species.

Respiratory disease is often secondary to poor husbandry. *Bordetella bronchiseptica* and *Streptococcus pneumoniae* are common aetiological agents. The upper airways are often first affected, with dissemination to the lungs and possibly systemic disease. Antibiotics and supportive care should be given.

*B. bronchiseptica*, *S. zooepidemicus* and *Pasteurella* species may cause otitis media, with an associated loss of balance and head tilt. The prognosis is guarded, but some respond to antibiotics.

Cystitis and urolithiasis are relatively common in guinea pigs. Antibiotics and NSAIDs are usually administered to treat cystitis. Cystotomy is required to remove any bladder stones. Recurrence is reduced by minimising concentrate feed and increasing water consumption (such as by adding fruit juice to drinking water and wetting vegetables before they are offered).

Males may develop urethral obstruction with plugs, but these can be gently removed.

Dystocia can be seen, particularly in females first bred after closure of pubic symphysis. A caesarean is required, but there is a guarded prognosis (due to the associated risks of anaesthesia and surgery for the dam).

Pregnancy toxæmia is seen in pregnant females or in non-pregnant obese individuals. Depression and anorexia are rapidly followed by collapse and coma. Ketoacidosis can be easily tested for using urine ketone dipsticks. Treatment involves administration of warmed dextrose/saline IP or SC, oral glucose and corticosteroids, but the prognosis is guarded.

Hypovitaminosis C (scurvy) is common in guinea pigs on an inappropriate unsupplemented diet.

Common signs include lameness and a reluctance to move. Treatment is via the administration of 100mg/kg vitamin C daily, with a response to treatment seen within two weeks. Vitamin C should be supplemented in any ill guinea pig.

Chronic interstitial nephritis is commonly reported in older (more than three years old) guinea pigs. It is thought to often develop after chronic inflammatory conditions, such as staphylococcal pododermatitis, resulting in chronic renal amyloidosis and nephritis.

- Most of the drugs mentioned in this article are not licensed for use in guinea pigs. Informed owner consent should be obtained before off-label use.
- Register at [www.vetsonline.com](http://www.vetsonline.com) to download published *Veterinary Times* articles.

## Further reading

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Figure 1. A guinea pig in a hospital kennel, with hay, (used for bedding as well as diet), vegetables and commercial mix. The cardboard box provides somewhere to hide.

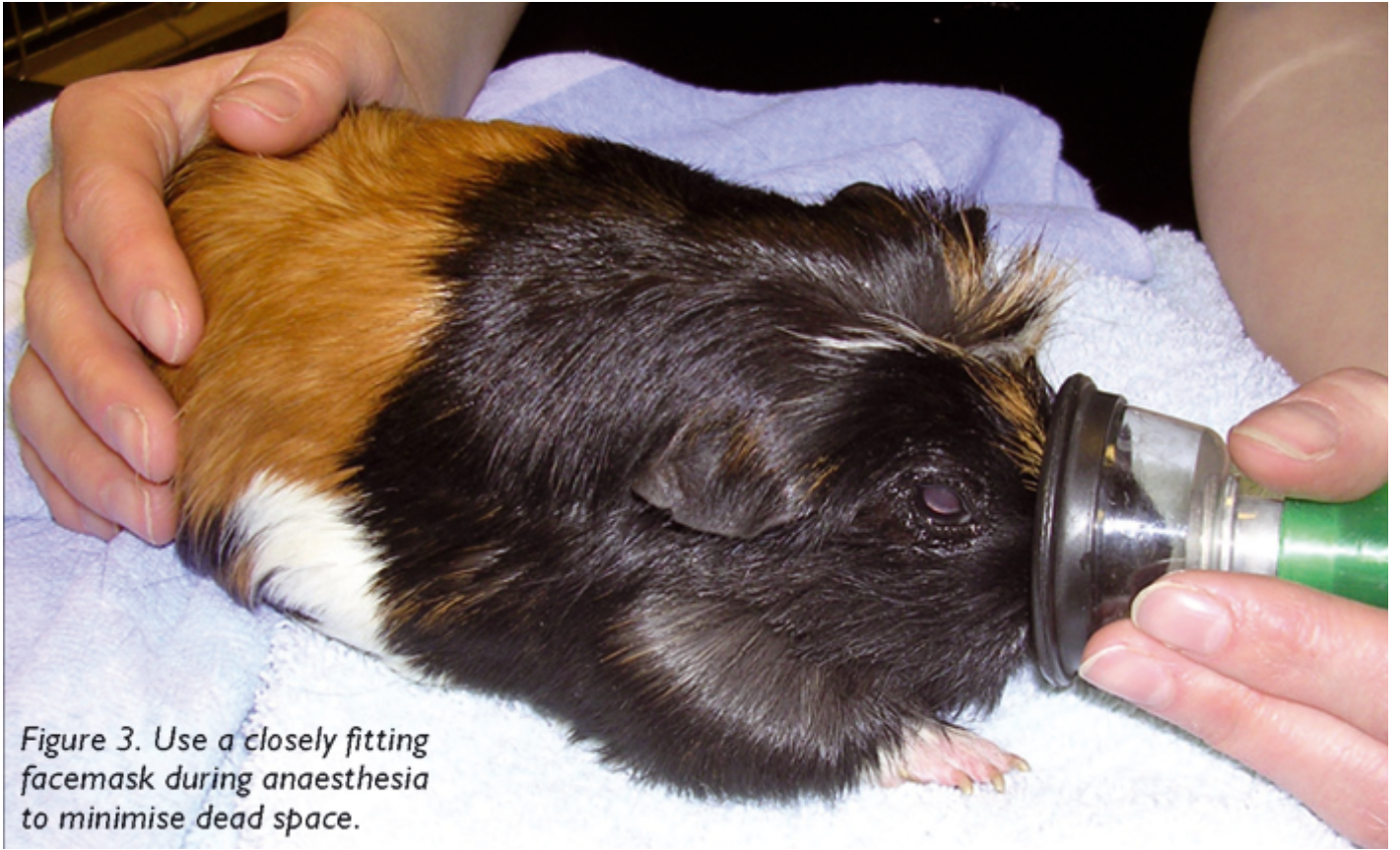
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Figure 2. Always support a guinea pig around the thorax and abdomen when lifting.

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*Figure 3. Use a closely fitting facemask during anaesthesia to minimise dead space.*

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